

A PUBLICATION OF THE FOREST HISTORY SOCIETY

SPRING/FALL 2013

VOL. 19, NOS. 1 & 2

Forest History Today



MESSAGE FROM THE PRESIDENT

Saving Manuscripts Has Always Challenged Preservationists

STEVEN ANDERSON

This month I started reading Stephen Greenblatt's *The Swerve: How the World Became Modern*. It is about a book finder, Poggio Bracciolini, who in the 1400s seeks out the ancient manuscripts transcribed in monasteries over the previous thousand years. He recovers a great number of classical Latin manuscripts, many decaying and at risk, in German, Swiss, and French monastic libraries. In particular, he locates and arranges for a transcription of Lucretius' poem *On the Nature of Things*, a literary work that inspired humanists and others during the Renaissance and certainly contributed to modern thought.

One amusing passage describes the extent to which monasteries went to protect books that had become scarce and valuable during the Dark Ages. On occasion scribes would place a curse on such manuscripts. "For him that stealeth, or borroweth, and returneth not, this book from its owner," one wrote,

let it change into a serpent in his hand and rend him. Let him be struck with palsy, and all his members blasted. Let him languish in pain crying aloud for mercy, and let there be no surcease to his agony till he sing in dissolution. Let book worms gnaw at his entrails in token of the Worm that dieth not, and when at last he goeth to his final punishment, let the flames of Hell consume him forever.

Soon after, the invention of the printing press led to much wider dissemination of books, which for five hundred years remained the main form of distribution of ideas. In the second half of the twentieth century, the development of computers portended the technological shortcut to the sharing of ideas and the publication of books—a change that defines our lives in the early twenty-first century.

Of course, saving books and other manuscripts and printed materials remains a challenge for libraries and archives today. The Forest History Society, though a small nonprofit educational and research organization, plays a significant role in such preservation for the forest and conservation community.



Bracciolini's discoveries and transcription efforts enabled the distribution of manuscripts that changed the world. Similarly, in preserving, making accessible, and helping researchers interpret forest and conservation history, the Forest History Society is aiding the evolution of public discourse about natural resources management and policy.

The Forest History Society is the national archives for, among many other organizations, the Society of American Foresters, the American Forest & Paper Association, the Association of Consulting Foresters, the American Tree Farm System, and American Forests, the oldest citizens' conservation group in the United States, with records that extend back to 1875.

With a multitude of other individual, company, and organizational collections, including the U.S. Forest Service National Headquarters History Reference Collection, the Society is the foremost location for students, teachers, journalists, and others to start their research. The breadth of these complementary collections enriches their research experience, and the Society's professional staff—librarian, archivist, historian, and forester—help them hone their ideas and dig deeper into the history and its meaning. No organization or location can provide more immediate public access and outreach to such a range of materials about the historical relationship of humans and their forests.

This is why our staff and leadership are taking the recent electrical fire at the Society's headquarters with utmost seriousness and attention. Although our archives were not affected, the extent of smoke in the administrative parts of the building has forced the Society's staff into temporary quarters for several months. With your help we will emerge from this disruption stronger than ever. Even before the fire, our board of directors had been working toward securing new facilities for the Society. The planned new building will provide expanded areas for preservation of materials, new spaces for students and researchers, and additional capacity to accommodate new technology and formats of materials that we will be asked to preserve in the future. We hope you will support this effort and partner with us in these pursuits. □

CONTENTS SPRING/FALL 2013

Forest History Today

A PUBLICATION OF THE
FOREST HISTORY SOCIETY
DURHAM, NC

Vol. 19, Nos. 1 & 2
Spring/Fall 2013
Published April 2014



EDITOR

James G. Lewis

EDITORIAL CONSULTANTS

Sally Atwater and Dianne Timblin

CONTRIBUTING EDITORS

Andrea Anderson,
Steven Anderson, Kathy Cox,
Eben Lehman, Cheryl Oakes,
and Maggie Porell

DESIGN

Zubigraphics

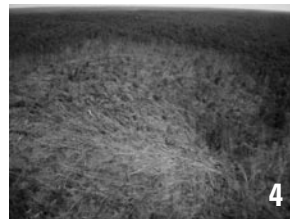
Forest History Today is published by the Forest History Society to keep readers apprised of the best forest history writing and FHS activities.

Please send article proposals to Jamie Lewis, 701 Wm. Vickers Avenue, Durham, NC 27701, 919/682-9319 or e-mail to: jglewis@duke.edu.

ON THE COVER

Logger Bob May loads timber in August 2013.
Courtesy of Denise Vaughn

Articles appearing in this journal are abstracted and indexed in *HISTORICAL ABSTRACTS* and *AMERICA: HISTORY AND LIFE*.



FEATURES



-
- 4 **Derecho! The Forgotten Windstorm that Changed the Ozarks**
DENISE HENDERSON VAUGHN
- 14 **The Rise and Fall of the Gulf Coast Tung Oil Industry**
JEFFREY B. ROBB AND PAUL D. TRAVIS
- 23 **Forestry Education in Quebec: The First 50 Years**
CYRILLE GÉLINAS
- 30 **From the Mountains to the Prairies: Reflections on My 21 Months with AmeriCorps**
CHRISTINE E. AMORESANO
- 34 **Lessons from Harvard Forests and Ecologists: Bob Marshall's Plot**
DAVID R. FOSTER
- 42 **Making Common Cause for Conservation: The Pinchot Institute & Grey Towers National Historic Site, 1963–2013**
CHAR MILLER

DEPARTMENTS



-
- 52 **Biographical Portrait: The Mattoons and McLeans—Deep Forestry Roots**
ANDY MASON
- 55 **History on the Road: Charcoal and Utah's Early Mining Industry**
DOUGLAS H. PAGE JR., SARAH E. PAGE, THOMAS J. STRAKA, AND NATHAN D. THOMAS
- 64 **Books and Films of Interest**
EBEN LEHMAN AND JAMES G. LEWIS
- 71 **Mark Your Calendar**

ANNUAL REPORT



-
- 72 **From the Chair**
- 73 **Treasurer's Report**
- 74 **Contributions and Project Sponsors**
-
- 76 **Gifts to the Forest History Society Library**
- 78 **Awards and Fellowships**
- 80 **Publications of the Forest History Society**

EDITOR'S NOTE

by James G. Lewis

Anniversaries help us mark the passage of time. They can be times of joyful celebration or of somber reflection. Regardless of why it is being observed, an anniversary often prompts us to examine the legacy of the event it commemorates. Fifty years has passed since President John F. Kennedy dedicated the Pinchot Institute for Conservation Studies. His September 1963 visit to Grey Towers, the ancestral home of Gifford Pinchot, was the first stop on his national conservation tour and commanded national press attention. The tour came as the modern environmental movement was finding its footing and issues, some of which Kennedy's tour stops unwittingly pointed to: hydroelectric power, nuclear facilities, and protected landscapes.

In his new book, *Seeking the Greatest Good: The Conservation Legacy of Gifford Pinchot*, Char Miller helps us understand what happened during the half-century that followed Kennedy's visit. It was published in conjunction with the 50th anniversary of the establishment of the Pinchot Institute and the Pinchot family's donation of Grey Towers to the federal government. During Gifford's life, Grey Towers was the center of much activity and conversation regarding the future of America. His son wanted to ensure that the discussion about conservation continued by offering the estate as the headquarters for the Pinchot Institute and a meeting place for the U.S. Forest Service, which his father had established. Miller's **Making Common Cause for Conservation** is adapted from his book.

Also at the dedication of Grey Towers was "Sam" Mattoon, the wife of John Mattoon, a longtime federal government employee and champion of conservation in his own right. Her husband had a major role in coordinating events for the Forest Service that day. Andy Mason shared with me that John's family had deep roots in forestry and agreed to write about them. If the **Biographical Portrait** seems familiar, you may have seen it first on our blog, *Peeling Back the Bark*.

The centennial of the establishment of the forestry school at Laval University in Quebec prompted the publication of another book, *L'enseignement et la recherche en foresterie à l'Université Laval: De 1910 à nos jours (Teaching and Research in Forestry at Laval University: From 1910 to the Present)*. Its author, Cyrille Gélinas, discusses the first half-century of the school in his summary history, **Forestry Education in Quebec**. Jean-Claude Mercier and Marie Coyea have provided a translation.

It has been 80 years since the creation of the Civilian Conservation Corps (CCC). Established in 1933 to address the record unemployment rates during the Great Depression as well as the unprecedented environmental disasters unfolding across the country, "Roosevelt's Tree Army," as it was sometimes called, transformed the landscape and the men who worked it, doing a

lot of good for the country and its citizens during its brief existence. Initially, however, no minorities could join, and women were never allowed in this army. Sixty years after Franklin Roosevelt established the CCC came the AmeriCorps National Civilian Community Corps, which was modeled on the CCC. This tree army has welcomed men and women of any race. The goals are largely the same: to transform the land while transforming the people who work the land. That is certainly apparent in **From the Mountains to the Prairies**, Christine Amoresano's reflections on her stint in AmeriCorps.

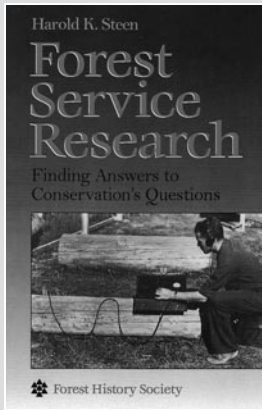
I find anniversaries curious. Why is the 50th more cause for celebration than the 20th or 80th or 90th? Is there more cause? In April 2014 it will be 90 years since Richard Fisher wrote a letter to Robert Marshall in which the director of the Harvard Forest invited the young forestry student to come study an old-growth forest on Pisgah Mountain in New Hampshire. Marshall accepted the invitation to attend Harvard, but he chose to study a different parcel of land, one that later became known as Bob Marshall's Plot. Ninety years after it was written, is this letter less important because of Marshall's decision? Read David Foster's **Lessons from Harvard Forests and Ecologists: Bob Marshall's Plot** and decide for yourself.

