CONNECTICUT Woodlands

WHEN OLD BECOMES CUTTING EDGE:
Can Connecticut Live on Wood, Sun, and Wind?

The Magazine of the Connecticut Forest & Park Association Fall 2009 Volume 74 No. 3

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Woodlands

The Magazine of the Connecticut Forest & Park Association

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Wood is the local heat source that many forget. See Steve Broderick's article on page 6.

Connecting People to the Land

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.

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.

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On the Cover:
Solar panels on the roof of the Fitton family's garage provide electricity in Old Lyme.

Photo by C.M. Glover.

DEPARTMENTS

CONNECTICUT Forest & Park ASSOCIATION

When communication isolates

BY DAVID PLATT

CFPA President David Platt

I am worried about something I am seeing and want a reality check. I am hoping that the good readers of Connecticut Woodlands can help me out. Life is precious, and it moves by way too rapidly. I may be crazy, but the technology revolution seems to be making it much worse. Technology seems to be isolating each of us more and more from each other and from the rhythms and pleasures of our natural world.

Now I admit that this technology revolution is fantastic. DVDs are a vast improvement over eight-tracks and records. Cell phones offer clear advantages over landlines and phone booths. I admit that fancy video games are more interesting and challenging than Kick the Can. And e-mail—bless its existence—has increased the efficiency and speed of the written word in ways that the inventor of the facsimile machine could never have dreamed.

What is the cost of these "advancements"? I receive hundreds of e-mails every day. Although only a relatively small percentage are useful, I have to read virtually every darned one of them to figure that out. Moreover, a decent percentage never should have happened. Many of us send e-mails in situations where we should be picking up the phone, or better yet talking face to face. Reasons vary, but some of it is laziness, some of it is convenience, and some of it is simply hiding behind the machine.

I lose time, and I lose the benefit of higher-quality forms of communication. And how many "crackberry" addicts have you observed marching down streets and hallways, oblivious to their surroundings?

A cell phone or PDA, used correctly, is an incredibly convenient tool for keeping in touch when out and about. Misused, it is amazingly annoying and downright dangerous. All around us people are talking, loudly, e-mailing or text-messaging while at the dinner table, hanging out in crowded public places, walking down the street, sitting at the beach, or riding a bike. Or worse yet, driving a car—we all see the horrifying statistics. These machines have all become ways for their sensory-deprived users to shut out the world.

Music lovers are having a field day with iPods and other tiny but powerful musical devices. But again, they use these devices not just to enjoy music, but in place of, and to shut out, the natural world. Can one really feel the experience of skiing the Rockies with music blaring in one's ears? Does hiking a Blue-Blazed Hiking Trail with earphones on count as going into the woods, even if you can't hear the birds singing and the wind whispering through the pines?

There is another way to approach all this innovation. Not by rejecting it, but by embracing it differently. Of course we should use technology to our advantage, but do so in moderation by using it as a tool—a tool to gain more quality time. Think about it. Can you use technology to be more efficient and productive, and thus to gain more time on the beach, in the woods, or on the trails? Do you take the easy way out by replacing real, personal communication with the fake stuff, or can you resist the urge? When you get out to enjoy the natural world, can you make a conscious effort to leave technology behind so you don't cheat yourself on the experience?

Perhaps most important, can we all focus on the young — that important next generation of incredibly proficient technology users that is nipping at our heels? This is a special challenge given that they are growing up as technological wizards and don't know what life is like without these powers. I see a real danger as many of these kids immerse themselves almost 24/7. Can we all try to set a better example, and encourage and nudge in different directions? If we do not, are we at risk of raising generations of adults with inferior interpersonal skills? And with little or no appreciation of the wonders of our natural world?

Please e-mail me, send me a text message, or call me on my cell with your thoughts. . . . Or talk to me on the trail.

Smart growth, smart grid, smart headquarters

BY ERIC HAMMERLING

Over the past decade, political support for the concept of smart growth has grown. Smart growth means developing urban areas compactly to avoid sprawl and the many pressures sprawl puts on natural resources. Smart growth is not only an important concept, but also a wonderfully catchy term. The words "smart" and "growth" are extremely positive, and at the same time, they not-so-subtly suggest that any other kind of growth is not smart.

Although the concept of smart growth has grown in currency, we are also hearing more and more about the concept of a smart grid. As many of you know, the electric power grid is the infrastructure that is responsible for energy transmission (moving electricity in bulk over medium-to-long distances) and distribution (moving lower-voltage electricity to consumers locally).

According to the experts, the current grid is not yet "smart" because it has limitations in how it can best incorporate renewable sources of energy. Renewable resources such as solar, wind, tidal, hydro, and biomass are variable. For example, solar production is limited at night, and wind production is limited on a still day. These sources are quite different in predictability and variability when compared with power plants fed by fossil fuels that can operate at a constant rate. Also, the energy produced by some renewable sources (such as hydropower) can be relatively limited compared with fossil fuel production. Those with limited generation capacity may only be suitable for local distribution rather than for being transmitted over long distances. And of course, no energy production comes without some environmental cost.

Putting aside the many complexities of transmission and distribution, it seems prudent to improve efficiencies within the grid and make it smarter because we use a lot of energy in our homes and other buildings. As Peter Miller wrote in National Geographic in March, "Buildings, not cars, produce the most CO2 in the United States. Private residences, shopping malls, warehouses, and offices account for 38 percent of the nation's emissions, mainly because of electricity use." Similarly, a new U.S. Department of Energy publication entitled The Smart Grid: An Introduction (Office of Electricity Delivery and Energy Reliability, 2009; available for download at www.oe.energy.gov says, "If the grid were just 5 percent more efficient, the energy savings would equate to permanently eliminating the fuel and greenhouse gas emissions from 53 million cars."

CFPA Executive Director Eric Hammerling

"If the grid were just 5 percent more efficient, the energy savings would equate to permanently eliminating the fuel and greenhouse gas emissions from 53 million cars."

— The Smart Grid: An Introduction (Office of Electricity Delivery and Energy Reliability, 2009)

Faced with these compelling statistics, Connecticut Forest & Park Association board members Ruth Cutler, Caroline Driscoll, and I worked with our affiliate colleagues at the National Wildlife Federation to craft a resolution for the new Energy Conservation Incentives Program for Homeowners. NWF adopted it at its annual meeting earlier this year. This resolution recognizes that buildings are a large consumer of energy and that the incentives for energy efficiency improvements should extend both to new homes as well as existing homes.

Not surprisingly, we also felt it was critical to evaluate our own energy use at CFPA headquarters, the James L. Goodwin Forest & Park Center. We commissioned a baseline energy audit that reviewed our energy usage over the past three years, comparing us with similar buildings in this region. We are very pleased that the audit reported, "The building's energy performance exceeds the EPA's 75-percent minimum ranking requirement that would qualify the building for an Energy Star performance rating." Despite this encouraging outcome, we are always striving for improvement and have recently upgraded the efficiency of our light bulbs and ballasts through a Clean Energy Fund/Connecticut Light & Power incentives program.

We'll continue to do our part, track our progress, and let you know how our energy conservation efforts turn out.

Ways to ignore paradise

Every fall I get restless.

It finally hit me why. Just when the weather reaches near perfection, students have to go back to school. Children have their backpacks back on and, in my neighborhood, wait for a bus to take them a short distance around the corner, past Keyboard Pond, underneath gorgeous leaves they can't smell or crunch. Working people are all starting to wear dark-hued, uncomfortable fashions, hanging dried corn on the doors, sweeping up and discarding colorful leaves that fell there, sitting inside instead of out, and making lists for the holidays.

By late February or early March, when the remnants of plowed snow line the roads, covered in a layer of grimy sand, a lot of us dream of paying a lot of money to fly thousands of miles to some 70-degree sun that reminds us of Connecticut in the fall.

This year I will take the home-turf challenge. I will sit outside every day it isn't raining. I will try to become myopic and provincial until the bitter winds of late November take over. And then, I will retreat indoors with a deeper sense of gladness.

— *Christine Woodside*

BY STEVE BRODERICK

Forests are Connecticut's natural vegetative groundcover. If you stop mowing your lawn today, it will start reverting to forest tomorrow, all on its own. And the forest that grows there will not be just any forest, but very likely a thick forest of primarily deciduous tree species such as oak, hickory, maple, and ash. These woods are dense, have high British thermal unit (BTU) values, and produce a lot of heat when burned.

We are blessed in this regard. A quick look at a global vegetative cover map (a good one is available at www.unep-wcmc.org/forest) shows that only a small percentage of our planet grows such forests naturally. As a result, this is and always has been a logical region to burn wood for heat and energy.

For most of human civilization, in fact, wood has been the primary source of heating in Connecticut. Early European explorers wrote of seeing hundreds of Native American fires burning along the Connecticut coast at night. European colonists, viewing the forest as an obstacle to farm creation, are said to have burned as many as 30 cords per year in a single household. By the mid-19th century, charcoal was rivaling water power in many parts of the state as a source of industrial power, and wood burning was still the way people heated their homes. Connecticut's forests were cutover (cleared of timber quality trees) repeatedly to supply these energy needs.

The early 20th century saw a huge change in this pattern with the advent of fossil fuels, first coal and then heating oil. By the 1950s, wood as a primary heating fuel had disappeared from all but the most rural homes, and our forest was growing once again. By the 1970s, for the first time in more than a century, it was again common to see timber-sized forests across the state.

