

CONNECTICUT **Woodlands**



## TREES AND UTILITY LINES

BECOMING “STORMWISE,” UNCUDDLY SNAPPING TURTLES,  
AND NEW ENGLAND TRAIL’S GATEWAY

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PETER OTIS

*The New England Trail has officially reached Long Island Sound. A crowd celebrates at the dedication. See page 28.*

## Connecting People to the Land

**Our mission:** The Connecticut Forest & Park Association protects forests, parks, walking trails and open spaces for future generations by connecting people to the land. CFPA directly involves individuals and families, educators, community leaders and volunteers to enhance and defend Connecticut's rich natural heritage. CFPA is a private, non-profit organization that relies on members and supporters to carry out its mission.

**Our vision:** We envision Connecticut as a place of scenic beauty whose cities, suburbs, and villages are linked by a network of parks, forests, and trails easily accessible for all people to challenge the body and refresh the spirit. We picture a state where clean water, timber, farm fresh foods, and other products of the land make a significant contribution to our economic and cultural well-being.

## Connecticut Woodlands

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# CONNECTICUT Woodlands

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*It's reality. Power lines in Connecticut usually go through trees. The "Storm-wise" research project on the University of Connecticut campus thinned out weak trees, on the left side, and left all trees up to the corridor, on the right. Trees retained on the left do not lean or overhang the lines and have been provided with growing space.*

PHOTO BY JOEL STOCKER

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# Experience teaches this tree planter slowly



BY ERIC LUKINGBEAL

**A** friend of mine just asked me for some advice about trees. Her family is building a new house, and it is nearly finished. It sits at the back of an old cornfield, about 300 feet

off a country road. There is not a single tree around it, so she has a clean slate.

Having a clean slate may sound like an advantage. But in my experience as a tree lover, all that empty space can lead to stupidity. When we moved to Granby 30 years ago, few trees surrounded our 1920 Sears Roebuck kit house. Two big catalpas—sometimes called “mother and father” trees—stood on either side of the house. They give us lots of shade, and the seeds that fall aren’t as inconvenient as many people say. The lawnmower hastens their return to the soil; they don’t need to be raked. One of the few non-stupid decisions I made was to leave the catalpas alone.

I planted some trees and allowed volunteers to grow. I made good choices and mistakes. Here is a partial list of my sins. (My wife has a more complete list.)

1. In about 1986, a landscaper friend gave

me a Dawn redwood, which I planted on a steep bank overlooking a cornfield. Growing conditions proved ideal; in 20 years, it got really big. It ruined the formerly beautiful view of the cornfield. The Dawn redwood is now gone, much to the chagrin of the arborist who had to cut it down.

2. At around the same time, I bought some 4- to 5-foot bare-root pin oaks from a western New York nursery. They were so cheap, only \$7 or so, that I got a bunch of them. I now realize that I planted only two in the right places. Those two now stand more than 50 feet tall, and their trunks measure more than 20 inches in diameter. All the rest of them press in too close to the house or each other. They seemed so far away from each other when I planted them.

Now is a good time to point out that I have no education or training at all in these matters. I am not an arborist or a landscaper or a forester. I just know how to dig a hole. And that has led to much trouble.

3. Another category of my mistakes concerns volunteers. I just can’t bear to cut them down when they’re doing so well. Right now we have a cedar near the road that will have to come down soon because it blocks the view of traffic, making pulling in and out of the driveway hazardous. We have a catalpa whose canopy is merging with a black walnut’s.

There’s also a birch that should be removed.

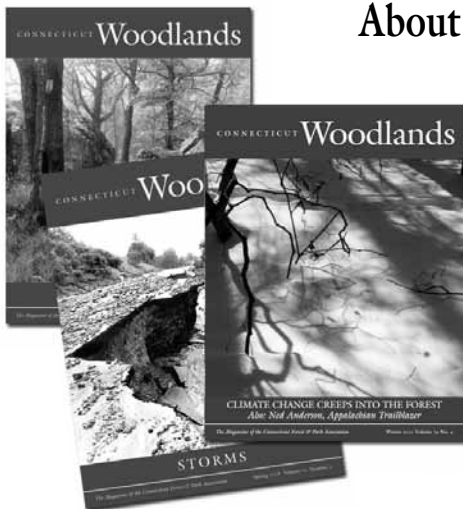
4. Oh, there are a lot more problems, if we consider shrubs. Just a few months ago, I removed the rhododendrons that grew too close to the house. A buckeye bottlebrush (very near the same spot where the Dawn redwood expired) grows too close to the fence and threatens to obscure the same lovely view of the cornfield. But I’m holding the line on that, so far, on the grounds of my status: I am a Buckeye, too.

I said that experience has taught me. That is not exactly correct. If learning is the detection and correction of error, I have learned nothing. I keep making the same mistakes. I think the trees will fit the spaces I choose forever. And I am often wrong.

The wealth advisors caution that past performance does not guarantee future results. With tree planting, the opposite is true, at least in my case.

I really should disclose all this to my friend who asked for advice. I’m meeting her at the new house site later this morning. I’ll think about how to disclose the truth in an appropriate way. Or maybe I should just take my wife with me.

*Eric Lukingbeal is a retired environmental lawyer. He lives with his wife, Sally King, in Granby, where he serves on the town’s land trust and planning and zoning commission.*



## About Connecticut Forest & Park Association and Connecticut Woodlands Magazine

*Connecticut Woodlands is a quarterly magazine published since 1936 by CFPA, the private, non-profit organization dedicated to conserving the land, trails, and natural resources of Connecticut.*

*Members of CFPA receive the magazine in the mail four times a year. CFPA also publishes a newsletter several times a year.*

*For more information about CFPA, to join or donate online, visit our website, [www.ctwoodlands.org](http://www.ctwoodlands.org), or call 860-346-TREE.*

*Give the gift of membership in CFPA. Contact Marty Gosselin at 860-346-TREE.*

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# The one problem CFPA will tackle: engaging future generations



BY ERIC HAMMERLING

Last September, the Connecticut Forest & Park Association Board of Directors held a strategic planning retreat at the Connecticut Historical Society.

The mansion is the former home of Curtis Veeder, who served on the CFPA board himself. Mr. Veeder donated Penwood State Park to the public. At this retreat, the board decided to articulate an ambitious vision looking ahead not 5 or 10 years, but to 2030.

Board President Eric Lukingbeal suggested that our strategic plan should answer three questions:

1. What is the problem that needs solving?
2. What role does CFPA have in solving that problem?
3. What will it take for CFPA to address this problem successfully?

CFPA works on several aspects of conservation including advocacy, environmental education, land conservation, trail maintenance, and recreation. It challenged us trying to name only one problem that, if solved, would benefit us all. We held small gatherings of board members, and we realized that all of us share a deep concern that future generations will become increasingly disconnected from the outdoors and lose the sense of care for the land that is necessary to protect, manage, and use it wisely.

Author Richard Louv has called this lack of connection to the outdoors “nature deficit

**IF THIS TREND IN OUR YOUTH CONTINUES WITHOUT A COUNTERBALANCE, IT WILL NOT TAKE LONG BEFORE FUTURE GENERATIONS OF CITIZENS AND LEADERS WILL BECOME DISCONNECTED FROM THE ENVIRONMENT AROUND THEM.**

## Average daily time 8-18-year-olds spent with media:

TV	4 hours 29 minutes
Music/audio	2 hours 31 minutes
Computer	1 hour 29 minutes
Video games	1 hour 13 minutes
Print	1 hour 13 minutes
Movies	25 minutes

Source: Kaiser Family Foundation/The New York Times

disorder.” The time people do not spend outside, they spend absorbed by electronic media.

Tamar Lewin, education reporter for *The New York Times*, wrote an article entitled “If Your Kids Are Awake, They’re Probably Online” that featured the graphic showing this disconcerting trend.

If this trend in our youth continues without a counterbalance, it will not take long before future generations of citizens and leaders will become disconnected from the environment around them. Disconnection from the outdoors among youth is implicated in several problems such as obesity in children and related health issues, but our primary concern at CFPA is that *unless we invest and act now with a concerted effort over many years to reverse this trend, the next generations of Connecticut citizens and leaders will care less and less about protecting the forests, parks, and trails that you have helped build and protect over the last century.*

The many victories we have proudly achieved together over many generations must not be undone.

We are now in the final phase of that strategic planning process. Do not be surprised if we contact you for your ideas about solving this problem. If you have not heard from us yet, feel free to e-mail or call me directly before the end of October. Thank you!

*Eric Hammerling has directed CFPA for six years. He lives in West Hartford.*

# Walking & Writing

“What is both necessary and sufficient—for honest work—is to have faith in the evidence of your senses and in your common sense,” wrote one of my favorite writers, the cranky Edward Abbey. He added, “To be true to your innate sense of justice. To be loyal to your family, your clan, your friends, and your community.”

In July and August, I taught a writing workshop at the Connecticut Forest & Park Association that connected trail walking to “the evidence of your senses.” Abbey made a writing career from the words that came to him as he wandered around the desert Southwest. Abbey wrote down what he really believed. He made doing that look easy.

I believe that true ideas come out of an uncluttered mind. Many writers already realize that their work is not merely an indoor, sedentary pursuit, but that the best ideas come in a flash while we are doing other things that have nothing to do with writing. My workshop introduced writers to my method of tapping into ideas: walking—alone, outdoors, with no agenda.

When I walk in the woods, or even on a sidewalk, I enter a new place of the mind, after I train myself not to think about goals but rather to listen. Here, the flash of ideas has room to unfold. My formula is 60 minutes of motion followed by 20 minutes of writing. This can burst open even the most blocked mind.

We writers think we have to sit like monks to work. We spend hours in a seat holding back the wild beast, followed by a few minutes, perhaps, watering the flowers. In my workshops, we all worked to reverse that thinking. I took the writers out into Highlawn Forest behind CFPA. Because we wanted more time back in the meeting room, we limited the walks to a half hour. The late Brenda Ueland in *If You Want to Write* (Graywolf Press, 1987) says that if we walk to fulfill a grim regimen, we tally our lives or tasks. Instead of this, our aim in the walks is to

Continued on page 25

## P R E A M B L E

MANAGING SMARTER,  
NOT CUTTING HARDER

In response to Hurricane Irene and a pre-Halloween 2011 nor'easter and then Hurricane Sandy in October 2012, tree-cutting crews swarmed to the roadsides and cut many standing trees, even when the trees looked stable. The series of articles on the next pages asks: Must we simply cut when we could actually cultivate?

Huge amounts of money are at stake. The Connecticut Department of Transportation doubled its annual highway tree-trimming budget after Irene and the nor'easter in 2011, and then in 2012 doubled it again, to \$2 million. That looked small compared with Connecticut Light & Power's approach: It doubled its annual tree-cutting budget in 2012 to more than \$53 million. That, in turn, seemed almost nil compared with United Illuminating's budget passed this year for \$100 million for tree trimming over eight years in the 17 towns of its service area.

The best science and the last century-plus of reforestation together tell us that worsening storms, trees, and utility lines will be at war with one another unless we respond differently. Read on about new theories and research. These foresters believe that roads can continue to wind their way through trees in the future. Those trees might not be the same species of trees we now have. They will be situated differently. We do not have to cut down all the trees.

—Christine Woodside  
Editor, Connecticut Woodlands



*A shot of the arborist crew working, along with portable band-saw mill and green lumber products in view.*

JENNA KLINCK

BY THOMAS E. WORTHLEY  
WITH DR. MARK RUDNICKI, DR. JEFFREY WARD,  
AND DR. JOHN VOLIN

**O**n October 30, 2011, I worked at Great Mountain Forest with colleague Dr. Jeffrey Ward of the Connecticut Agricultural Experiment Station, running a workshop about controlling invasive species. I arrived home in Higganum just as the heavy wet snow was beginning to accumulate. That fall's weather had been glorious with—as yet—no killing frost. Oaks, hickories, and beeches still held leaves that were slowly changing color. But now as I parked my truck, the trees creaked and cracked. I worried that limbs would fall on my truck.

The next day, another friend and colleague, Dr. John Volin, whose long driveway was blocked by fallen trees and branches,

# INTRODUCING THE “STORMWISE” INITIATIVE

## THE RIGHT TREES IN THE RIGHT PLACES



asked me if I could help him clear it.

“Well, John,” I replied, “I’ll be happy to come over and help as soon as I cut my own way out, but it might be a couple days.” My wife and I live up a long woodland road. We had lost the tops of a couple of trees a few weeks earlier during Irene. The pre-Halloween 2011 snow, however, left quite a bit to clean up. But our situation did not seem so bad. We heat with wood, we sawed one downed white oak trunk for a nice picnic table, and the power came on after a couple days.