How should we mark an anniversary of a natural disaster that initially caused extensive destruction but seems to have brought about positive change in its wake? In May 2014, it will be five years since a major windstorm, called a *derecho*, swept across the Ozarks. Many people in that region are still unaware of the extent of damage done by the storm, as Denise Henderson Vaughn notes in her article, **Derecho! The Windstorm That Changed the Ozarks**. Would public acknowledgment of that event's anniversary help raise awareness of what happened and ease tensions between the local populace and the U.S. Forest Service?

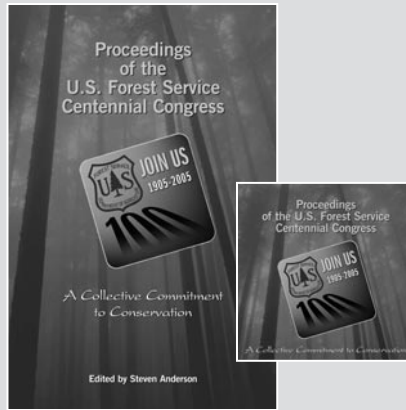
What if there is no clear date by which to mark an event? What if something quietly begins and later quietly ends, with no clear dates to mark either? And what if the land has changed, and how people relate to the land has changed, too? This is essentially what happened to the tung oil industry in the United States, according to Jeffrey B. Robb and Paul D. Travis in **The Rise and Fall of the Gulf Coast Tung Oil Industry**. It is also true of the mining and iron smelting industry in Utah, as Thomas Straka and colleagues convey in the **History on the Road** column.

Next year marks the 50th anniversary of the passage of the Wilderness Act. It also marks the 150th anniversary of the publication of Henry David Thoreau's *The Maine Woods*. Both events will be celebrated, in very different ways. What other forest history-related anniversaries will there be? You'll have to wait for the next issue to find out. □

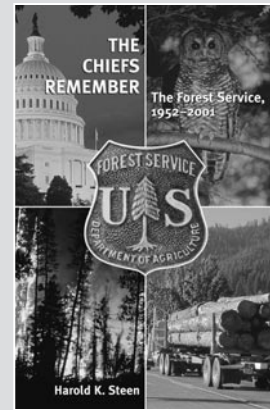
U.S. Forest Service History from the Forest History Society...



**Forest Service Research:
Finding Answers to Conservation's Questions**
Harold K. Steen, paper \$10.95



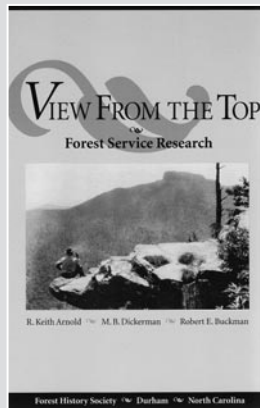
**Proceedings of the U.S. Forest Service
Centennial Congress: A Collective
Commitment to Conservation**
Steven Anderson (ed.), paper \$24.95;
Also available on CD with bonus material



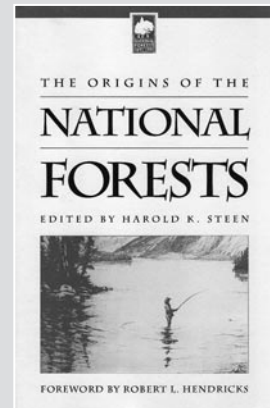
**The Chiefs Remember:
The Forest Service, 1952-2001**
Harold K. Steen, cloth \$29.00, paper \$20.00



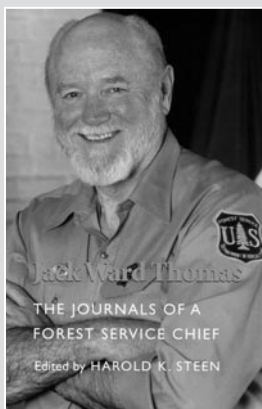
**The Forest Service and the Greatest Good:
A Centennial History**
James G. Lewis, cloth \$29.95, paper \$19.95,
3-DVD set \$18.00



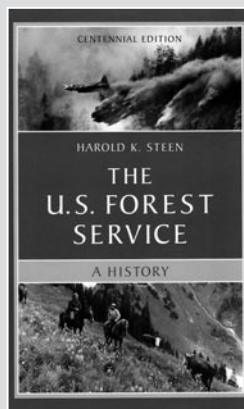
View From The Top: Forest Service Research
R. Keith Arnold, M.B. Dickerman, Robert E.
Buckman, paper \$13.00



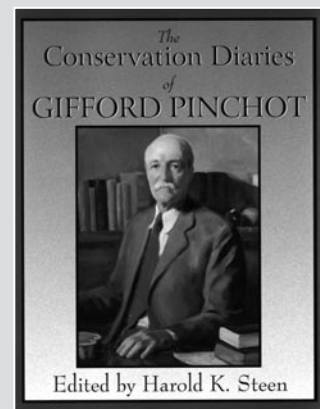
**Origins of the National Forests:
A Centennial Symposium**
Harold K. Steen, cloth \$31.95, paper \$16.95



**Jack Ward Thomas:
The Journals of a Forest Service Chief**
Harold K. Steen (ed.), paper \$30.00



**The U.S. Forest Service:
A History (Centennial Edition)**
Harold K. Steen, cloth \$40.00, paper \$25.00



The Conservation Diaries of Gifford Pinchot
Harold K. Steen (ed.), cloth \$29.00, paper \$17.95

On May 8, 2009, a windstorm of unprecedented fury swept across Ozark forests in southern Missouri, toppling millions of trees and leaving an imprint on the landscape for decades to come. The magnitude of forest damage was not immediately understood, and the impacts never were well publicized. Blown-down areas were so immense that loggers are still salvaging timber now, almost five years later.

DERECHO!

THE FORGOTTEN WINDSTORM THAT CHANGED THE OZARKS

When a blast of “odd wind” swept in, dislodging dead branches, John Kabrick and four colleagues abandoned their work at the U.S. Forest Service’s Sinkin Experimental Forest, scrambled into two trucks, and headed for a small clearing. For nearly an hour, the gale toppled trees

first in one direction, then in another, then another. They watched short-leaf pine succumb first, followed by hardwoods. Their parking spot became unsafe, but each place they moved was vulnerable. At one point, slamming a truck into reverse barely saved its hood from being crushed by a large oak.

“It was beyond fright,” said Kabrick, the forest’s supervisor, as he described the slow-motion horror scene that unfolded on May 8, 2009, in southern Dent County, Missouri. “There was a short time when I had no idea that we would actually get through it. It just seemed like a matter of time before trees would fall on us.” When the wind subsided, the two vehicles were trapped by hundreds of trees, and the group walked out.¹

That same morning, about 10 miles to the east in Reynolds County, landowner and ecologist Peter Becker’s meticulously managed forest of towering oaks came crashing to the ground. Fallen trees blocked his winding gravel driveway for a week, electricity was out for 15 days, and the scenery was devastated. Perhaps most crushing was the realization that nature had overruled his effort to set an example of sustainable harvesting.²

Veteran logger Larry May was working in the woods that day on a long, narrow ridge in northeast Shannon County, some 18 miles south of Becker’s place, when a tornado struck without warning. He did not even have time to jump into the cab of his

nearby log truck. He crawled under and desperately gripped the driveshaft, his eyes clenched against pelting dirt and debris. Three trees fell on the truck, pinning it to the ground. When he emerged, most of the forest was horizontal, making walking nearly impossible. To his amazement and relief, his son and a third logger had survived, clinging inside their logging skidder. Using chainsaws and a skidder, the three struggled through the maze, taking five hours to fight their way eight miles to the highway.³

The ferocious storm knocked down vast swaths of timber in a concentrated 17-mile-wide, 100-mile-long path across the southeastern Missouri Ozarks, but its bite was felt over a 24-hour period along a 1,000-mile ribbon that stretched from central Kansas through Illinois, Kentucky and Tennessee, then faded in Virginia and North Carolina. The National Weather Service reported sustained winds higher than 60 mph for most of its course, with many instances of 90 mph microbursts, and a few gusts over 100 mph. The long-lived, complicated storm system, called a *derecho*, spawned some 40 tornadoes, 23 of them in Missouri.⁴

This *derecho*’s effect on forest landowners and the forest industry in the Ozarks has gone virtually unnoticed. That story is explored here, with a focus on the coping strategies of three large forest landowners: Missouri Department of Conservation, Mark Twain National Forest, and Pioneer Forest.

BY DENISE HENDERSON VAUGHN



COURTESY OF JASON JENSEN

Tornado-toppled trees lie in the Logan Creek Conservation Area in western Reynolds County, photographed about a week after the storm by a resource forester with the Missouri Department of Conservation.

