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The Working Forest

By Robert Sullivan

Over the winter, David Foster wanted to cut down some trees. His neighbor didn't want him to. Foster is the director of the Harvard Forest, a 3,500-acre experimental forest in the middle of Massachusetts. When you are the director of an experimental forest, people aren't sure you should be cutting down trees. "We're cutting an acre of forest, nonnative conifers," he told me calmly on a day in February, while grabbing some snowshoes. A forest ecologist will tell you that if you cut down some woods — not all the woods, but some of them — a new forest will quickly replace them. There's a joke in Massachusetts that if you forget to cut your lawn, you will have a forest. For an ecologist, tree-cutting can be a stimulus plan that actually works.

This cycle of forest succession is an observation that Foster attributes to Henry David Thoreau; when Foster is walking in the forest, something he does a lot, he will spot some young white pine trees, for example, in a freshly cut field and say, "There's Henry Thoreau for you!"

The forest is back in New England. It returned, counterintuitively, while the population increased: Massachusetts, the third most densely populated state, is on the Top 10 list of most forested states. The forest is back to what we think of as Thoreauvian levels, even though, as Foster will tell you, the woods had been cut down by the time Thoreau was writing. "When Thoreau wrote 'Walden,'" Foster likes to note, "New

England was at the peak of deforestation." Meanwhile, the forest no one knew existed is threatened, not just by the ax this time but by parking lots and housing developments. According to Massachusetts Audubon, between 1971 and 1999 the land considered developed increased to 24 from 17 percent of Massachusetts, while "wildlife habitat," which is defined as forest, wetlands and open water, declined from 70 to 64 percent. The second chance to save the returned forest has concerned Foster for the past few years, and now a plan he helped develop, called Wildlands and Woodlands, or W & W, has been moving through conservation circles like an aggressive invasive species. It suggests preserving 2.5 million acres in Massachusetts, or half the area of the state, from development. As opposed to old-style conservation, which primarily establishes protected public lands, W & W proposes conserving large, aggregated chunks of private land. Radically, it proposes that the land stay in private hands, allowing it to be used for limited purposes, like logging or recreation, as a way to encourage land stewardship rather than strip malls. "This isn't restricting development," Foster says. "It's directing it."

Foster is an ecologist and an environmental historian — a paleoecologist — concerned with the long-term processes that have shaped the land, like fires, floods, 18th-century forestry practices and Colonial

farming. Tall and lanky, Foster is often in fleece and jeans, a camera around his neck. He is always clicking: a photo of a 200-year-old hemlock tree, of evidence of the 1938 hurricane, of a stone wall in the woods that would have, in Thoreau's time, been in a field, a field that time turned into woods. It can seem as if Foster is trying to freeze-frame the precise state of the New England ecology for future reference. On that February day, as he strapped on his snowshoes and set out the back door, he recalled the time he was chided by a group of colleagues on a train in British Columbia. He photographed all the clear-cuts, forest burns and dead trees while everyone else looked away. They dubbed him Dr. Death. "I said, hey, for me it's all about dynamics," he said, crunching onto a forest trail. "It's all about change."

The Harvard Forest, too, is about change. Established in 1907, the Harvard Forest resembles a regular forest, but snowshoeing through, you soon begin to notice the little yellow flags planted in a snow patch, the metal measurement bands around the trees, the fence around a stand of saplings to protect them from the moose that have come back to Massachusetts, not in stray pairs but in herds. Experiments are everywhere, visible and not: cables run underground to heat the soil in one patch of woods; in another, fans are being set up to blow hot air. "It's a forest of many observations," Foster said, pressing forward.

One particular observation — the one Foster is heading toward — has stunned even those deeply interested in forests. This same New England forest that people did not even know existed has been doing a better job of keeping carbon out of the atmosphere than anyone imagined.

"O.K., here's Julian," Foster said as we reached the foot of an industrial staircase seemingly built to nowhere, anchored to a pole that was once a boat's mast. Julian is Julian Hadley, an ecophysiologicalist on staff at the Harvard Forest. "Watch the ice on the

steps," Hadley said as we climbed. Up at the wobbly top, the sonic anemometer, in concert with other instruments, measures the flux or exchange between the atmosphere and photosynthesizing trees — the inhale of carbon, called the uptake, and the exhale of oxygen and water.

