

CONNECTICUT

# Woodlands

FALL 2019

## Improving habitat with fire



A MAGAZINE OF THE CONNECTICUT FOREST & PARK ASSOCIATION



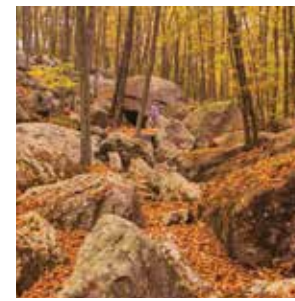
**On the Cover:** Fire technicians monitor a controlled burn at Goodwin State Forest. Photo by Beth Bernard.



Protecting our remaining old growth forests, page 7



Capturing an autumn sunset from the top of Ragged Mountain, page 12



Explore Connecticut's ancient history at Ledyard's Glacial Park, page 18

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## CONTRIBUTOR'S Spotlight



**Katherine Hauswirth** is an award-winning writer, editor, and naturalist based in Deep River, Conn., whose work explores our intimate connections to nature. The author of "The Book of Noticing" and winner of the Soul-Making Keats Literary Competition, Katherine's work has appeared in Orion online, the Christian Science Monitor, and other publications. In 2015, she was named Edwin Way Teale Artist-in-Residence. Katherine regularly leads nature writing workshops and retreats, and blogs at First Person Naturalist.

### Connecticut Woodlands: What were you most surprised to learn while working on the "Rare and Wondrous" piece?

I knew that old growth was scarce here in Connecticut, but wasn't aware it was such a tiny percentage. It was heartening to learn about so many thoughtful people and communities who love these forests and are good stewards of the land.

### What first inspired you to write about nature?

I wanted to share the sense of heightened awareness and connection I felt when spending time alone in nature. One of my first published nature pieces was called "Fish Story," about watching fish in the rocky shallows of Long Island Sound.

### How does writing affect your experience in nature?

Beloved poet Mary Oliver, who so often wrote about nature, was known to carry a notepad. I've adopted her practice, but with the next phase of technology—I dictate notes into my cell phone and snap pictures to reflect on later.

### Briefly describe your writing practice. Do you have a specific place and time that you prefer to write?

Early mornings are my favorite time to write. Also, a friend and I share rent on a creative writing office, and going to this separate place is often helpful. I worked on my book, "The Book of Noticing: Collections and Connections on the Trail," there.

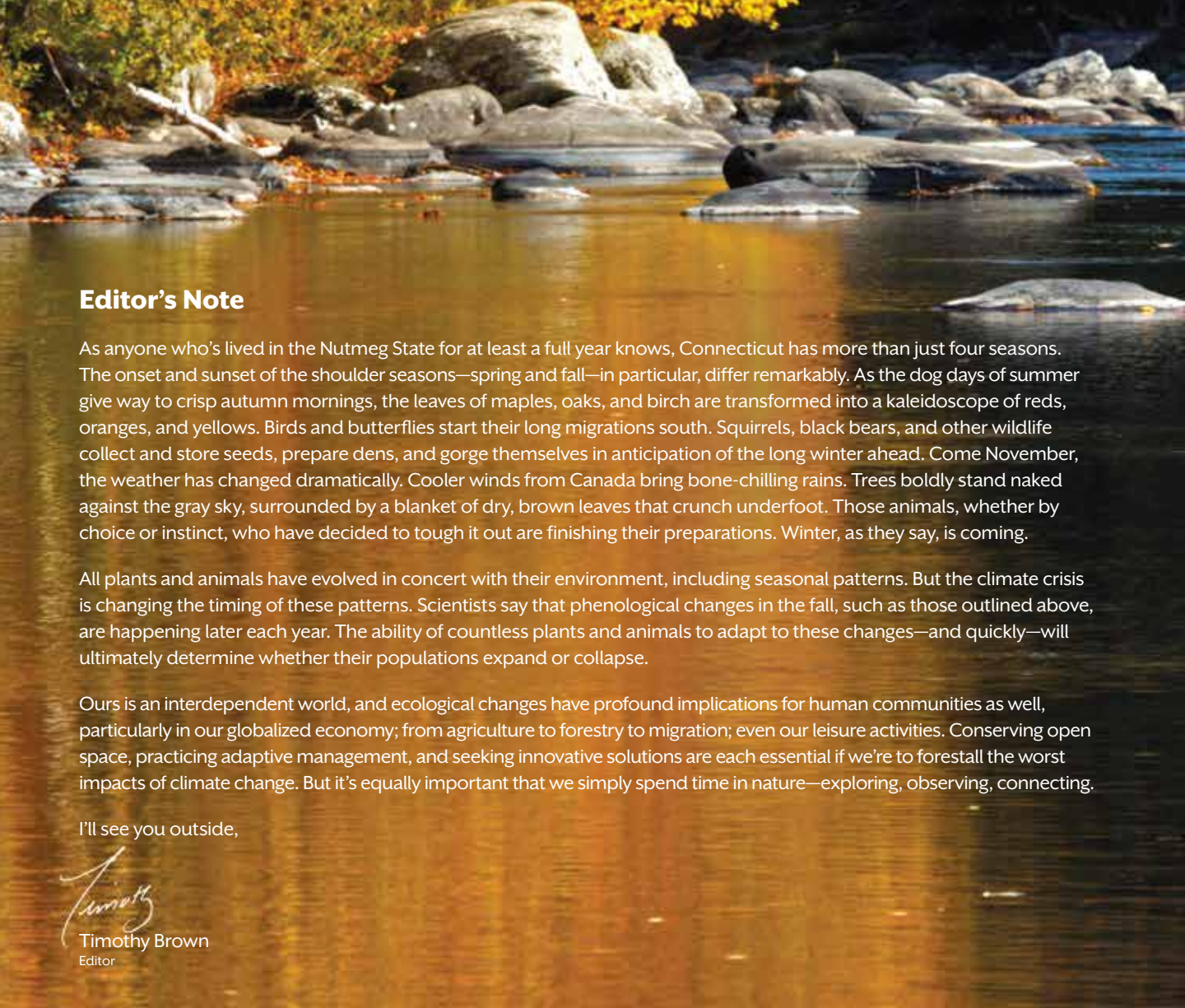
### Who are three nature writers that should be on everybody's must-read list?