“SUPER DERECHO”

Derecho, a Spanish adjective that can mean “straight” or “direct,” originated in 1888 to describe a storm with direct winds, as opposed to a tornado (Spanish *tornar*, “to turn”).⁵ But the use of *derecho* as a weather term languished until researchers dusted it off in the 1980s and defined specific parameters: a derecho must exceed 250 miles in length with sustained, damaging winds of 58 mph or greater for four hours or longer. Scientists identified 377 storms in the United States between 1986 and 2003—or nearly 21 per year—that fit the criteria.⁶

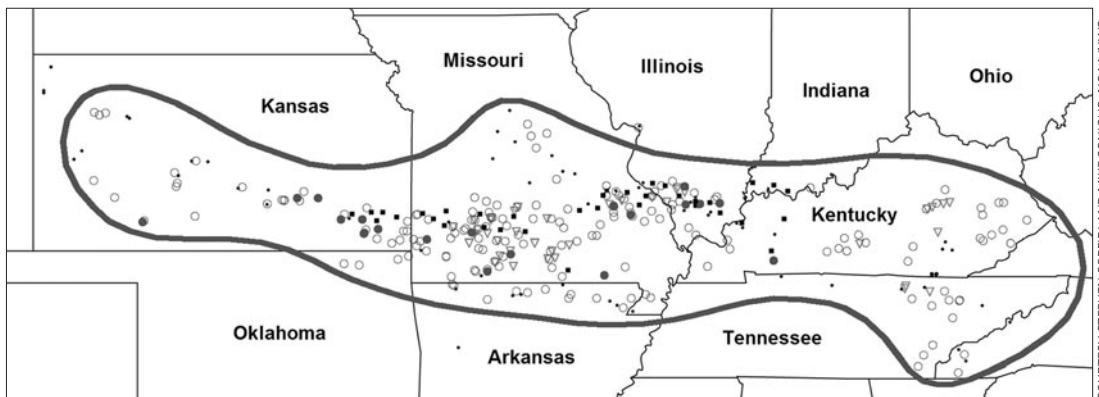
Historically, some derechos compete with tornadoes and

hurricanes in terms of loss of life and property. Between 1986 and 2000, derechos accounted for 153 deaths and 2,600 injuries—about half the number related to tornadoes and about two-thirds the number attributed to hurricanes. As for property damage, one derecho in 1998 accounted for \$432 million in losses paid by insurance companies.⁷

The May 8, 2009, derecho and its companion tornadoes caused plenty of damage over its thousand-mile span, particularly near urban areas. Seven people died in four states, and the National Weather Service reported many damaged structures and thousands without power for extended periods.⁸ The Missouri governor’s

The storm lasted about 24 hours and stretched about 1,000 miles from central Kansas through Illinois, Kentucky, and Tennessee, before petering out in Virginia and North Carolina.

- Large open circles = 58 mph wind
- Large filled circles = 74 mph wind
- Small filled circles = .75" hail
- Open triangles = tornadoes
- Filled squares = flash flooding



COURTESY STEPHEN CORFIDI AND MIKE CONIGLIO, NOAA/NWS



COURTESY OF HANK DORST

The shortleaf pine that fell near Bunker, Missouri, during the May 2009 derecho was still salvageable as of November 2009, when this was taken. Most pine was unusable within a year, but large oaks stayed viable for years and some are still being harvested

office assessed damage to public property and infrastructure at \$48.7 million.⁹ If the derecho had blown over more populated areas, the damage would have undoubtedly been in the hundreds of millions of dollars, with many more casualties.¹⁰

Even if there was relatively little financial loss, this storm was in fact unprecedented. Its meteorological characteristics included an area of intense low pressure of a sort never before documented in a derecho. That, plus its longevity and sustained high winds led Morris Weisman of the National Center for Atmospheric Research in Boulder, Colorado, to describe the event as a “super derecho.”¹¹ The nickname stuck, and the National Weather Service now refers to this storm as the Super Derecho. Meteorologists are not considering a new storm classification using that term, but to this day, no other derecho has exhibited that same structure or intensity.¹²

TREE MORTALITY AND ITS RIPPLE EFFECTS

In Missouri, some of the derecho system’s hardest blows fell on sparsely populated, heavily forested areas. People in its path, like John Kabrick and Larry May, marvel at the low incidence of injuries and structural damage. But timber mortality was extraordinary. Ground conditions played a role; soils were saturated from 11 inches of rain in about two months, with three inches in the previous two weeks,¹³ so root systems were vulnerable. In most places, leaves had fully emerged, acting like sails. The trees toppled like dominos.

Media reports did not emphasize or document forest damage, and the Super Derecho’s magnitude was not immediately understood. In July, the Missouri Department of Conservation (MDC)

estimated uprooted timber along the derecho’s path to total 204 million board feet, valued at \$12 million¹⁴—a low value, given that timber prices had fallen by more than half since before the 2008 recession.¹⁵

MDC’s calculations are conservative; true timber losses are probably much higher. MDC included only trees lost on lands identified as catastrophically damaged, rather than all impacted acreage. Records of actual timber salvage from the area’s three largest landowners amount to 109 million board feet. However, these three ownerships account for less than half the total acres identified as catastrophically damaged. Further, one of them, the U.S. Forest Service, only recovered about a third of its downed timber.¹⁶

Catastrophic damage was identified by change-detection software that compared satellite images recorded before and after the storm. More than 113,000 acres in southeast Missouri were thus categorized, most in the 100-mile swath across Dent, Shannon, Reynolds, Iron, Madison, and Bollinger counties. The computer analysis did not recognize areas where the canopy was not so disrupted to be obvious from a satellite. But those areas are widespread, and so the actual acreage affected is much greater than that identified as catastrophic.

Forest landowners report feeling grief and depression after the storm destroyed their scenic surroundings and many retirement nest eggs. They were overwhelmed with the logistical realities of removing piles of debris and attempting to retrieve and sell tumbled trees.

Peter Becker’s 120-acre farm overlooking the West Fork of the Black River was in the main path of the derecho. He had recently



COURTESY OF PETER BECKER

Landowner Peter Becker retained crop trees when he conducted an individual tree selection harvest in mid-2008. The forest in this photo, taken just after the logging, was later tipped over by the derecho. Becker's wife Marina Wong leans against a tree in the center.

conducted a harvest using selection cutting, as part of a controlled study published in a forestry journal.¹⁷ He and his colleagues had demonstrated the profitability to loggers and landowners of harvesting poor-quality, small-diameter timber along with sawlogs. The goal was to remove undesirable trees cost-effectively during the harvest and to leave the best trees to grow for later harvest and for regeneration.

Ultimately, Becker hoped to encourage this type of management regionwide as a substitute for the more common methods of clearcutting and high-grading.¹⁸ The carefully harvested forest was his legacy. "We had done something to improve its quality and that was a statement of our value system," he said. But the storm turned his forest into a de facto clearcut. "It was a huge disappointment," because in the end, the only statement was that "nature ultimately will rule," he said. A year later, a logger salvaged his magnificent, downed white oaks.¹⁹

Overall, landowners say they fared poorly. Timber prices were already depressed because of the recession, but the storm created a local glut, dropping prices even more. Loggers were overbooked. One owner said he felt lucky to find a logger who had a buyer for his furniture-grade trees, even though they were turned into railroad ties and charcoal.²⁰

Traditional financial safety nets offered only minimal help.

Farm insurance typically does not cover timber losses, and federal disaster assistance requirements are stringent. Timber owners discovered complicated requirements that prevented most of them from even claiming a casualty loss on their income taxes.²¹

Some landowners qualified for assistance through the Natural Resources Conservation Service (NRCS). In 2009, 50 landowners in 11 counties were allocated some \$525,000 in "storm damage forest rehabilitation funds" administered by NRCS for implementing conservation practices while conducting salvage harvests.²² Some also received conservation subsidies through the Farm Service Agency, which paid for removal of debris that posed a wildfire risk.²³

The local forest industry benefited from the windfall. Harvest of derecho blowdown lasted for several years because many fallen trees were partially rooted, prolonging their lives. Salvaging continues even now, but loggers' efficiency and productivity are hampered by dense new growth, degraded timber quality, dangerous dangling limbs, and fallen logs that impede skidders.²⁴

Nevertheless, the storm provided several years' employment at a time when the forest industry nationwide was at a low point. Sawmills in derecho territory stayed in business; one owner called the storm "a lifesaver" because the plentiful, cheap timber allowed area mills to undercut competitors.²⁵ But now that the salvage is winding down, these mill owners worry about availability of

standing timber. Thus, the long-term result of the storm was to create a natural boom and bust for the local forest industry.

BIG OWNERS, BIG CHALLENGES

Salvage logging after a natural disturbance is often controversial. People with economic interests typically want to recoup their investment and avoid waste while ecologists offer ample evidence that salvaging can interfere with ecosystem recovery.²⁶ After the derecho, however, even environmental activists who in previous years had appealed U.S. Forest Service timber sales did not object to salvage harvests. The fallen timber “would build a lot of homes and make a lot of flooring,” one said. “If it’s being used, then maybe some other trees that weren’t hit will stay standing longer.”²⁷

Even without interference, of the four owners who hold large tracts within the blowdown area in southern Missouri—Mark Twain National Forest, Missouri Department of Conservation, Pioneer Forest, and the Ozark National Scenic Riverways, operated by the National Park Service—the Forest Service was the last to take action.

The Park Service did not conduct salvage logging because of legal restrictions, but the agency did clear debris from about 22 miles of roads, plus campgrounds and other visitor areas.²⁸

Pioneer Forest’s aggressive strategy

The derecho hammered parts of Pioneer Forest. In the 1950s Leo Drey had purchased cutover Ozark forests on rocky, steep ground and established the enterprise that grew into Missouri’s largest private landholding.²⁹ Ever since, Drey and his foresters have doggedly practiced single-tree selection on Pioneer Forest’s 140,000 acres, gradually transforming the straggly trees into stands of immense oaks and shortleaf pines, nearly quadrupling volume per acre since the 1950s. Large tracts are now leased to the state for public recreation, particularly for backcountry hiking.³⁰

The storm seriously disrupted Pioneer Forest’s decades-long management plan. Foresters were dismayed to discover large patches of blowdown on 22,000 acres, with nearly 7,000 acres catastrophically damaged. Two punches hit their land: a tornado across the southern holdings, and to the north, the main derecho.