The past few years of carbon monitoring at the Harvard Forest have shown that the so-called midlatitude forests of the United States (the forests stretching up from the Carolinas into New England and Canada and the Midwest) are reducing the global increase in carbon by more than 10 percent. The Northeast forest doesn't hold as much carbon as, say, the Amazon. But the Harvard Forest has shown that the rate of carbon-holding is changing in surprising ways. When you balance out the carbon taken in and released, the Northeast forest retains two to four tons of carbon per hectare every year, in part because the Northeast, with relatively young trees, isn't creating as much carbon in the form of decomposing trees and foliage. "The forest is growing and increasing its uptake of carbon," Hadley says. In the East, in fact, as forests hold more and more carbon, the rate of new carbon storage uptake is surpassing the Amazon's. Suddenly, with this new discovery, the forest of the East, back from devastation, is a big and important player in global carbon storage.

This science might sound unrelated to land conservation, but this is where Foster comes in. After snowshoeing back to headquarters, he checked the mail. The irate neighbor is now more irate — a letter arrived equating the Harvard Forest's tree-cutting with Middle Eastern aggression — and this had Foster talking about the value of working forests, which got him back to carbon, the big point being that the forest is a machine, a machine that goes into overdrive each spring, as the green leaves bloom in what is known to forest ecologists as a "leaf out."

“When the great, green wave of leaf out spreads across the Eastern U.S., the entire earth’s atmosphere will change,” he said. “Atmospheric scientists at the Mauna Loa Observatory in Hawaii will see the carbon decreasing in the atmosphere. The forest is producing oxygen. It’s cleaning the air. It’s purifying the water. You try to explain to people that this is a huge natural machine that is working for you, and that we have to invest in it because that’s what we do — we invest in infrastructure.”

Wildlands and Woodlands is a 24-page color booklet that Foster helped write and publish in 2005; it looks less like an academic paper than a how-to kit. As opposed to a lot of papers that fall like trees in a forest, this one has ended up being a blueprint. At its most basic, W & W proposes leaving areas designated as wildlands untouched. These are forests drawn from land that is already set aside — ecologically vibrant core forests, like state and federal wilderness areas. The rest of the protected forest would be woodlands, which would connect to the wildlands and enhance them, by facilitating the movement of animals, the propagation of plants and the improvement of the forest as a carbon-sucking tool, because the healthier the forest, the more carbon it sucks. The woodlands would be conserved as forests but managed in “an ecologically sustainable manner.”

“Ecologically sustainable manner” is a scary phrase to an environmentalist; in the West it has been used to justify intensive clear-cutting, for instance. But W & W does not see a contradiction between protecting the forests and logging them, as well as using them for other sustainable activities like hunting, snowmobiling, horseback riding and paintball battling. “Managed woodlands are important in fulfilling connections between people and nature,” the plan says. Foster argues, in other words, that we need to get back into the woods, on an everyday basis, both with walking stick and ax.

“That’s where producing local wood is like using local food,” Foster says. “Now we tend to do it in places we don’t see. And we’re going to preserve our land, but, hell, we live in houses and we like the wood. Where’s it coming from? It’s going to come from British Columbia and Malaysia — and cutting it is going to do damage to much more pristine areas and without oversight. Here in Massachusetts, we’ve got oversight. You can’t produce all your wood in the Massachusetts forest, but if you obtain your resources locally, people might pay more attention to how their resources are used. Also, people might live more sensibly if they knew where their resources were coming from.”

The report is practical, subdued, nondoctrinaire and full of science, as well as lots of Foster’s photos. Its core is a call to put down the rhetorical arms, and it radically recasts how forests are viewed. The new forest, as described in W & W, is both a natural and an economic entity. Forests provide traditional sources of income, but the plan also raises the question that if we give tax credits to factories that cut their emissions, might there be economic support for forests that not only pull carbon from the air but also clean the water that we would otherwise filter via costly water-filtration plants?

[Efforts to conserve land along W & W lines have popped up around New England, and conservation groups around the nation like the plan, too. “David Foster put it together in this accessible and cogent way and said we can reverse these trends,” says Laurie Wayburn, president of the Pacific Forest Trust, a land trust based in San Francisco. “This is a very visionary way of recognizing the inevitability of development but not the uncontrollability of where and how this development takes place.”](#)

W & W, in its methods, is modern land conservation written backward. It involves landowners selling their development rights, through something called a conservation easement, to a state or nonprofit agency, which holds those rights “in perpetuity” (meaning for as long the United States maintains its current government and system of laws). In a W & W scheme, although the owner can’t put a subdivision on the land, he or she still owns it and can continue to live on the land and carry out limited logging or farming, or rent out a vacation home.