It feels impossible to name only three—I could fill this magazine with names! But I'd have to go with Edwin Way Teale, Barbara Hurd, and Mary Oliver. Teale wrote in Hampton, Conn., and his property, Trail Wood, is now a Connecticut Audubon site. I highly recommend his "A Walk Through the Year."



Warden's fire equipment, 1937. Story on page 14.

The Connecticut Forest & Park Association (CFPA) is a 501c3 nonprofit organization that protects forests, parks, walking trails, and open spaces for future generations by connecting people to the land. Since 1895, CFPA has enhanced and defended Connecticut's rich natural heritage through advocacy, conservation, recreation, and education, including maintaining the 825-mile Blue-Blazed Hiking Trails system. CFPA depends on the generous support of members to fulfill its mission. For more information and to donate, go to [ctwoodlands.org](http://ctwoodlands.org)



## Editor's Note

As anyone who's lived in the Nutmeg State for at least a full year knows, Connecticut has more than just four seasons. The onset and sunset of the shoulder seasons—spring and fall—in particular, differ remarkably. As the dog days of summer give way to crisp autumn mornings, the leaves of maples, oaks, and birch are transformed into a kaleidoscope of reds, oranges, and yellows. Birds and butterflies start their long migrations south. Squirrels, black bears, and other wildlife collect and store seeds, prepare dens, and gorge themselves in anticipation of the long winter ahead. Come November, the weather has changed dramatically. Cooler winds from Canada bring bone-chilling rains. Trees boldly stand naked against the gray sky, surrounded by a blanket of dry, brown leaves that crunch underfoot. Those animals, whether by choice or instinct, who have decided to tough it out are finishing their preparations. Winter, as they say, is coming.

All plants and animals have evolved in concert with their environment, including seasonal patterns. But the climate crisis is changing the timing of these patterns. Scientists say that phenological changes in the fall, such as those outlined above, are happening later each year. The ability of countless plants and animals to adapt to these changes—and quickly—will ultimately determine whether their populations expand or collapse.

Ours is an interdependent world, and ecological changes have profound implications for human communities as well, particularly in our globalized economy; from agriculture to forestry to migration; even our leisure activities. Conserving open space, practicing adaptive management, and seeking innovative solutions are each essential if we're to forestall the worst impacts of climate change. But it's equally important that we simply spend time in nature—exploring, observing, connecting.

I'll see you outside,

Timothy Brown  
Editor

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Thanks to photo contributions from:  
Beth Bernard, Tom Brooks, Teresa Gallagher, Emery Gluck, Laura Kolk, Bob Leverett, Jack McConnell, Emil Stankov.

Sustainably printed on FSC-certified paper using LED-UV cured, vegetable-based inks and solar power.

Connecticut Woodlands is a quarterly magazine published since 1936 by CFPA. The magazine is distributed to members and donors, as well as public libraries and other state and local offices. Advertising local goods or services is welcome. For specifications and rates, visit [ctwoodlands.org/rates](http://ctwoodlands.org/rates). To advertise, contact [tpeters@ctwoodlands.org](mailto:tpeters@ctwoodlands.org) or call 860-346-TREE.

# CFPA Updates



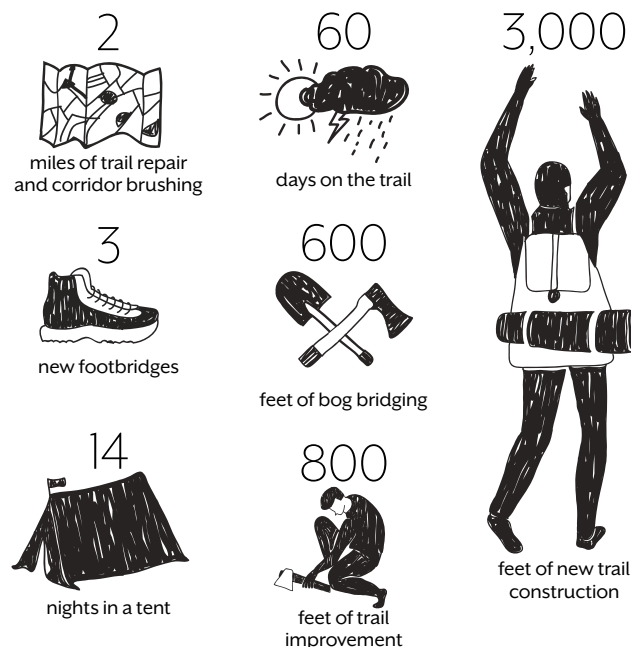
This year marked the third season of CFPA's Summer Trail Crew. The program provides young people with field experience, team work, backcountry carpentry, Leave No Trace ethics, and trail building skills. The Trail Crew has become a critical component in CFPA's ability to tackle bigger trail improvement projects.

The 2019 Trail Crew—Sarah Healy, Marissa Jayawickrema (Crew Leader), Mike Pazareskis, Faren Roth, Alexander Staddon, and Brennan Turner (Field Coordinator)—worked on Blue-Blazed Hiking Trails throughout Connecticut, from Cornwall to Voluntown, Granby to Wallingford. They hauled lumber for bridges, dug sidehill for relocations, and improved drainage to minimize erosion. They brushed, blazed, sweated, and hiked all across the state.