“We didn’t get to pick the trees,” said Terry Cunningham, then forest manager. Along the main derecho path, some of the worst damage affected the best trees, those on north-facing slopes. They fell with crowns pointing uphill, which Cunningham found peculiar considering that the storm had moved from west to east.

The destruction seemed overwhelming. “The clocks are ticking”—rot would quickly degrade the downed timber—“and the markets are bad. What are you going to do?” Cunningham said. The three staff foresters knew they would be competing with nearby state and federal agencies, but as a private enterprise, Pioneer Forest faced no legal hurdles, so they moved quickly. They secured extra loggers within days, jumping from six to 20 logging sales. To attract the mills, they dropped their stumpage price from \$200 per thousand board feet to \$125, and they streamlined their sales process, selling by weight rather than attempting to measure volumes with a timber cruise.

Before the storm, Ozark loggers typically were equipped to handle only eight- to 10-foot logs, a tradition that dates back to mule-logging days when sawmills were low-tech and labor intensive. Because the storm toppled and tangled trees of all sizes, loggers found that to extract high-value sawlogs, they had to also handle low-value trees, just to get them out of the way. Trees less

than 10 inches in diameter are typically marketed for paper or pallets and are sold in full-tree lengths. To recoup their labor, a number of loggers purchased tree-length trailers and thus expanded their services and products. The storm instigated a long-term policy change: Pioneer Forest now requires loggers to cut not just sawlogs but also tree-length pulpwood when harvesting standing timber.³¹

It took Pioneer Forest two and a half years, cutting only salvage, but nearly all fallen trees were retrieved. Salvaging yielded more than 30 million board feet, or 1.5 times the company’s typical annual target harvest for standing timber.³²

MDC salvages all its blowdown

The derecho system nearly flattened about 7,700 acres belonging to the Missouri Department of Conservation, which manages about 600,000 acres of forestland statewide.³³ Damage to state land was primarily caused by tornadoes, although small holdings in the main derecho path were also hit.

Despite the protocols required of a state agency, MDC foresters moved promptly and bid out more than 50 sales contracts. Like Pioneer Forest, they simplified sales, selling by weight rather than measuring board feet. The agency ended up salvaging on about 28,000 acres, producing close to 22 million board feet. Work started in July 2009 and was finished in December 2010.³⁴ A press release announcing completion touted the economic benefit to loggers and sawmills, and said the fallen timber was not subject to wildfire or decay.³⁵

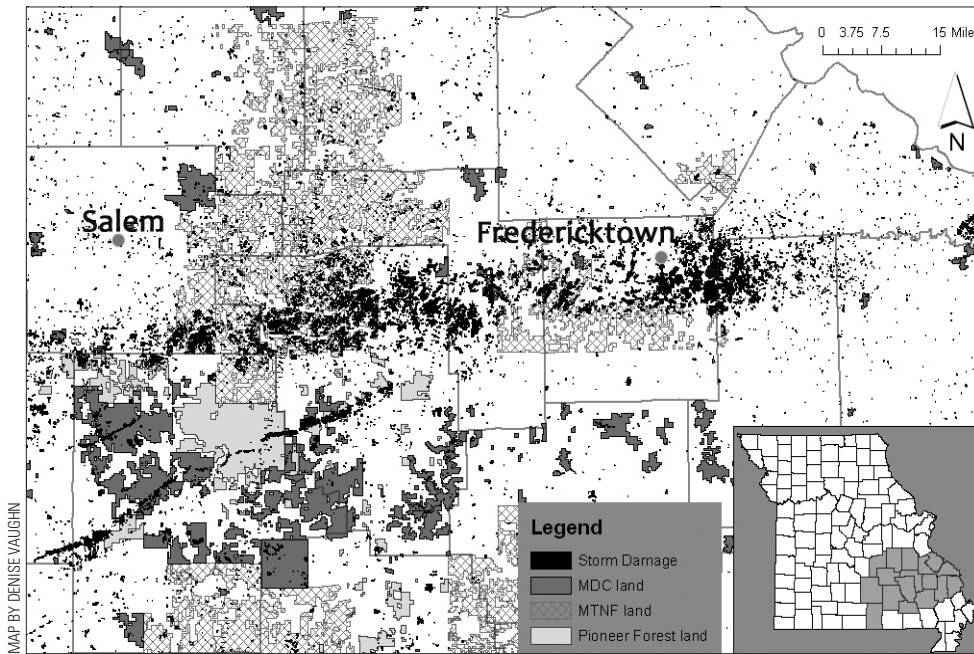
Some Ozark residents were critical of how the agency, which has goals that include helping landowners, focused primarily on its own land, leaving small, private forest owners to fend for themselves. But MDC officials say they did not turn away anyone requesting help, and their foresters provided technical assistance to applicants for NRCS storm damage funds.³⁶

MDC is authorized to set up an incident command system to help victims of tree-related disasters such as the 2011 Joplin tornado, but the system was not implemented following the derecho. “I don’t think we initially realized the magnitude of the storm and the scope of damage,” said State Forester Lisa Allen. With few deaths and little property damage other than trees, the derecho “went unnoticed. It didn’t make the headlines, even in Missouri,” she said. In hindsight, she said, MDC should have set up a state-level incident command.

Cumbersome process for the Forest Service

Of the big ownerships, the windstorm wreaked the most havoc on the Mark Twain National Forest, nearly all of it along the derecho’s main path. Within the 1.5 million acres of total landholding, 29,000 acres suffered catastrophic damage—quadruple the area on either Pioneer Forest or MDC land. Forest Service silviculturist John Bryan estimates that 80,000 to 90,000 acres had serious damage, most on the Salem Ranger District but also on the Fredericktown and Potosi districts.³⁷

The lack of media attention affected decision making. Dave Whittekiend, forest supervisor at that time, was unable to “sell the event” to the regional office in Milwaukee, to “convince them that this is a big deal and we need a lot of extra help.”³⁸ With piles of fallen limbs along roadsides obstructing the view, the extent of damage was not obvious at first. A month passed before Salem district staff could arrange an airplane flight for a view from above. Satellite images finally provided definitive evidence of the blow-



Catastrophic forest damage from the May 8, 2009, derecho affected three big landholdings: the Missouri Department of Conservation, the Mark Twain National Forest, and Pioneer Forest. The main derecho winds traveled almost straight east. To the south, tornadoes sliced in a northeasterly direction. The chart below compares three owners' salvage operations.

DERECHO SALVAGE OPERATIONS FOR BIG OWNERSHIPS IN MISSOURI OZARKS

Landowner	Acres Owned in Missouri	Acres of Catastrophic Damage	Acres of Derecho Salvage	Board Feet Salvaged	Typical Annual Harvest	Time Spent	Percent of Blowdown Salvaged
U.S. Forest Service/ Mark Twain National Forest	1.5 million Acres	29,000 Acres	18,000 Acres So Far	57 Million Board Feet as of October 2013	45 Million Board Feet per Year	4+ Years and Still Working	Estimated 30–35%
Missouri Department of Conservation	600,000 Forested Acres of 789,000 Total Acres	7,700 Acres	28,000 Acres	22 Million Board Feet	16 Million Board Feet per Year (10-yr. Average)	18 Months	100%
Pioneer Forest	140,000 Acres	7,000 Acres	22,000 Acres	30 Million Board Feet	8 Million Board Feet per Year	2.5 Years	100%

down's scope. "My thoughts were, there's so much timber down, there's no way we're ever going to get it," said Salem District Ranger Thom Haines. Initially, opening blocked roads, securing public safety, and protecting against wildfires were among his priorities.³⁹

At times it may have seemed easier to cut through the fallen timber than the federal agency's red tape. On the Salem district, it took about a year to remove downed trees within 50 feet of the 180 miles of affected roads that adjoin Forest Service land. Creating that initial 100-foot fire break was accomplished by issuing forest product removal permits to loggers, rather than by executing timber harvest contracts, which must comply with the National Environmental Policy Act (NEPA), a complicated process that typically takes a full year.

Issuing timber salvage contracts began the second year, after the Salem district staff completed NEPA paperwork: documenting predicted impacts to wildlife, watersheds, community economics, cultural resources, and endangered species; issuing scoping

documents; soliciting comments; and allowing time for appeals (none were filed). Except in two areas already slated for timber sales, the contracts restricted loggers to strips extending 300 feet on either side of the roads. Elements of the plan were intended to minimize environmental impact. Because roads typically traverse ridgetops, little salvage would take place on hillsides and in hollows, reducing the likelihood of soil erosion and removing the need to build logging roads. Facing less damage, Potosi and Fredericktown district foresters took a different approach, targeting pockets of blowdown timber. Most fallen timber on those two districts was harvested.

The Forest Service has no mechanism to provide financial aid for nonfire emergencies, so staffers were expected to cope with the additional timber sales using existing funding.⁴⁰ They also had to conduct cruises to estimate timber volumes because superiors at the regional level would not allow selling the fallen timber by weight. Their objections centered on accurately gauging its

volume and therefore its value. This frustrated Wittekiend, who said “the material didn’t have much value; it was a liability for us.” Further, during the time-consuming timber cruises employees were exposed to considerable risk while “crawling over and under that jackstrawed material.” Other than a modest waiver concerning cruise accuracy, Mark Twain staff did not receive any categorical exclusions or emergency waivers, so progress was slow.