In a typical plan, the owner would sell the development rights at 75 percent of their market value, with the remaining 25 percent eligible for treatment as a charitable deduction under federal and state law. The owner profits from the sale of the rights and the decrease in taxes. Groups of landowners are encouraged to work together in regional partnerships, or what W & W describes using the Hobbit-esque term Woodland Councils, several of which are already in operation around New England.

Selling a conservation easement is a fairly obscure legal agreement. “You only come across it when somebody dies,” says Keith Ross, a forester turned real estate broker who pioneered using such easements to preserve 760,000 acres of woods and streams in Maine called the Pingree tract. “People who are very wealthy — they know about it. The average Joe doesn’t deal with the estate tax. But it allows land to be in private ownership and to be perpetually protected.”

Ross is now working on the Western Massachusetts Pilot Aggregation Project, a Pingree deal writ small (more landowners with lesser acreage) that still takes a big bite of land, 12,600 acres. It’s a regional scheme, and he has enlisted Scott Sylvester, a forester who has overseen logging jobs in the area for decades. W & W operates on the idea that local foresters are trusted by landowners and uniquely situated to work with them. As

naturalists they recognize ecologically valuable land; as loggers they value the economy of scale implied by larger tracts. “You may have six different owners and houses on the property, which makes it more difficult to do a timber sale or salvage the trees after an ice storm or prevent disease,” Sylvester said.

A result of aggregating land parcels is a situation not unlike the one inside the Adirondack Park and Forest Preserve, where land is protected under the New York State constitution. In the case of the Adirondacks, private landowners are grandfathered into the public preserve. In the case of W & W, the public reserves are, in a sense, being grandfathered onto the private land — to make for an Adirondackification of the Eastern United States, before the forest that has quietly returned is quietly developed away.

Some wilderness advocates criticize the sale of conservation easements. “I call them development easements,” says Jonathan Carter, the director of the Forest Ecology Network, a wilderness advocacy group in Maine. As the Green candidate for governor in Maine, he criticized the Pingree sale and similar arrangements, calling for more wilderness areas and arguing that timber companies would use easements to destroy what is left of the forest. And yet, even as a critic, he is on the same page as W & W in many ways, having spent a week in March visiting members of Congress, urging them to link forest conservation with greenhouse-gas reduction. “Just as we pay farmers not to grow crops, we ought to pay landowners not to cut trees,” he says.

David Foster sees the choice as not between wilderness and managed woodlands but between managed woodlands and sprawl, and he considers the former to be a much better buffer for wilderness areas. (W & W is the flip side to

smart growth, the rural component of urban planning.) Longtime landowners, he notes, often have a natural inclination toward land conservation, even if financial pressures have historically pushed them toward selling out to the new superstore, the racetrack developer or the mall. “Most people think that landowners want to get the most money they can out of the land — that they want to squeeze every nickel they can out of it,” Foster says. “But people have never asked. So Keith comes along and pulls together a thousand people and says, ‘Would you be interested in getting 75 percent of the development rights?’ and you could stay on the land and manage it as you have been managing it, as good stewards. And they all jump. But nobody has offered them a chance to do it before.”

The Harvard Forest plan begins in the woods of Vermont, with David Foster and Henry David Thoreau, where over summers during graduate school, on family property, Foster was slowly building a cabin. He had graduated from Connecticut College, where, early on, when he was a religious studies major, his high-school girlfriend (now wife) persuaded him to take a botany course, which changed everything. In his cabin he was reading and rereading Thoreau’s journals — volumes and volumes of daily notes on the woods and the working landscape of antebellum New England. In the journals, Foster began to notice sights and sounds in Thoreau’s 19th-century landscape that were at odds with the landscape around his cabin in the woods: Thoreau described bells, cows and everywhere axes chopping wood, while it was quiet around the Vermont cabin. Foster eventually wrote a book on the journals, titled “Thoreau’s Country,” in 1999. “I thought about the nature of Thoreau’s woods,” he wrote, “which he described as being very open and tame, filled with woodchoppers at their work, children gathering chestnuts and sassafras shoots and early-rising farmers traveling to market.” As he walked through the Vermont woods, he began to find stone walls among the trees and the lilac bushes

that are vestiges of farmhouses — signs of civilization deep in nature.