Support is provided by the CT Recreational Trails & Greenways Program, National Park Service, and CFPA donors.

To learn more about CFPA and our upcoming events, go to [ctwoodlands.org/CFPA-events](http://ctwoodlands.org/CFPA-events)

## 2019 Trail Crew By the Numbers



## From the Statehouse

By Eric Hammerling

### 2019 State Legislative Recap... It's Not Over Yet

In February, Governor Lamont proposed his first two-year budget for Connecticut, and debates over the FY 2020-21 state budget dominated the 2019 session of the CT General Assembly.

CFPA's top priorities this year included keeping the Passport to the Parks intact, protecting the Community Investment Act (CIA) from sweeps, and authorizing bonding for the Recreational Trails & Greenways program. So, what happened?

#### Passport to the Parks Remains Intact

To keep Passport to the Parks funding intact, the two key battles were to ensure that there were no diversions of Passport funding to non-park purposes and, two, there were no exemptions to the Passport fee (\$5 per year paid on personal vehicle registrations through the Department of Motor Vehicles).

*No Diversions:* Although the Governor's budget did not propose any diversions, the General Assembly's Appropriation Committee budget proposed diverting \$300,000 from the Passport for non-park-related purposes.

*No Exemptions:* There were several bills introduced to exempt certain groups from paying the Passport to the Parks fee. CFPA's concern was that exemptions for any group would result in an endless parade of special exemptions that could ultimately de-fund the Passport and undermine the maintenance of State Parks. One proposal to exempt households with multiple vehicles from paying the fee on each vehicle would have reduced the Passport funds by over 50 percent, in addition to being challenging for the DMV to administer.

Fortunately, thanks to a significant public outcry led by CFPA supporters, there were no funding diversions from the Passport to the Parks in the final FY 2020-21 budget, and no bills allowing exemptions from the Passport fee were passed.

2019 has been another record-setting year so far for attendance at State Parks as more people learn that Connecticut residents no longer have to pay a fee at park gates. In 2018 (the first year of the Passport), State Park attendance increased by approximately 10 percent over the previous year. Officials estimate that attendance will likely increase

by another 10 percent in 2019. Thank goodness there were no diversions or exemptions to the Passport this year, because CT DEEP needs every dollar to sustainably maintain State Parks and meet this increasing demand.

#### CIA Remains a Dedicated Fund

The Governor's budget proposed sweeping the Community Investment Act (CIA) funds—generated outside the budget from a \$40 municipal document recording fee—into the General Fund. Although the sweep would have moved funds to the state agencies who administer CIA funds for open space and farmland protection, historic preservation, affordable housing, and to support a safety net program for dairy farmers at the same levels as FY 2019, these swept funds would have immediately become more vulnerable to budget cuts through intense competition with many programs across state government supported by the General Fund.

The proposed sweep of CIA's off-budget funds into the General Fund ultimately did not happen, but the final budget included an earmark of \$1.5 million in CIA funds for the safety net for dairy farmers. The struggle for Connecticut's dairy farmers is urgent and real, but the \$1.5 million will likely come at the expense of grants for open space, farmland, and other CIA priorities that are also investments in Connecticut's quality of life.

#### Bond Funding for Recreational Trails & Greenways Still Needs to be Authorized

A "special session" to consider bonding priorities is expected this fall, and the fate of the grants program for Recreational Trails & Greenways currently hangs in the balance. Since 2016, this grants program has invested \$10 million in 60 recreational trail projects that improve trails in more than half of Connecticut's municipalities.

CFPA has asked the General Assembly to authorize at least \$3 million annually in bonding for recreational trails and greenways. If additional bond funding is not authorized, Connecticut will have no funding left to continue making prudent investments for trails and your health. This would be a huge loss for our state.

So far, 2019 has been a good year at the statehouse for forests, parks, trails, and recreational lands, but your involvement as an individual advocate is essential for ongoing success. Please look for CFPA's email alerts, engage early and often, and you will make a difference!

*Eric Hammerling has served as the Executive Director at the Connecticut Forest & Park Association since 2008.*

## Rare and Wondrous

### Seeking, Finding, and Preserving Connecticut's Old Growth

By Katherine Hauswirth

One of the first things you notice at Ballyhack Preserve in Cornwall is the carpet underfoot from generations of pine needles. Mosses paint fallen giants in ranges of green, complemented by sprawling, multicolored mosaics formed by lichens. The surrounding 200-year-old white pines and hemlocks, the abundant ferns and other low-growing plants, and decades of decay at ground level come together to create a softened effect. Here is a welcome silence just minutes from Route 125, but somehow a world apart. And then there is the scent. 🌲

Joan Maloof describes it as a “sweet, rich, earthy smell” that fills the senses. She used to attribute this scent to the mountains, but wonders if her own, much flatter Maryland landscape might have smelled that way once, too, “before the grandfather trees were gone, in a time when the trees’ breath merged with that of the fungi and the birds and the insects.”

Joan, a biologist, is professor emeritus at Salisbury University and founder of the Old-Growth Forest Network (OGFN), which works to identify and preserve old growth as well as plan for *future* old growth. But Joan, who has authored four books about forests and old growth, also emphasizes the importance of simply connecting people with forests. “We want to create the next generation of people who know and understand and love the forests,” she says.

But what exactly is old growth? Old growth is difficult to define, but generally considered forest that has never been cut. There’s also secondary old growth—forests that were harvested, but have since regenerated. Joan, however, tends to eschew a precise definition of old growth, joking that “probably as much wood fiber has been spent discussing that as is contained in all the eastern old-growth forests!” Moreover, old growth differs according to the forest type. “You could have a 200-year-old forest in the eastern U.S. and that would be considered an old-growth forest,” Joan notes. “But if you have a 200-year-old redwood forest, that’s not really an old-growth redwood forest.”