Whittekiend recommends that the Forest Service establish a dedicated fund for nonfire forest disasters, such as wind, ice, or insects, so that damaged trees can be utilized. “Additional resources really make a difference. That’s why the Forest Service is so effective at fighting fires,” he said. And in future emergencies, Wittekiend said he would push hard for a weight-scaled method of selling damaged timber.⁴¹

The lengthy salvage process continues. As of this writing, loggers are still harvesting blowdown on the Salem district, but the timber is so degraded that it is no longer bid out.

Despite the impediments, Bryan estimates that on all three districts, the Forest Service has salvaged 18,000 acres so far. Probably a third of damaged trees have been retrieved, yielding an estimated 57 million board feet, plus some standing timber intermixed, for a total of 80 million board feet harvested from affected lands. Production per acre is high because “we lost our big, mature trees on some of the best, high-volume acres we had,” Bryan said. But even with this harvest, “the sad part is if you look, you can’t even tell we’ve done anything because it’s so big,” he said.⁴²

Loggers and mill owners grumble that “millions of dollars’ worth of timber is rotting in the forest.”⁴³ They criticize the red tape and slow pace, comparing the Forest Service unfavorably with MDC and Pioneer Forest. Haines responded, “We came on line last because our system is more cumbersome. Our lands are owned by 300 million other people. We have to address all their concerns.”

An unintentional benefit of the agency’s tardiness, Haines said, is that it provided a reprieve for private landowners because loggers were more available to the private sector early in the salvage. Additionally, salvage timber entered the market more steadily over the four years, a stabilizing factor that did not further depress the already low prices.

In the Salem district, a good percentage of the timber still lying in the woods beyond the ridgetop salvage areas is not expected to be harvested.⁴⁴ Thus, it could fuel a forest fire. The biggest wildfire on record for the Mark Twain, nearly 5,000 acres, ignited in November 2011 in blowdown timber.⁴⁵ Some areas only burned lightly, but others were hot enough to scorch standing timber. Bulldozers could not penetrate the snarled mass to build fire lines. Firefighters retreated to defend the roads, already cleared of fuel by the salvage operation. Later, during the extended drought in the summer of 2012, the Ozark region experienced summer wildfires for the first time in memory. One became a crown fire, unheard of in these forests. It was partly in blowdown timber.⁴⁶

Fear of fire is driving a new Forest Service plan to protect areas surrounding the town of Bunker. The project area is nearly 23,000 acres, of which about 9,300 acres will be designated as fuel breaks along ridgetops, where bulldozers will build fire lines and where down trees will be salvaged, chipped, cut small, or burned. About 18,000 acres are slated for prescribed burns, presumably in areas that cannot be easily reached for harvesting. The Forest Service expects to salvage another four million board feet of timber.⁴⁷

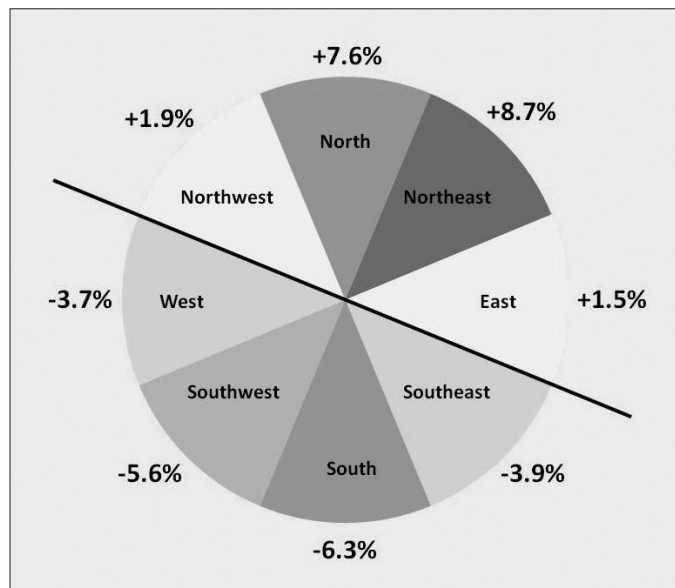


CHART BY DENISE VAUGHN

This chart shows the percent of damage on various slopes as compared to the landscape as a whole. Aspects (slope direction) are evenly distributed throughout in an eight-township study area, but the damage was more concentrated on north and northeasterly-facing slopes, and less so on southerly slopes. The axis dividing more damage and less damage runs from west-northwest to east-southeast.

CONFOUNDING DAMAGE PATTERN EXPLAINED

Even while derecho winds howled around him and he feared for his life, Sinkin Experimental Forest Supervisor John Kabrick managed to make scientific observations. Initially, when the pines were falling, winds blew west to east, he said, “and they almost appeared straight line. After about 15 minutes of that, the trees were blowing from north to south.” Eventually the hardwoods started to come down, too. “And after another 10 to 15 minutes, just before it ended, they seemed to be blowing from east to west,” he said.⁴⁸

When MDC Resource Forester Jason Jensen assessed damage from an airplane about a week after the storm, he was surprised to see trees lying in one direction on some hillsides but at a 90-degree angle to that on nearby hillsides.⁴⁹

Kabrick and Jensens’s descriptions do not support the idea of a derecho as consisting of straight-line winds. Further confusing matters are the anecdotal reports from foresters saying slopes facing in northerly directions sustained higher levels of timber damage.

These observations have been validated by a landscape-scale GIS analysis conducted by this writer. The analysis examined catastrophic timber damage by aspect (the direction a slope faces) in an eight-township study area, covering 288 square miles. Northern and northeastern aspects received 40 percent of all catastrophic storm damage, even though they represent only 24 percent of the overall landscape. Similarly, the southerly aspects had a good deal less damage than the landscape as a whole. Disproportionate damage to north-facing slopes only occurred along the main derecho path, not in areas hit by tornadoes, the GIS analysis showed.

Thus the air hurtling along the main derecho path could not have been mere straight-line winds. But what exactly happened? The Super Derecho complex developed a strong low-pressure

area well behind the storm's leading edge. It was so low, according to the National Weather Service, that "air had to rush in from behind to equalize the pressure difference."⁵⁰ This created winds stronger than 80 mph and lasting up to 20 or 30 minutes, which increased the storm's forward motion.⁵¹

These conditions contributed to the derecho's most extraordinary characteristic, described as a "mesoscale convective vortex," an unusually strong, long-lived, large-scale circulation. It "resembled the core of a tropical storm, complete with a small 'eye,'" leaving a "nearly continuous damage swath" that the National Weather Service called "unprecedented."⁵²

Weather scientists Mike Coniglio and Morris Weisman explained the timber damage pattern. Even though the system moved from west to east, "the damage was directly associated with that very tight, very intense circulation," said Coniglio. Within the rotating vortex, the strongest, most persistent, and most damaging winds were from northerly directions. They were on the back edge of the vortex, so when it whipped around, these winds delivered the second blow of a one-two punch—hence, the damage to north-facing slopes.⁵³

POST-DERECHO CONSEQUENCES

Tornadoes damage Ozark forests every year. But people who experienced the Super Derecho, like John Kabrick, Peter Becker, and Larry May, know this was no ordinary disaster. The storm is unmatched in regional memory for its degree of forest damage.⁵⁴ It created a timber management nightmare for landowners—big or small, government or private—who all competed for scarce loggers, and who overloaded sawmills with nearly unsellable timber during the height of the worst recession in decades. Local loggers and sawmills found reprieve from that recession in the form of inexpensive salvage timber, but the large influx set off a boom-and-bust economic cycle, leaving uncertain long-term prospects for the forest industry in the hardest-hit areas. New practices adopted to meet the storm's challenges have become institutionalized, changing the way some timber sellers and buyers do business.

Now, almost five years later, Ozark forests are recovering. The forest succession pattern born from the derecho is still in its infancy. Much of the fallen wood has been harvested or has decayed, but a combustible jumble still lies on thousands of acres. Whether this potential fuel sparks further forest damage is yet to be seen, but if ignited by wildfire, it could set off yet another successional stage.

Plot sampling conducted in a southern Illinois forest, both pre- and post-derecho, indicates that the May 2009 winds inflicted the heaviest losses to oaks, which had dominated the forest overstory prior to the storm. Researchers predict that succession will favor species that fared better in the storm, including hickory, sassafras, and sugar maple. This could shift the composition of species in the long term.⁵⁵

A study of the recovering forest understory in a hard-hit Missouri state park found that derecho-affected areas contained more plants, thicker vegetation, and more prairie-type vegetation than nearby undisturbed areas. Birds such as the yellow-breasted chat capitalized on the abundance within this new shrub layer.⁵⁶ Because trees grow slowly in the Ozarks' thin soil and rocky underpinning, it may be decades before the forest's new composition can clearly be determined and even longer before the forest canopy regains its former height and spread. □



Logger Bob May loads timber harvested from Forest Service land near Bunker in August 2013. Most sapwood is degraded and many logs are completely unmarketable.

Denise Henderson Vaughn covered forests and other natural resource issues as reporter for The West Plains Daily Quill in south-central Missouri. More recently, while a graduate student at the University of Missouri at Columbia, she has taught journalism classes and served as a science writer. Vaughn's investigation into the derecho, a graduate project, was supported by funding from Pioneer Forest.

