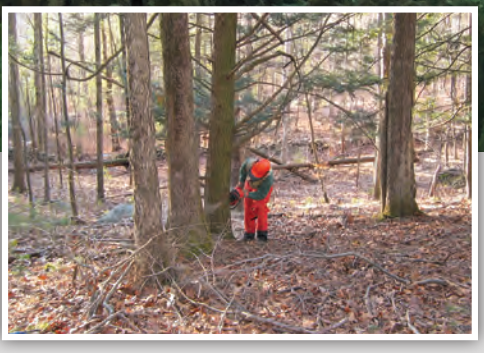
# the Forest Steward

Autumn 2022

Volume 7, Number 2

*Ecologically, economically, and socially responsible forestry from planted stands to protected areas.*

*Old growth trees tower above a changing landscape. Photo by: Colleen Robinson*



*Thinning begins the process of stand improvements in an eastern hemlock stand.*

Forest Stewards Guild

*putting the forest first*

INSIDE

Forest Stewards Guild
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2019 Galisteo St., Suite N7
Santa Fe, NM 87505
505-983-8992
www.ForestStewardsGuild.org



# Developing Sustainable Practices for the Full Spectrum of Forest Management

Al Sample, Board Chair

*A natural origin red pine stand in the Lake States that has had a commercial thinning and a prescribed fire as part of its management.*

Forests are among the most widespread and important biomes on Earth, providing essential goods, services, and habitat to many of the planet's species, and containing about two-thirds of the carbon in living organisms. The Forest Stewards Guild supports conserving this array of values through the continued development, testing, and application of forestry practices across the full spectrum of management intensities—from forest plantations to protected areas.

Central to the Guild mission is facilitating the development of the scientific knowledge and forest management practices that will: conserve forests including all forest types; sustain them for the full array of goods, services, and values they provide; and maintain their resilience in the face of continuing environmental change. Intensive forest management and planted forests can play a critically important role in meeting human needs for food, shelter, and energy from a relatively small proportion of the world's forest land. Well-managed planted forests can secondarily provide valuable wildlife habitat and watershed protection while reducing demand pressures on high conservation value forests elsewhere. The Guild also supports extensive forest management that prioritizes the protection of critical watersheds and soils, conserves habitat for sensitive or imperiled plant and animal species, and maintains and enhances existing forest carbon stocks and sequestration capacity.

The world's forests are increasingly being called upon to play their most ancient role, that of moderating climate at the global scale. Of all the technological mechanisms devised to reduce the atmospheric concentration of carbon dioxide and other greenhouse gases, forests are by far the most effective, least-cost, and most readily applicable means of reabsorbing greenhouse gas emissions from other human activities. Optimizing forest carbon management in some forests may require practices designed to reduce the risks and impacts of wildfire.

This edition of the Forest Steward offers examples of how the land ethic and other key Forest Stewards Guild values can be applied across the entire spectrum of forest management intensities. The Guild's complete position statement on the full spectrum of forest management can be found at https://foreststewardsguild.org/policy-and-recommendations/.

# The Cerro Gordo Story

by Scott Ferguson & Shane Hetzler, Trout Mountain Forestry

**Cerro Gordo is a unique, privately owned, cooperative land venture that originated in 1974.** Led by a visionary group of back-to-the-land idealists, the cooperative bought 1,165 acres of forest and meadows near Cottage Grove, Oregon, with the goal of living in a rural setting while also protecting the natural resources.

The venture survived many trials and tribulations in the decades after Cerro Gordo's founding. Trout Mountain forester Scott Ferguson first met representatives of the Cerro Gordo community on a forest tour in 1984. At that time the group was looking for a forest manager to help them initiate a harvest program of selective logging on several hundred acres of young Douglas-fir stands. Their goal was to promote forest health and diversity while thinning for income to pay their annual property mortgage payments.

Over the years the annual harvests provided support for a community that was gradually changing as some people moved on in their lives and as other investors appeared. Ultimately over 140 different families owned a piece of the ranch, all held together by founder Chris Canfield with the help of a dedicated group of community supporters.