Across many regions of Connecticut, the situation was far worse. Fallen trees blocked roads and cut off electricity for many days. Tales of personal hardship, lost business, and cleanup costs abounded; losses to the state were estimated in the multimillions, and about a year later, many of us experienced

another similar disruption when Sandy came ashore.

Governor Dannel P. Malloy formed an advisory committee, the Governor’s Two-Storm Panel (a year later renamed the Three-Storm Panel, after Sandy). The Two-Storm Panel recommended the formation of the Statewide Vegetation Management Task Force. It also called for new research on storm resilience at the University of Connecticut.

As it happens, some research was already underway. The UConn School of Engineering was developing a damage prediction model that worked with incoming storm-weather data with the intent of informing utilities where to expect the worst conditions. Dr. Mark Rudnicki of the UConn Department of Natural Resources and the Environment was already studying

biomechanics research. The vegetation task force report ultimately offered some good common-sense suggestions: that we should be able to retain our wooded roadsides but that those forests would be different than most forest. The right tree should be established in the right place. Roadside trees should be shorter, wider trees with crowns that spread in all directions rather than tall, crowded, narrow-crowned trees.

### How Trees Crowded Roads

Most of the trees in Connecticut today matured slowly starting in the early 1900s. Roadside woods have remained nearly unmanaged for the better part of 100 years. When utility companies began building the infrastructure to distribute electrical power, the roadside forest had a vastly different appearance, structure, and condition than it has today. As the power infrastructure has expanded to accommodate growth and development, its essential configuration (wires mounted on poles) has not changed. But maturing trees in the adjacent forest have changed greatly. They have grown taller and more dense. The forest is a bit like an unweeded garden now. Many fine and robust specimens stand, but a lot of trees are, well, unhealthy, near the end of their natural life span, struggling for space, damaged or defective, and in short, aren’t so great (with respect to being near to key infrastructure). Correcting the situation will not happen overnight either.

Simplistic approaches such as removing everything within a certain distance of the asphalt is impractical, controversial, or unacceptable. Initial regulatory directives to the utilities such as “enhanced tree trimming” addressed only part of the issue and are not long-term solutions. Creating forest conditions along roadsides that are truly storm-resilient requires managing trees for the right species mix, age structure, and spatial arrangement based on site conditions. That in turn will require a suite of plans, policies, and practices, based in the best available silvicultural and arboricultural science, community engagement, utility backing, and public support to put into effect. “Stormwise” is an initiative undertaken to address these challenges.

With deep appreciation to Connecticut Forest & Park Association and Connecticut Woodlands magazine for providing this forum, we take this opportunity to introduce

the Stormwise Initiative. In this issue, a series of articles is presented that highlight the science and research supporting Stormwise, describe the roles of the many partners and collaborators in the endeavor, and encourage the public information and engagement that will be key to the success of the project.

### The Stormwise Authors

**Dr. Mark Rudnicki** is associate professor of natural resources in the Department of Natural Resources and the Environment at UConn. His research career has focused on the science of how wind affects trees and spans the North American continent. Mark co-authors an article with UConn Master of Science candidates **Jenna Klinck** and **Amanda Bunce** that will provide some fundamental information on tree biomechanics. Perhaps it will clear up the mystery of why trees near the edge of the forest might fail in high winds, while trees next to an open field do not.

**Dr. Jeffrey Ward** is chief scientist in the Department of Forestry and Horticulture at the Connecticut Agricultural Experiment Station in New Haven. His article describes Stormwise forest roadside vegetation management research now underway and the creation of demonstration areas at locations across the state. Dr. Ward has decades of forestry research experience in Connecticut and offers insight as to how research results can translate to management recommendations.

**Dr. John Volin** is professor and department head in the UConn Department of Natural Resources and the Environment. He is working with a talented doctoral candidate and co-author, Jason Parent, to investigate how remote sensing technologies can be applied to assessing and managing the roadside vegetation. They will introduce you to Light Detection And Ranging, called LiDAR. This technology can paint a digital three-dimensional picture of the forest edge, providing utilities and communities with important information about potential risk and work prioritization.

As associate extension professor, UConn Extension Forester **Thomas E. Worthley** is examining the potential for wood product value recovery from roadside forest management. Working with nontraditional harvesting methods and local utilization scenarios, perhaps our roadside forests might also become “working lands,” generating local jobs and economic activity. Economic



AMANDA BUNCE

*The view of the “ground crew” (UConn NRE student Bailey McNichol) from the top of the sensor installation ladder.*

benefits are anticipated with a more resilient power infrastructure and long-range through dramatic reductions in trimming schedules.

Finally, we are all involved in the vast challenge of sharing this information with professionals, local officials and decision makers, landowners, public utilities, the labor force, and the public. This will be accomplished through lectures, workshops and training programs, articles, publications, and electronic media. This series of articles is just a beginning. We imagine “Stormwise Communities” (akin to “Firewise” communities in the West) in which roadside forests are present and healthy but where the power stays on (most of the time); where residents, town officials, local utilities, the environmental community, and local businesses are engaged together in the management of these woodlands for the benefit of all.

From a forest vegetation standpoint, Stormwise is based on three very simple ideas:

- ▶ Trees with space to grow will be healthier trees.
- ▶ Tree crowns and branches will develop toward the sunlight.
- ▶ Trees that are exposed to wind conditions will develop what we call wind-firmness.

Putting these ideas into practice requires integrating modern technology, arboricultural science, and good silvicultural technique in innovative ways that will place forest management right out in plain view. Stormwise is new and has not been practiced in other parts of the country. Connecticut is leading on this initiative, and the people here who know the most about trees, forest management, remote sensing technology, and power systems are working on it.

Stormwise is funded by Connecticut Light & Power (a Northeast Utilities company), United Illuminating, and the U.S. Department of Agriculture Forest Service. Audubon Connecticut and the Connecticut Department of Energy and Environmental Protection are research partners. Cooperating landowners who have agreed to locating research and demonstration sites include the White Memorial Foundation, Manchester Water and Sewer Department, Connecticut Water Company, South Central Connecticut Regional Water Authority, and UConn Forest. Many other agencies, organizations, and individuals have expressed their support and encouragement.



# ASSESSING TREE HAZARDS THROUGH REMOTE SENSING

*LiDAR technology can measure tree heights, hills, and more*

BY JASON PARENT AND DR. JOHN VOLIN

The Stormwise program of strengthening roadside trees will take many years to put into practice. To get the most benefit in the short term, foresters and contractors will focus on areas where the forest presents the greatest risk to power lines. Connecticut has nearly 17,000 miles of power lines, so remote sensing offers the best solution for assessing those risks from the air.

Airborne light detection and ranging technology (LiDAR) allows us to measure tree heights and stand density as well as the slope and orientation of the terrain. Using geographic information systems (GIS), a computer system that allows us to manage and analyze geographical data, we can use the LiDAR data to identify trees that are close enough and tall enough to be potential risks to power lines. These data can then be incorporated into the University of Connecticut’s storm damage prediction model, thereby making it more robust in its predictive ability.

Airborne LiDAR uses a laser scanner, along with a global positioning system (GPS), to provide extremely accurate three-dimensional measurements of the landscape. The laser scanner measures the locations of features on the earth’s surface relative to the aircraft while the GPS determines the location of the aircraft. Modern laser scanners can emit more than 100,000 laser pulses per second and thus quickly generate large amounts of point measurements with elevation and location information. The distance between point measurements can range from several meters to several centimeters depending on the frequency of the scanner and the altitude and speed of the aircraft. The closer the points are together, the smaller the features that can be consistently identified with the data. For instance, when the point spacing is close enough, we have been able to even detect the cross arms of utility poles with our LiDAR data. During the past decade, LiDAR data have become routinely used to measure forest canopy height and other stand characteristics.

## Three-Fourths of State Surveyed from Air

LiDAR coverage of Connecticut has increased rapidly in recent years with data having been acquired for nearly 75 percent of the state since 2010. These data were intended to model terrain, so they were collected in the late fall when the leaves were off of the deciduous forest canopy trees. The lack of leaves allows laser pulses to penetrate the canopy more easily and reach the ground, which is ideal for terrain models. However, data collected during leaf-off conditions may be less ideal for measuring forest canopy height and density. The laser pulse will penetrate further into a leaf-off canopy before it reaches a cluster of biomass that is dense enough to generate a detectable return signal. Thus, we expect LiDAR to underestimate canopy height when the data are collected during leaf-off conditions.

Before using the leaf-off LiDAR data to identify tree hazards, we first needed to know whether the data could measure the height of the forest canopy with an acceptable level of accuracy. In summer 2013, we measured the heights of 1,650 trees in northeastern Connecticut and surveyed their locations. We also measured canopy density within 120 forested sample plots. We then compared the field measurements to the models that we created from the LiDAR data. As expected, we found that our data did underestimate canopy heights, but the estimates were low by only about 1.5 meters on average. The accuracy of the height estimates did not differ much among the 17 deciduous tree species that were included in the field survey. We also found that by using the LiDAR data we were able to accurately estimate canopy density despite the leaf-off conditions.

Because our models closely compared with the field data, we were able to use the LiDAR

data to create maps of canopy height and density. Mapping and measuring heights for individual trees with LiDAR, however, is an ongoing challenge that we hope to resolve in the future. Nonetheless, currently we can assess power line tree hazards by simply creating a grid that reflects the height of the forest canopy at any given location. The heights of the grid’s cells and their distance from the power lines can then be used to determine whether the forest canopy at that location is tall enough and close enough to strike the power line. We refer to the grid cells in which the forest canopy can pose a risk to the power lines as *tree hazard cells*. To date, we have mapped the tree hazard cells throughout eastern Connecticut and, during the next several months, we will map them out for the nearly 75 percent of the state where LiDAR data are available.

Mapping the tree hazard cells is only a first step in assessing the risk that roadside forests pose to utility infrastructure. A tree located near a power line doesn’t necessarily have a high potential for failure. Based on biomechanics research, Stormwise investigators suspect that certain characteristics of a forest stand can help predict the likeliness of tree failure during a storm. Stand density is one important factor that may help predict tree failure, and fortunately, this is another characteristic that we can estimate with LiDAR. We can also measure attributes such as the slope and orientation of the ground and the roughness of the canopy, which can affect the exposure of trees to the wind. With soil data, provided by the Natural Resource Conservation Service, we can also identify tree hazard cells that are located on wetland soils where tree roots are typically shallow and weak. In our ongoing research, we are assessing which forest characteristics are useful in predicting the occurrence of power failures at locations reported in Northeast Utilities’ records.

Because all of the strategies in the Stormwise program will take many years, LiDAR and other geospatial data will help focus these efforts first on the places where they can have the greatest positive impact in the short term.



*The demonstration area along Gadpouch Road in Meshomasic State Forest. At left, the road before thinning; at right, after. The power lines on this bucolic gravel road supply most of the power for Colchester, sections of East Hampton, and Hebron.*

## A NEW WAY TO MANAGE ROADSIDES

*Cultivate forests that can withstand winds*

BY JEFFREY WARD

Think back to the two storms of 2011 when hundreds of thousands of Connecticut residents lived without electricity for many days after Hurricane Irene and the pre-Halloween storm. Think back to Hurricane Sandy the following year, which left hundreds of thousands in the dark and blocked roads for a week or more. We have been lucky that a hurricane has not had a direct hit on Connecticut since Gloria in 1985. Imagine if Connecticut’s taller forests had been hit by back-to-back hurricanes as the state was in 1955 with Hurricane Connie and Hurricane Diane, or the Category 3 hurricane of 1938 that knocked down half the trees east of the Connecticut River. Imagine.

As much as our iconic stone walls, the trees blanketing our hillsides and lining our streets define Connecticut’s sense of place. We are the fifth most forested state, and our urban areas have the highest forest cover (67 percent of the land mass) in the nation. Working on parallel tracks, members of the State Vegetation Management Task Force, which I co-chaired with Tom Degnan, and

**AS MUCH AS OUR ICONIC STONE WALLS, THE TREES BLANKETING OUR HILLSIDES AND LINING OUR STREETS DEFINE CONNECTICUT’S SENSE OF PLACE. WE ARE THE FIFTH MOST FORESTED STATE, AND OUR URBAN AREAS HAVE THE HIGHEST FOREST COVER (67 PERCENT OF THE LAND MASS) IN THE NATION.**

faculty at the University of Connecticut, led by Mark Rudnicki, Tom Worthley, and John Volin, have developed similar strategies to manage trees along the approximately 7,600 miles of roads that cross landscapes that would be considered forested landscapes in the traditional, rural sense.