NOTES

1. John Kabrick (Forest Supervisor, U.S. Forest Service Sinkin Experimental Forest), interview with author, June 27, 2012.
2. Peter Becker (Reynolds County, Missouri, landowner and forest researcher, Eastern Ozarks Forestry Council), interview with author, May 27, 2012.
3. Larry May (Bunker, Missouri, logger), interviews with author, July 17, 2013, and August 2, 2013.
4. Stephen Corfidi, Robert Johns, and Jeffrey Evans, "The 'Super Derecho' of May 2009," (2010), accessed May 14, 2013, <http://www.spc.noaa.gov/misc/AbtDerechos/casepages/may82009page.htm>. This website offers a detailed scientific account of the formation and activity of the Super Derecho.
5. Walker S. Ashley and Thomas L. Mote, "Derecho hazards in the United

- States," *American Meteorological Society* (November 2005): 1578. Gustavus Hinrichs, a University of Iowa physics professor, conceived the term *derecho*.
6. *Ibid.*, 1579–80.
 7. *Ibid.*, 1587.
 8. Brian Barjenbruch, "Derecho!!! Winds roar on May 8, 2009," National Weather Service, Springfield, Missouri, last updated June 19, 2009, accessed August 11, 2013, http://www.crh.noaa.gov/sgf/?n=vol14num3_page2; and "Storms cut through Midwest, killing 5," *Associated Press*, May 9, 2009, accessed November 5, 2013, http://www.nytimes.com/2009/05/10/us/10storm.html?_r=1.
 9. "Gov. Nixon expands request for federal assistance to include public infrastructure storm damage in 46 counties," Missouri Governor's Office Press Release, May 28, 2009, accessed November 25, 2013, http://governor.mo.gov/newsroom/2009/Request_for_additional_federal_assistance.
 10. Michael C. Coniglio (Researcher, NOAA National Severe Storms Lab, Norman, Oklahoma), interview with author, July 15, 2013.; and William Bunting (Operations Branch Chief, Storm Prediction Center, Norman, Oklahoma), interview with author, July 15, 2013.
 11. Clark Evans (Professor of Meteorology, University of Wisconsin), email correspondence with author, November 25, 2013.
 12. Corfidi, "The 'Super Derecho' of May 2009"; Morris Weisman (Senior Scientist, National Center for Atmospheric Research, Boulder, Colorado), interview with author, November 26, 2013; and Coniglio, interview.
 13. Missouri Historical Agricultural Weather Database, Round Spring Weather Station, University of Missouri Extension, accessed May 14, 2013, http://agebb.missouri.edu/weather/history/index.asp?station_prefix=rsp.
 14. Jim Low, "Storm damage estimated at \$12 million," Missouri Department of Conservation press release, July 10, 2009.
 15. Becker, email message to author, October 29, 2013.
 16. John Bryan (Silviculturist, U.S. Forest Service, Rolla, Missouri), email message to author, October 29, 2013.
 17. Peter Becker, et al., "Economics of coharvesting smallwood by chainsaw and skidder for crop tree management in Missouri," *Northern Journal of Applied Forestry*, Volume 28, Issue 4 (2011): 214–18.
 18. High-grading is a logging practice that involves harvesting the best trees, usually those with the largest diameter, and leaving the smaller and poor-quality trees on the site.
 19. Becker, interview, May 27, 2012.
 20. George Momper (Shannon County, Missouri, landowner), interview with author, October 28, 2013.
 21. Larry Godsey, "Understanding timber casualty loss," University of Missouri Center for Agroforestry, 2009, accessed October 27, 2013, <http://eofcorg.files.wordpress.com/2012/04/understanding-casualty-loss-of-timber.pdf>.
 22. Nate Goodrich (Missouri State Forester, Natural Resources Conservation Service), email correspondence with author, November 4, 2013; and "Missouri 2009 EQIP policies for storm damage forest rehabilitation," Natural Resources Conservation Service, Washington, DC.
 23. Dennis Johnson (County Executive Director, USDA Farm Service Agency, West Plains, Missouri), interview with author, October 30, 2013; Momper, interview; and "Farm subsidies," Environmental Working Group, accessed October 30, 2013, <http://farm.ewg.org/region.php?fips=00000>.
 24. Lannie May (Bunker, Missouri, logger), interview with author, July 17, 2013; and Bob May (Salem, Missouri, logger), interview with author, August 2, 2013.
 25. Jerry Richards (owner, Mark Twain Forest Products, Centerville, Missouri), interview with author, July 17, 2013.
 26. David B. Lindenmayer, Phillip J. Burton, and Jerry F. Franklin, *Salvage Logging and Its Ecological Consequences* (Washington, DC: Island Press, 2008), 5, 13.
 27. Tom Kruzen (environmental activist, Mountain View, Missouri), interview with author, July 21, 2013.
 28. Rusty Rawson (Chief of Maintenance, Ozark National Scenic Riverways, Van Buren, Missouri), interview with author, October 31, 2013.
 29. Susan Flader, "Missouri's Pioneer in Sustainable Forestry," *Forest History Today* (Spring/Fall 2004): 2–15, accessed October 26, 2013, <http://www.foresthistory.org/Publications/FHHT/FHTSpringFall2004/2004MissouriPioneer.pdf>.
 30. L-A-D Foundation Annual Report, October 2013, 16–22.
 31. Terry Cunningham (Forest Manager, retired, Pioneer Forest, Salem, Missouri), interviews with author, April 11, 2012, June 27, 2012, and November 10, 2013.
 32. *Ibid.*, October 21, 2011, April 11, 2012, and June 27, 2012; and Jason Green (Manager, Pioneer Forest), interview with author, June 27, 2012.
 33. Jim Low, "News and Events," *Missouri Conservationist*, February 2013, accessed October 28, 2013, <http://mdc.mo.gov/conmag/2013/02/news-events>.
 34. "May 2009 derecho salvage report," Missouri Department of Conservation (undated). This report was hand-delivered to the author by State Forester Lisa Allen on June 13, 2012.
 35. "MDC storm-damaged timber salvage report," Missouri Department of Conservation (undated). This report was hand-delivered to the author by Conservation Agent Brad Hadley, Eminence District, on July 2, 2012.
 36. Clint Dalbom (former MDC Forest District Supervisor, Eminence District), interview with author, July 3, 2012; Jason Jensen (former MDC Resource Forester, Clearwater District), interview with author, October 30, 2013; and Lisa Allen (State Forester, Missouri Department of Conservation), interview with author, November 4, 2013.
 37. Bryan, interview with author, July 22, 2013.
 38. David Whittekiend (former Supervisor, Mark Twain National Forest), interview with author, November 4, 2013.
 39. Thom Haines (Salem District Ranger, Mark Twain National Forest), interview with author, July 3, 2012.
 40. Bryan, interview; and Haines, interview.
 41. Whittekiend, interview.
 42. Bryan, interviews, July 22, 2013, and December 11, 2013.
 43. Denver Wisdom, Jr. (Bunker, Missouri, sawmill owner), interview with author, July 22, 2013.
 44. Haines, interview.
 45. James Turner, "Scoping report, Bunker Area Derecho Fuels Project," Salem Ranger District, Mark Twain National Forest, September 2012, 8, accessed November 5, 2013, http://a123.g.akamai.net/7/123/11558/abc123/forestservic.download.akamai.com/11558/www/nepa/90794_FSPLT2_286909.pdf.
 46. Bryan, interview; and Haines, interview.
 47. James Turner, "Environmental assessment: Bunker area derecho fuels," U.S. Department of Agriculture, Forest Service, Mark Twain National Forest, Salem District, September 2013, 14–16, accessed November 5, 2013, http://a123.g.akamai.net/7/123/11558/abc123/forestservic.download.akamai.com/11558/www/nepa/90794_FSPLT3_1452885.pdf.
 48. Kabrick, interview.
 49. Jensen, interview.
 50. "Severe storms move through the Ozarks—May 8, 2009," National Weather Service Weather Forecast Office, Springfield, Missouri, May, 2009, accessed June 1, 2012, http://www.crh.noaa.gov/news/display_cmsstory.php?wfo=sgf&storyid=27308&source=2.
 51. Barjenbruch, "Derecho!!! Winds roar on May 8, 2009."
 52. Corfidi, "The 'Super Derecho' of May 2009."
 53. Coniglio, interview; and Weisman, interview.
 54. Becker, interview, October 29, 2013.
 55. Eric J. Holzmüller, David J. Gibson, and Paul F. Suchecki, "Accelerated succession following an intense windstorm in an oak-dominated forest," *Forest Ecology and Management* 279 (September 1, 2012): 143–144.
 56. Otis G. Allen and Allison J. Vaughn, "Natural disturbance factors and song-bird populations at Johnson's Shut-Ins State Park," Missouri Department of Natural Resources (poster presented at the Missouri Natural Resources Conference, January 30–February 1, 2012, Lake of the Ozarks). Missouri state parks are managed to promote biodiversity and were not subject to salvage logging.



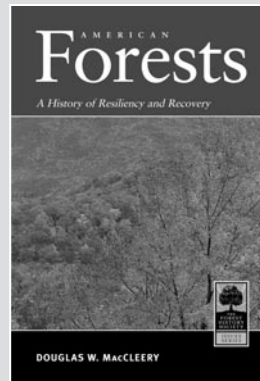
The Issues Series are booklets that bring a historical context to today's most pressing issues in forestry and natural resource management. The series aims to present a balanced rendition of often contentious issues. They are attractive, informative, and easily accessible to the general reader.

\$9.95 each.

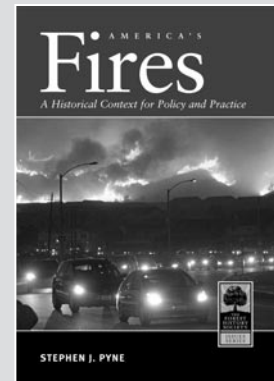
Call 919/682-9319
for discounts on orders
of ten or more.