The 1970s marked the next major change in our wood energy use, when the Organization of Petroleum Exporting Countries signaled the end of the cheap oil era by imposing embargoes on its customers. Prices rose fast and lines at gas stations lengthened. In a single decade, Connecticut's wood fuel consumption exploded from an estimated 50,000 cords per year in 1970 (primarily pleasure burning in fireplaces) to more than 500,000 cords 10 years later. Since that time, wood fuel use has stabilized, tracking oil prices fairly closely, but remains high compared with mid-20th-century standards.

My own home wood-burning story began in the 1970s and is not uncommon in our state. For years, I supplemented and reduced my oil consumption somewhat by burning wood in stoves and fireplace inserts. Then in 1994, for $1,200, I purchased an "add-on" wood boiler for the basement that plumbed directly into my oil-fired base-

CONNECTICUT'S
Forests *as* Fuel

From woodpile to biomass, preparing for an uncertain future

board hot water system. As long as I keep a wood fire going, we burn no oil in my house. If I let the wood fire die, the oil automatically takes over.

Using this system, 5 cords of wood and about 250 gallons of oil will heat my 2,300-square-foot home for a year, saving me over $3,000 annually given current oil prices. All the wood I cut is a by-product of my tree farm management activities. I cut wood for reasons besides seeking fuel. I do it to thin timber stands or enhance wildlife habitat. Most of the oil I do burn is used for domestic hot water in the summer months.

The Biomass Revolution?

For several decades now, people like me have used most of the fuelwood in our state—heating one family at a time. But now, early in a new century, significant wood energy changes are once again in the wind. Biomass has become a word on many tongues, even if we aren't always sure exactly what it means. Wood biomass, in the form of chips to be burned for heat or electricity, is now looking like the next major trendsetter in Connecticut's long wood energy story.

Several factors are driving this movement. Chief among them are the future uncertainty of oil prices and supplies and Connecticut's "renewable portfolio standards" that will require electricity providers to obtain 27 percent of their power from renewable energy sources by the year 2020. These factors, along with incentives from the Connecticut Clean Energy Fund, have resulted in four major proposals for electrical generation facilities in Connecticut that would use wood biomass for all or part of their fuel. Several more are proposed for Massachusetts. If all four Connecticut proposals succeed, together they would generate roughly 126 megawatts of electricity and consume well over 1 million tons of wood fuel a year. Forest growth data in tons is difficult to come by, but that could consume as much as half of the total net annual growth of wood in all of Connecticut's forests, public and private.

What might this mean for Connecticut's forests? Well, first it's important to understand that for decades now, Connecticut's forests have been growing more wood than we harvest. The primary reason for this has been the lack of markets for small or low quality trees—wood that is not timber quality. Connecticut foresters have long lamented this lack of markets, because it means many timber and habitat improvement practices that require removal of such

Nancy Cohen

New England's consumption of firewood is stable.

trees can only be done at significant cost to the landowner. As a result, the total volume of wood in our forests has been steadily increasing, while things like timber quality, timber value, and habitat diversity have suffered. As someone trained in forestry economics, I instinctively view new markets as opportunities and believe that some level of demand for such wood can be a good thing for Connecticut's forests and rural economies.

Considering Private Lands

That said, many key questions remain unanswered as we move slowly toward this new market. Among them are these: How much wood from our forests is truly available for biomass each year? Thanks to the U.S. Forest Service, we have good data on the total amount of wood in our forests. But that forest is divided into tens of thousands of private ownerships. How many of these owners will be willing or able to engage in biomass harvesting?

Closely related is the question of how much these plants would be able to pay for wood chips. If it costs a harvester more to deliver a ton of chips than the buyer pays for it, then the answer will be close to zero. And if the end price isn't high enough so that something is left over for the landowner to sell as stumpage, only the most motivated, actively involved owners would be willing to give their wood away in the interest of improving timber stands or diversifying wildlife habitat.

How do we ensure that biomass harvesting is done in ways that are ecologically sound and sustainable? Connecticut has had a State Forest Practices Act since 1991, and yet the majority of commercial timber harvests continue to be done with no professional forestry supervision. Furthermore, Connecticut currently has no written guidelines or regulations for the sustainable harvesting of wood biomass. Foresters, landowners, and loggers will need such guidelines to ensure that our forests sequester carbon, provide diverse wildlife habitats, and retain other essential functions and services as we make wood for this market.

Anchoring the Wood Market: How?

As we grapple with these questions in the short and mid-term, there is at least one other, longer-term issue we should be focusing on. Given today's technology, there are several ways we can use wood for energy. We can heat our homes directly in residential stoves and wood furnaces, using pellets or chunk wood from local forests. We can develop small to mid-sized thermal plants, scaled to the needs of a school, college campus, or a hospital. These facilities use wood mainly to produce heat consumed on site, but may generate some electricity as well.

We can develop large-scale electrical generating facilities, which either burn wood to produce steam or heat wood at high temperatures to produce a gas, which is then burned to make electricity.

The four plants I mentioned earlier all fall into the third category. Yet generally speaking, thermal uses (burning wood to make heat directly) are more efficient than burning wood to make electricity. If we consider transportation costs and production efficiency, large-scale electric plants are by far the least efficient of the three options.

Yet it's also true that if woods operators are to invest thousands of dollars in the equipment needed to harvest biomass in commercial quantities, they need to have reasonable assurances that a market, and profit potential, are here to stay. That may mean one or two large electrical generation facilities will be required to anchor this new market and create enough demand for an efficient production infrastructure to develop. Ultimately, the key to a successful wood energy future will be finding the optimal combination and scale of these uses: one that creates a stable market and a sustainable level of demand, while making the most efficient use possible of our precious wood resource.

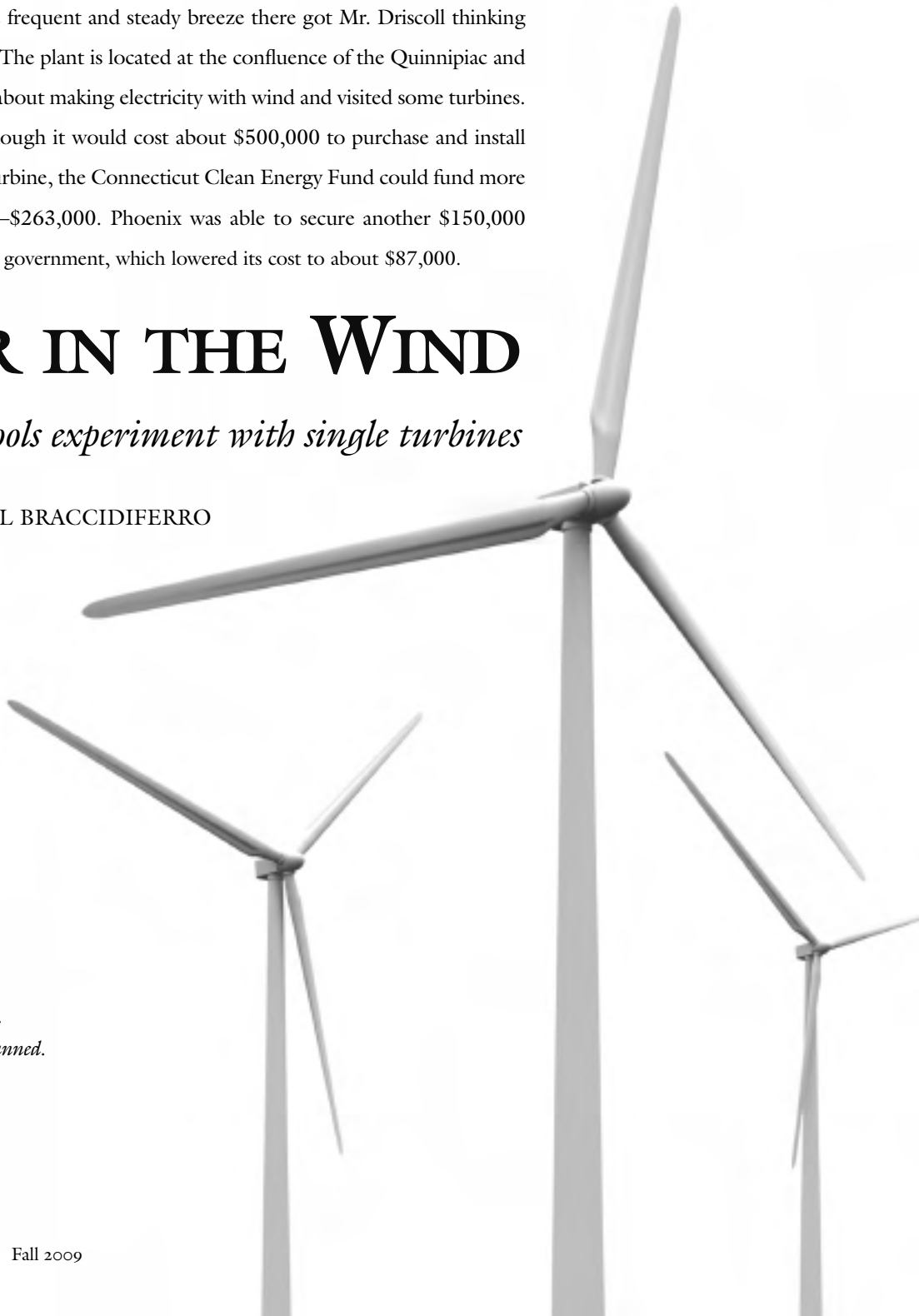
Steve Broderick is the forester and program director at the Goodwin Forest Conservation Education Center in Hampton. The center is operated jointly by CFPA and the Connecticut Department of Environmental Protection under cooperative agreement. *The author thanks Eric Hammerling, Bob Perschel, and Doug Emmerthal for their reviews of this article.*

Brian Driscoll wanted to save money on energy costs, while operating his New Haven business in a more environmentally friendly manner. His challenge: retrofitting an old building. Phoenix Press, the commercial printing company he's run with his brother for 28 years, operates in a 55,000-square-foot, 125-year-old building. Solar panels would have necessitated a new roof on the antique structure—a very expensive proposition. "We quickly dismissed that," he said. But the frequent and steady breeze there got Mr. Driscoll thinking about a wind turbine. The plant is located at the confluence of the Quinnipiac and Mill rivers. They read about making electricity with wind and visited some turbines. They learned that although it would cost about $500,000 to purchase and install a 100-kilowatt wind turbine, the Connecticut Clean Energy Fund could fund more than half of the cost—$263,000. Phoenix was able to secure another $150,000 grant from the federal government, which lowered its cost to about $87,000.