At the suggestion of the Connecticut Department of Energy and Environmental Protection’s Division of Forestry, a collaborative team of scientists, DEEP staffers, and private foresters assembled to tackle the challenge of maintaining the aesthetic appeal of forested Connecticut byways while reducing the potential of tree-caused damage to the utility infrastructure during severe storms. Those scientists included experts from the Connecticut Agricultural Experiment Station, the University of Connecticut, Audubon Connecticut, and utility arborists from

Connecticut Light & Power and United Illuminating. We have been fortunate for the assistance of landowners who have provided locations for demonstration areas, including the Connecticut Water Company, Manchester Sewer and Water Department, the White Memorial Foundation, South Central Connecticut Regional Water Authority, and the UConn Forest.

### **Cold Fieldwork Begins Stormwise Initiative**

On a brisk December morning, it was 10 degrees Fahrenheit with 16 inches of fresh snow on the ground at the Stormwise roadside forest management demonstration area along Gadpouch Road in Meshomasic State Forest. The power lines on this bucolic

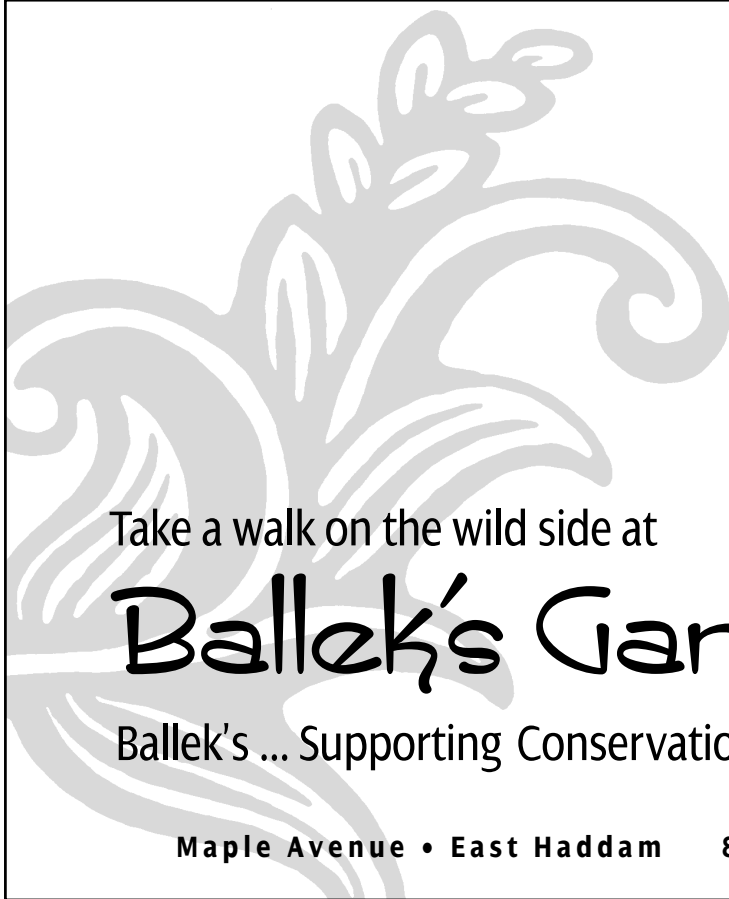
*continued on page 22*

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# TEAM MEASURES HOW MUCH TREES SWAY

*Hardwood study identifies resilient trees with goal of fewer crashes into power lines*

BY JENNA KLINCK AND AMANDA BUNCE WITH DR. MARK RUDNICKI

**A**t the top of a 40-foot ladder, harnessed safely to a gently swaying hickory tree, University of Connecticut graduate student Jenna Klinck secures a tilt sensor that will record the movements of this tree for years to come. She is a researcher on a project in Dr. Mark Rudnicki’s tree biomechanics lab, part of the Stormwise initiative. The team measures changes in tree sway dynamics. The group hopes to evaluate—and eventually improve—the resiliency of roadside trees in storm-force winds.

Recent destructive storm events in the Northeast have inspired utility companies, researchers, and other collaborators to work together on this project in an attempt to better prepare our communities. In the past, tree sway studies have been focused primarily on conifers where the timber industry can suffer severe economic losses from storm damage, and little attention has been paid to deciduous hardwood species. A critical look at how to best manage northern hardwood forests is long overdue, and UConn and its partners are taking the initiative.

## Utility Cutting Regimes Do Little

To protect our power lines from tree damage during a storm, power companies have initiated trimming cycles where every 3 to 5 years they cut tree limbs 8 to 10 feet back from the lines. This method is much better than no preparation for storm events at all, but it does nothing in the event of whole trees falling. Entire tree failure is the cause of more than half of tree-related power outages and accounts for 90 percent of all outages during a storm. Stormwise suggests taking a more holistic approach by looking at not just at offending limbs, or even whole trees, but at the entire forest. By using forestry management practices in these fragmented edge woods, we can create a more stable woodland situation.

## Letting Strong Trees Remain

Stormwise management aims to maintain the benefits of the woodland while improving its resiliency in a storm. One scenario involves thinning the forest edge to 100 feet back from the wires, removing dangerous and unhealthy trees, or trees that have run the course of their lifespans. Straight, strong trees and species that best hold up to wind are selected to remain standing and provided with space to grow. Thinning to provide space for the crowns of these selected trees allows a more even distribution of sunlight. Remaining trees then grow more balanced crowns, and more wind flows within the forest edge. Trees exposed to more wind change their growth patterns accordingly. They become stouter at the base, gaining girth and a more substantive root structure, and over time become more wind firm. In the future, as these trees age and eventually reach their natural lifespans, trees that are best suited for the immediate edge will have the opportunity to take over. Short, strong native species such as dogwoods and ironwoods will be encouraged to grow along utility rights of way and adjacent to roads. This will maintain the aesthetics and wildlife habitat so important to us, while not compromising the safety of the people that live in such close proximity with them.

Stormwise is novel among research projects for its multidisciplinary nature. The tree biomechanics lab works closely with the vegetation managers at utility companies who have electrical engineering backgrounds and help determine what is needed to keep people, trees, and utilities all working safely in concert. Arboriculture and forestry techniques, often very separate, work together in the Stormwise management plan for a forested edge.

The students involved in the project have varying backgrounds in forestry, ecology, and meteorology. Dr. Rudnicki’s lab also works with UConn students studying wood products, so that when a site is thinned, none of that wood goes to waste. Locally sourced hardwood is great for flooring and cabinetry, and the team does much of the milling of the wood right on site using a portable saw mill and other small-scale harvesting technology.

## Talking to the Public

A far-reaching cooperative effort such as Stormwise benefits immensely from the involvement of the social sciences. Researchers are looking at the bigger picture of power grids and future storm threats, but it’s important to understand what individuals think about the management of trees and power lines in their front yards. In addition to determining public opinion, the Stormwise team facilitates public education. Property owners usually fiercely love trees that are a danger to us during storms. There certainly are people in Connecticut content to suffer an outage or two for the sake of their trees. Understanding public opinion, opening communication, and increasing education about collaborative research efforts with Stormwise edge management and utility vegetation management will play an essential role in successfully increasing the resiliency of our trees and reducing the threat storms pose. The Stormwise project hopes to span the Northeast and involve a wide variety of people and organizations. Only with everyone working together will we get the best research done and the best results for our communities.

## Jenna Klinck Passes the Baton

Ms. Klinck’s site in the UConn Forest has been collecting tree sway data for two years now. The forest edge has been thinned and the dynamics of the trees are changing. She will soon be graduating and passing her work to incoming graduate student Amanda Bunce, who is developing two additional sites: one in Torrington and one in Orange. Each site brings different tree species and edge structures into the equation, widening the scope of the research. With each new tree or edge studied, Stormwise gathers more of the information necessary to move forward with possible management techniques for our beloved northern hardwood forests.

With the potential effects of a warming climate including increased frequency and severity of storms, this research will provide future forest managers with the tools they need to maintain New England’s forested beauty while protecting the safety of its people and communities.

# FOSTERING STORMWISE COMMUNITIES

Creating storm-resilient roadside forests will require the cooperation, understanding, and support of many different interested parties. The enormous informational, educational, and promotional undertaking of the Stormwise Initiative is to contact, communicate, and engage with numerous stakeholders who might have varying opinions and perspectives on the issues, increase their knowledge, and gain their support. Many stakeholder groups we expect will ultimately be engaged in Stormwise include the following:

## Communities of Place

- ▶ State and local elected officials
- ▶ Conservation commissions
- ▶ Tree committees
- ▶ Tree wardens
- ▶ Planning and zoning commissions
- ▶ Landowners
- ▶ Homeowners

## Communities of Interest

- ▶ Connecticut Forest & Park Association
- ▶ Audubon Connecticut
- ▶ Connecticut Tree Protective Association
- ▶ Tree Warden Association of Connecticut
- ▶ Connecticut Urban Forest Council
- ▶ Bartlett Arboretum & Gardens
- ▶ Garden Club of New Haven
- ▶ Connecticut Professional Timber Producers Association
- ▶ Society of American Foresters
- ▶ Land trusts

## Communities of Practice

- ▶ Arborists
- ▶ Foresters
- ▶ Forest harvesters
- ▶ Urban foresters
- ▶ Utility arborists
- ▶ Portable mill operators/community
- ▶ Larger sawmill operators
- ▶ Biomass/chip/firewood/mulch producers

Watch for announcements about workshops and other educational opportunities.

One educational program being planned and piloted through a collaboration between CFPA and the University of Connecticut Extension is expected to be of interest to local commissioners and volunteers. It will address how becoming a storm-wise community means also being a tree-wise community and is intended to elevate knowledge and understanding about trees, tree health, and tree management. Workshop details will be announced in fall 2014.

## YOU'RE IN AN ELEVATOR, AND SOMEONE ASKS, "WHAT IS 'STORMWISE?'"

*Here is what we say*

BY CHRISTOPHER MARTIN

1. Stormwise brings together multiple tree care disciplines resulting in a holistic approach to healthy and resilient roadside trees and forests.
2. No amount of tree trimming aside from wholesale clear-cutting 100 feet-plus on both sides of roads will prevent power outages from ever more frequent extreme weather events. A multifaceted approach is necessary:
  - ▶ Use microgrids that keep essential local government and community services functional during widespread power outages.
  - ▶ Harden above-ground utility infrastructure.
  - ▶ Move utility lines underground whenever possible.
  - ▶ Promote land-use policies that discourage sprawl and fragmentation of remaining forest land.
  - ▶ Remember that trees are not solely responsible for keeping electricity running.
3. Stormwise applies the latest forest research to make informed decisions on when to trim, retain, and remove trees. These decisions ride on understanding which tree species are compatible with roadsides and overhead utility lines.

4. Connecticut has some of the most diverse woodlands in the nation. Well over 60 tree species call Connecticut home, exemplifying that one size does not fit all when it comes to roadside tree and forest care. A white birch tree is far different from a white oak.

5. Connecticut's combination of population and tree/forest canopy cover places us number one in the country for potential power line–tree conflict.

6. We have saturated Connecticut's forest landscape with roads and power lines underneath a mature forest canopy. This is both a blessing and curse, making Connecticut a highly desirable place to live but also making the state very vulnerable to power outages associated with roadside tree failures.