As the core group aged and looked to the future, it became apparent that the venture was not sustainable both from a financial and an actuarial standpoint. For the Cerro Gordo vision to survive, everyone would have to be bought out and the property consolidated into one unified entity. The trouble was, there was no money available to do this.

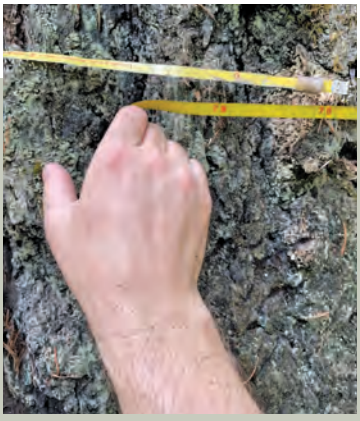
The buyout took a decade and involved the timely appearance of two new opportunities to monetize the conservation value of the ranch. The first was a working forest conservation easement from the Natural Resources Conservation Service that paid landowners to manage forest stands for older trees and habitat that might help spotted owls and other denizens of mature forests. This program protected 457 acres of the Cerro Gordo Forest in 2009 and provided cash to settle debts and begin the owner buyout effort.

Tragically, around the time the easement closed, Cerro Gordo founder Chris Canfield died suddenly. In shock, the community pulled together with a core group of members "stepping up" to help finish the work and save the ranch. This work would need to find an additional $2,000,000 to buy out the large ownership group.

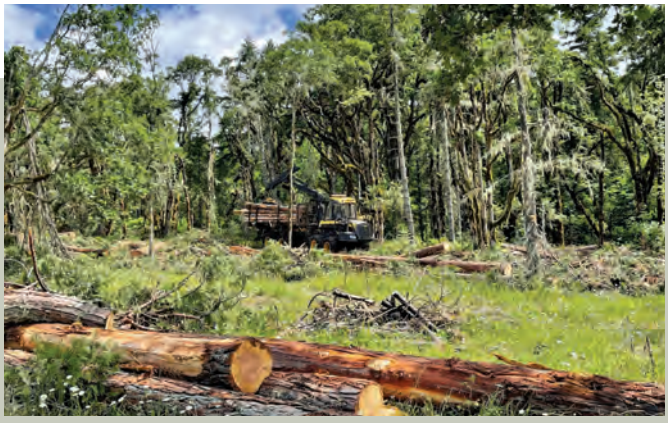
The final push required a lot of effort, good karma, and a dose of serendipity. An additional 534 acres of Cerro Gordo outside of the original easement supports a mix of high-quality habitats including prairie, oak woodland, and maturing second-growth conifer forest. This site, and the quality of habitats on these acres, were a good match for yet another conservation easement program, this one managed by the Oregon Department of Fish and Wildlife and funded by the Bonneville Power Administration. A botanical survey of the meadows found exceptional native grass diversity and several notable populations of rare and threatened plants. In 2019, the final piece was put in place as these acres were officially conserved with an easement held by the McKenzie River Trust. Somehow Cerro Gordo had secured purchase agreements from 140 separate owners, and the easement payment of nearly $2,000,000 was enough to pay off all the agreements and transfer ownership into a single nonprofit aptly named "Cerro Gordo Land Conservancy" (CGLC).

Today, a combination of timber harvest revenue, grant funding, and endowment dollars help to perpetuate restoration and maintenance on the property. Both uneven and even-aged silviculture is practiced, with a target rotational age of 80+ years. A minimum 20% retention by basal area is included in each regeneration harvest unit. While much of the potential thinning has been accomplished over the past four decades, additional work has removed encroaching conifers from the prairies and oak stands, which are some of the most imperiled habitat types in the WillametteValley. Complex snag structure and downed woody debris piles have been created across the property to add to the habitat value. In a final twist, the owners of the original easement at Cerro Gordo are transferring ownership of those 457 acres to CGLC, so that future timber revenue from the working forest acreage can also support the long-term viability of the property. Cerro Gordo will continue to embody management across the entire spectrum of forestry, with each represented point along that spectrum contributing to the overall sound stewardship of the property in perpetuity.