A Finger in the Wind

Companies and schools experiment with single turbines

BY GAIL BRACCIDIFERRO



Wind power will never be a barn-burner in Connecticut, but small projects are planned.

Istockphoto

Wind energy is produced by a wind-driven set of propeller blades at the top of a tall, thin tower. The blades spin a shaft and provide power to a generator. The turbines come in various sizes. Tower heights also vary and the potential for producing energy is divided into three categories.

"Without the grant(s), we probably would not have been able to do this," Mr. Driscoll said.

Once the turbine begins operating this fall, Phoenix Press is expected to begin saving some $30,000 a year on its energy costs, which means that the savings will pay for their costs in only three years. Any electricity generated by the turbine when the printing plant is closed, they will sell back to the power company.

The Phoenix Press small wind project and others like it — a single turbine generating power on-site — typifies the likely shape of wind power in Connecticut in the immediate future. Plans for a handful of small wind turbines are currently in the works throughout the state. Made financially viable through grants similar to the one received by Phoenix Press, the goal is to study the initial set of turbines, educate a sometimes still skeptical public about the possibilities for wind energy, and hope this particular form of renewable energy becomes more economically feasible in the future.

"It will never be a barn-burner here," said Glenn Weston-Murphy, a cofounder of the Connecticut Wind Working Group, who is also a research support specialist at Yale University's School of Engineering and Applied Science. He meant that large wind farms will not come to Connecticut. The landscape here isn't windy enough for that. "What could work in Connecticut are individual turbines sized for local locations and loads," he said. "I have advocated we get some real data."

To that end, the Connecticut Clean Energy Fund is building several demonstration wind projects designed to make power as well as to show how efficient wind can be here and teach the public about it. The new projects are either newly installed or planned at the visitors' center at Long Wharf in New Haven, at the YMCA in Meriden, and at high schools in Lebanon and Coventry.

"The purpose of the demonstration projects is to answer questions: does wind make sense? Will it be embraced? What are the right locations?" said Keith Frame, director of new technologies for CT Innovations, the administrator of the clean energy fund.

Wind energy is produced by a wind-driven set of propeller blades at the top of a tall, thin tower. The blades spin a shaft and provide power to a generator. The turbines come in various sizes. Tower heights also vary and the potential for producing energy is divided into three categories. Small wind turbines are those designed to generate 100 kilowatts or less—although Mr. Weston-Murphy said in Connecticut, "small" generally means less than 50 kilowatts. Larger wind projects haven't been explored for Connecticut. Intermediate projects are designed to generate up to 1 megawatt, according to Mr. Frame. Large wind projects can have turbines producing as much as 5 megawatts and may include several wind towers in a single location. Large wind projects are what the public calls a wind farm.

Although the U.S. Department of Energy has set a goal to produce 20 percent of the country's energy needs with wind by 2030, one challenge to achieving this is that the windiest places tend to be sparsely populated, meaning that the power would have to travel somewhere. Researchers are studying cost-effective ways to store or transport energy.

Connecticut is not a pacesetter when it comes to studying the potential for wind energy, said Mr. Weston-Murphy. Massachusetts and Rhode Island both are building more demonstration projects. While plans for a commercial wind farm off the Cape Cod coast have been mired in controversy, residents of Block Island, Rhode Island, have favorably reviewed a proposal for a wind farm off their coast. Block Islanders pay some of the highest electric rates in the nation.

Portsmouth Abbey, a Catholic school located in the northern part of Aquidneck Island, Rhode Island has had a functioning wind turbine there for a number of years. The turbine produces 40 percent of the school's energy needs, Mr. Weston-Murphy said.

The Wind Does Not Come Sweeping Down the Plain

Despite brisk shoreline breezes, Connecticut's wind patterns are neither intense enough nor steady enough to provide the state with much potential for large wind farms given the current turbine technology. The American Wind Power Association ranks Connecticut 33rd of the 50 states in its potential for large wind projects. In measuring for wind potential at a height of 50 meters off the ground, the U.S. Department of Energy, using wind maps developed by Truewind Solutions, ranks the vast majority of Connecticut as "poor" in its large-scale wind potential. The windiest areas are located in the small mountains of the far northwest corner of Litchfield County and along a narrow strip hugging the shoreline. Even in those areas, the wind class is not higher than 3 on a scale of 1 to 7. The Department of Energy considers a Class 4 or higher rating optimal to develop large wind projects.

Despite this, some companies are looking into larger-scale wind projects. BNE Energy is currently testing the wind potential of sites in Colebrook and Prospect. It has reported that, depending on the wind data it collects, it could build as many as five wind towers on the Colebrook site, which would constitute a 10-megawatt wind generation facility.

BNE is the exception, though. Those who advocate wind energy don't write off the potential for large or medium projects, noting that technological advances in the turbines might make them more viable later. In the meantime, Connecticut's most immediate and far-reaching potential is with small, single turbine projects designed to serve only the location on which they are sited.

Bob Wall, a cofounder of the Connecticut Wind Working Group and director of energy market initiatives for the Connecticut Clean Energy Fund, said many of the state's

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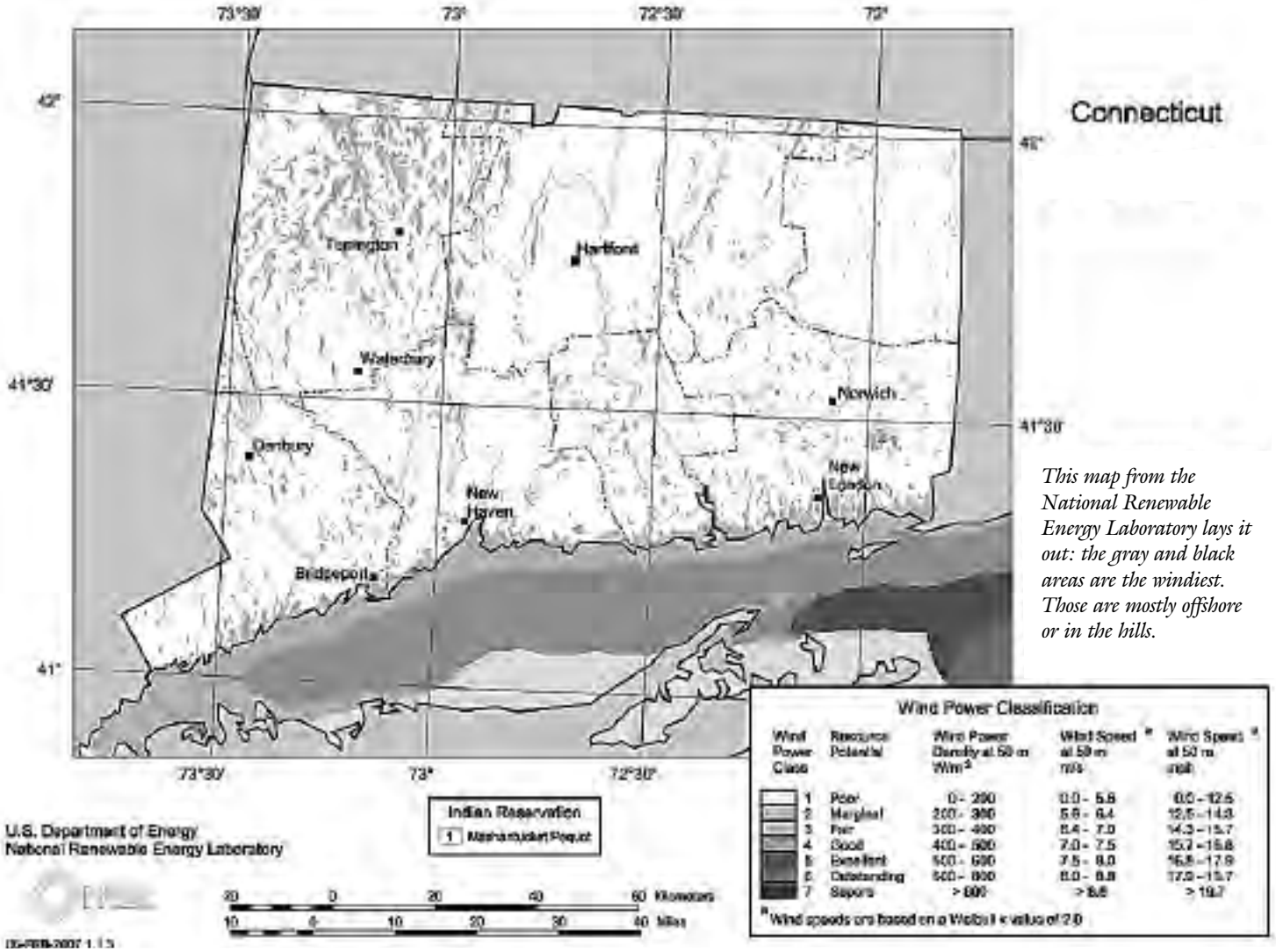

This map from the National Renewable Energy Laboratory lays it out: the gray and black areas are the windiest. Those are mostly offshore or in the hills.