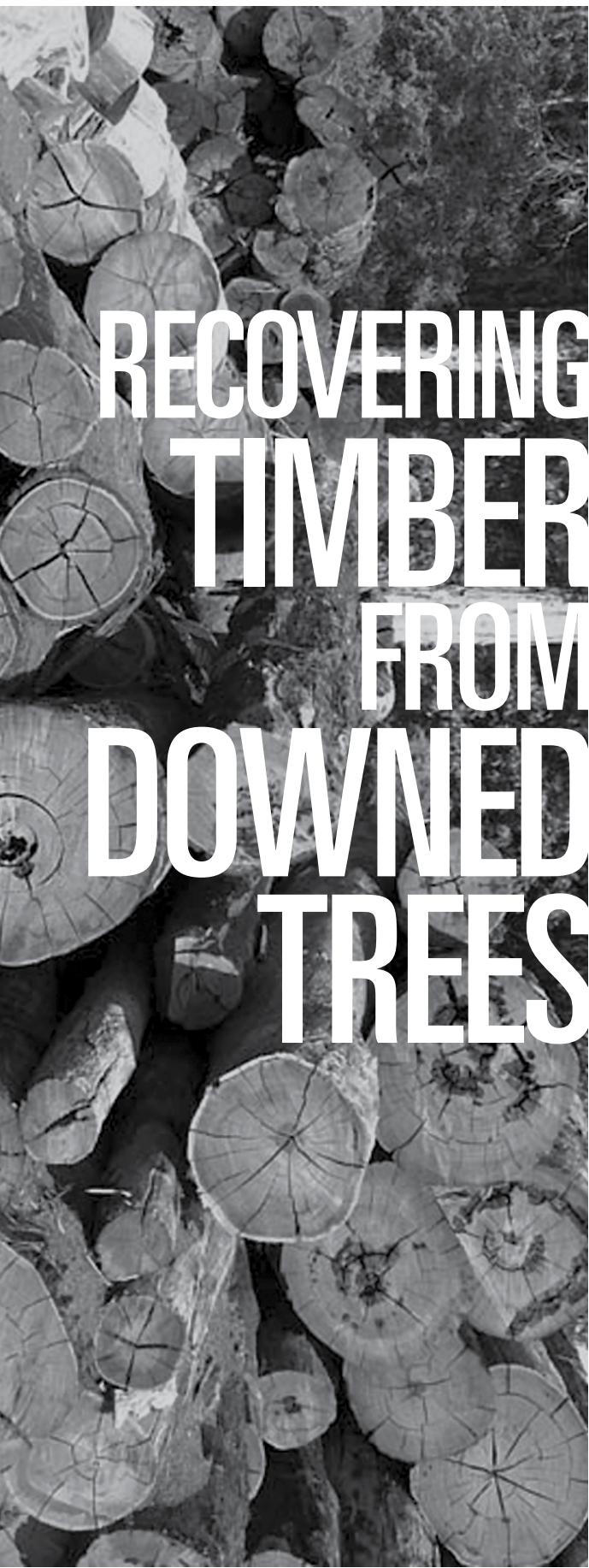
7. Tree trimming intervals may be reduced from every 3 to 5 years to every 8 to 15 years.

8. When roadside trees must go, the timber can become lumber, furniture, or flooring, and other tree-trimming byproducts can be recycled into woodchips or firewood for the landowners.

*Christopher Martin is the Connecticut state forester*

*Unlike weeds, culled trees have value*

BY THOMAS E. WORTHLEY


 RECOVERING  
TIMBER  
FROM  
DOWNED  
TREES

During last summer’s Emerald Ash Borer Survey, I drove along River Road in Killingworth somewhat amused by the signs. A tree crew contracted to the power company had recently performed some right-of-way maintenance that included tree trimming and removals. The people who lived along the road advertised their feeling about the trimmings with placards that said things like, “Don’t touch this wood,” “Spoken For,” and “Please!!! Take this Wood!!! Free!!”

I have seen this kind of scene before after trimming along power rights-of-way. All of these signs subtly indicate value, to someone, who might want to burn it or sell it or use it as a chopping block. Even the homeowner who wants to give the wood away reminds us that it is “Free!”—acknowledging that it has value and that they do us a favor by letting us haul it away.

When they are standing, trees, as we know, have a very real value, even if it does not involve a cash price. Trees, of course, also can have a monetary value as ornamentals or as a source of raw material for wood products. In one setting, value might take into account the substantial expense to remove a tree. Or, in another setting, someone might pay real money for the privilege of removing trees. A red oak deep in the forest and a red oak standing next to a road can produce timber of identical quality, and while the equipment, logistics, and costs of removing those trees might vary greatly, the potential usefulness of the wood itself for products does not change.

**Waste Not**

The fact is, although I love trees, I also love wood. And things made from wood. And I hate to see good wood go to waste. Some of our roadside trees have outstandingly beautiful wood. Efforts investigating urban wood value recovery and some business models producing high-end products are taking advantage of this fact—a prime example being a Connecticut firm called City Bench, Inc. At the University of Connecticut, we ask how we might utilize and recover value from trees designated for harvest in a Stormwise-scale roadside forest management operation.

If we set out to select the best, most promising trees of various ages and species, at the optimum spacing for healthy growth, wind resilience, and future management in our roadside forest strip, then we are in turn designating some trees for removal to provide the growing space for our desirable trees. I know gardeners who do this kind of thing all the time when they thin carrots and pull weeds. The difference is that although weeds get turned into compost, trees can be turned into all sorts of useful items depending on size, species, and quality. However, if a silvicultural treatment proposed in a roadside forest strip is not connected to a larger harvest in an adjacent stand, economies of scale can impede utilization and value recovery if traditional harvesting methods are suggested.

A Stormwise treatment prescription applied, for example, to 400 feet of roadside, with trees growing 100 feet in from the road, affects only 1 acre of land. Traditional timber harvesting businesses with equipment designed for 50- or 100-acre forests might not be interested in such a small area or volume of wood. So suggesting Stormwise prescriptions for roadside woodlands where no adjacent timber harvesting is planned requires options for scale-appropriate strategies, equipment, and methods for implementation, utilization, and value recovery. To that end, micro-scale harvesting trials at UConn Forest testing small-scale equipment, value-added operations, and small-volume marketing strategies are underway as part of the Stormwise initiative.

The research site we have on the UConn Forest Fenton Tract is literally a 400-foot-by-100-foot, 1-acre-wide strip along the pump house power line right-of-way. The crown thinning implemented there used a combination of

arboricultural and small-scale silvicultural methods. A tree crew equipped with a bucket truck removed designated trees exhibiting a risk of impact to the power lines. A bit deeper into the woods, directional felling techniques as taught by chainsaw classes were applied in felling designated interior trees. Trees were sectioned into sawlogs and firewood logs and pulled from the woods using a light rig consisting of the four-wheel-drive rugged terrain vehicle and trailing arch, one log at a time. Firewood was split and stacked for sale this fall. Two loads of logs were sorted by species and grade and sold roadside. Other logs were sawn on site into various lumber products using a small portable bandsaw mill. This material is drying and will be offered for sale in small quantities.

Recognizing that a product does not really have any real dollar value until there is a willing customer, we estimate for this operation that we almost broke even between the cost of implementation and the products recovered. An interesting observation was the difference in approach taken between the forest crew and the arborist crew. In the first case, each tree felled was assessed and viewed as a collection of various products. The skill with which the tree was sectioned for grade and accurate lengths determined its ultimate marketable value. The arborist crew was rightly and primarily concerned with the safest way to remove the tree without damaging infrastructure, but also with no regard to potential product use. The arborist crew was very interested to learn that a section of trunk left just a bit longer could be a marketable log or a cut made on just the other side of a knot might double a log's dollar value. Sharing skill sets between and among these woods and tree professionals will have real potential in wood value recovery under Stormwise.

Other value-added activities remain under investigation. Producing lumber on the portable bandsaw mill is satisfying and rewarding, but it also requires specialized skills for best value recovery. Research is underway to assess the potential and capacity of portable bandsaw mills in Connecticut to play a role in small-volume wood utilization. We are also experimenting with a solar-powered dry kiln. Results of these activities will be reported at a future date.

I believe local businesses and markets could grow around the idea of local wood products produced from wood that comes from Stormwise management. Increased awareness and interest, sound information and realistic options made available, economic development efforts, and fostering education and skill development are among the positive outcomes possible under this initiative. For all the emphasis on high technology in education today, working with an ancient material such as wood still remains an application of science, technology, engineering, and math.

More information related to this topic can be found in an interesting new publication from the Connecticut Department of Energy and Environmental Protection Forestry Division, *The Use of Wood from Urban and Municipal Trees*, by Christopher Donnelly and Gabriela Doria.

## PERSPECTIVES ON VALUE

BY THOMAS WORTHLEY

Examining the logistics and economics of value recovery from forest products is an important component of the Stormwise initiative. Such information will contribute vastly to operational decision-making when planning the management of roadside forests for storm-resilience. The real value to citizens, however, of a Stormwise management scenario will be twofold.

First, consider the hundreds of millions of dollars of economic losses, and risk to life and property resulting from storm-related tree failures. If the number of tree failures decreases significantly, the numbers and duration of power outages would also dramatically lower. We know that we cannot eliminate tree-related power failures entirely, but even cutting them back by half would deliver an enormous economic benefit.

Second, maintaining storm-resilient conditions in roadside forests over the long term will require different on-the-ground management. We envision vegetation management treatments perhaps every 15 or 20 years, as opposed to the four- to six-year trimming schedule the utilities now follow. A different set of management skills, lower-cost equipment, and longer periods between treatments should translate to savings for ratepayers.

## IN THE TRENCHES WITH THE VEGETATION MANAGEMENT TASK FORCE

BY ERIC HAMMERLING

Following Hurricane Irene and the snowstorm before Halloween in 2011, the State Vegetation Management Task Force formed to work on improving forest health, making roads safer, and ensuring more reliable electricity to better manage Connecticut's roadside forest.

I chaired the task force. Bill Logue was the professional facilitator. The group included 20 members representing electric and telecommunications utilities, arborists, tree wardens, forestry researchers, state and federal regulatory agencies, municipal public works managers, and conservation organizations. The task force published its final report on August 28, 2012 (available online at [ct.gov/deep/svmtf](http://ct.gov/deep/svmtf)), the one-year anniversary of Hurricane Irene, which caused great damage in Connecticut even though it had just been downgraded to a tropical storm.

### One Size Does Not Fit All

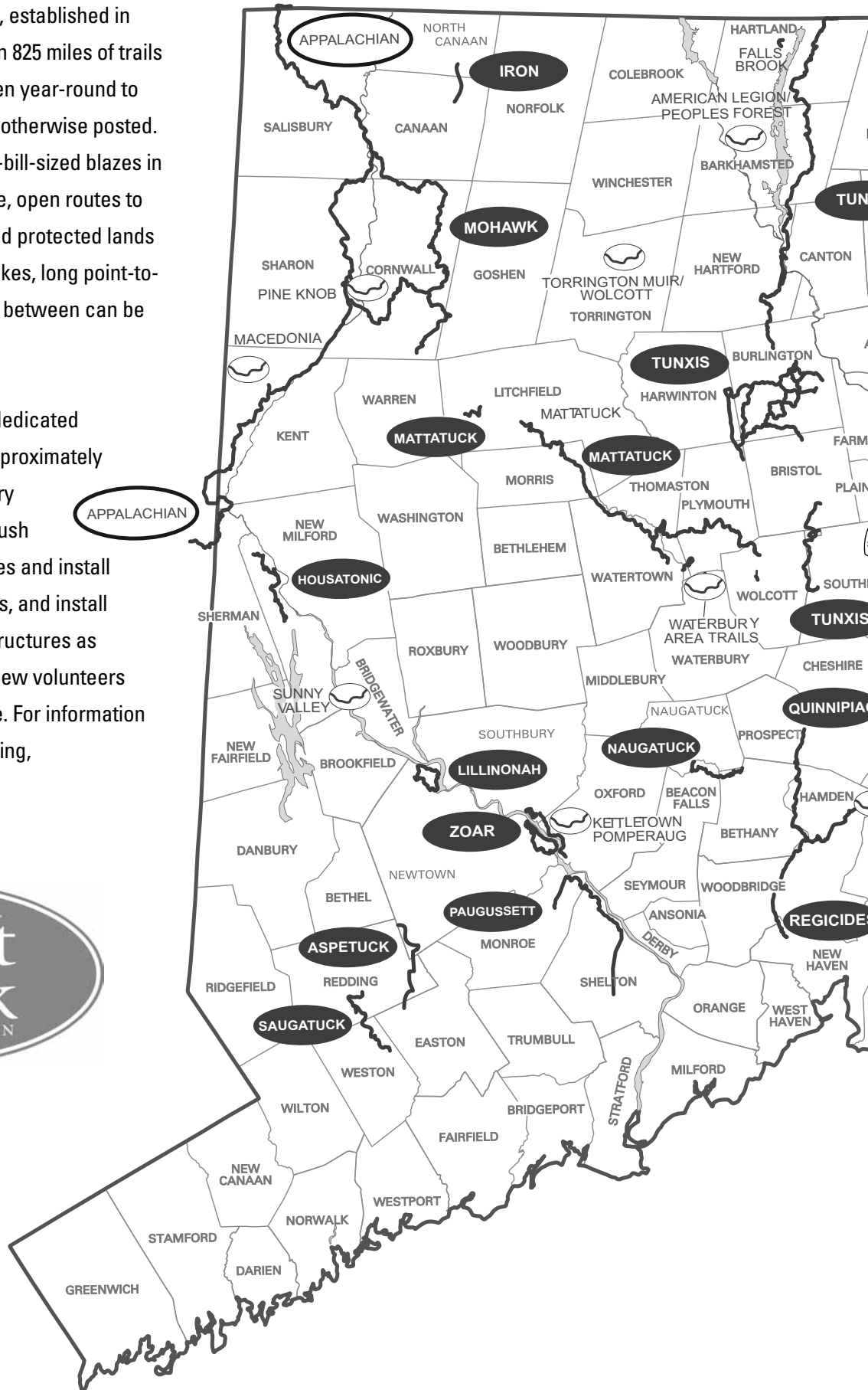
The task force's consensus recommendations can be boiled down to three principles:

- ▶ **One size does not fit all:** Tree trimming and removal efforts should vary based on a mix of urban, suburban, and rural considerations.
- ▶ **Size matters:** Healthy, mature trees are central to community character and provide the greatest economic, environmental, and societal benefits.
- ▶ **Reduce risks but retain benefits:** Tree pruning and removals should be scheduled over time, which emphasizes retaining healthy trees, defers removal until such time as they decline or pose hazards, and considers replanting with “Right Tree/Right Place” trees and shrubs that are more compatible with traditional poles and wires.