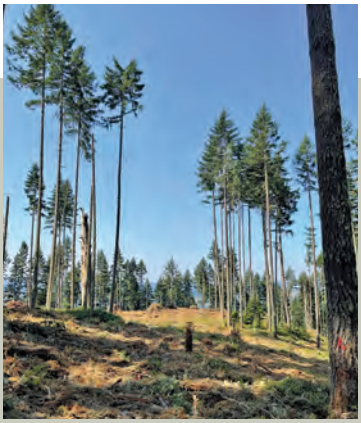




*A Douglas-fir tree on the property that is over 6' at DBH. The overall goal of the working forest easement is to grow more trees like this to support Northern Spotted Owl habitat, while simultaneously providing FSC-certified forest products and revenue to fund further maintenance and restoration.*



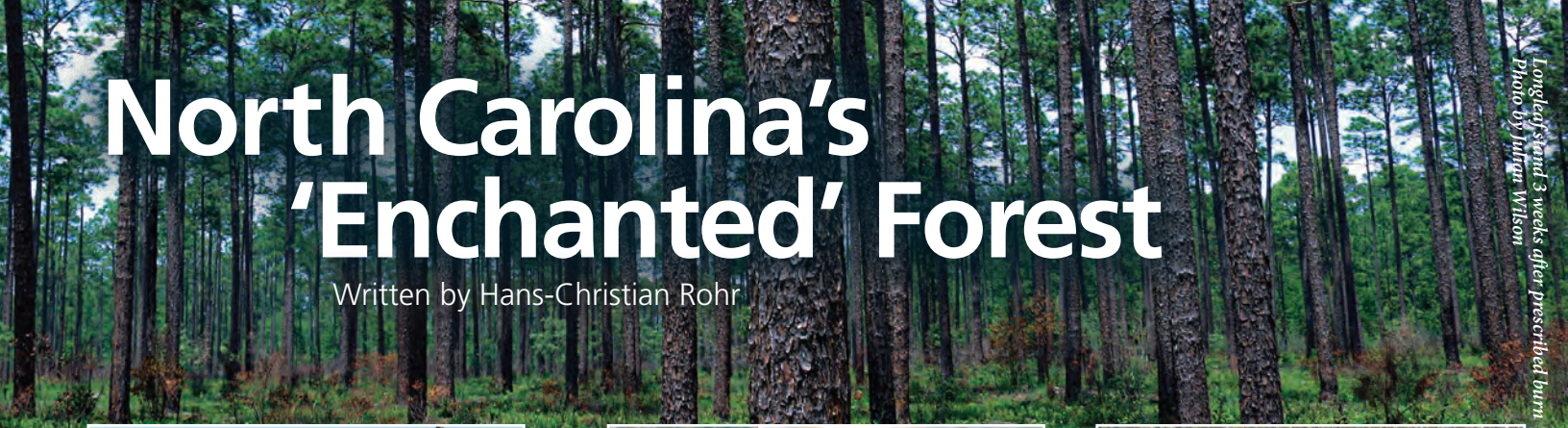
A forwarder gathers recently harvested Douglas-fir and incense cedar logs from a prairie and oak restoration project. They are being removed to counter conifer encroachment that has persisted since anthropogenic fire (which historically maintained these sites) was halted in the 1850's due to the forced removal of the Kalapuya, the original inhabitants of these lands.



*A recent patch cut with retention, including two age classes and several retained species. Note the collection of old and new snags. All photos on this page credited to CGLC*