Wind power

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farmers, on the lookout for ways to cut costs, are interested in wind power. Bishop's Orchards, which operates a farm market, winery, and bakery at its 320-acre farm near the coast in Guilford, currently has a test tower measuring the wind energy potential at that site.

"I'd like to see the one Bishop's is proposing actually built," said Guilford Town Planner George Kral. "I'd like to see how it works, whether it's worth it and the impact it has."

Zoning regulations and public opinion can be a stumbling block to wind projects, though. In Guilford, because of the Bishop's Orchards plan, the town recently changed its zoning regulations to allow for small wind turbines. Wind turbines are now allowed if a special permit is issued; before the town will issue the permit, neighbors and other residents must be able to comment and ask questions about the proposals. Mr. Kral said he believes residents would support the plan at Bishop's.

Pine Point School's Struggle

In the shoreline town of Stonington, however, contentiousness killed a proposal to locate a small wind demonstration project at Pine Point School, an independent school for preschool through grade 9. "It was going to be a wonderful part of our learning lab," Pine Point Head of School Paul Giese said about the single-tower wind turbine that had been proposed.

Mr. Giese said officials at the Connecticut Clean Energy Fund asked Pine Point to consider locating a 10-kilowatt wind turbine on school property. CCEF had identified three areas of the state where it most wanted to locate test turbines: Litchfield, New Haven, and Stonington. Because Pine Point has plenty of property and had already demonstrated a desire to explore renewable energy options by developing a solar project, the school seemed a logical site.

Local zoning regulations did not allow for a wind turbine, however, so a zoning change was needed before the project could move forward. While town officials studied the project and a proposed a regulation change, neighbors' concerns grew louder and more intense. They worried about noise produced by the wind blades, the risk the turbine posed to birds and bats, the unsightliness of the tower, and even the potential danger to students.

Despite efforts to alleviate residents' concerns by sponsoring field trips to see other wind turbines in action, the proposal was ultimately scuttled because CCEF officials want demonstration projects located in places where the local community supports and encourages them.

"The zoning regulation was being shaped to our project," Mr. Giese said. "CCEF said the regulation was not going to be what they wanted. The regulation would have killed the incentive for subsequent wind projects in town."

Despite brisk shoreline breezes, Connecticut's wind patterns are neither intense enough nor steady enough to provide the state with much potential for large wind farms given the current turbine technology. The American Wind Power Association ranks Connecticut 33rd of the 50 states in its potential for large wind projects.

Wind proponents contend the advantages of wind power far outstrip its disadvantages and they hope the demonstration projects popping up in Connecticut will help alleviate misunderstandings and consternation about wind turbines.

"Most of the argument against wind is based on a lack of knowledge and a fear of the unknown," Mr. Weston-Murphy said. "Education and early discussion is key for passing ordinances and getting these tools in place to allow for wind projects."

Once the small wind demonstration projects are up and running, CCEF hopes to begin a rebate program designed to defray the $50,000 to $75,000 upfront costs for homeowners interested in installing small turbines.

Even as small wind projects are still a novel sight in the state, Mr. Frame said CCEF also is exploring the development of so-called intermediate wind, which has the potential to produce much more energy at a fraction of the cost of establishing a large wind farm. "Very few companies are yet operating in intermediate wind," Mr. Frame said.

To help get the blades turning in Connecticut, CCEF approved a $750,000 loan to Optiwind to develop a demonstration project in Torrington, Mr. Frame said. In June, Torrington's Planning and Zoning Commission approved the plan, which calls for a 200-foot tower located on a 167-acre dairy farm owned by George Klug. Local residents supported the proposal, although Optiwind's plans for a similar project in Goshen were scrapped after it faced intense local opposition.

"We're pretty excited about the potential for the Klug Farm," Mr. Frame said.

Even as current wind data and turbine technology make it appear that wind energy will not be a major renewable energy component in Connecticut's future, wind proponents contend its potential should not be ignored.

"There are decent prospects and technologies are always improving, so the hope is that as developers come up with more efficient systems, wind could be more viable," Mr. Wall said. "I think there will be a day when it's worth it for homeowners to put up turbines without subsidies. I think eventually prices will drop. We're starting to see that in the solar industry. It's hard to predict how commonplace it will be, but it's important to remember that as with all renewable energy, there is no one silver bullet. You have to look into many different options. You need to have a well-balanced portfolio."

Gail Braccidiferro is a seasoned journalist who teaches at the University of Connecticut.

Which Way Is South?

How to Make ENERGY ON A ROOF

Rebates return: Going broke not required

BY CHRISTINE WOODSIDE

IN THE 35 YEARS SINCE researchers first began to hunker down at what became the National Renewable Energy Lab in Colorado, trying to improve solar energy to bring more of it into people's houses, the sun has remained stuck in the dark. Technology has improved greatly, but the best solar panels still are only about 40 percent efficient. To most of us, the sun remains that bright object we try to ward off with creams, not the on-site power source some dreamers thought it would be. The dream might yet come true, though—in many years, but it could happen. The reason solar energy remains elusive to most of us is that it costs so much to install solar photovoltaic panels to make electricity — about $50,000 for the typical house — that without some kind of subsidy most adults could not hope to recoup the cost in their lifetimes. Solar hot-water systems cost much less, but require a backup system because they usually can't do the whole job for a house.

Fossil fuels remain relatively inexpensive, but many people are starting to understand that for their grandchildren or great-grandchildren, that won't be true. And so more and more people around the country are willing to become "early adopters" of solar photovoltaic panels.

The cost has also come down, once again. Federal stimulus money has brought back the state of Connecti-

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Starting Small

One of the most inexpensive and sensible ways to light the edges of paths and driveways is the solar-powered driveway light. We have some that cost about $10 apiece at a home store, and at about $25 and up, you can buy sturdier ones that look quite nice.

If you dislike the look of solar PV panels on your roof, consider roofing shingles that double as solar panels. At least two companies produce these now. The downside is that they have been reported to be less efficient than the thicker PV panels.

Another way to start small is to invest in DC solar-powered appliances, each attached to individual solar panels that send DC to the appliance. (An inverter to convert to AC is not necessary because these don't connect to the household electrical system.)

One of the most logical and useful solar-powered appliances is the solar-powered attic fan, also called an attic vent. It looks like a rectangular solar panel on the roof, but it includes a fan that blows hot air out of the house. The fan receives the most power from the solar unit when the house needs the fan the most—on hot, sunny days. These fans typically cost in the hundreds of dollars.

Or try a solar-powered sump pump, which doesn't rely on the electricity supply of the house that might shut down during a flood. Individual solar panels hook up to power laptop computers and other communication devices for fieldwork or travel. Call any solar dealer to ask about these products, or search on the Web to learn more.

This article is a version of chapter 2 of Christine Woodside's book, Energy Independence: Your Everyday Guide to Reducing Fuel Consumption *(Lyons Press, 2009).*

Solar energy

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cut's rebate program, which covers about half the cost of a solar photovoltaic system. These rebates have made solar affordable to the middle class for the first time since the incentives of the Jimmy Carter years.

Because solar is still a relatively new technology, and because it requires conservation, some people might feel reluctant to try it. But if a solar-photovoltaic system hooks into the power grid, backup power is always available, although you have to buy it. So solar users remain those rare individuals who are motivated to conserve energy in their houses. The solar users I have met talk about their conservation ethic. They don't want to have to resort to buying too much electricity from the grid — especially while they are still paying for the solar panels. They want to make it work. When they bought the panels, they also bought into a way of life. They made a commitment to spend more money than most to provide basic utilities, and every day they have to take steps to live differently at home — by using less power.

Federal stimulus money has brought back the state of Connecticut's rebate program, which covers about half the cost of a solar photovoltaic system. These rebates have made solar affordable to the middle class for the first time since the incentives of the Jimmy Carter years.

Solar users have acted on their belief that the time has come when ordinary Americans need to look at the sun someplace other than at the beach. David Brown, an artist and farmer in Old Saybrook, once spent a year painting sunrises. One of those mornings happened to be the first day of 2000, which most of us interpreted as the start of the new millennium. When Mr. Brown got to the shore of the Connecticut River, he found a crowd of people looking to the east, waiting with him for the sunrise. One of those people suggested to Mr. Brown after he finished his painting, he might like to take

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Opposite page, Rooftop solar photovoltaic panels at Horst Engineering's renovated medical device plant in East Hartford provide about half of the 7,000-square-foot building's electricity. A Connecticut Clean Energy fund grant paid for a sizeable portion of the cost. Horst's CEO, Scott Livingston, is a member of the CFPA Board of Directors.

Scott Livingston


Horst Engineering
SUNPOWER

Solar energy

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a drive around to Old Saybrook's town beach on Long Island Sound, a few miles away — there was something he ought to see. He headed over to find a crowd of people patiently waiting for the sun to rise from the southwest.

If you plan to harness energy from the abundant amount of sunshine that hits most regions of the Northern Hemisphere, be sure you know which direction is south. If your roof does not face the right direction, you can affix panels to poles set wherever they need to be. Then consider the funds. In most cases, for every watt a solar panel generates, it costs roughly $8 to $10 in initial investment. Thus, 1,000 watts of power, or 1 kilowatt, would cost about $8,000 to $10,000. Generating 4 kilowatts, or enough to power a fairly conservation-savvy household, would cost roughly $32,000 to $40,000 to install the equipment.