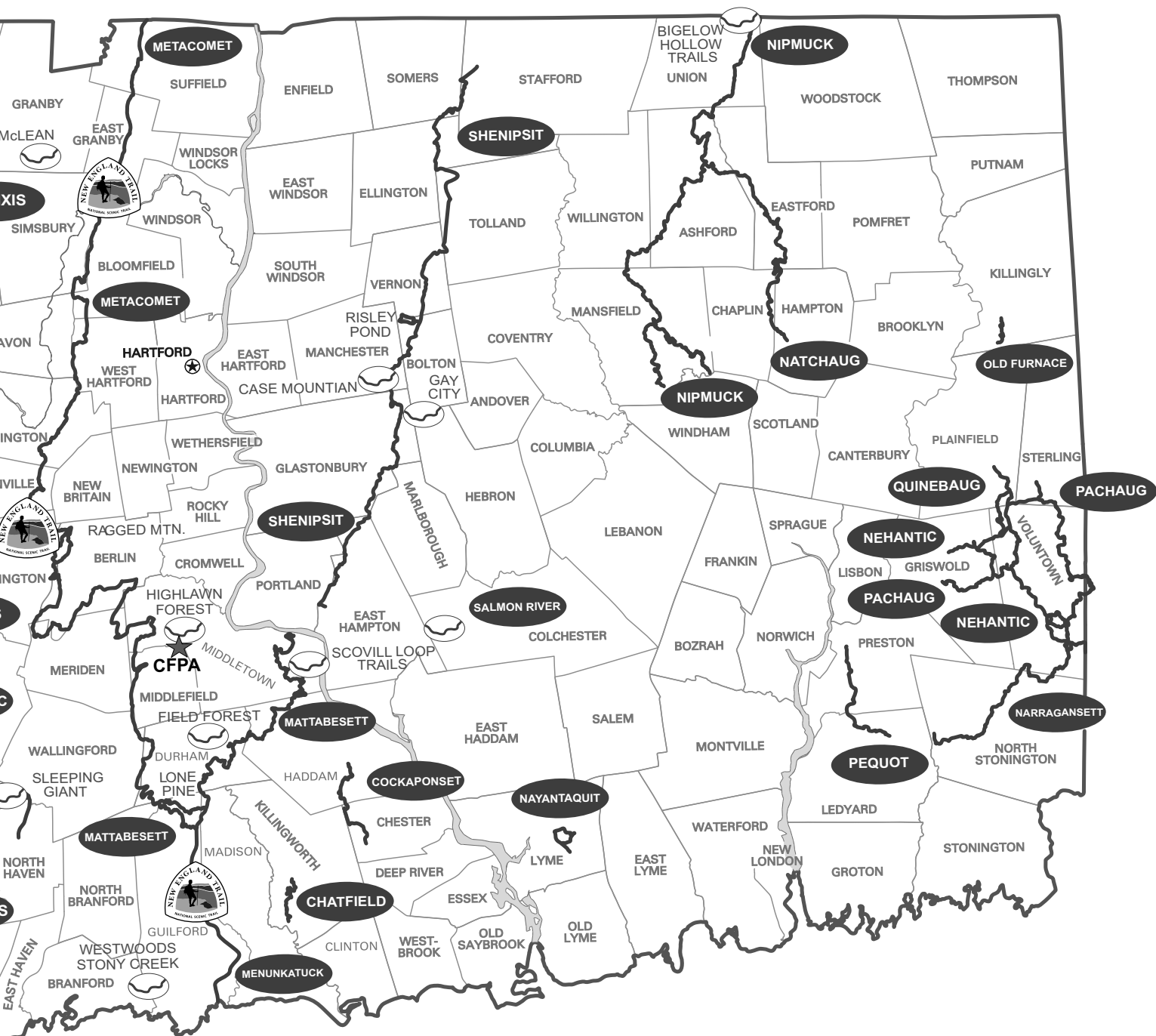
Although its mission of presenting its final report is complete, task force members continue to meet periodically, joined by additional experts, to wrestle with issues such as the knowledge standards for municipal tree wardens and tree-trimming practices of electrical utilities that have been the subject of both state legislation (in 2013 and 2014) and a docket decided this June by the Public Utilities Regulatory Authority (#12-01-10). Several of the task force members are also involved with the Stormwise effort. Because the task force still cares, our recommendations won't get lost.

The Blue-Blazed Hiking Trails, established in 1929, currently total more than 825 miles of trails in 96 towns. The trails are open year-round to all forms of foot travel unless otherwise posted. The trails, marked with dollar-bill-sized blazes in a signature shade of light blue, open routes to exploring the open spaces and protected lands of Connecticut. Short loops hikes, long point-to-point hikes, and everything in between can be found on the Blue Trails.

The trails are maintained by dedicated volunteers who contribute approximately 20,000 hours of trail work every year. Trail volunteers clear brush and downed trees, paint blazes and install signs, coordinate work parties, and install bridges and additional trail structures as necessary. CFWA welcomes new volunteers to help with trail maintenance. For information about the trails and volunteering, see [ctwoodlands.org](http://ctwoodlands.org).







# CONNECTICUT'S BLUE-BLAZED HIKING TRAILS

## INTERACTIVE BLUE TRAILS MAP ONLINE

<http://www.ctwoodlands.org/BlueTrailsMap>

Whether you're a devout hiker of the Blue-Blazed Hiking Trails or a walker looking for a local escape, the Connecticut Forest & Park Association's new online trails map will help you plan your outing before your boots hit the ground. As a companion tool to the *Connecticut Walk Book*, this map will allow you to zoom in and see the latest trail locations, learn trail names and distances, and fully discover all that Connecticut hiking has to offer.

*Meet Two of CFPA's Board Members*

The Connecticut Forest & Park Association's Board of Directors represents the organization's most influential volunteers. In the last issue of Connecticut Woodlands, you met its Wesleyan University board members, Erin McGrath and Alex J. "Jed" Siebert, who co-chair the WesCFPA affinity group. This issue, we feature Raymond "Ray" Radikas and R. Richard "Rich" Croce, who joined CFPA's board in May.

**Ray Radikas** joined CFPA in 2004. He is assistant vice president and lead vendor relationship manager for Lincoln Financial Group's strategic business partners. He has more than 20 years' experience in the financial services industry, working with retirement plans with previous experience at ING and Hartford Life.

He graduated from Central Connecticut State University with a bachelor of arts in economics. Mr. Radikas also serves as an incorporator for the Boys & Girls Club of New Britain. He loves to read, go brook fishing, and hike the Blue-Blazed Hiking Trails with his wife and two daughters.

A native of Wellesley, Massachusetts, **Rich Croce** moved to Connecticut in 1990, discovering the Blue-Blazed Hiking Trails a year later, when he moved to Killingworth. He was hooked. He realized the recreational opportunities provided by the trails and, discovering that they were maintained by CFPA, he made it a long-term goal to get involved and serve the CFPA in whatever capacity possible.

Mr. Croce maintains a law office in Middletown and is admitted to practice in Connecticut and Massachusetts. Mr. Croce earned his BA in history and political science from Allegheny College and his JD from the University of Dayton School of Law. He lives in Killingworth with his wife, Peggy, and son, Gordie.



Ray Radikas



Rich Croce

**CFPA CONSERVATION PROGRAMS**

**CONSERVATION ADVOCACY**

Every year since 1897, CFPA has provided legislators with an Agenda for Connecticut's Land and People. CFPA's advocacy priorities have included securing adequate resources for the Connecticut Department of Energy and Environmental Protection to manage state parks and forests; support the preservation of working forests and agricultural lands; and lead efforts to secure National Scenic Trail designation and ongoing support for the New England Trail.

**BLUE-BLAZED HIKING TRAILS**

The Blue-Blazed Hiking Trail System, established in 1929, is one of CFPA's most visible and lasting contributions to recreation. The Blue Trails total more than 825 miles in 96 towns. The infrastructure for managing this massive area consists of CFPA's trail stewardship director, the CFPA Trails Committee, and more than 100 volunteer trail managers who through work parties and ongoing maintenance activities donate more than 15,000 hours of volunteer time each year.

**ENVIRONMENTAL EDUCATION**

Three elements make up CFPA's Environmental Education program: (1) CFPA co-sponsors the nationally acclaimed Project Learning Tree (PLT) Program and offers hands-on professional development workshops for teachers and non-formal educators on forests and related natural resources topics; (2) The James L. Goodwin

Forest Conservation Education Center in Hampton features native plant wildlife gardens, an 80-acre demonstration forest, a museum, hiking trails, and a classroom to provide forestry, wildlife, and general conservation education programs for youth and adults; and (3) CFPA has long been known for its conservation-themed publications such as Connecticut Woodlands (published since 1936), the Connecticut Walk Books (published since 1937), and Forest Trees of Connecticut (recently republished in 2012).

**LAND CONSERVATION**

Over the past 100 years, CFPA has been instrumental in the acquisition of more than 100 state parks and forests for public use and enjoyment. CFPA owns properties or holds conservation restrictions on approximately 2,000 acres. The conservation priorities for the program are in lands associated with working forests and/or hiking trails.

**WalkCT**

Describing 130 walks and growing, CFPA's WalkCT.org website provides information on places to walk throughout Connecticut. CFPA sponsors free WalkCT Family Rambles. Volunteer leaders are trained to connect families to the outdoors with fun, engaging, family-friendly walks every month of the year.

**Visit [ctwoodlands.org](http://ctwoodlands.org) for more information on CFPA programs and activities.**



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# IS A SNAPPER HARVEST OF 11,000 TOO MUCH OR JUST RIGHT?

*Connecticut started requiring permits in 2013, but biologists and advocates question whether rules help turtles*

BY GAIL BRACCIDIFERRO MACDONALD

**P**ity the snapping turtle.

It remains ubiquitous enough to be considered a nuisance. Its very name conjures ferocity. It has a reputation (exaggerated) for aggression. It's not cuddly. It's not even cute by most definitions of the word. No, snappers are the Rodney Dangerfield of reptiles.

And yet, also consider these facts: Ancestors of today's snapping turtles (*Chelydra serpentina*) shared the earth with the dinosaurs. As top-end predators, snappers play an important ecological role in the food web. Because they live about 70 years, they provide vital environmental information to researchers. Historically, they provided a vital protein source for early dwellers of this landscape, and many people still salivate at the prospect of a good turtle soup. And in China, snapping turtles are highly valued for both their meat and their purported medicinal qualities.

These are among the reasons many conservationists contend the common snapping turtle deserves a lot more respect, as well as more regulatory and statutory protection.

"We need to do everything we can to maintain biodiversity. They play an important role," said Dennis Quinn of Plantsville, an amphibian and reptile researcher who operates CTHerpConsultant LLC.

After centuries of regulation-free snapper trapping, Connecticut adopted its first turtle trapping regulations last year. These establish a summer turtle trapping season, restrict trapping

methods, limit gear, and place a minimum legal size limitation on trapped turtles. It seems that snappers are important reptiles, and their numbers and health remain a bit of a mystery.

Mr. Quinn, who provides reptile information for the Connecticut Department of Energy and Environmental Protection and others, said in an interview that the snapping turtle can play an important role in studying water quality in a particular area over time. Because the species spends most of its life underwater and the turtles can live so long, taking blood samples from an older animal could provide valuable information about the water in which it is living, he said.