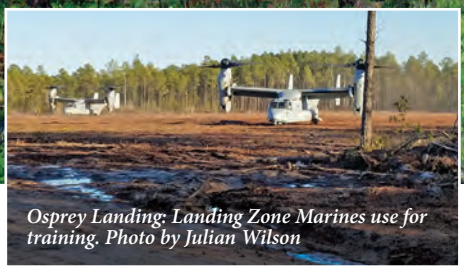
# North Carolina's 'Enchanted' Forest

Written by Hans-Christian Rohr

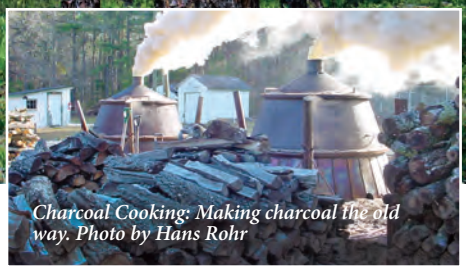


Longleaf stand 3 weeks after prescribed burn
Photo by Julian Wilson

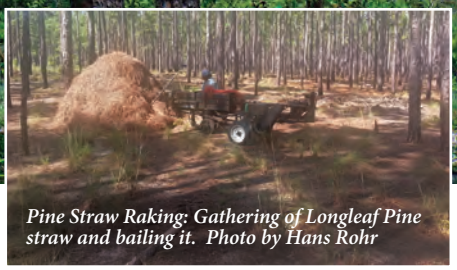




*Osprey Landing: Landing Zone Marines use for training. Photo by Julian Wilson*



*Charcoal Cooking: Making charcoal the old way. Photo by Hans Rohr*



*Pine Straw Raking: Gathering of Longleaf Pine straw and bailing it. Photo by Hans Rohr*

**Bladen Lakes State Forest, sometimes referred to as "the enchanted forest," is about 50 miles northwest of Wilmington, North Carolina.** At 33,500 acres, it is the largest state-owned forest in North Carolina. This working forest funds its annual budget through the sales of timber, pine straw and charcoal, as well as through land use leases with the U.S. Department of Defense and the N.C. Wildlife Resources Commission (NCWRC). Over 90% of our operating costs are covered through receipts from our planted stands. We try to make all forestry related decisions through evaluating ecological and economical sustainability. The forest is open for the public to enjoy, and some activities require a special use permit.

Although we are part of the N.C. Forest Service, we are entirely receipt based and do not receive money through tax appropriations. We operate like a private business, but we must abide by all state policies, which may affect management objectives, budget guidelines or operational procedures.

The forest was established during the Great Depression when the federal government acquired land under the Bankhead-Jones Farm Tenant Act. In 1954, the land was given to the state to exhibit that with proper management, the poor soil can produce self-sustaining forestry. It is now managed as an economically and ecologically self-sustaining demonstration forest.

**Our current management objectives are to:**

- Integrate sound management practices and the promotion of good forest stewardship throughout the forest.
- Use renewable resources to increase value while protecting special resources.
- Regenerate harvested resources through artificial and/or natural practices.
- Maintain sound wildlife management practices with assistance from the NCWRC.
- Serve as a model for sound and innovative management practices.
- Provide research sites to universities and others to further the science of multiple use forestry.
- Use the forest for training for the division, universities, and other agencies.

Approximately 16,500 acres of the forest are managed plantations. The remaining acreage is mostly natural, mixed pine hardwood stands, bottomland hardwood stands, and pocosins and Carolina bays. Most of our bays are co-managed with the help of the N.C. Natural Heritage Program. Carolina bays are elliptical freshwater depressional wetlands that fill with rainwater and may be periodically dry.

Our rotation times vary according to species and management practices. About half our plantations are in longleaf pine and the rotation time is between 60 and 80 years for straw stands. Loblolly rotations are 40 years along with some slash and shortleaf pine stands. All other stands are on a rotation time of more than a century (oaks, Atlantic white cedar and Bald cypress).

Our main source of income is from harvesting stands that have reached the end of their rotation (about 400 acres per year), and thinnings (about 650 acres per year). Sales are conducted as lump sums or per unit sales. Our second largest source of income is pine straw, which we sell through a six-month lease contract. With the help of The Nature Conservancy, we are attempting new methods to harvest the straw to protect certain vegetation unique to longleaf savannas. Charcoal sales is another source of small income. We cook scrub oaks we harvested out of longleaf straw stands to make them cleaner and the raking easier.

We lease most of our land to the NCWRC as game lands. We also lease two landing zones to the Marines for training osprey pilots for takeoff and landing.