In 1983, Foster joined the Harvard faculty as a professor of forest ecology, becoming the director of the Harvard Forest in 1990. In the meantime, he was asked to be on the board of the Mount Grace Land Conservation Trust, a small nonprofit in a nearby town. “I grew up in southern New England and I love New England passionately, but I’m not a conservationist; I’m an ecologist,” he says he was thinking at the time.

As Foster the ecologist learned more about local conservation, he developed what would become his standard W & W presentation, the story of the forests of New England, which he gives in meeting halls or in walks through the woods. The history portion goes roughly like this: Forests are burned by Native Americans, cut by Colonial farmers, until, by the time Thoreau takes a temporary living place at Walden Pond, deforestation is at its peak — only 20 percent of the woods remain. Walden is set in a vista of stumps. By the time Thoreau dies, in 1862, people are moving away from the farms of New England and the East, to the cities, to work in factories, or to the West, to start new farms. The woods grow back. The woods thrive. But now, Foster’s presentation goes, the woods are disappearing again, this time thanks to bulldozers rather than axes. “Currently, Massachusetts loses approximately 40 acres of open space daily to development,” according to the W & W report.

The W & W report emerged after Foster brought together various groups of ecologists, environmental historians, foresters and other academics at the Harvard Forest and elsewhere. Dave Kittredge, the extension forester at the University of Massachusetts at Amherst, had been studying private landowners’

relationship to their land, and Brian Donahue, an environmental historian at Brandeis, had been working on suburban forestry. An activist plan was a big step for Foster, as an academic, but when you talk to him about it, you get the feeling that he had reached a point in his life where he wanted to do something with his knowledge. “People said, ‘You’re jeopardizing your credibility by saying what should happen,’ ” he says, “and you know, we all looked at each other and said, first of all, science is not as objective as people think it is. And second, it’s time we worked on something we believe in.”

By the end of the winter, Foster had patched things up with the neighbor, or patched them up as well as he could. In the Sisyphean attempt to mediate landscape interests, there are always brush fires.

“Some of the wilderness purists kind of scoff at the idea” of W & W, he told me. “They say: ‘It’s not really going to be wilderness. Wilderness is Glacier National Park.’ You get the attitude from the people who are interested in forest management that says, ‘Well, why would you want to set something aside that could be harvested?’ Then you get the people who are worried about everything that could happen in the world, and they say: ‘Well, what if it blew down? Or what if you got an invasive species? What if some chestnut blight got in? What would you do?’ And you go, ‘You’d just leave it.’ ”

Foster has spent a lot of time thinking about what it means to manage a forest, and he has concluded that managing nature means making choices, and one of those choices might be doing nothing at all. “That’s an active management decision,” Foster says. “They think management decision means I have to have a chain saw in my hand. But the idea is that you’re making a very conscious, well-conceived decision on this particular

place to do nothing. Just think about how fascinating it is, and Thoreau was fascinated with this, too. Take a landscape that has been fields and has stones walls running through it and has all this old millwork, and you just let it gradually become wilder and wilder and wilder and just study it or just appreciate it.”

Foster ended our walk with a trip to the Harvard Forest dioramas — incredibly detailed Playmobil-scale dioramas that document the change in the New England landscape from before the Colonial period to the early 20th century. Lately he has taken to focusing on one diorama in particular, the one he thinks of as a centerpiece, which pictures Richard T. Fisher, who was the founder of the Harvard Forest, sitting in an old-growth grove with Nathaniel Shaler, the Harvard dean of science whose idea it was to set aside a forest for observation.

When Foster stares quietly into the diorama, you get the idea that he has thought about the scene for a long time. “What do you see?” he finally asks, professorially. “You see them sitting there contemplating.” Foster seemed to be willing himself into the scene, too. “They are hunkered down in old growth,” Foster says. “And what does that say to us? It’s these guys learning from nature and then applying nature to management.” Foster has a kind of whispered shout going, and he is trying to hold in his enthusiasm and failing, though no other visitors are there, and he is ultimately in charge of the museum, after all. “See, it has the W & W thinking right there,” he says. “You have to sit down and you have to learn from nature, but you have to manage.”

Robert Sullivan is the author most recently of “The Thoreau You Don’t Know.”