Bob Leverett, coordinator for two Massachusetts counties in the OGFN and the cofounder of the Native Tree Society, agrees that arguing over what old growth is misses the

point. Bob is widely credited for putting New England’s old growth on the map, but he says the bigger issue is to understand the ecological role of older trees, including their ability to sequester large amounts of carbon dioxide from the atmosphere more effectively than younger trees. Young trees grow fast, but older trees have much more leaf surface area for photosynthesis. A small percentage growth in a very large tree can overwhelm a high percentage growth rate in a young, small tree.

Connecticut’s remaining old growth, estimated to be just one-tenth of one percent, is generally found in areas where trees could not be felled or removed easily. For example, the hike into Sage’s Ravine, which straddles the Connecticut-Massachusetts border, is moderate-to-strenuous. Those who undertake the steep, rugged descent will find themselves surrounded by old-growth hemlocks and oaks. Bigelow Pond in Norfolk boasts several hemlocks estimated to be over 300 years old in the lower reaches of a rocky area. And “Old Growth in the East: A survey” lists an eight-acre stand at Mount Riga of white pine, eastern hemlock, American beech, and yellow birch that have likely never been logged due to access challenges.

Ballyhack Preserve, however, is a great “starter” trail that provides hikers with the experience of being in an old-growth forest without demanding an especially athletic venture. The mildly winding, half-hour walk takes in the Valley of the Giants, designated a State Critical Habitat and described by the Cornwall Conservation Trust as “a bottomland stand of massive, old eastern white pines and eastern hemlocks that tower above the canopy.” The tornadoes that wreaked havoc on the nearby Cathedral Pines in 1989 were kinder to Ballyhack, allowing more of the old trees to stay rooted. When so many of the Cathedral Pines fell, the Nature Conservancy, which owns the property, resisted a call for salvage logging in order to study how forests regenerate after a natural disaster.

Bob says that people who have experienced an old growth area come away with a deepened appreciation for the forest as much more than simply a resource for human consumption. Many bird species such as the Blackburnian warbler (*Setophaga fusca*), for example, prefer older forests of spruce, balsam fir, pine, and hemlock with high canopies. Hollow cavities that develop in decaying trees create important nesting places for many creatures. Even fallen trees play a crucial role in enhancing the habitat for reptiles, amphibians, and insects, and the moisture in old-growth areas provides key support for wildlife, fungi, and microorganisms. Studies suggest that biodiversity is much higher in old-growth forests;



A hiker at Ballyhack Preserve in Cornwall.

when these woods are disturbed that biodiversity is quickly diminished—a heightened threat in this time of climate crisis.

Foresters used to consider older forests as “overmature,” which, from a commerce perspective, translated as “not economically viable;” forests that included dying trees were often described as “diseased” or “decadent.” But these days, land managers increasingly view forests as dynamic ecosystems with multiple values. The USDA’s 2015 Conservation Practice Standard on Forest Stand Management recognizes the need to retain snags and downed trees in order to support wildlife as well as facilitate carbon storage.

More than 70 percent of Connecticut forests are owned privately. Landowners can promote old-growth characteristics by not harvesting certain “reserve” trees. “Generally speaking, Connecticut’s older and larger diameter hardwoods and pine are cut too soon. Retaining some reserve trees as standards through another rotation might be a nod to maintaining old growth characteristics,” says CFP Board of Directors member, Star Childs, a forestry consultant and trustee at Great Mountain Forest. In addition, landowners are starting to reap the economic benefits of not harvesting older trees. Carbon offset projects compensate landowners

*Continues on page 20*

We want to create the next generation of people who know and understand and love the forests.

Joan Maloof

Only a small fraction of Connecticut’s old growth forests remains. Photo below by Bob Leverett. Photo on previous page by Laura Kolk.



# ...HIDDEN... TREASURES

## A local hiker rediscovers her passion for the trail.

By Timothy Brown

In 1854, a wilderness guide named James Perrott planted a bottle along the banks of Cranmere Pool, deep in the heart of Dartmoor, England. Inside the bottle was Perrott's business card. Dartmoor, a soggy, rugged landscape known for its natural beauty, had become a popular destination for those seeking solace from London and other industrialized cities. Guides such as Perrott, who was widely considered the best around, shepherded wealthy adventurers through the moor's dangerous and disorienting peat bogs and mires.

Perrott's bottle was a challenge to other hikers. Those who made the arduous 16-mile round-trip trek and found his bottle would leave their own business card, as if to say, "I was here"—sort of like planting a flag only more discrete. Word of Perrott's challenge spread quietly like a secret society amongst Dartmoor's guides who eventually began planting bottles of their own. By the early 1900s, engraved stamps and logbooks had replaced business cards and bottles. But letterboxing remained largely a British pastime until 1998 when an article in Smithsonian magazine introduced letterboxing to Americans. Today there are more than 22,000 letterboxes planted throughout the U.S., with Connecticut boasting more letterboxes per square mile than any other state.

Letterboxing combines hiking with folk art. It's the folk art which distinguishes letterboxing from other treasure-huntesque activities, such as geocaching. Letterboxers use clues, generally posted online, to find a small hidden container. Inside the container is a hand-carved rubber stamp that letterboxers use to stamp their logbook, similar to a passport. Every time you find a new box, you get another stamp. Letterboxers also leave their own stamp in the logbook inside the

container. Like Perrott's business cards, it's a way of saying "you were there." But letterboxers are identified solely by their trail name, written along with the date next to their stamp in the logbook.

"Letterboxing is very secretive," explains Teresa Gallagher, who has been an active letterboxer since 2006. "When you're letterboxing, you're not supposed to let anyone know what you're doing. If somebody asks, you lie. I like to tell people I'm looking for snakes because they leave right away."