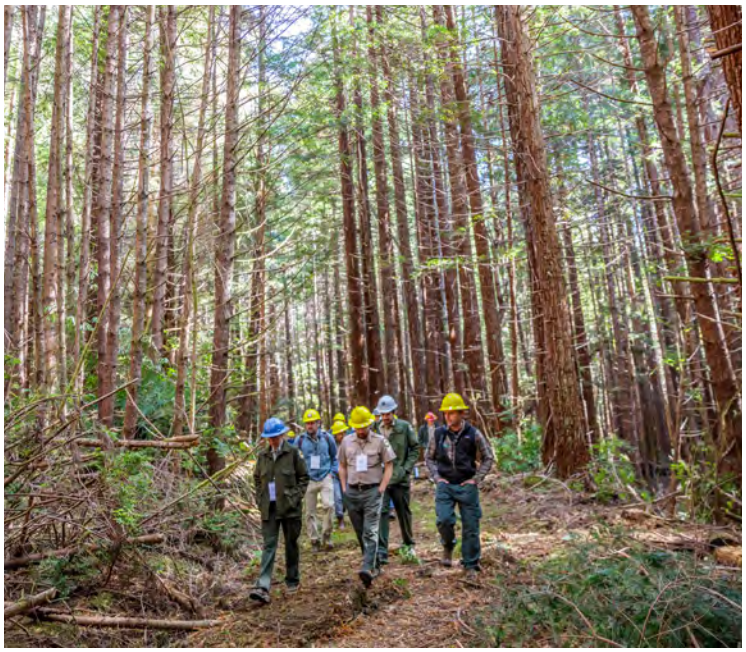
All harvested stands will be reforested according to the soils and surrounding stands within two years by either artificial methods (planting), or natural regeneration.

We have several red-cockaded woodpecker colonies, and other endangered or threatened species, that we strive to extend territory for and protect. There are also numerous study sites. The biggest is a 50-acre full rotation site for loblolly pine under the management of Virginia Tech.

Bladen Lakes State Forest, as well as the N.C. Forest Service, is always open to new, scientific suggestions from the community when considering forest management.

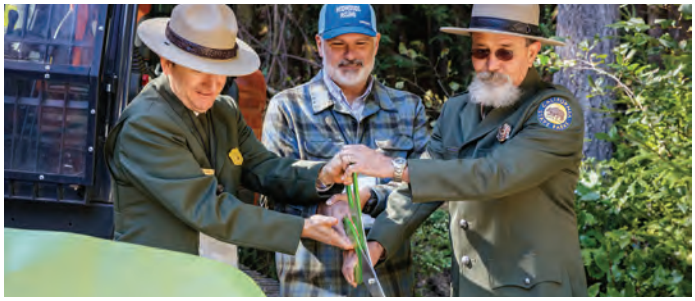
# Redwoods Rising – restoration of an iconic landscape

Written by Benjamin Blom



*Project partners hike through an untreated second-growth redwood forest in Redwoods Rising in October 2019. All Photos by Max Forster*

*California State Parks Forester Lathrop Leonard talks to partner organizations about forest restoration under Redwoods Rising in October 2019.*



*Leadership from Redwood National Parks, California State Parks and Save the Redwoods League ceremonially start restoration work at Redwoods Rising at the partnership kickoff in October 2019.*

The awe-inspiring forests of Redwood National and State Parks leave a lasting impression on any visitor or observer. The 120,000 acres that constitute this landscape encompass half of the world's remaining old-growth redwood forests and the tallest trees in the world. These towering giants harbor imperiled salmon and trout, marbled murrelets, northern spotted owls, and the western lily. They also store more carbon per acre than any other forest on Earth. Given these superlatives and their protection in parks, one would not expect this to be a major site for restoration.

However, despite their ecological riches and stunning beauty, these forests are far from pristine and untouched. Approximately 2/3 of this landscape bears the scars of decades of industrial logging that predated incorporation into the parks, some of which took place as recently as the 1990s. Decades later, these logged stands are densely stocked with Douglas fir and crisscrossed by hundreds of miles of eroding logging roads that pour sediment into the area's streams. What's more, these recovering forests are characterized by uniformity and lack the complex forest structure that supports the diverse native fauna of this region, including threatened species such as the marbled murrelet. They are also more vulnerable to stressors that are increasing in frequency and intensity as a result of climate change, particularly high-severity wildfire and drought. The parks' remaining old-growth areas effectively exist as islands, disconnected from each other by swaths of dense, unnatural second-growth forests.