The good news about snapping turtles is that they appear to range widely in states east of the Rocky Mountains. They remain common in Connecticut and many other states. A person who is knowledgeable about snappers and their habitat can find dozens of the turtles in a very short amount of time, Mr. Quinn said. Snappers also have adapted well even as the state has experienced tremendous growth and development. They continue to thrive even in polluted waters, for example.

But anecdotally, awareness of the turtles' particular vulnerability during breeding season also appears to be increasing. In spring and early summer, when the females

lay eggs on land, both adult females and juveniles often become roadkill. Residents report, however, seeing traffic stopped on busy streets to allow turtles to cross.

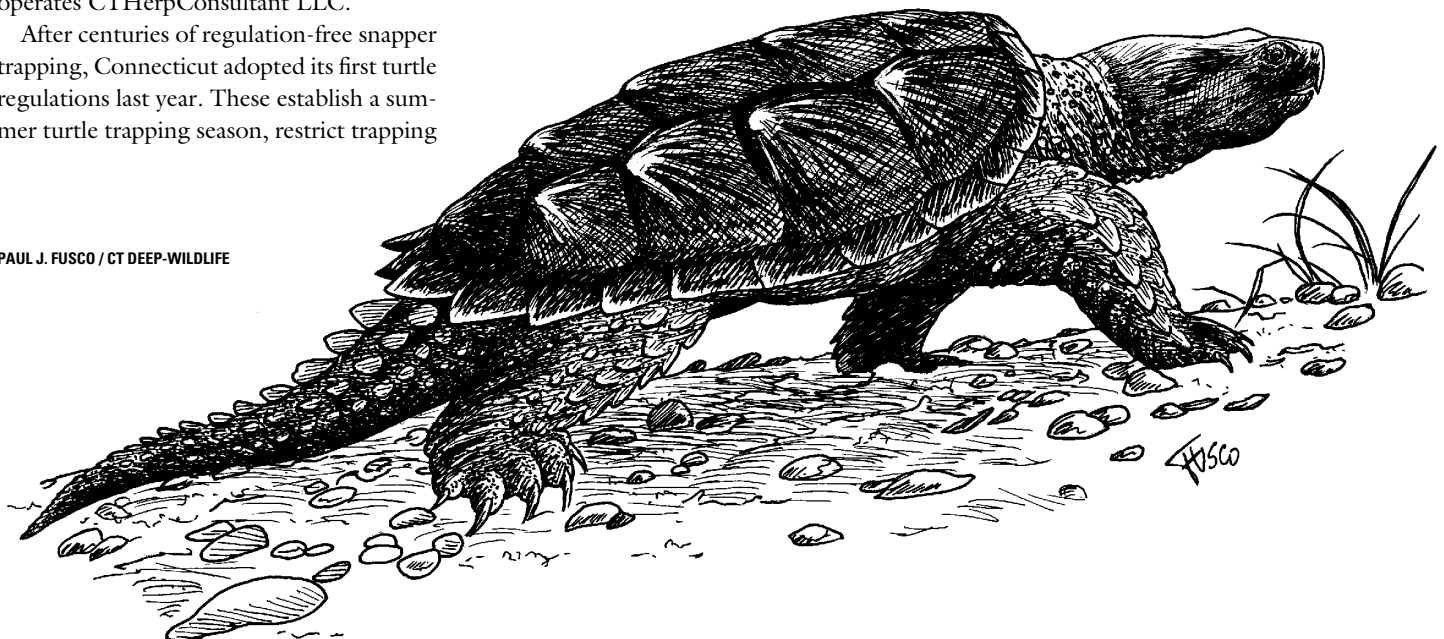
How much trapping goes on? How much is too much?

In 2012, when DEEP sought comments on these regulations, numerous individuals and groups spoke up on behalf of turtles. In a December 20, 2012, letter, Wesleyan University Environmental Studies and Biology Professor Barry Chernoff wrote, "I wish to applaud the Connecticut DEEP for proposing regulations to stop the wholesale taking of common snapping turtles." Conservationists say there also are plenty of reasons for concern about the future of the state's snapping turtle population.

It can be difficult to garner widespread public support for a creature that is as cute-challenged as the snapper, for example. This is probably one reason Barrie Robbins-Pianka of Middletown, a conservationist and photographer who also is a turtle advocate, said she often feels her crusade is a lonely one.

"It is not a widely shared concern at this point," said John C. Hall, executive director of the Jonah Center for Earth and Art, a Middletown-based ecological organization. Mr. Hall said that Ms. Robbins-Pianka helped convince him of the need to advocate for turtles.

PAUL J. FUSCO / CT DEEP-WILDLIFE



At the very foundation of concerns among turtle supporters is that no basic data about the state's snapping turtle population exists. Although states such as Maine and New York based their turtle trapping restrictions and regulations at least partly on thorough studies of the species within their borders, Connecticut has done no such study, nor is any study being planned or even discussed.

Mr. Quinn said Connecticut needs a baseline study of snapping turtles that would include data such as how old, large, and healthy the current population of snappers is. "As far as I know, there is nothing in the works."

Those who trap snappers aren't required to report how many they take during the official season (July 15–September 30). Permits say trappers must not take more than 5 a day or 30 a season. There is no requirement that those who get turtle trapping endorsements from the state report their catches, so there is no means by which to compile data to determine whether the amount of turtles being trapped will adversely affect the species or whether such trapping is sustainable. Conservationists say that renders the permit limits nearly worthless.

Consider some basic math. Ms. Robbins-Pianka said DEEP issued 364 turtle trapping endorsements in 2014. If each trapper bagged the legal limit by September 30, nearly 11,000 turtles would have been taken this year.

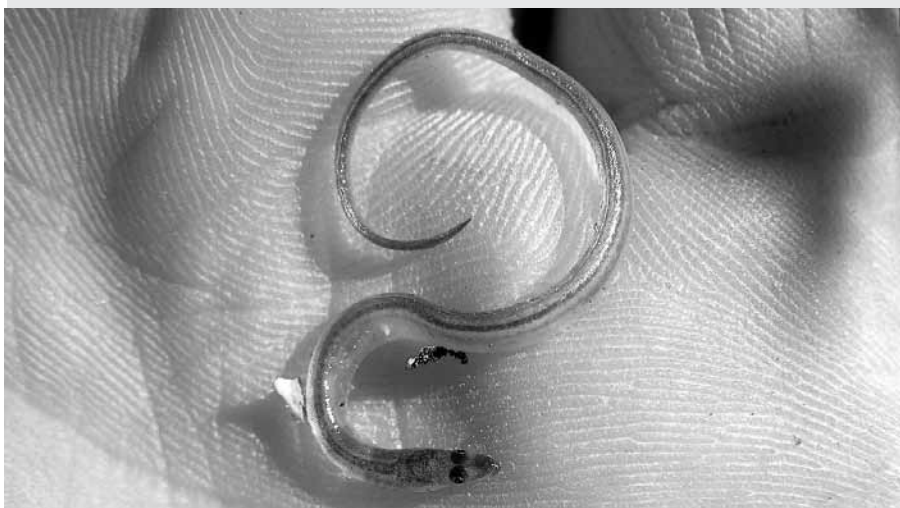
Despite the existence of regulations, Ms. Robbins-Pianka said that the state statute that protects and limits birds, quadrupeds, reptiles, and amphibians from commercial sale specifically excludes the snapping turtle. She and other turtle advocates have been working to gain legislative support to change the statute, but state Senator Andrew Maynard of Stonington, who is vice-chairman of the General Assembly's Environment Committee, said in July that he was not aware of any formal discussion of the issue.

### Asian Markets Prize Turtles

The commercial demand for snapping turtles, especially from the burgeoning and lucrative Asian markets, is the prime threat to the species. In 2008, the International Union for the Conservation of Nature reported that more than a half million snapping turtles were exported to East Asia, where the turtles are prized for food, as pets, and for use in traditional medicines. The turtles come both from the wild and turtle farms. The organization estimated the number of snappers exported had increased by more than 400 percent over the previous five years, and the Asian demand has only continued to grow.

It is easy to find a wide variety of turtles for sale online—try Googling "snapping turtles for sale." Retailers' websites indicate they will ship turtles; individual juvenile snappers sell for about \$50. It's difficult to determine exactly where these turtles come from. One retailer did not return an inquiry about the turtle trade. But some retailers' websites indicate that at least some of their stock is farm-raised.

*continued on page 22*



[HTTP://WWW.FRIENDSOFMERRYMEETINGBAY.ORG/CYBRARY/AMERICANEEL/GLASSEEL.JPG](http://www.friendsofmerrymeetingbay.org/cybrary/americaneel/glasseel.jpg)

*A baby American eel or "glass eel"—in high demand in Asia but in trouble in Connecticut.*

## THE AMERICAN EEL

*Another non-cuddly species netted in the dark of night*

Once quite common, the squiggly and snakelike American eel (*Anguilla rostrata*) has been determined to be depleted, probably because of the demand for the very young eels, called glass eels or elvers.

The eel, like the snapping turtle, does not inspire an overwhelming outpouring of public affection. Despite its humble appearance, the eel is recognized as an important species, and most states currently control eel fishing. Much of the demand for trapped eels comes from Asia, where the glass eels grow up before being smoked for eating.

The Atlantic States Marine Fisheries Commission completed a benchmark assessment of eel stock in 2012. This assessment, which found stock at or near historically low levels, led the commission to consider a management plan aimed at protecting and replenishing the species, which plays a vital role in the aquatic food web. The Connecticut Department of Energy and Environmental Protection's Marine Fisheries Division, along with other environmental agencies up and down the East Coast, held hearings in June and July, and the commission was scheduled to decide on a plan in August.

According to the Connecticut Fund for the Environment, eels are a food source for migratory birds and game fish, and with smoked eel considered a delicacy in Asia, eels are threatened with overfishing. David Simpson, director of DEEP's marine fisheries division, said another major threat to eels are the dams built on many Connecticut waterways during the 18th and 19th centuries, a time when factories were harnessing waterpower.

The dams block eel access to freshwater lakes and ponds. Although eels spawn in the ocean, they navigate upstream in the spring and spend 20 to 40 years maturing in freshwater. Both the state and conservation groups have worked in recent years to reopen eel passages between salt and freshwater.

Along with the management plan that could significantly reduce or even completely close the glass eel fishery, the U.S. Fish and Wildlife Service is considering adding the juvenile eels to the Endangered Species List.

*—Gail Braccidiferro MacDonald*

### **Other States Rein in Commercial Sales**

In recent years, some states have outlawed commercial snapping turtle trapping. New York, for example, bans commercial trapping. Federal officials in 2009 raided a Maryland turtle-meat processing operation after getting information that poached turtles from New York had been shipped there. The raid was reported as being part of a much wider investigation into the illegal trapping, sale, and shipping of turtles.

In Connecticut, no such ban controls the market. Those who study and advocate for turtles say that some of those who hold Connecticut permits operate commercially. Turtle supporters say they fear bans in other states will increase the number of trappers in Connecticut. Exactly how many may be taking snappers for commercial sale in Connecticut? That number is not known.

“Personally, I think there shouldn’t be any commercial trappers,” Mr. Quinn said.

Such sentiments are backed by research. In a January 2014 letter

written to two New York state senators at a time when the legislature there was considering the possibility of legalizing turtle trapping, Collette Adkins Giese, the amphibian and reptile senior staff attorney for the Center for Biological Diversity, wrote, “Stable turtle populations are dependent on sufficient long-lived breeding adults to offset the effects of high egg and nestling mortality and delayed sexual maturity. As such, scientists warn that freshwater turtles—and common snapping turtles in particular—cannot sustain any significant level of harvest from the wild without leading to population crashes.”

Ms. Robbins-Pianka said she will continue to work to raise awareness of the plight and threat to Connecticut snapping turtles, but in a state where DEEP’s resources are strained, she understands the challenges ahead. “All turtles are in decline. Trapping is not sustainable,” she said. “But getting protection for snappers doesn’t have a lot of legs.”

*Gail Braccidiferro MacDonald is a freelance reporter and associate professor-in-residence at the University of Connecticut.*

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### **MANAGING ROADSIDES** *continued from page 10*

gravel road supply most of the power for Colchester, sections of East Hampton, and Hebron. Staff from the agricultural experiment station and UConn mapped and measured all of the trees in a strip 40 meters deep and 400 meters long (approximately 130 feet by 1,300 feet). Along with such standard forestry measurements as species, diameter, and height, we measured such factors as lean, crown asymmetry, internal decay, and dieback that increase the risk that a tree, or one of its branches, would fall onto utility lines.