Teresa loves being in the forest. She grew up spending her summers bushwhacking through the north woods where there were no blazed trails, no maps, and no cell service. And she has hiked in Acadia, the White Mountains, and the Adirondacks prior to letterboxing. But back home in Connecticut, there was little incentive for her to drive to the next town and check out their trails, so she would just walk the same local loops over and over—until she discovered letterboxing.

"I used to be a very average, local hiker, and frankly I was getting kind of bored with it," Teresa admits. Letterboxing gave her a different kind of focus. She started by searching for letterboxes that were hidden on local trails that she had helped to build. The first couple of stamps were not that impressive, she says. But then she discovered one that was intricately carved. The clues were in a cartoon format; the trail was beautiful; there was an overlook. Everything was perfect. And she was hooked.



"Letterboxing got me to go outside of my neighborhood. I began to travel more to different areas and my hiking experience really evolved," she says. "You get into a collection mindset. For example, there were 22 boxes along the Quinnipiac Trail and I wanted to get them all. By the time I was done, I had hiked the entire trail."

Teresa moved on to other trails, including the New England Trail (NET), which she first heard about from other letterboxers. She ended up hiking all the NET in Connecticut, including all the interconnecting trails, and finding all the boxes, some 500 in all.

She continued to explore the Massachusetts portion of the NET, making weekend getaways because it's such a far drive. "I made it to the New Hampshire border and I kept wanting to hike new trails. Some didn't even have letterboxes," she says. Eventually she started backpacking. "It got me out of my local, you know, do-an-afternoon-loop hiking mentality, and got me out of my rut."

As of this writing, Teresa has found 3762 letterboxes and hidden 275. Letterboxing has completely transformed the way she experiences the woods.

"I'm not just hiking; I'm trying to letterbox. It changes your perspective," she says. "Some trails have a lot of letterboxes and some don't. It's nice to go back and forth between looking for a particular tree or rock trying to figure out a clue, and just walking." Teresa is currently in the process of hiking all 825 miles of the Blue Blazed Hiking Trails. She's already covered over 600 miles of the statewide trail system, which is maintained by a host of CFPAs volunteers and staff.

In 2003, on the centennial anniversary of the founding of our state forest system, the Connecticut Department of Energy and Environmental

WHEN YOU'RE LETTERBOXING,  
you're not supposed to  
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Teresa Gallagher

Protection (DEEP) placed letterboxes in all 32 state forests; in 2005, DEEP planted another series. Hikers who visit five letterboxes of either series earn a Connecticut State Forests Centennial Patch. Those who find letterboxes in all 32 state forests earn a walking stick. CFPAs has also planted letterboxes on Blue Blazed trails and led letterbox Rambles.

For those who are new to letterboxing, AtlasQuest.com, a website that bills itself as "a letterboxing community," is a great place to start. The website provides numerous

resources, including chat boards, clues to letterboxes, and a strict code of conduct for letterboxers to follow.

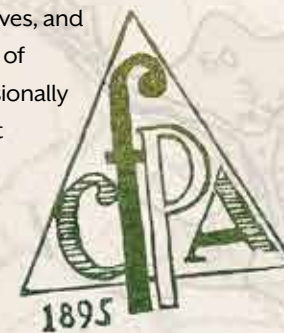
Letterboxers use gauges, knives, and needles to carve stamps out of simple rubber blocks. Occasionally people will use store-bought stamps, but that is frowned upon. "Some stamps are kind of crude, which is fine because someone actually carved it," Teresa says.

"But other stamps are just exquisite. People will spend 20 hours carving a stamp, and there it is, hidden in a forest." Not all letterboxes are hidden in the woods, however; you can also find letterboxes in urban settings, or even indoors.

"There's a big social aspect to it," Teresa says. "You get to know other letterboxers by their trail names, and sometimes people pair up and go together. Travelers will hide letterboxes in other states or even other countries. It becomes a community."

Many of Teresa's hand-carved letterbox stamps celebrate our blue-blazed trails.

Timothy Brown is Editor of Connecticut Woodlands.





## TOPPING OUT AT RAGGED MOUNTAIN

**A**fter a long day of climbing at Southington's Ragged Mountain, Emil Stankov and Chad Hussey topped out just as the last rays of a November sunset faded from the sky. As they removed anchors and collected their gear, Emil grabbed his iPhone and quickly snapped a shot of Chad on the summit. It was the cap, in Emil's words, to a "perfect day of climbing."

For Emil, a financial consultant who lives in the Boston area, it was his first time at Ragged, widely considered Connecticut's most popular climbing site. He had made the two-hour drive to climb with the American Alpine Club's (AAC) "It Ain't Over 'Til It's Over," a sort of last hurrah of the season for the region's climbers. Chad, an experienced climber and certified guide, leads the annual cragging day on behalf of the AAC.

The event draws climbers from throughout New England and New York, and occasionally even other countries. Climbers don't need to be AAC members to participate,

and all levels of climbers are welcome. At the end of the day, everyone goes out for pizza. "It's all about the comradery," Chad said.

Although Connecticut lacks the big climbs and sweeping ridge lines that you can find in New Hampshire's White Mountains or New York's Shawangunk Ridge, the Nutmeg State boasts a number of excellent crags, especially along the Traprock Ridge, a stretch of volcanic basalt rock—also called "traprock"—in the central region of the state. Legendary climbers including Fritz Wiessner, who also popularized several routes at Sleeping Giant State Park,

first pioneered climbing at Ragged in the 1930s. According to the website Mountain Project.com, Ragged Mountain now offers nearly 90 climbs, including both traditional and top rope routes.

"When temperatures are getting a little chilly, Connecticut has some exposures where you follow the sun," Chad said. "The event highlights a world-class destination."