In this context, Redwoods National Park, California State Parks and Save the Redwoods League joined together in 2018 to form an unprecedented partnership called Redwoods Rising. The primary goal of this partnership is to restore more than 70,000 acres of previously logged forests, remove 300 miles of abandoned, failing logging roads, and reconnect two of the world's largest remaining old-growth forests. In doing so, the project partners hope to set these forests on a trajectory to become old-growth forests of the future in the face of a warmer and drier climate. Recognizing that a collaborative approach was the only way to operate at such a large scale, the three partners developed a shared restoration strategy and began implementation in 2019.

The primary activities of Redwoods Rising are restoration thinning, logging road removal, and aquatic restoration. Building on decades of research and restoration experience in the Redwood region, thinning prescriptions are written to establish a more natural species composition and accelerate the development of complex forest stand and habitat structure, which characterize the old-growth forests of the region. Variable density thinning results in a multi-aged forest with gaps that allow for accelerated growth rates of residual trees. Through two years of implementation (2020 and 2021), the partnership has thinned over 2,100 acres of second-growth forest. Road removal and aquatic restoration progress has been equally successful, with 44 miles of road removed so far and numerous wood structures incorporated into the area's creeks to enhance habitat for salmon and trout.

While the accomplishments of Redwoods Rising are impressive, its greatest strength lies in collaboration. Each partner brings unique skills and expertise to the work, which allows the partnership to accomplish more than could be done individually. Within the work portfolio of Save the Redwoods League, similar partnerships are being considered in the Santa Cruz Mountains and Giant Sequoia National Monument, both of which have been heavily impacted by unprecedented wildfires in recent years. Recent experiences in both landscapes show that old-growth forests are vulnerable in the face of a changing climate. The actions we take now to restore and steward these inspiring forests will determine their fate in an uncertain future.

# Restoration of Eastern Old-growth Forests:
## there is no one-size-fits-all approach

Written by William S. Keeton



*Structural Complexity Enhancement in a northern hardwood-hemlock forest in Vermont, 13 years following treatment. All credits to W. Keeton unless noted.*

There is never a dull day in the forestry realm, thanks to a wide diversity of opinions and continuous debate over what some view as competing approaches, like reserve-based conservation versus active forest management. Yet both approaches are important and, in my opinion, complementary rather than mutually exclusive.

Questions of how best to conserve and restore old-growth forests epitomize the tension between passive and active approaches at the center of U.S. forest policy debate for more than a century. Great progress has been made towards holistic sustainable forest management, recognizing that we need a variety of approaches to provide a full array of values, biodiversity, and ecosystem services. Within this approach is the understanding that late-successional and old-growth ecosystems are key elements of complex, multifunctional landscapes. And usually that means both protecting what little old-growth forest remains as well as restoring more old-growth elsewhere to reestablish larger, more contiguous areas of complex forest habitat.

Opinions diverge on how best to accomplish old-growth restoration. Should we rely primarily on wildland areas where late-successional forests may redevelop passively? Or should we use silvicultural treatments to actively accelerate restoration where stand dynamics are profoundly altered or where older forest structures are severely under-represented?

As usual in forestry there is no simple answer. So much depends on the specifics. Are invasive species present? Have stand structure and composition been altered by fire suppression? How has land use history altered successional dynamics? What about the loss of keystone species and structures, like large American beech and American chestnut? How will climate change affect future successional trajectories and disturbances? These challenges require a multi-pronged approach; there is no one-size-fits-all. This is where complete reliance on passive management carries great risk and takes us back decades in the forest management debate.