The average electricity use in Connecticut is about five times that amount, but people who go solar quickly get down to the lower level by incorporating major conservation moves into their habits. Also, beware. Rebates won't last indefinitely. Connecticut renewed its rebate program, but several of the leading states that have put out millions to help install solar systems have ended theirs. In New Jersey, which paid 70 percent of more than three thousand solar systems from 2000 to 2008, rebates ended in that year because the state said it would cost billions to reach its goal of providing just 2.2 percent of its power from solar by 2020. Officials are pursuing an energy-credit system instead. How this will help residential customers isn't clear, but New Jersey has been a big leader in solar energy, and it seems poised to try to do something. Other states looking into a different way of pursuing solar installations are New York, Colorado, and Maryland.

Starting Small

I recommend considering small, appliance-by-appliance approaches to solar photovoltaics. Not only is it difficult to provide power for an entire household on the technology, you need not feel it's the only way to go. You can start very small, although to do so will feel like a hobby. It's possible to buy a single 100-watt panel for about several hundred dollars — but that doesn't include other equipment you need to hook up to the grid. (Remember: If you sign up to receive rebates or incentives, many of those programs require a grid connection.) Gail Burrington, owner of Burrington's Solar Edge in Windsor Locks, does not recommend that you go solar on such a small scale. According to Ms. Burrington, it would not be worth the cost to provide so little electricity for your house, but I think that even the exercise of working with a solar panel is worthwhile.

Scott Livingston

Even with a rebate, it takes something between about 10 and 20 years to recoup the financial cost of most systems — depending on the size of the system, electric rates, and whether a rebate covers part of the cost. But the environmental benefits begin immediately when you produce clean energy that doesn't pollute the air.

Even with a rebate, it takes something between about 10 and 20 years to recoup the financial cost of most systems — depending on the size of the system, electric rates, and whether a rebate covers part of the cost. But the environmental benefits begin immediately when you produce clean energy that doesn't pollute the air. Many objects for which we pay dearly depreciate from the moment we buy them. The Connecticut Clean Energy Fund explains in its guide for consumers that, "buying a PV system is like paying years of electric bills up front. You'll probably appreciate the reduction in your monthly electric bills, but the initial expense may be significant. Improved manufacturing has reduced the cost of PV equipment to less than 1 percent of what it was in the 1970s, but the cost amortized over the life of the system is still about 25 cents per kilowatt-hour. This cost is roughly twice the direct retail price that most Connecticut residents now pay for electricity from their utilities."

A solar system that would provide the amount of power most Americans use now would have to be very large—too large to be practical. Solar power in enough quantity can comfortably provide for needs, but it can't provide for the kind of waste Americans take for granted. So you would have to learn to turn off lights and power strips, unplug appliances that do not run off power strips, and stop using unnecessary electric appliances. Heating and cooling use the most energy. If you had a solar PV system, you'd need to heat your water with propane or a separate solar hot-water system. You'd also need to cut back on cooling. Start by buying a low-energy refrigerator.

The Consortium for Advanced Residential Buildings, a program of the Department of Energy, has determined that energy savings from solar panels can vary greatly from house to house based on how carefully people conserve. In California in 2003, a construction company built a group of energy-

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In the Pachaug State Forest, Hell — in name only

Stephen Wood

The view off Flat Rock Road, above Hell Hollow, is anything but hellish.

BY STEPHEN WOOD

For an enjoyable hike without problems reaching your parked car, sometimes it makes sense to combine sections of several trails for a loop. Hikers yearning for summits tend to overlook the Blue-Blazed Hiking Trails in eastern Connecticut. Although the hills here aren't as impressive as those in the central and northwest regions, they offer other charms.

This year try the Halloweeny hike in the Hell Hollow area of Voluntown. New England's Colonial roots are on full display throughout this hike. Old stone walls, cellar holes and mill races dot the woods. The Puritan-inspired place names certainly add a unique component to your Halloween season hiking.

Step by Step

This approximately 7-mile loop begins on the Pachaug Trail just east of the Hell Hollow Pond parking area. Head north through towering white pines, enjoying views of the pond to the left. After .4 mile, bear left at the yellow-blazed crossover trail through some low-lying marshland and along several old stone walls.

The trail wends its way through the Pachaug State Forest, following crumbling stone walls and an old woods road on the way to intersect with the Quinebaug Trail. Here it skirts the northern reaches of Hell Hollow. In Colonial times and thereafter, bedeviled farmers often attributed poor farming here to Satan. Actually, the culprits were thin soil and rocks, (Other more colorful stories abound about the area, but I don't endorse them.) Nearby Mount Misery was named for similar reasons.

Following the blue blazes to the right (north) and continue two-tenths of a mile to the beautiful Lockes Meadow Pond, a favorite spot for bird watchers, at 1.5 miles from the start to the northern terminus of the Quinebaug Trail.

To continue the loop, head left (southwest) on the blue-blazed Quinebaug Trail along the woods road. Ascend slightly. After about .1 mile, look immediately to the left for some large boulders piled on top of each other. There is very short little trail that heads to the base of the largest formation — a small rock cave formation known as Devil's Den.

Continue ascending slightly. The road, called Flat Rock Road, earned its name from the large, exposed, flat rock you come to shortly. This hilltop is a great spot for a break while enjoying views to the south. Continue along the trail and bear sharply left once the road becomes paved. Descend back into Hell Hollow, passing old cellar holes. The next section of the trail can become locally flooded after heavy rains, which no doubt some people attribute to the devil.

Continue along the Quinebaug Trail, cross Hell Hollow Road (from here, the parking lot is about .3 miles to the left), and enter a dark pine forest. Thick fog often encases this low-lying area—more creepiness. The trail is now deep in Hell Hollow.

Before the screaming can begin, the trail reaches the edge of Phillips Pond and the picturesque picnic grove. Head left towards the picnic area and pick up the blue-red-blazed crossover trail back to the Pachaug Trail. This mile-long connector skirts Phillips Pond and climbs through beech and maple trees before meeting the Pachaug.

Bear left (north) on the blue-blaze Pachaug to complete the remaining mile to the parking lot at Hell Hollow Pond.

Directions

From I-395, exit 86, head east along route 201 and continue straight onto Stone Hill Road when 201 bears right. Continue along Stone Hill Road. At Breakneck Hill Road intersection, continue straight onto Hell Hollow Road (The road sign is often stolen), which is a winding, narrow paved road. Park on the left, just past the pond.

From Route 49: About halfway between routes 14A/165/138, at the top of the hill look for the CFPA blue oval Pachaug Trail sign. This is Hell Hollow Road, located directly across Route 49 from Cedar Swamp Road. Follow the road to the parking area before the pond on the right.

Stephen Wood lives in West Hartford and chronicles his ongoing quest to hike all the CFPA trails at ctmuseumquest.com. Visit the site and click on "Hikes."

Solar energy

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efficient houses in Sacramento. The utility, Sacramento Municipal Utility District, offered solar systems to builders at a discount to encourage lower electricity usage. The built-in roof panels generated 3.3 kilowatt-hours, or theoretically enough to power the homes without backup power from the grid. The utility announced that the goal was for the houses to use zero net electricity throughout the year — in other words, to use only the sun. Throughout 2004, the utility kept track of electricity use at 11 of the houses. Only 2 of the houses reached the goal. The rest used varying amounts of added electricity beyond the solar systems. The discrepancies showed that "the ultimate responsibility in attaining 'zero energy' lies with the user," as CARB reported in a newsletter.

Professor Invested Early in an Array

In 2003, Peter Markow, a chemistry professor at St. Joseph's College in West Hartford, and his wife, Claire, decided to invest in a solar PV system for their house in Tolland, where they live with their son and daughter. They refinanced the house (this was before rebates) and located a clearing at the back of their property where they could mount the 48 100-watt panels, which cost $51,000. "We have no real south-facing roof, so we mounted them on metal poles on concrete tubes going down four feet," he says. "We put them up in November 2003. In 2004, 81 percent of all our electricity needs came from the sun." As good as that was, he notes that the saleswoman had optimistically predicted that 100 percent of their needs would be fulfilled by the panels. It is true that occasionally, for short periods, the panels gave them much more than they needed. April 2005, for example, was an unusually sunny month with almost no rain. According to a computer program Mr. Markow monitors daily, the system provided 121 percent of the Markow family's electricity that month. (Of course, the amount above 100 percent went out onto the power grid.)

Conserving electricity is not difficult, Mr. Markow says. They switched to compact fluorescent bulbs, which use much less energy than regular bulbs. The house is well insulated. They use an oil furnace. They close windows in the summer to keep the night's cool air inside the house. And the attic is insulated, holding in heat in the winter and cool air in the summer.

"I was doing this because I wanted to do it," he says. "I want to show the world that this is doable — right here in Connecticut." The truth is that solar PV panels operate better in cool temperatures, when electrons move off the silicon more efficiently.

"The aspect I'd like to promote is: What's the environmental benefit of doing this, and the environmental cost of our energy use," Mr. Markow says. Using his computer program, which records the total amount of energy the panels bring in (whether it goes out to the grid or not), Mr. Markow is producing detailed records of his foray into alternative energy. Most months, they spend slightly more for power than they saved by making their own, but as they learn to conserve at crucial times of the day, their savings could increase.