**F**or those who prefer to keep their feet on the ground, a number of hiking trails traverse the mountain, including the 51-mile Metacomet Trail, a Blue-Blazed Hiking Trail that runs from Meridan's Hanging Hills to the Massachusetts border. The trail, designated as part of the New England National Scenic Trail, or NET, is maintained by CFPA volunteers and staff. The Ragged Mountain Foundation manages some 56-acres on the mountain for both conservation and recreation. Other partner organizations, including The Nature Conservancy,

Appalachian Mountain Club, and the Access Fund work to protect the mountain's unique flora, maintain trails, and ensure safe access for climbers and other recreationalists. Conservation advocates work to prevent erosion, for example. But Chad is concerned that the popularity of the mountain, plus its proximity to urban development, "put it in danger of getting loved to death."

Emil, who's originally from Bulgaria, picked up climbing after watching a documentary about Alex Honnold. He started in gyms, but quickly transitioned outside, exploring the region's crags on weekend adventures. He was excited to climb with Chad—whom he'd previously met—at Ragged. And the view from the top was just the icing on the cake. "It was just a case of being in the right place at the right time," Emil said.

**For more information about the annual "It Ain't Over 'Til It's Over" cragging day held each November, go to [americanalpineclub.org](http://americanalpineclub.org)**

# Fighting for Fire

After decades of fire suppression, prescribed burns are helping to restore Connecticut's endangered habitats.

By Hanna Holcomb

A sign of Smokey Bear hangs on the park office at the Hopeville Pond State Park campground. His catchphrase "Only you can prevent wildfires," reminds campers of their duty to safely light and extinguish their campfires to prevent their spread.

But just a short walking distance from the park office, acres of forest have been intentionally set ablaze. Since 2002, Connecticut's Department of Energy and Environmental Protection (DEEP) has supervised four controlled burns on 26 acres at Hopeville Pond Natural Area Preserve.

"The objective of all these fires was to sustain the pitch pine-scrub oak ecosystem which was in decline at the park," said Emery Gluck, an environmental protection forester at DEEP.

Hikers can see the difference between the burned and unburned forest on the dirt path surrounding one of the areas. If you step into the unburned forest, you crunch across leaf litter and downed branches. White pine, maples, and oaks tower 50 feet above. Only small patches of sunlight reach the forest floor; the sun is otherwise blocked by the thick canopy above.

But as you move into the burned area, you have to be careful to avoid stepping on the low bushes and ferns poking through scattered pine-needles. Full sunshine beats down. A few mature trees that were not destroyed by the burn remain, the bottoms of their trunks blackened up to 12 feet high. And, as was hoped, scrub oak and pitch pine saplings

grow throughout the area, taking advantage of the ideal conditions created by the fire.

This controlled burn and others across the state are changing ecosystems and making habitats more favorable for plants that would otherwise be outcompeted. Fires allow more sunlight to reach the forest floor, restore nutrients to the soil, and can clear invasive plants. Smaller, frequent fires remove downed trees and leaf litter that act as a fuel and can lead to larger, more destructive fires. A natural part of many ecosystems, fire has proven to be an effective tool for forest ecologists and other land managers.

We had way too much fire in the early 1900s. And then the pendulum swung the other way and we had, from an ecological point of view, too few forest fires. **Emery Gluck**

But the use of fire for land management is hardly a new technique. For both native tribes and early European settlers, fire was a common and convenient way to clear dense forests throughout the region.

"A lot of the trees were really large, and cutting down hardwoods—if you ever try to do it with an ax or a handsaw—is incredibly hard work," said Jeffrey Ward, chief scientist in the department of forestry and horticulture at the Connecticut Agricultural Experiment Station.

## Anatomy of a Burn



After months of preparation, the burn day finally arrives. If conditions are right, the forestry crew reviews the fire plan and surveys the burn site (1). Drip torches are used to ignite the fire (2, 3). Firebreaks limit its spread. A suppression crew uses handtools and backpack water pumps to control the fire (4, 5). The crew inspects the site to ensure that the fire is completely extinguished (6).





## Before, During and After a Burn



A springtime controlled burn at the James L. Goodwin State Forest. Images left to right: The site prior to burning; immediately following the burn; 15 days later, new, healthier plant life covers the site.

Native peoples burned forests to make it easier for hunters to spot game, and more difficult for hostile tribes to sneak through the woods. Burning was also used to increase yields from blueberry and huckleberry bushes. European settlers used fire to clear farmland and maintain fields. Burning increased soil fertility, yielding more nutrients for growing crops. It also cleared shrubs and saplings, opening space for grasses and forbs.

“This improved pastures and made it easier for their hogs to find the acorns to fatten them up before slaughter in the fall,” said Ward.

By the early 1900s, however, perceptions of fire had begun to shift. Catastrophic wildfires in the Midwest and West consumed millions of acres and cost thousands of lives. In Connecticut, more than 30,000 acres burned annually in the decades between 1905 and 1930. During the same period, the conservation movement in the United States was gaining momentum. Conservationists argued that forests—with their aesthetic, recreational, and natural resources—were too valuable to be lost to wildfire.

Established in 1905, one of the Forest Service’s mandates was to identify and suppress all forest fires. In the 1920s, fire lookout towers rose across the country, including 44 in Connecticut alone, and communication techniques and fire-fighting equipment steadily improved. The Smokey Bear wildfire prevention campaign was developed in 1944. Posters and cards of the affable bear taught citizens about wildfire prevention.

By the 1930s, the number of acres that burned each year in Connecticut had dropped below 10,000, and by 1945 it had fallen to less than 5,000.

“We had way too much fire in the early 1900s,” said Gluck. “And then the pendulum swung the other way and we had, from an ecological point of view, too few forest fires.”