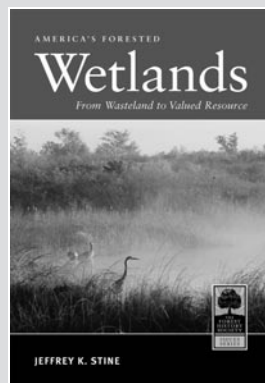
Wood for Bioenergy
by Brooks C. Mendell & Amanda Lang
88 pp; 10 photos; 18 figures



American Forests
by Douglas W. MacCleery
65 pp; 36 photos; 18 figures



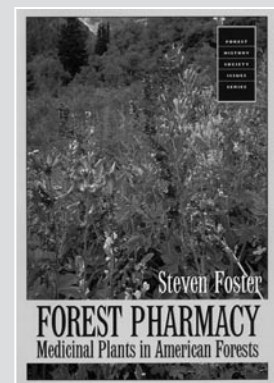
America's Fires
by Stephen J. Pyne
94 pp; 22 photos; 31 figures



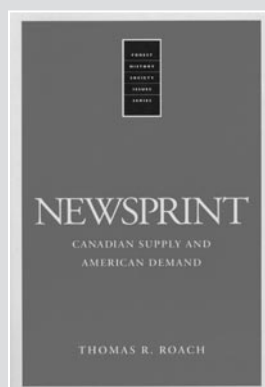
America's Forested Wetlands
by Jeffrey K. Stine
96 pp; 28 photos; 7 figures



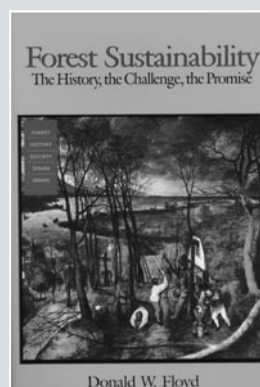
Genetically Modified Forests
by Rowland D. Burton & William J. Libby
79 pp; 36 photos



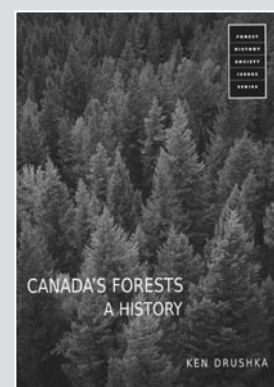
Forest Pharmacy
by Steven Foster
58 pp; 17 photos; 4 tables



Newsprint
by Thomas R. Roach
56 pp; 26 figures



Forest Sustainability
by Donald W. Floyd
80 pp; 21 photos; 11 figures



Canada's Forests
by Ken Drushka
105 pp; 17 photos; 14 figures

For Gulf Coast farmers looking to reclaim cut-over pine lands in the early twentieth century, the introduction of the tung tree as a cash crop was considered a “godsend,” the oil produced from its seeds an economic elixir. The oil’s versatility made it a “priority item” during World War II. But by the end of the century, the domestic tung oil industry was virtually dead. What led to this reversal of fortune?

THE RISE AND FALL

OF THE GULF COAST TUNG OIL INDUSTRY

Native to central and western China, the tung tree (*Aleuritis fordii*) had its American heyday in the mid-twentieth century because of its versatile oil. American tung researcher W. Wilson Kilby described the species as “the most profitable cash crop grown in its climatic area,” the Gulf Coast.¹ Introduced in the early

twentieth century to the United States, it was seen as a “godsend” for a region that had just been stripped of its most commercial tree species, pine. But successfully transplanting the trees and establishing a sustainable industry proved as elusive as the expected profits, and by 1970 the industry had collapsed because of freezes and natural disaster.

For centuries, the oil from tung seeds (“nuts”) has been used in China for waterproofing wood, cloth, and paper.² The first recorded use of tung oil in paints is in Confucius’ Book of Poetry, compiled some 24 centuries ago.³ Tung oil reportedly was mixed in the mortar used to make parts of the Great Wall of China. Eight hundred years ago, Marco Polo noted that Chinese vessels sailing the Indian Ocean used a mixture of lime, chopped hemp, and “a certain wood oil” to caulk their ships.⁴ A journalist traveling in China in 2003 noted that Chinese fishing boat builders still used this combination as a natural sealant for their vessels.⁵

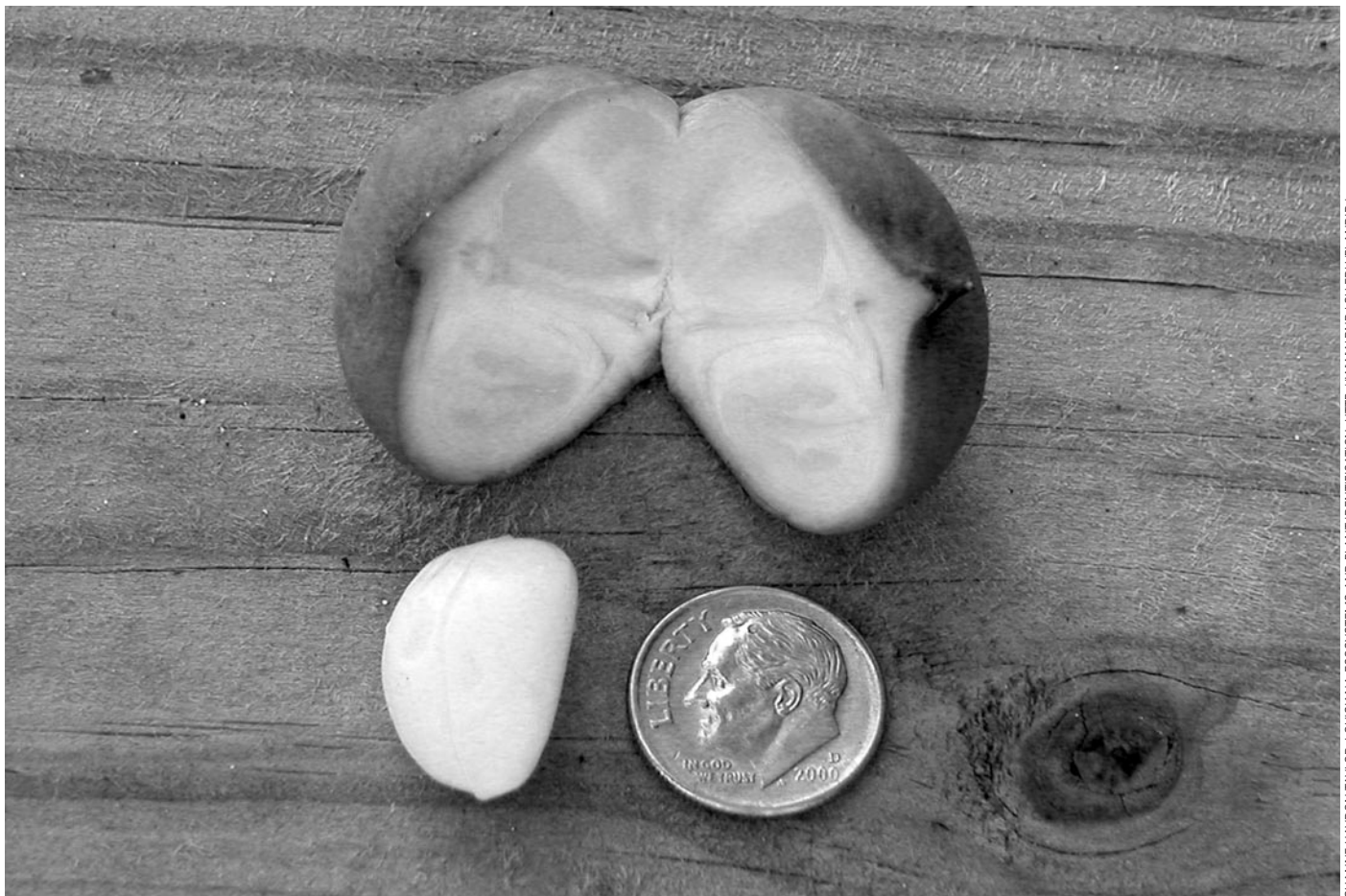
Tung oil has many other uses. In addition to its principal uses as an ingredient in paint and varnish, linoleum and oilcloth, and printing inks,⁶ during World War II, the Chinese used tung oil as a supplement to extend gasoline-fueled vehicles.⁷ More recently,

tung oil has been an important ingredient in the manufacture of hardwood board, automobile brake linings, gaskets, adhesives, composition moldings, caulking compounds, and the insulation of electric wires and equipment.⁸ In 1995 twelve million pounds of tung oil were used in the United States, with 43 percent used as a drying agent for inks, 41 percent in paints and coatings, 14 percent in building materials, and 2 percent for miscellaneous other uses.⁹ Tung oil has long been preferred because it is quick drying and has a hard finish. These characteristics make it superior to other oils such as linseed, soybean, and oiticicia, which must be dried with metal dryers.¹⁰

Tung trees begin to bear fruit in their third year and yield commercial quantities at four to five years of age. Maximum production occurs in the tenth to twelfth years of growth. Trees are expected to be commercially productive for at least twenty years after maximum production begins. But cultivating tung trees is challenging: the crop requires five to fifteen days of freezing weather, acidic soil, and at least 40 inches of rain a year.¹¹

Tung trees are also planted as ornamentals because of their “spectacular spring floral display,” and the toxic properties of the

BY JEFFREY B. ROBB AND PAUL D. TRAVIS



SUANNE HAYDON TAYLOR, LOUISIANA ECOSYSTEMS AND PLANT IDENTIFICATION - HTTP://WWW.RNR.LSU.EDU/PLANDID/

“From little things, big things grow” goes an old saying. Tung seeds, or “nuts,” which are about one-half inch in length, have been the foundation of an important product for centuries.

tree’s foliage, sap, and nuts have led to the issuance of patents for the use of tung tree extracts in controlling termites and boll weevils.¹²

THE DEMISE OF THE PINE BELT

The introduction of the tung tree as a commercial crop coincided with the demise of another one, the longleaf yellow pine (*Pinus palustris*). Before the Civil War, southern Mississippi was covered by a vast forest, part of a longleaf yellow pine belt that stretched from East Texas to the Florida Panhandle. Giant pines, some more than ninety feet tall, with girths at the base measuring three to four feet, loomed above Mississippi soil, interspersed with occasional stands of loblolly and slash pine.¹³ John H. Claiborne, an early Mississippi journalist, author, and historian, described the timber in 1841: “For twenty miles at a stretch you may ride through these ancient woods and see them as they have stood for countless years—untouched by the hand of man and only scratched by the lightning flying tempest.”¹⁴ These forests were eventually touched by the destructive “hand of man,” initially for the naval stores industry and then for timber; they were depleted in Mississippi by the 1930s.