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Connecticut Forest Policy: Possible New Directions

BY WILLIAM R. BENTLEY

Connecticut has a rich and proud history in conservation. Early leaders like Gifford Pinchot and George McLean were born here. Connecticut hired the nation's first state forester and passed one of the earliest forest tax laws. Pioneering policies, coupled with declining agriculture, allowed the state's forested area to increase from 20 percent in 1860 to almost 65 percent in 1952. Over the past 57 years, forest growth has exceeded forest removals by a two-to-one ratio, but Connecticut's forest area has declined to 58 percent of the total area. Private forests are more fragmented today. Compared to a half-century ago, the state produces less clean water, has fewer acres of wildlife habitat, sequesters less atmospheric carbon, and provides fewer of other valuable services from forests.

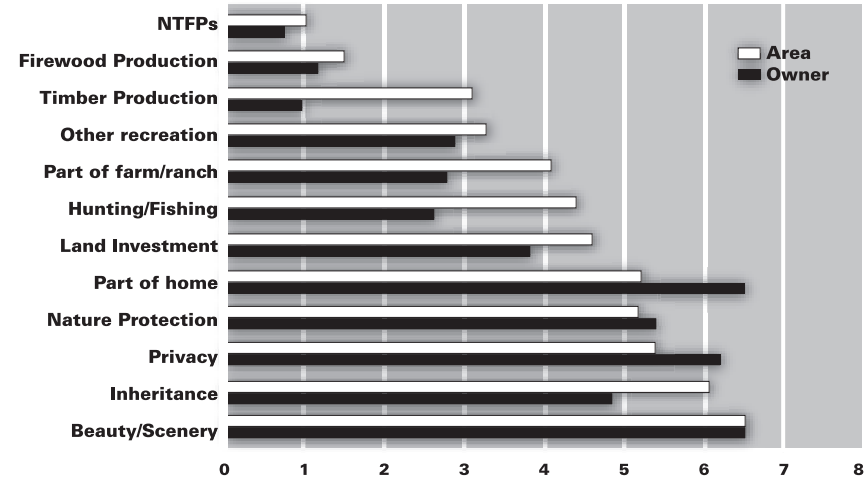
Can local economy boost forests?

Connecticut's most important forest policy question is whether the processes of development and fragmentation can be stopped or even slowed. Can institutional changes, including new market mechanisms, encourage private owners to retain their lands as working forests? Or is the loss of forestland inevitable as land prices for development rise to ever higher levels?

We do have a clear picture of what owners of small woodlands value in their land: beauty, scenery, privacy, and natural area protection. (See the graph.) Timber investment returns are not ranked high, but inheritance and land investment are important. They want "non-development values" from their forestlands, but also treat their lands as assets to bequeath to their heirs, or as places for retirement. Given this understanding, let's look at Connecticut's policies guiding forest management today on private lands, and let's consider possible new policies.

Current Forest Practice and Tax Policies

Connecticut's forest practice regulations are simpler and less onerous than other states' policies. Landowners make voluntary commitments to care for their land, which works well in a state this small. The policy direction also reflects strong belief in property rights, which is affirmed by Connecticut's constitution, laws, and case law. A few critical policies guide private forest management here: the Forest Practices Act, the Inland Wetlands and Watercourses Act, and voluntary Best Management Practices for forests.



Why People Own Woodlands

This chart by B.J. Butler and reprinted from a U.S. Forest Service research bulletin quantifies why private citizens choose to own forest tracts in the United States. "NTFP" stands for non-timber forest products.

A recent ad hoc review of forest policy and practices recommended a simple timber harvest notification form. It would replace a variety of application forms in various towns with a uniform process that would allow forest owners to harvest timber as a farm activity, without permission from authorities. This is the historic legal view of harvesting, which is reaffirmed by the Inland Wetlands and Watercourses Act. It would not entitle anyone to harvest wood that would damage wetlands or downstream properties and watercourses. A notification form would allow local wetlands commissions to ascertain if a more thorough review is necessary. The draft form is being circulated to towns and the Connecticut Department of Environmental Protection for review.

Connecticut has implemented various tax policies to create incentives for landowners to retain properties as forests. These include the Tax Law/10-Mill Law, which was originally passed in 1913 and has been amended several times. At this point, the 10-mill law affects 75 landowners in Connecticut who own a total of 14,050 acres; these are among the larger forest holdings in the state.[1]

Public Act 490, which was enacted in 1962 to help preserve open space, is the more important tax law for forestlands. The forestland values are set every 10 years by the State Forester, and are less than any of the agricultural classifications or open space in towns that have this category.

Changes have been suggested for improving PA 490. Among them are to require renewal every 10 years; require forest stewardship plans for continuation of PA 490 forest tax status; or require repayment of 10 years of taxes plus interest if land is withdrawn from PA 490 status.

While each argument has positive points, the initial purpose of PA 490 was preserving open space, not forest stewardship. The strongest supporters of PA 490 are the Farm Bureau and agricultural interests. They are reluctant to open the act to legislative changes because bad changes are just as likely to emerge as good ones.

Policy Changes that Might Work

Few new policy alternatives are being considered because several good policies are already are in place. Smart growth initiatives, a revised transportation policy, improved city environments, especially schools, and more comprehensive planning and zoning at the town and regional levels could help. None of these are the conventional topics of forest policy, which reflects the realities of high rural land values. Forest landowners and professional foresters should look to

town planners, regional collaboration, mass transit advocates, land trusts, and environmental organizations as potential allies in changing land use policies.

Some policy initiatives specific to forestry deserve consideration. One is to modify the state tax code to favor donating lands and easements for conservation and open space purposes. Connecticut does not allow deductions for charitable gifts. This proposal would allow deduction of up to half of the taxpayer's adjusted gross income for gifts and bargain sale prices on lands and easements over a 16-year period, as is true for federal income tax deductions. This is an inexpensive way to capture open space without direct expenditure of public funds.

Payments to forest owners for the good that their forests provide the land — such as sequestering carbon, protecting watersheds, and providing wildlife habitat — would encourage working forests. A simple version would pay a set amount per acre annually to any forest owner who has a forest stewardship plan and agrees to a rolling 10-year restriction on development. The annual payment might be significantly higher for owners who place conservation easements on their properties. These payments probably would not compensate for the current low ratio of timber prices to land values in Connecticut, but they would help justify maintaining working forests as open spaces in the state.

Professor Chad Oliver, director of the Yale Global Institute of Sustainable Forestry, has often suggested another incentive for forest owners.[2]

If the state or a town wants more of a particular forest type, such as an early successional stage or a savannah, it could pay landowners to grow one. The purchase agreements might be for 10, 15 or 20 years, depending on how long a landscape can easily be kept in the desired stage of stand development.

The important element here is that taxpayers must appreciate how important forests are.

Connecticut was a critical starting point for the forest conservation movement in America. The overarching question is: What kinds of environments do Connecticut citizens value and what forest-based services are worthy of public payments?

1. From comments in the appendix of Connecticut's statewide forest resource plan.

2. Dr. Oliver made this point most recently at the Symposium on the Future of Connecticut's Forests, sponsored by the Student Chapter of the Society of American Foresters, at the Yale School of Forestry and Environmental Studies on February 27, 2009.

William Bentley is a forestry consultant and principal of Salmon Brook Associates of North Granby.

Wood Cooking is HOT

BY JEAN CRUM JONES

Cooking on a wood fire has made a surprising comeback in the early 21st century. It's one of the more unusual, unexpected foodway trends. Cooking with wood makes some feel independent using a local, renewable fuel. Some families are learning to cook in their fireplaces to share a quiet, elemental task that contrasts with the frenetic high-tech world. Others are exploring wood cooking with new appliances for the flavor of wood-fired ovens and grills they have tasted at restaurants.

The history of cooking begins with wood. Prehistoric man first cooked by suspending animal carcasses over open fires of sticks and logs. Later, they learned to use containers to cook food over fires. Cooking progressed to fireplaces, which initially were campfires built inside shelters. After millennia of fireplace dependence and improvements, the Industrial Revolution brought cast iron cooking stoves. Wood fueled these stoves until the early 1900s, when coal began to dominate.

Connecticut was denuded of forests by 1900, so the widespread adoption of coal for fuel, distributed economically by the railroads, contributed to the regeneration of Connecticut's natural forest cover, led by the efforts of the fledgling Connecticut Forest & Park Association. When Americans began using electric and gas ranges in the 1920s, they brought speed, cleanliness, and convenience to the kitchen, and most folks were happy to abandon their old hulky black iron stoves.

Some Victorian-era women wrote articles railing against the "stovey" taste of the new cooking technology, which they said impregnated food prepared in cast iron ranges. Many, including Connecticut's Harriet Beecher Stowe and Catherine Beecher, complained bitterly about the loss of flavor and of women's cooking knowledge. Fire, which had been a prominent part of women's daily routine for thousands of years, was now enclosed. No longer did the hearth seem the center of the house. Nostalgia for a past perceived as more simplified and golden motivated many women to raise charitable funds to purchase historic houses with fireplace kitchens. These former homes were opened as house museums. Historic

Susie Bonta, Old Sturbridge Village

An interpretive guide cooks Thanksgiving dinner on the hearth in Sturbridge, Massachusetts.

New England, a cooperative of house museums, www.historicNewEngland.org/resources/Americaskitchens) has declared 2009 the year of the kitchen.

At Plimoth Plantation in Massachusetts, looking around the recreated village of humble cottages of 1627, I can actually see where these settlers derived all their food. It was a very local supply. The fireplaces are primitive, built on a dirt floor against a wall under a chimney. These hearths provided nutrition, warmth, and reassurance. Historic Deerfield, in northwestern Massachusetts, demonstrates open hearth cooking during the 1700's Colonial period. The fireplaces are brick, well equipped, and fairly large. At Olde Sturbridge Village, representing the 1830s in New England, interpreters show how people made the transition from fireplaces to cast iron stoves. All of this reminds a visitor just how difficult the "good old days" were. Especially before the invention

of the safety match in the 1840s, just keeping the home fires burning was a constant task.