Research conducted in the early 20th century showed that controlled burns helped to maintain some species, restore soil nutrients, kill pests, and remove downed timber that could fuel larger wildfires. Despite these findings, the Forest Service maintained a policy of total fire suppression, fearing that advocating for controlled burns would confuse their message of fire prevention. In addition, they didn’t have the proper machinery, or enough workers, to control a burn. But with mounting evidence in favor of controlled burns, and improvements in machinery, the Forest Service began conducting controlled burns by the late 1940s. In the 1950s about 250,000 acres nationwide were intentionally burned each year. That number has steadily risen since; about 6.5 million acres were intentionally burned in 2017.

**P**rescribed burns allow land managers to balance the ecological necessity of fire with the threat that out-of-control fire poses to people and ecosystems. Burns are conducted only after months of preparation and permitting, and only on days when environmental conditions—such as temperature, humidity, wind speed, and other factors—are right. And air quality, as

measured by the levels of six air pollutants, must be *good* or on the high side of *moderate* throughout the state.

“If there’s any place in the state that’s below the better half of *moderate* then we can’t burn,” said Gluck. “Even if we’re burning in eastern Connecticut, we can’t burn if Greenwich has poor air quality.”

If both air quality and weather align, the burn can proceed. The burn area includes “firebreaks” such as roads and streams to prevent the fire from spreading beyond the intended area. Everyone on scene is briefed about the expected burn pattern, communication, and contingency plans, and the crew works together to start, control, and extinguish the fire. After a controlled burn, the area’s regeneration is closely monitored.

**C**ontrolled burns are a critical tool for land managers to maintain healthy ecosystems such as grasslands and pitch pine forests, and to improve habitat for birds and other wildlife. Grasslands used to cover about 20 percent of Connecticut, maintained by regular fire, or plowing and grazing. But since the late 1800s, grasslands have rapidly disappeared due to urban development, changes to agricultural practices, and land use policies that favor forest regeneration. DEEP is currently using fire to help restore threatened grassland ecosystems, which are vital for dozens of bird species such as the bobolink and eastern meadowlark who depend on grasslands as their primary breeding habitat. DEEP conducts controlled burns on grasslands in March and April to clear woody growth, promote native grasses, suppress invasive species, and restore nutrients to the soil.

Pitch pine and scrub oak barrens are another rare ecosystem that depends on regular, low-level fire. These barrens

are composed of a lower shrub layer of scrub oaks, low bush blueberry, and grasses under a canopy of pitch pines. Prior to colonial settlement, pitch pine accounted for 60 percent of the pine species in Connecticut, but today less than 1 percent remains.

Pitch pine saplings grow in dry, sandy soils and need ample sunlight. Even older trees can’t survive in the shadow of taller trees, such as white pine. DEEP uses a combination of harvesting white pine followed by controlled burning to promote pitch pine growth.

Pitch pine have thick, scaly bark that protects the cambium layer from fire, and their seeds germinate best in mineral soil exposed by fire. The seeds are stored in either serotinous or nonserotinous cones. Serotinous cones are sealed shut by a natural resin and can remain closed for several years. When the resin is melted by fire, the cone releases its seeds. Studies suggest that these resin-bound cones are more common in locations that experience frequent fire. The number of nonserotinous cones, which release seeds soon after they mature, increases where fire is infrequent.

On August 9, 2019, Smokey Bear turned 75. But even with education and improved fire-fighting technologies, more than 3 million acres have already been burned by wildfires this year. And though wildfires may damage towns and timber resources, a policy of complete fire suppression can be just as dangerous. Controlled burns, like the ones conducted at Hopeville Pond Natural Area Preserve, are essential for protecting habitat diversity and preventing large-scale wildfires.

*Hanna Holcomb recently graduated from Wesleyan University with a degree in biology and English.*

# Ledyard's Glacial Park



## Visitors to this small, city park gain a huge appreciation for our geologic past.

By Timothy Brown

Photo by Jack McConnell

New England is well-known for its rocky soil and iconic stone walls. But at Ledyard's Glacial Park in southeastern Connecticut, hikers can follow the blue blazes through the middle of a massive boulder train unlike any other in the region. The short trail is a window into the area's deep, geologic history, back to a time when the land was covered by a massive ice sheet that stretched from the Rocky Mountains to the Atlantic Ocean. The hundreds of boulders—collectively known as a *glacial moraine*—are strewn throughout the 22-acre municipal park. They're an impressive sight, even for those with a well-trained eye.

"I've not seen anything quite like it," says Robert Thorson, a professor of geology at the University of Connecticut. "I take my students there all the time."

Moraines are identified by the presence of sediment—in this case, large boulders—that appear out of place on the landscape. They can be found wherever there are, or were, glaciers, from the Himalayan mountains to the cornfields of Iowa. The boulders at Ledyard are gifts of the Laurentide ice sheet, a massive glacier which began to form in Ontario's Laurentian mountains during the Wisconsin glaciation some 100,000 years ago. At its peak, it covered five million square miles, burying over half of North America under a sheet of ice, in some places, up to two miles thick. Extending southward from present-day St. Louis to New York, it carved

moraines that together form a band that stretches from Hammonasset State Park to Ledyard to western Rhode Island.

"There's a rhythm to the recession," says Thorson. "Between the terminal zone where the ice is active and the northern zone where the ice is stagnant and melting backwards and dominated mostly by meltwater, is this zone in southeastern Connecticut: the recessional moraine zone. And there the glacier seems to be intermittently stabilizing or possibly advancing a little bit to create those moraines."

Individual stones that appear out of place from the surrounding geology are called "erratics," which means "to wander." Erratics can be different in terms of size, shape, or composition. For example, if you're hiking and find a piece of granite and everything else is limestone, the granite rock is an erratic. The most famous example of an erratic in New England is Plymouth Rock. Thorson says that word "erratic" was used before the glacial period was even identified. In fact, it helped geologists to define the glacial period.