There is clear value in protecting remaining old-growth forests globally. But can we actually recover more old-growth into the future? The proposition that we might one day restore eastern old-growth within both protected and working landscapes is no longer theoretical. At least a half dozen experimental studies have proven that it is possible to actively restore old-growth characteristics in redeveloping secondary forests. Scientists have shown that modified gap-based silviculture, as well as irregular shelterwood and variable retention harvesting, can reintroduce some aspects of structural complexity and age-class diversity into secondary stands, while resulting in favorable regeneration, growth, and timber yield. Others have ex-

perimented with enhancing the downed log component. Most of these "natural disturbance-based" approaches add complexity to managed forests but are not designed for full old-growth restoration.

I have tested a system called Structural Complexity Enhancement or SCE. Rather than trying to achieve old-growth structure and function overnight, the idea was to emulate the natural tree mortality and disturbance processes that direct how a forest develops over time…to push those along faster. SCE employs a variety of silvicultural techniques in tandem, each targeted at a different process of stand development or structural feature. We created small, irregularly shaped gaps to free up growing space for advanced regeneration and to regenerate new seedlings. The gaps were placed deliberately to also "crown release" many of the large, dominant canopy trees; previous work had shown that this method can dampen or arrest declining growth rates in larger trees. We used variable density marking to create horizontal heterogeneity. Some trees were either felled and left as downed woody debris, or deliberately pushed/pulled over to create both downed logs and tip-up mounds. Other trees were girdled to form snags, vital habitat for many wildlife species.

SCE has proven effective at enhancing habitat characteristics for a range of late-successional biota, including herbaceous plants, salamanders, and fungi. The tree regeneration story showed ups and downs in seedling recruitment, survival, and establishment over time. But after 13 years of monitoring, SCE ultimately resulted in diverse and abundant regeneration, though competition with beech sprouts was a problem in certain patches, suggesting a need for beech control on poorer sites especially. On the economic side, the study found that SCE will at a minimum pay for itself and, when site and market conditions are favorable, generate enough profit to make it attractive for some landowners. Perhaps most exciting, however, has been the effect on carbon sequestration and storage. SCE resulted in much higher carbon storage than the conventionally harvested stands we compared against, an effect attributed to both the higher structural retention after harvest and unexpectedly high carbon uptake rates. Prospects look good for SCE and other types of old-growth silviculture as one part of the portfolio of carbon forestry options.

Future old-growth in the East will be different from the past. Though our forests have shown remarkable resilience to widespread clearing in the 18th and 19th centuries, many features have changed or were lost along the way. As the climate changes and threats from invasive species expand, the deck will be shuffled once again. Old-growth in some form will persist, even if forest composition changes and species ranges and co-occurrences shift. Adapting to global change will always require a suite of approaches – both passive and active – highlighting that there is no-one-size-fits all approach when it comes to either forest sustainability or natural climate solutions. Though the future is uncertain, with care and attention future generations will have the same experience of walking through an eastern old-growth forest that ours has enjoyed.

**Read more of this article as an online extra at http://www.foreststewardsguild.org/magazine**

W. Keeton measuring tree heights in an active old-growth restoration area in Vermont. Photo credit: Kathleen Masterson, Vermont Public Radio

Old-growth northern hardwood-hemlock forest used as reference for active silvicultural restoration, Adirondack State Park, NY.

Structural and biological complexity created by tree mortality and disturbance in an old-growth forest used as a reference for silvicultural treatments tested in Vermont.