In the Colonial period, the housewife arose a couple hours before dawn to rekindle the fire and to get breakfast started. In those agrarian days, way before electric lights, most people worked for a couple hours before breakfast, which was generally eaten around 9 a.m. The housewife began most of the serious cooking of the day using what was in season. She may have rotisseried a game bird on a vertical string; braised pots of stews and beans, (with pudding bags tucked alongside) in big kettles hung over the fire on crane hooks; baked a fruit cobbler in a Dutch oven in the hot ashes, or prepared corn griddle cakes or fish on a flat iron pan directly over the flame. Long-handled spatulas, forks, and spoons were the most common utensils, not to mention hearth tools.

The cook knelt by open flames where cinders flew from unscreened fires, lifting and moving heavy pots, and reaching into the heat to stir or turn cooking food. Burns were common injuries, and women's long dresses sometimes caught fire (death by fire was the second cause of mortality for women after childbirth complications). They constantly were sweeping the floor near the cooking hearth and scrubbing the hearth to keep it free of grease. Grease landed in dripping pans during roasting. Though the general arrangements were sparse, the cook could turn out prepared dishes with remarkably tasty results. Cook books were not common items until the mid 1840s. All good cooks knew their recipes by heart.

The big meal of the day, dinner, was eaten between 2 and 3 p.m. Afterwards, women devoted themselves to other household chores—gardening, spinning, laundry, hauling water. They ate a light supper, requiring little food preparation, at twilight. The fire was the last thing at night the cook tended to, banking it for the next morning's use.

Hearth cooking is in many ways similar to crock-pot cooking — it requires recipes that require long cooking time over low heat. Its strength as a cooking method is in gently melding flavors. It might take all day, but it's a perfect method for stews, beans, soup stocks, and many one-pot meals. Obviously, the fire needs to be attended during the cooking time, whereas the crock-pot can simmer away on its own.

Knowledge of fire is necessary to control it. Having the right wood is essential. Hardwoods are the best. The preferred wood for cooking is a fruitwood, such as apple wood. Not only do the fruitwoods provide the best coals, but they let off a pleasant aroma. Ash, oak, hickory, hard maple, or dogwood are also good hardwoods. The two essential properties are that they generate an even, intense heat and that they produce a good supply of red-hot coals.

A working fireplace always has a large layer of ash. Ash is used to regulate the rate at which wood burns. Importantly, ash is used to bank the fire at night or when someone leaves the house in the daytime. Banking wood and embers with ashes reduces the risk of fire while one is away or asleep.

To start a one-pot meal, begin by placing the cooking pot filled with ingredients directly on the hearth a couple inches from the flames. Control heat by moving the pot closer or farther from the fire. To speed things up, embers can be pushed up with a fireplace shovel against the side of the pot closest to the flames. Stir as needed, until it is hot. If something is being cooked that has a lot of liquid, soup for example, stirring is rarely needed because of convection currents within the pot. Many dishes cooked by the fire's light stir themselves.

Hearth cooking probably makes no sense for everyday cooking, but it can be used for special days or for special ingredients. Perhaps

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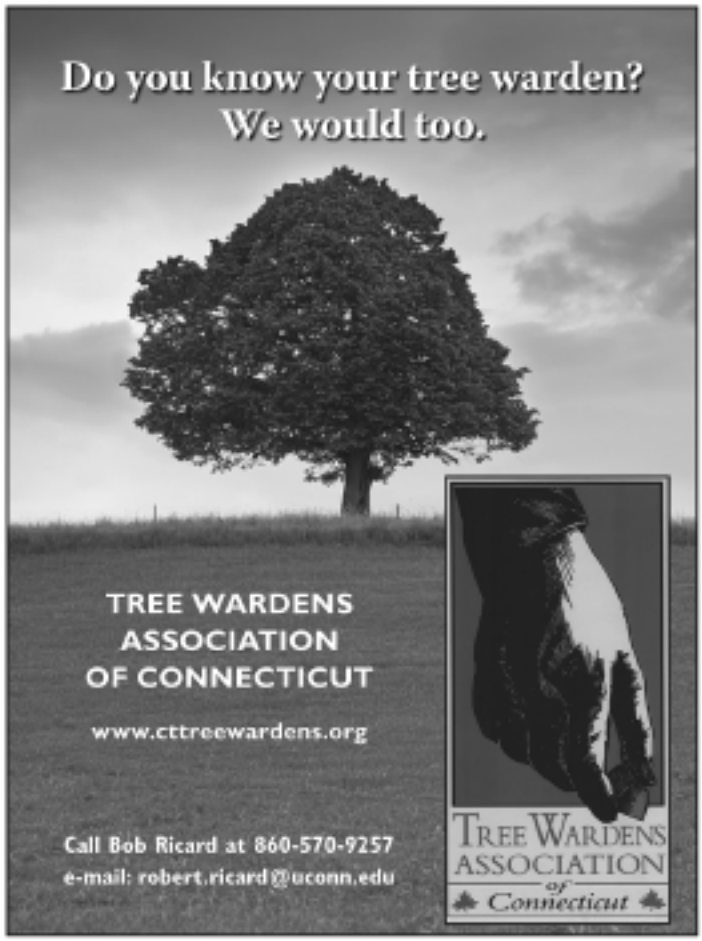
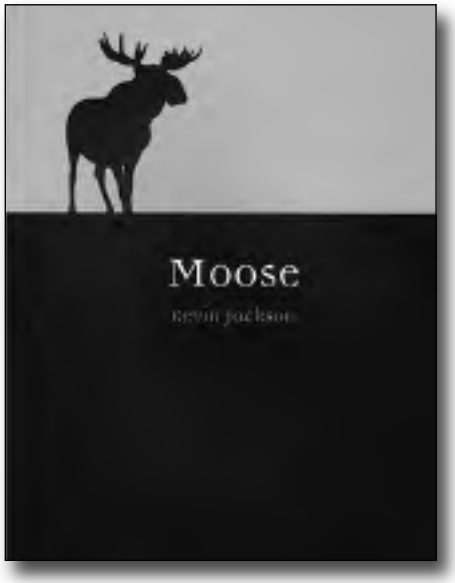


The Largest Living Member of the Deer Family

Moose, by Kevin Jackson.
Reaktion Books Ltd: London, 2008. 200 pages.

BY ROBERT M. RICARD



How many natural history books do you know of that have the likes of Bullwinkle, of Rocky and Bullwinkle cartoon fame, as the main character? Remember? In episode after episode, the idiot savant Bullwinkle J. Moose, and pal Rocky the Flying Squirrel, alleviate the cold war anxieties of children of a certain age by thwarting the diabolical schemes of Pottsylvanian spy Boris Badenov and sultry companion Natasha.

In *Moose*, Kevin Jackson takes us on a wonderful journey that examines the real and contrived world of the moose. The result is fun and yet educational in a succinct way. *Moose* is one of 25 already published books in a series entitled Animal. Sixteen are forthcoming. All of the books follow a simple formula: the first chapter introduces the topic, followed by chapters covering on the natural history of the animal, followed by chapters on human and animal encounters throughout history. Each ends with the symbolism the animal carriers for people.

The moose is the perfect animal for this style of book — comical, even grotesque, a curiosity throughout history. Its big body held up by spindly legs seems to defy gravity. Its muzzle (or irreverently the "schnozzola") is long and bulbous. Its rabbit-like ears frame and emphasize the nose. Its hump is Quasimodo-ish.

Besides being a primary food source of Native Americans throughout North America until the twentieth century, moose have entered our pop culture. Bullwinkle isn't the only moose of note, for example, to capture and hold our imagination. There is Mr. Moose on The Captain Kangaroo Show; Mort the Moose on the credit sequence of Northern Exposure; and Dr. Seuss's Thidwick the Big-Hearted Moose. West Harford, Connecticut placed life-sized, decorated cow statues downtown. Toronto did something similar, but with the icon of the boreal forest. How many of us have had a friend or acquaintance, often an offensive lineman, nicknamed Moose?

Alces alves is the largest living member of the deer family Cervidae. Moose are native to the higher lands of the northern hemisphere, and particular to tundra regions and boreal forest. These lands occur in North America, Scandinavia, and across northern Eurasian continent. There are several subspecies. Size varies with sub-species and gender: the Manchurian moose is the smallest and the Alaskan moose is the largest.

Jackson provides copious illustrations including ancient cave paintings and drawings by European explorers of the North America continent. A detail of a map drawn by Gian Battista Ramusio in 1556 may be the earliest European depiction of a North American moose. Depicted near a mountain Jacques Cartier named Mont Royal, a moose is larger than other animals implying a dominant role in the northern forest. (Ramusio calls this area Monte Real — Montreal.)

Jackson devotes a good amount of time and space to how people viewed and presented moose during the Enlightenment in paintings, illustrations, and literature. He also contrasts the romantic image of moose during this period with the hunting of moose to near extinction. (Don't forget Theodore Roosevelt's short lived Bull Moose party; Teddy shot his share of moose, too.)

Robert M. Ricard is a senior extension educator in urban natural resources and public policy with the University of Connecticut Cooperative Extension System.

Hearth cooking

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herbs and vegetables harvested from one's garden can be used to create a special hearthside soup or on a snowy day in mid-winter, grandparents can sit and play board games with grandchildren while a stew bubbles away nearby on the hearth. Fireplace cooking offers a world of sensory pleasure and sociability, as well as unforgettable memories.