**Glacial geology controls all the habitat. Everything about every ecosystem is influenced by the ice age here.** Robert Thorson

But Ledyard has hundreds of rocks. They're not considered erratics, according to Thorson, because they're all similar to each other.

"An erratic is an outlier; it's the thing that's different," Thorson says. "If you have one large slab sitting on a sand plan, it's an erratic. At Ledyard, you have thousands of large slabs all clustered together."

Ledyard's Glacial Park has two trails. The main trail, less than a mile long, cuts through the heart of the boulder train. Visitors to Glacial Park can also observe a kettlehole, a circular depression formed by the glacier. For most hikers, though, the real draw is the boulders.

"We do know that's fairly local rock; it hasn't moved very far," says Thorson. "We can tell that by the stones' composition. They haven't been mixed up. And all the blocks are fairly angular and jagged." The boulders at Ledyard are covered with a host of lichens and microbial organisms that you just don't get anywhere else, he says. But you don't need a degree in geology to appreciate the Ledyard moraine.

"It's just a massive concentration of jagged stone that is remarkable and exceptional," says Thorson. "One cannot stand there without viscerally feeling the power of the ice sheet. It's the visceral sense of power."

out the Great Lakes and created Long Island. As the glacier moved, it carried sediment ranging in size from fine particles of glacial flour to gigantic boulders. As the ice sheet melted or "retreated," it deposited this sediment forming moraines. Moraines can tell geologists a lot about the behavior of glaciers and their impact on the landscape.

"Glacial geology controls all the habitat. Everything about every ecosystem is influenced by the ice age here," Thorson says. "Every aquifer, every habitat, every soil is glacial. Every watershed, all of it. And the engineering applications of it are significant."

The Ledyard boulders form what geologists call a *recessional moraine*, meaning that its rocks were deposited as the Laurentide ice sheet retreated 17,000-13,000 years ago. By contrast, *terminal moraines*, such as those which created Nantucket Island and Block Island, for example, formed at the outermost edges of the ice sheet. Ledyard is one of just a handful of recessional glacial

**Rare and Wondrous**, Continued from page 9

who make long-term commitments to storing carbon on their property in the form of trees.

“My hope is that eventually forest carbon offset projects might encourage landowners of many size tracts to retain higher density and longer age rotations, if not for old growth, for the good of soils, inoculants, and other unseen forms of biodiversity,” says Star, who’s about to close a carbon offset deal at Great Mountain.

Communities can also help to protect forests by establishing easements. Joan points out that not all easements explicitly prevent logging, and well-intended individuals or organizations may be unaware of this until it’s too late. Forever-wild easements typically prevent logging as well as building, subdividing, commercial or industrial activities, and farming, according to the Northeast Wilderness Trust.

Susan Masino, a Trinity College professor and basic neuroscientist who specializes in brain health and serves as OGFN’s coordinator for Hartford County, studies the connections between forests and brain health as a research fellow at Harvard Forest. In a recent article in *Frontiers in Forests and Global Change*, Susan and her coauthors argue that growing existing forests intact to their ecological potential, an approach called “proforestation,” maximizes carbon sequestration and enhances biodiversity. Those benefits are the tip of the iceberg, they say. In addition to improving water and air quality and providing flood and erosion control, proforestation supports public health benefits, such as helping people who suffer from anxiety, depression, and chronic pain.

Joan describes her alliance with Bob, Susan, and others in the OGFN as “just like a forest”—enhanced by variety. This group is spreading the word on the benefits of old growth and striving to defend these places, and each

brings a unique perspective to the OGFN. Bob, who has an engineering background, is an expert in measuring trees. Joan’s perspective is one of a biologist, and her books are accessible reads for the general public. Susan continues to study the potential health benefits that forests can provide. “A forest can increase structural integrity and improve functional activity in areas important for executive function, mental health, and emotional processing,” she says.

Joan is quick to recognize wood as a valuable renewable resource and is in favor of some areas being treated as cropland in order to maximize wood fiber extraction. And she recognizes the need for thoughtful forestry approaches to promote old-growth characteristics. But, at the same time, OGFN is focused on the importance of protecting old growth, which has been declining on this continent since European settlers first arrived.

Because old growth is so scarce, OGFN works to facilitate and protect future old growth, trees that will reach their senior years long after those who worked to preserve them are gone. Susan worked with the Town of Simsbury to have the 42-acre Belden Forest designated as the first Connecticut forest in the OGFN. A memorandum was co-signed with the Town, and Belden Forest will be officially designated in a ceremony on October 25th.

The leaves will be falling from the trees, but the bare branches will witness a burgeoning new era of promise as the humans below celebrate the forest’s preservation.

*Katherine Hauswirth writes primarily about nature and contemplation. Visit her at First Person Naturalist or read her The Book of Noticing: Collections and Connections on the Trail.*

**Visit Connecticut Old Growth**

Forest ecologist Harry White, OGFN County Coordinator for Litchfield County, recommends the following locations to explore old growth. The DEEP hosts a web page for the Campbell Falls location:

- ☼ Ballyhack Preserve, Cornwall. Easy hike through a 200-year-old forest. Trailhead is located near the intersection of Route 125 and Dibble Hill Road.
- ☼ Gold’s Pines, Housatonic State Forest, West Cornwall. Natural Area Preserve featuring Connecticut’s oldest white pine stand and the state’s tallest tree—a nearly 145-foot-tall Eastern white pine. Trailhead is located off Route 128.
- ☼ Campbell Falls State Park Reserve, Norfolk. Natural area without facilities. Follow Route 272 north from Norfolk center. Take a left onto Old Spaulding Road. Park is on the right.



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My hope is that eventually forest carbon offset projects might encourage landowners of many size tracts to retain higher density and longer age rotations.

☼ Star Childs



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