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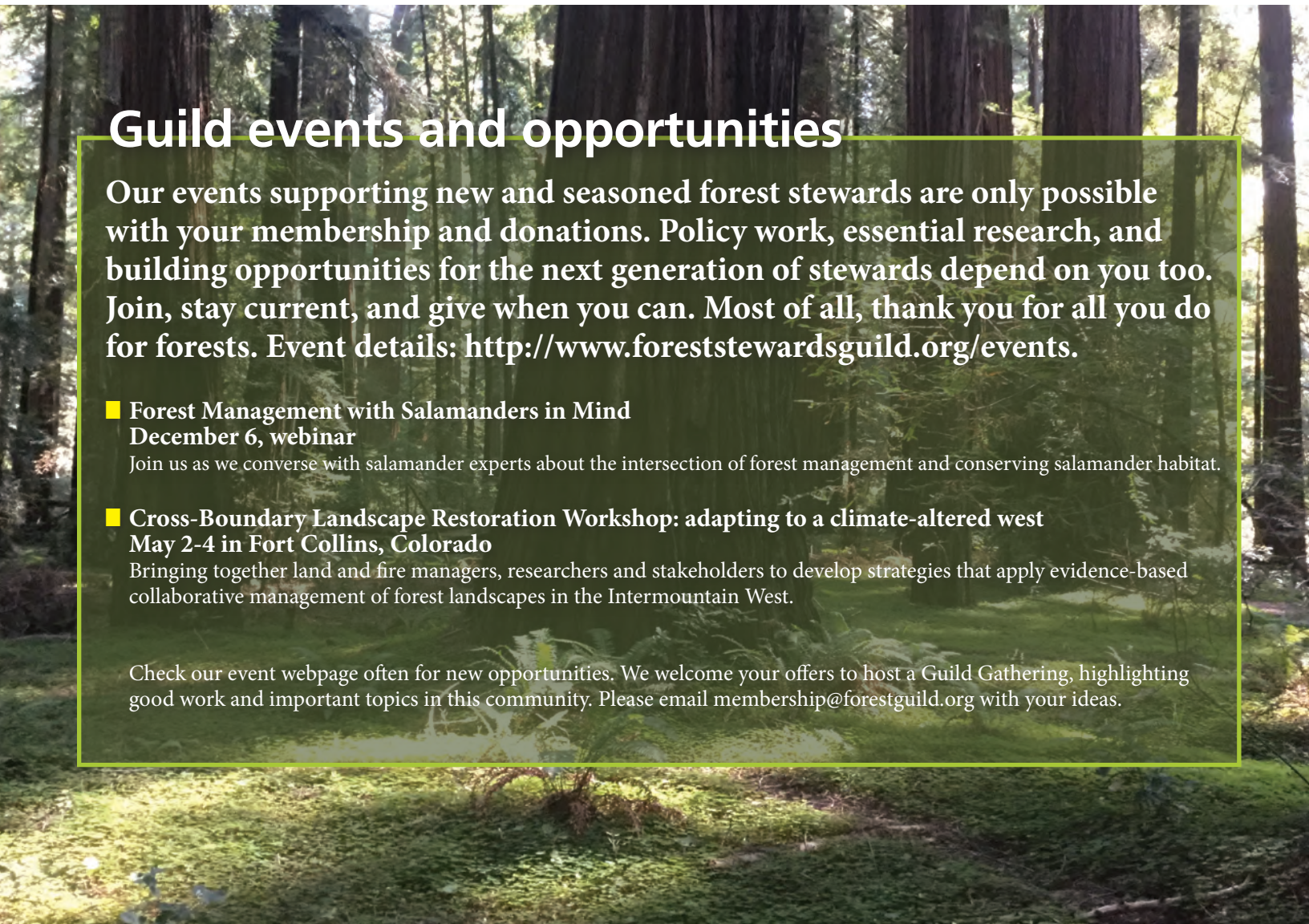

# Guild events and opportunities

**Our events supporting new and seasoned forest stewards are only possible with your membership and donations. Policy work, essential research, and building opportunities for the next generation of stewards depend on you too. Join, stay current, and give when you can. Most of all, thank you for all you do for forests. Event details: http://www.foreststewardsguild.org/events.**

- **Forest Management with Salamanders in Mind**
  **December 6, webinar**
  Join us as we converse with salamander experts about the intersection of forest management and conserving salamander habitat.

- **Cross-Boundary Landscape Restoration Workshop: adapting to a climate-altered west**
  **May 2-4 in Fort Collins, Colorado**
  Bringing together land and fire managers, researchers and stakeholders to develop strategies that apply evidence-based collaborative management of forest landscapes in the Intermountain West.

Check our event webpage often for new opportunities. We welcome your offers to host a Guild Gathering, highlighting good work and important topics in this community. Please email membership@forestguild.org with your ideas.