Highly Recommended Book:

The Magic of Fire: Hearth Cooking: 100 Recipes for the Fireplace or Campfire, by William Rubel (William Rubel, 2004). The author relates the history of hearth cooking as well as describes the nitty-gritting of cooking over soft flames and glowing coals.

Jean Crum Jones is a registered dietician who, with her husband Terry, runs the Jones Family Farm.

WALKABILITY *It's the Way to Go*

BY LESLIE LEWIS

My husband likes to tell the story of the drill sergeant he had in basic training years ago, who ardently declared that "your feet are your PMOT—Primary Mode of Transportation." As a society, we seem to have gotten away from that idea, but there are encouraging signs that change is "afoot."

Municipalities around the country are looking at their walkability indexes. This includes rating things like street crossings, sidewalks, safety, and the general car/pedestrian interfaces. New York City is this year's host of Walk 21, an international conference on walkability. In Connecticut, the Department of Transportation is updating the state's bicycle and pedestrian plan to ensure that non-motorized forms of travel get more consideration in transportation design and funding. These are all exciting steps pointing us in the right direction. While gas prices have moderated from their highs of 2008, no one believes that low prices will last. It is important that our cities and towns start to prepare a welcome for a new wave of walkers.

Here at CFPA, we hope that the WalkCT program will help people think about how, where, and why they walk, and what would make those walks more enjoyable. Building on these fundamentals, we envision a culture where walking (and cycling) will become part of the transportation fabric in Connecticut. At a meeting with advocates for a multi-use trail along the Merritt Parkway in Fairfield County in spring 2008, DOT Commissioner Joseph Marie asked how that trail might connect with train stations and other transit stops. This is a great sign that the DOT is seeking a true multimodal transportation system that includes non-motorized alternatives.

We as individuals can help make a walking Connecticut a reality too. Take a look around your town or city and note what works and what doesn't. Can you walk to a shopping area or a park? Can your child walk to school or a playground? If the answer is yes, lace up those sneakers and get moving. If not, talk to your local or regional planning office to see if there are projects in the works that could improve conditions. Seek out pedestrian accident statistics. These might highlight a particularly problematic intersection or stretch of road. Write letters to the editors of newspapers, blog about the issues, and get people talking. Find out if your education department has looked into Connecticut's Safe Routes to School program. Better walking opportunities lead to healthier citizens, more vibrant communities, and economic development. Let's walk, Connecticut!

Leslie Lewis is the director of WalkCT and enjoys exploring ways to make walking more a part of her daily routine.

Is Your Community Walkable?

The next time you take a walk, keep these questions in mind and share what you find with your town officials and members of your community.

1. Do you have room to walk?
2. Is it easy to cross streets?
3. Do drivers behave well?
4. Is it easy to follow safety rules?
5. Is this walk pleasant?

To see an entire walkability survey, go to www.walkableamerica.org

Great Walking Resources

Alliance for Biking and Walking
www.peoplepoweredmovement.org

America Walks
www.americawalks.org

American Heart Association
Start!Walking Program
www.startwalkingnow.org

Connecticut Safe Routes to School
www.ctsaferoutes.ct.gov

National Highway Traffic Safety Administration
www.nhtsa.dot.gov/people/injury/pedbimot/ped

Pedestrian and Bicycle Information Center (PBIC)www.pedbikeinfo.org

WalkCT
www.walkct.org

Fungus attacks tomatoes and potatoes

Late blight, well known as the cause of the 1840s Irish potato famine, was found on tomatoes and potatoes in every county in Connecticut last summer and in many states along the East Coast, according to the Connecticut Agricultural Experiment Station. The fungus-like organism that can travel through the air is a rapid killer of tomato and potato plants.

Wayne Hansen, owner of Wayne's Organic Garden in Oneco, said he first noticed the disease on some of his plants in late July. "It's more than frustrating, it's extremely costly," Hansen said. "It's devastating."

Sharon Douglas, head of the Department of Plant Pathology and Ecology at the Connecticut Agricultural Experiment Station, said in the 27 years she has spent with the department, this year's blight outbreak was the earliest and most widespread.

Douglas said the source of some of the infected plants has been traced back to big box stores, such as Lowe's, Home Depot and Wal-Mart. The cool weather also contributed.

—Source: Emily Groves, Norwich Bulletin, August 1, via Christopher Zurcher's ctenvironmentalheadlines.com

Forester Broderick wins national award

The Society of American Foresters has awarded Stephen Broderick its Technology Transfer award, one of seven national awards the society is giving this year.

The award recognizes outstanding achievement in technology transfer, implementation, and extension by a Society of American Foresters member as evidenced in the recipient's career or involvement in SAF Working Group or science program activities. Presented annually, the award consists of an engraved plaque and a $1,000 honorarium.

Broderick is a forester and program director with Connecticut Forest and Park Association. For many years he was an extension forester with the University of Connecticut Cooperative Extension in Brooklyn. Working with his colleagues in Vermont and Massachusetts, he helped create the Coverts Program, which trains private forest landowners, working with professionals, develop outreach skills to teach their peers what they know about forest stewardship. There are now nearly 20 such programs across the nation. Broderick also assists with estate planning for private woodland owners, and he helped found the Green Valley Institute in eastern Connecticut, which provides technology transfer and education on land-use change and policy and helps foresters lend their expertise to issues pertaining to zoning, master planning, and planning for the future.

Broderick was one of six award recipients who was expected to be honored at the 2009 SAF National Convention from September 30-October 4.

—Source: Society of American Foresters

CFPA *Store*

Trail Gear

CFPA Logo Hats
Two-toned low-profile 100% cotton baseball cap with KHAKI CROWN, FOREST GREEN BILL, embroidered logo. Adjustable strap. (Hat not exactly as pictured here).
$15.00 (plus $2.00 shipping)

Books, etcetera

Forest Trees of Southern New England,
a 56-page paperback publication of the Connecticut Forest & Park Association. This manual is a simple description in accurate and nontechnical terms of the forest trees common in southern New England. It is intended for the general public to meet a pressing demand for a pocket manual which is easy to use and understand.
$2.00 (plus tax and $1.50 shipping)

Connecticut Woodlands,
A Century's Story of the Connecticut Forest & Park Association, by George McLean Milne, published by the Connecticut Forest and Park Association in 1995. A fascinating history, not so much of the Connecticut Forest and Park Association as it is of the dedicated men and women who have cared about Connecticut's forests and fields, hills, valleys, and parklands. Scattered through these pages are inspiring accounts of courageous struggles to protect the rich and varied natural environment of the state.
$25.00 (plus tax and $5.00 shipping)

A Shared Landscape,
A Guide & History of Connecticut's State Parks and Forests, by Joseph Leary, published by Friends of Connecticut State Parks, Inc. in 2004. Richly illustrated in four-color with maps and photographs, this 240-page guide offers an intimate look at Connecticut's public lands and tells you everything you need to know about where to go if you love to hike, bike, camp, fish, swim, hunt, watch birds, learn about ecology or cross-country ski.
$25.00 (plus tax and $5.00 shipping)

Limited Edition Reproduction Commemorative Maps

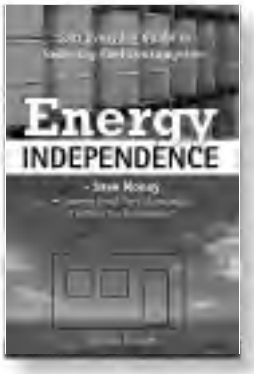
Quinnipiac Trail (1931)
$3.25 (plus tax and $4.00 shipping)

Original Appalachian Trail (1934) $3.75
(plus tax and $4.00 shipping)

The Connecticut Walk Book, WEST, and the Connecticut Walk Book, EAST, provide a comprehensive guide to hiking throughout the state. Published by the Connecticut Forest & Park Association, the two volumes are the 19th edition of the guidebook first released more than 75 years ago. Both volumes include the Metacomet and Mattabesett Trails of Central Connecticut. Both volumes include detailed two-color topographic maps that are crisp, clear, and easy to read. Complete trail descriptions accompany the maps.

Each volume **$19.95 members**
(plus tax and $5 shipping)

Each volume **$24.95 non-members**
(plus tax and $5 shipping)



Energy Independence,
by Christine Woodside. Lyons Press, 2008. A book for ordinary Americans who want to move away from fossil fuels. Learn about the most viable and affordable alternatives such as solar panels, wood, hydroelectric, hybrid cars, and more.
$16.95 (plus tax and $5.00 shipping)

Last Child in the Woods,
by Richard Louv. Lyons Press, Saving our children from nature-deficet disorder.
$13.95 (plus tax and $5.00 shipping)

Trail Gear

CFPA Logo T-shirts
Hanes Beefy Ts – 100% cotton, heavy weight, double needle hems, taped shoulder-to-shoulder,
Sizes: S-M-L-XL,
FOREST GREEN ON KHAKI.
$15.00 Limited supply.
(plus $4.00 shipping)

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16 Meriden Road,
Rockfall, CT 06481

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info@ctwoodlands.org

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Conserving Connecticut since 1895

Christine Woodside

A former feldspar mine in Middletown is home to a handful of old burned vehicles, probably from the 1960s. On their way to scout how to replace a trail bridge on the Mattabesett Trail, Connecticut Forest & Park Association's Western Roving Trail Crew chief, Bob Nodine, left, a Northeast Utilities intern, Jim Lerro, and Jeff Borne, Northeast Utilities senior land management administrator, stop to look.