The Gadpouch Road site was the first of eight locations around the state, one in each county, established as part of the Stormwise research initiative for healthy, storm-resistant roadside woods. Our goal is to develop practical, cost-effective methods that meld arboricultural (individual tree care) and silvicultural (forest management) practices.

In Connecticut, we want two conditions. We want forested roadsides and stormproof utility lines. Management of forests adjacent to utility infrastructure has become a highest-priority issue. Our proactive approach to develop storm-resistant roadside forests requires adaptive stand management from the forest edge to the interior. This preserves both aesthetic appeal and biodiversity by promoting the growth of healthy trees in the right place. There are two key words in that sentence: *develop and adaptive*.

#### **Creating the Right Conditions**

*Develop* is key because forests cannot be created. Forests, their trees, shrubs, and wildflowers are constantly growing and changing. The challenge is to create the conditions that will lead to the development of a desirable roadside forest and then to maintain it. One goal of our work is to examine a variety of treatment scenarios in various locations and forest conditions and document how the vegetation responds.

Forests must adapt. Conditions along our roadsides vary dramatically from place to place, so there is no single, one-size-fits-all prescription for forest management. Management prescriptions must

be tailored using detailed knowledge about existing conditions and a clear idea of the desired conditions we want to achieve. Prescriptions for young pine forests on dry sites would differ dramatically from those of ash forests with red maple understories on wet soils.

#### **Salvaging Roadside Removals**

Returning to Gadpouch Road, after the trees had been measured, CL&P and DEEP foresters identified trees that were leaning toward the wires or had severe defects. Those characteristics would increase their risk of falling during severe weather. Because loggers will not cut trees that would fall on wires, CL&P contractors removed the at-risk trees. They took the logs to the DEEP depot to be made into new picnic tables and other objects on state property. The remaining trees marked for removal were cut as part of a chainsaw safety class or sold to local firewood buyers.

Similar procedures were followed at the sites in Litchfield, Manchester, and UConn Forest in Mansfield, except the trees were removed as part of commercial forest harvest operations. Small-scale harvesting methods coupled with value-added operations are being tested at another UConn Forest site and at Nathan Hale Forest.

What might be considered desirable roadside forest conditions? Imagine, if you will, the immediate roadside forest edge being composed of short trees and shrubs, such as dogwoods, ironwoods, shadbush, and viburnums. Set back a bit from the utility lines would be widely spaced maples, beeches, and oaks interspersed with shrubs, wildflowers, and ferns. Widely spaced trees, such as those in open fields, develop crowns that are wide rather than tall, have stout stems and branches, and develop well-anchored, widespread root systems. All of the characteristics of open-grown trees make them more resistant to wind damage, especially to becoming wind thrown. These trees would still provide important aesthetic, hydrologic, and habitat benefits while remaining wind-firm and low risk to power and road infrastructure.

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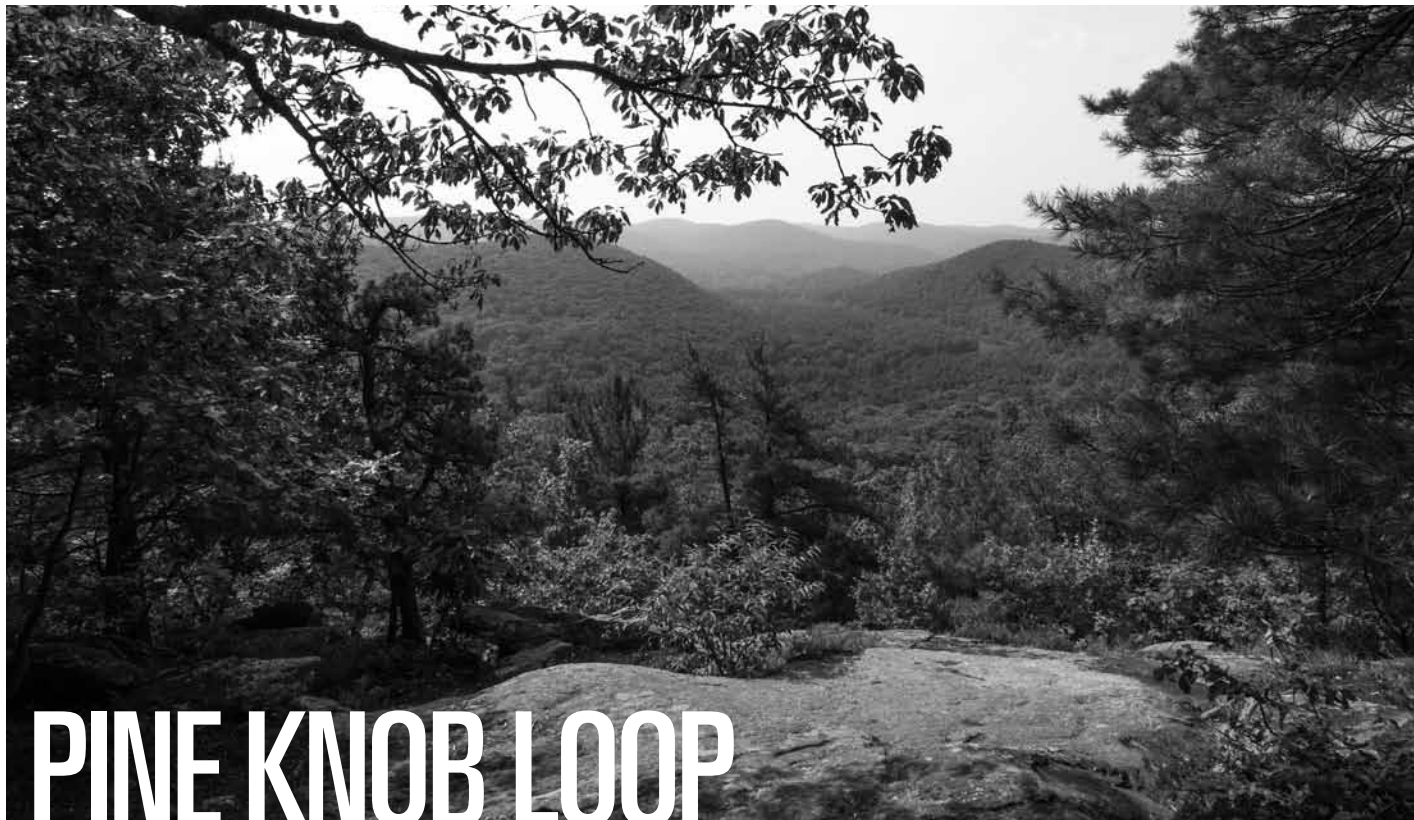
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# PINE KNOB LOOP

DIANE FRIEND EDWARDS

*The second of four viewpoints, where you might spot a bird of prey soaring.*

BY DIANE FRIEND EDWARDS

Fall is my favorite time to hike. On a muggy day in July, as I did my field research for this article, I stood at the viewpoint on the Pine Knob Loop Trail, looked out at the forested hills, and knew that the Housatonic River Valley would come to life with vibrant colors by early October.

Although only 2.5 miles long, the Blue-Blazed Pine Knob Loop Trail in Housatonic Meadows State Park and Housatonic State Forest in Sharon covers a wide range of terrain and landmarks. It goes from flat to rolling to steep and rocky, and back to rolling and then flat again. It winds through a forest of oaks, maples, and other hardwoods, as well as pines and hemlocks. In some places, pine needles cushion your footfalls; in others, slanted rock slabs make for challenging footing—*boots with soles that grip are a must!*

The trail goes over rocky outcrops, including at least one with a cave—perhaps a shelter for a bobcat or a bear? Scrambling to the top of the knob can require using all fours.

But easy sections of the trail let you look at your surroundings instead of your feet. My friend Donna and I enjoyed examining the moosewood (striped maple) saplings, the Christmas Tree ferns with their stiff fronds that stay green year-round, various berries and mushrooms, and occasional wildflowers.

The homeward stretch of the route follows a beautiful section of Hatch Brook, with waterfalls, ledges, and mossy boulders. At any of the four viewpoints along the trail, you might see a soaring vulture, a hawk, or a crow; we were thrilled to spot a raven—a bird once rare in Connecticut but now becoming more common—flying across the valley below while making its distinctive croaking call.

## The Hike

The hike begins at an unpaved parking area on the west side of Route 7, 1.1 mile north of the intersection with Route 4 in Cornwall Bridge. When I hiked the trail, it wasn't marked by a sign, but you can't miss the trailhead. It's the only trail there. The



DIANE FRIEND EDWARDS

*Hatch Brook tumbles over rocks in the homeward stretch.*





DIANE FRIEND EDWARDS

*Looking for the next blaze.*

path leads northward and shortly crosses Hatch Brook over large, flat steppingstones. In two-tenths of a mile, a Y intersection marks the start and end of the loop. You can hike the loop in either direction, but we followed the advice of the Connecticut Walk Book West and traveled counterclockwise.

After an easy stroll for another two-tenths of a mile along level ground and across several small brooks, you begin passing between or climbing over rocks as you ascend Pine Knob. A steep, half-mile climb brings you to the first overlook, where trees partially obscure the view. You then descend and climb again on steep, rocky terrain for three-tenths of a mile, reaching a second and then a third overlook, which offer better views than the first. At this point, you're on the northern summit of Pine Knob (elevation 1,120 feet). Next, the trail drops steeply over a large rock and then turns sharply right. (Donna and I were unsure about heading to the right here, because we couldn't see any blazes. But going left would have required a truly scary descent on a long rock slab. Right seemed the saner choice. In a minute or so, we started seeing blue blazes again. Whew!)

One-tenth of a mile from the right turn, the Pine Knob Loop Trail joins with the white-blazed Appalachian Trail as they both head southwestward, then south along a forested ridge to the south summit of Pine Knob (elevation 1,160 feet) and the fourth overlook. Descending from this summit is somewhat easier than from the north one. In three-tenths of a mile, the Pine Knob Loop Trail and the AT part ways. Here, you bear left to stay on the Blue-Blazed Hiking Trail as it heads southeastward past huge boulders and along the banks of Hatch Brook. When you reach the starting point of the loop, turn right to re-cross the steppingstones over the brook and return to the trailhead.

#### **Directions**

From the intersection of Routes 7 and 4 in Cornwall Bridge, drive north on Route 7 for 1.1 mile to the parking area on the left.

*Diane Friend Edwards is a writer, photographer, and lifelong lover of the outdoors. She lives in Harwinton with her husband, Paul.*

#### **EDITOR'S NOTE** *continued from page 5*

stop thinking about the destination, to turn off the noise. Try to be like a dog, sniffing.

We took no pen or paper, only maps of the trails. (I did not want my students getting lost.) When we returned inside, we sat and wrote whatever came into our minds for 20 minutes. We wrote even if it went badly.

What came of it? Each one of us had a completely different experience in that forest. One noticed a sassafras tree bending over the trail. Another thought of her mother who had recently died. Some of us came back with pictures in our minds. Others, emotions. I filled my page with sounds, which should not surprise me since I have hearing loss and my new hearing aids have brought life back in stereo.

Traffic faded as I walked in toward the pond, but it still roared. I felt grateful that the landowners had held back development. Locusts chattered, louder and louder, then softer and softer. The sound took me back to a kitchen late at night, where my father perched on the edge of a stool, holding forth on politics. It was a flash. Then I was back in the woods, holding the sound of restless insects. At the pond, the frogs lay still, waiting for evening. They were smart. It was getting on. I must gallop back to the others. The teacher was learning as much as the students.

I invite you to send what you write after taking a short walk in the woods. I predict that what comes out of your mind will surprise you.

—Christine Woodside

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BY JEAN CRUM JONES

Over the past few years, I have become enamored with chestnuts. At my small cooking studio, my teaching chef, who trained in Italy and France, likes to use chestnuts with many of our fall food dishes. Chestnuts taste delicious with our farm-grown baked winter squash, just roasted and chopped and sprinkled on top with a wee bit of brown sugar. Roasted fresh Brussels sprouts and chestnuts are incredible. So is pasta dressed with a simple sauce of sautéed onions, mushrooms, and chestnuts. We braise chestnuts with red cabbage, apples, and sage to create a startlingly good autumn dish. We use them in any stuffing recipe. We add them to our fall pork sausage and brown rice casseroles. We roast chestnut halves and use them as croutons in fall salads. Or we puree them for soups or sauces or to mix with maple syrup for a dessert topping.

### Low Fat, High Protein

Chestnuts are unlike other nuts. They have a high complex carbohydrate content and are low in fat. Most nuts contain more than 50 percent fat. But chestnuts contain less than 5 percent fat and a high-quality protein. Nutritionally, they are similar to brown rice. Like other nuts, they contain

minerals and fiber, but they also have vitamin C, which is unusual for a nut. Their calorie count is one-third that of peanuts and cashews, but their low glycemic index makes us feel satisfied longer.

The complex, fragrant flavor and texture of chestnut are difficult to describe: like a sweet potato—earthy and sweet—but also crisp. Fresh chestnuts contain approximately 50 percent water. I have learned to cut vents in chestnuts when I bake them. This prevents them from exploding. The hard shell and bitter inner skin come off easily after baking. It's a joy to cook and eat these fragrant nuts.

### A Quest for Local Sources

As I began using chestnuts in my fall cooking classes, I sought a Connecticut source for this essential autumn ingredient. An important focus of our seasonally based cooking classes is using locally and regionally grown foods. Most of the fresh chestnuts I was purchasing were imported from Italy. I felt frustrated that I could not find chestnut farmers in my home state. I have learned that U.S. production of chestnuts is less than 1 percent of total world production.

At one time in our country, chestnuts were a “free” food. The European settlers

of the eastern New World found virtually one solid chestnut forest. It was the dominant species in the woods from Maine to Mississippi, accounting for about a quarter of the trees in the wild. Not only offering straight, rot-resistant building lumber, every autumn, hailstorms of chestnuts fell from the trees when they were ripe. They were available to anyone who would be willing to go into the woods and gather the prickly burs that encase the nut. “Chestnutting” was a favorite fall activity of young people and not only for a winter food supply or some quick cash. My family has a wonderful picture of Philip Jones, circa 1908, heading off in his new car with a male companion and two young women to go “chestnutting,” according to the faded handwritten caption. The gathering of nuts was also a favored courtship activity!

In our area of Connecticut, the hills were originally covered with American chestnut trees. Indeed, our area of town, called “White Hills,” refers not to the long-lasting snow coverage but to that time in May to June when the chestnut trees profusely blossomed, bearing long, drooping white flowers, which gave the appearance from a distance of hill crests covered with white

# A YEARNING FOR CHESTNUTS

ISTOCK PHOTO

billowy snow. The American Indians relied on these chestnut-covered hillsides for hunting, because the deer and turkeys and other wildlife especially loved eating the plentiful chestnuts scattered all over the ground in September and October. The Indians also gathered the nuts, which they ate raw or roasted. Sometimes the nuts were used as a stuffing within any number of the abundant game birds that flourished in the eastern woodlands. The Indian women would also pound the dried chestnuts into flour and mix this with cornmeal, which they would wrap in cornhusks and boil. European settlers referred to this preparation as Indian bread, but the fact is that they were used to chestnuts because they had long grown a European cultivar. (Long popular in Europe, chestnut flour is now becoming available in the United States because it is gluten-free.) Wherever the Roman armies marched, they planted chestnut trees. Chestnuts were an essential component of the Colonial American diets and were used in many of the same ways we enjoy the nuts today. The American chestnuts were smaller and sweeter than their European counterpart.

### **Chestnut Blight**

American chestnut consumption plummeted after the decimation of the chestnut forests by the chestnut bark blight, discovered in a Bronx park in 1904. Within 50 years, almost 4 billion chestnut trees disappeared. The proliferation of chestnuts from other parts of the world could have led to the blight. First, European settlers planted chestnut trees for their nuts, which were bigger and plumper, though less sweet than the American variety. Thomas Jefferson, at Monticello, Virginia, and E. I. DuPont de Nemours at Brandywine, Delaware, established some of the first nurseries of French chestnuts in the early 1800s. Later in the 1800s, as plant explorers roamed the world looking for new plants for America, Japanese and then Chinese chestnut varieties were introduced as nut trees for orchardists and home gardeners. It is now believed that some infected Japanese nuts carried to America the fatal blight fungus that became so awesomely devastating to the American chestnut tree. The European chestnut trees

were also very susceptible to the blight, and large orchards were wiped out.

For the most part, however, the Japanese and Chinese chestnut trees proved resistant to the blight because they had coevolved with the blight fungus in their native lands. When attempts to stop the blight proved futile, chestnut growers and chestnut tree lovers urged that breeding programs be established to discover blight-resistant trees.

Today, the longest continuing U.S. chestnut-breeding program is ongoing at the Connecticut Agricultural Experiment Station properties in New Haven and Hamden. Scientists cross American chestnut trees with Japanese and Chinese varieties for both forest timber and nut production and work with a hypovirulent fungus to heal cankers. Because

## **TO LEARN MORE:**

### **CHESTNUT FACT SHEETS**

by **Dr. Sandra Anagnostakis of the Connecticut Agricultural Experiment Station.**

**Dr. Anagnostakis is known as Connecticut's chestnut lady.**

**Freinkel, Susan.**

*American Chestnut: The Life, Death and Rebirth of a Perfect Tree.*

**Berkeley: University of California Press, 2007.**

**CHESTNUTS ARE UNLIKE OTHER NUTS. THEY HAVE A HIGH COMPLEX CARBOHYDRATE CONTENT AND ARE LOW IN FAT. MOST NUTS CONTAIN MORE THAN 50 PERCENT FAT. BUT CHESTNUTS CONTAIN LESS THAN 5 PERCENT FAT AND A HIGH-QUALITY PROTEIN. NUTRITIONALLY, THEY ARE SIMILAR TO BROWN RICE.**

of the 80-year commitment of the experiment station to maintain records, to care for valuable chestnut breeding trees, and to be willing to work with other chestnut breeders throughout the country, many hope that the chestnut will make a comeback.

### **Imported From Europe and Asia**

Chestnuts are imported to the United States in quantities with total annual value exceeding 20 million dollars, primarily from Italy, China, and South Korea. Because of the warm, temperate climates in the Northern Hemisphere, parts of the United States are ideal for growing chestnuts, aided by the improved chestnut cultivars, advances in propagation, and new cultural techniques. The Chinese chestnut tree varieties seem to be emerging as the best for profitable orchard crops. As a food item, chestnuts are becoming more widely accepted as Americans search for healthy, environmentally

friendly foods. Currently, the biggest problem is finding American farmers to produce the nuts. In Connecticut, there is one large commercial producer of chestnuts; he sells his entire crop to Whole Foods in Massachusetts. Through recent Internet sleuthing, I found a few Connecticut farm stands that mention they have a limited supply of chestnuts in the fall: Belinsky Farm Stand in Oxford, Walnut Ledge Farm in Glastonbury, Hindinger Farm in Hamden, and High Hill Orchard in Meriden. I'll be making a beeline this fall to one of them to get my fresh chestnuts for our cooking classes and myself. And in the spring, I think I'll start growing a few chestnut trees with my grandchildren—maybe a future Jones Family Farms crop!

*Jean Crum Jones is a registered dietician who helps run the Jones Family Farms in Shelton with her family.*

# WHAT A DAY FOR A TRAIL DEDICATION:

# NEW ENGLAND TRAIL'S WATERFRONT GATEWAY IS COMPLETE

BY CLARE CAIN



**S**unday, June 8, 2014. The sun was bright, a nice breeze blew, and at least 300 trail supporters and friends of the New England Trail joined Connecticut Forest & Park Association to celebrate and dedicate the trail's southern gateway on Long Island Sound. And what a day we had! There were music and trail tattoo artists, stilters and jugglers, barbeque, beautiful weather, and the new boardwalk!

In conjunction with the Town of Guilford's 375th anniversary celebrations, droves went down to the shoreline for trail dedication festivities. The new 107-foot boardwalk and overlook platform extends from

Chittenden Park out onto sand dunes. At 5:46 p.m., as cheers and celebration filled the air, trail partners and event attendees watched the official ribbon cutting, inaugurating the southern end of the nation's newest National Scenic Trail.



### Unique and Beautiful Boardwalk

The boardwalk is unlike any other structure on the Blue-Blazed Hiking Trail System. The boardwalk is an ambitious piece of construction in a sensitive and shifting shoreline environment. Designed by Guilford architect William Thompson, the boardwalk utilizes a specialized footing design known as the Diamond Pier. Unique in the trail world and designed to withstand severe weather, the footings are the key to the

*Top, the official ribbon-cutting.*

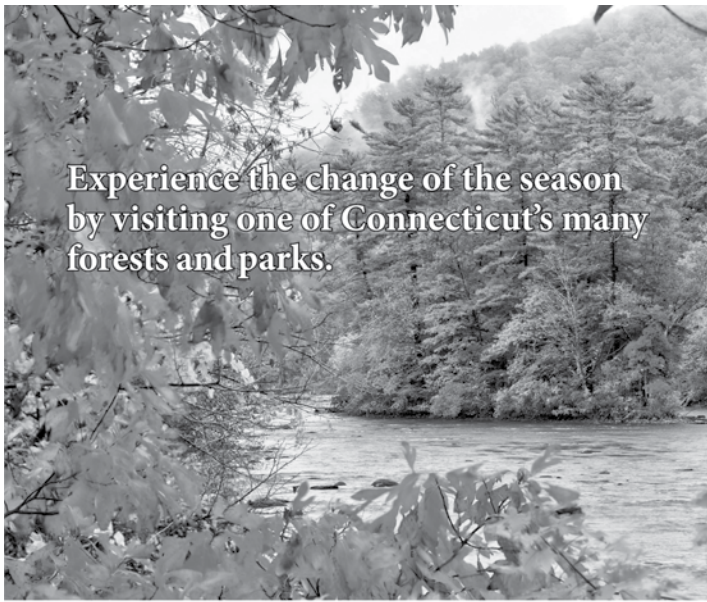
*Above, a trail map on a new kiosk shows the route.*

*Right, exploring the trail's beginning, on the new boardwalk in Guilford's Chittenden Park.*



PHOTOS BY PETER OTIS

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# DiamondPier®

## FOUNDATION SYSTEM



Installation of Diamond Pier foundations at Chittenden trailhead—shown are siting of piers (top left), closeup of single pier (middle); installation of boardwalk over framing (bottom right); two piers supporting framing (center). All photos provided courtesy of Steve McGuire.

- ▶ Low impact construction without excavation.
- ▶ The engineered solution for creating solid foundations without disturbing sensitive environments.
- ▶ Specified for the Chittenden trailhead overlook and boardwalk in Guilford, Connecticut—the Southern Gateway to the New England Trail.
- ▶ Since 1996, Diamond Pier® foundation systems have been successfully



installed by private, municipal, state, and federal clients in recreational and environmental education projects across the U.S. and abroad.

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**THE DIAMOND PIER DESIGN IS INGENUOUS IN ITS SIMPLICITY. A CONCRETE HEAD SITS ON THE GROUND SURFACE, AND STEEL BEARING PINS ARE DRIVEN THROUGH THE HEAD, INTO THE GROUND. THE PINS REACH DEEP INTO THE GROUND AND DON'T REQUIRE DIGGING HOLES OR POURING CONCRETE.**

boardwalk's sustainability. The Diamond Pier design is ingenious in its simplicity. A concrete head sits on the ground surface, and steel bearing pins are driven through the head, into the ground. The pins reach deep into the ground and don't require digging holes or pouring concrete (imperative considerations when building so close to the Sound). The decking and benches are made of Ipe wood, an incredibly strong wood that is particularly resilient to rot and excessive salinity.

We at CFPA feel quite proud of our southern gateway project. It is a testament to what can be accomplished through partnership and commitment to providing an exemplary recreational experience. The boardwalk marks the southern end of Connecticut's longest continuous trail, which traverses from sea to ridgetop, beckoning hardy hiker and casual explorer alike to explore. If you have yet to visit the southern stretch of the NET through historic downtown Guilford and the new boardwalk at Chittenden Park, you certainly should; it is the hottest new destination on the map!

We are especially grateful to the Guilford business community, all of our in-kind contributors, the volunteers and partners, and the variety of donors who made this project such a success—we couldn't have done it without them.

*Clare Cain is the trail stewardship director of CFPA.*



*This page: The decking and benches are made of rot- and salt-resistant Ipe wood.*

*Next page: Some of the 300 who came out to celebrate.*

PHOTOS BY PETER OTIS

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*A mother osprey (Pandion haliaetus) returns to her young above a salt marsh in Weekapaug, Rhode Island, near the Connecticut border. The fish hawk has made a remarkable comeback in southern New England since the pesticide DDT was banned in 1972.*

HAROLD HANKA