Just as the logging of longleaf yellow pine was reaching its peak, agronomist Eugene B. Ferris established Mississippi’s first agricultural experiment station at McNeill, Pearl River County, in 1902. His duties included assessing the nearby forest, which he described as having “the finest bodies of virgin longleaf pine timber the world has ever seen... The trees [grew] more than one

hundred feet tall, frequently with no limbs for a length of fifty to seventy-five feet.”¹⁵ In the 1980s, Henry “Botz” Whitney, a longtime southern Mississippi logger with vast experience cutting yellow pine, reminisced: “It was beautiful timber. Oh, I’m telling you, it was beautiful. [But] it’ll never be back anymore, mister.”¹⁶

Whitney lamented the loss of the virgin stands, but those who had invested in vast acreages of pine lands and who had led clear-cutting operations in southern Mississippi, including partners Lamont Rowlands and Lucius O. Crosby, had already begun casting about for new ways to make the land productive. The two had purchased the Rosa Lumber Company in 1917, and Crosby, a native of Mississippi, settled in Picayune to run the sawmill operation. They also teamed with Miles Goodyear that same year to form the Goodyear Yellow Pine Company and constructed a second mill a mile away with a capacity of 300,000 feet a day—three times that of the Rosa Lumber mill. Crosby’s son later asserted that his father “had no intention of letting the headlong stripping of the forests of South Mississippi make a ghost town of Picayune” and sought expert help. Crosby and Rowlands reasoned that perhaps tung trees, along with diversified agricultural crops, such as satsuma oranges, could provide the alternative they sought.¹⁷ During the Great Depression, Lucius O. Crosby Sr. employed a workforce in Crosby, Mississippi, where, according to L. O. Robbins, he “built the biggest broom handle plant in the world. We averaged a good million [broom handles] a month for several years”¹⁸ in the 1930s.

By then the planting of citrus groves on barren former pine



Lucius O. Crosby



Lamont Rowlands

After cutting out the commercial-grade longleaf pine in Mississippi, business partners Lucius O. Crosby and Lamont Rowlands decided to diversify the region's agro-industrial base first with satsuma oranges and then tung oil.

Giant longleaf yellow pines, some more than ninety feet tall, with girths at the base measuring three to four feet, rose from Mississippi soil and provided naval stores and timber for logs and pulp until the 1930s, when loggers had depleted the commercial stands.

lands in southern Mississippi and along the Gulf Coast was already underway. According to the *New York Times* in 1915, "The orange is the Satsuma. Already it has redeemed land that everybody thought was going to waste, and multiplied its value; and yet, as it were, its work has only begun." Agricultural experts had fanned out along the coast in Mississippi and Alabama and located a "suitable belt" of land where more than 10 million satsuma orange trees could be cultivated. These groves were planted in a "big area...that was regarded as practically worthless...pine land that had been cut over...bought for \$5 an acre."¹⁹

The satsuma mandarin (*Citrus unshiu Marc.*) variety probably originated in China hundreds of years ago but was first reported

in Japan more than 700 years ago. In the 1870s the U.S. minister to Japan, General Van Valkenberg, sent some of the first seedlings to America. His wife is credited with naming the citrus after Satsuma, Japan, the region from where they are believed to have originated. In the 1880s satsumas were introduced in Texas and Louisiana and within a decade were extensively planted in all southern Louisiana parishes.²⁰ In Alabama, the satsuma crop covered more than 18,000 acres in Baldwin and Mobile counties, and producers shipped 700 train car loads each season to Chicago, Boston, and New York markets. In the Florida panhandle, Panhandle and Jackson counties billed themselves as the "Satsuma Capital of the World," and more than 35,000 people attended festivals in 1928

and 1929. One city in Florida named itself Satsuma.²¹ But occasional freezes wreaked havoc on satsuma groves. Unpredictable weather conditions, along with the “sour orange scab” fungus, eventually reduced satsuma citrus to a crop of minor importance. What had appeared as an agricultural panacea thus proved over the years to be largely an economic pipe dream.²² Once again, local businessmen sought another way to build an industrial base.

THE TUNG INDUSTRY EXPANDS

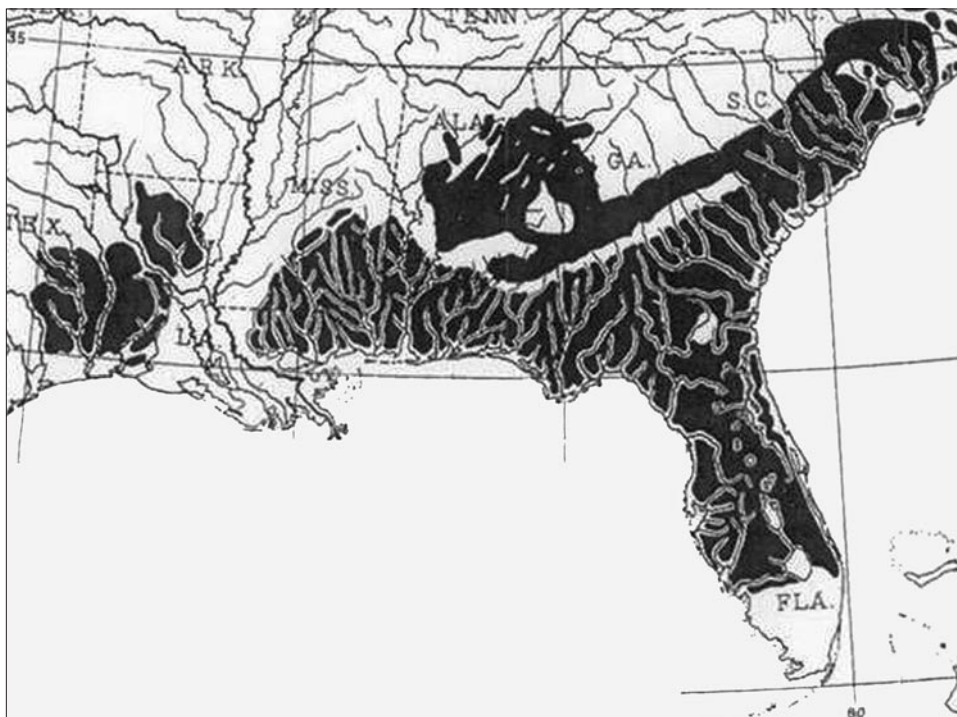
The Portuguese first shipped tung oil to Europe in the thirteenth century, but the first shipment to the United States was not until 1869. Skepticism about the oil’s effectiveness as an ingredient in varnishes delayed its importation in large quantities into the United States from China until the early 1900s.²³ As imports from China increased, efforts to establish tung as an American commodity began, led by government officials. Between 1905 and 1907 David Fairchild, the head of the Department of Agriculture’s Section of Foreign Seed and Plant Introduction, and L. S. Wilcox, general counsel to China, distributed tung trees to growers in the United States.²⁴

In 1912 the Bureau of Plant Industry, in a special bulletin approved by Secretary of Agriculture James Wilson, urged growers to establish tung orchards, and offered them a small number of year-old trees for free. In 1913 the first tung oil was processed in the United States by the Paint Manufacturers Association in New Jersey.²⁵ Because of special growing condition requirements, the Gulf Coast became the home of an emerging tung oil industry by the late 1920s.²⁶ Wilson Kilby described the introduction of tung as a “godsend” for Gulf Coast farmers looking for a replacement cash crop for large acreages of cut-over pine.²⁷

Chinese exports of tung oil to the United States surged in the 1920s as construction in America boomed. Oil was purified in Hankow, barged to Shanghai, and shipped in tankers to Seattle, the biggest port of entry.²⁸ Increasing Chinese exports and a desire to diversify the local economic base spurred efforts to establish tung plantations in Pearl River County between Poplarville and Picayune on cut-over timberland.²⁹ The American Tung Oil (ATO) Association was formed by a group of paint and varnish makers in 1924. Led by Harry Wiggin Bennett, who had seen tung trees in China, its 32 members included Sherwin-Williams, Valspar,

DuPont, Devoe and Reynolds, Pratt and Lambert, and Benjamin Moore.³⁰ ATO planted the first commercial orchards in Florida in the 1920s, and by 1930 some 8,000 acres of orchards were being cultivated in Florida, Louisiana, and Mississippi, with smaller plantings in Alabama, Georgia, and Texas.³¹

Lamont Rowlands planted 9,000 acres of cut-over pine lands in tung in 1925. He flew in his private aircraft throughout the Gulf Coast as “an apostle of tung,” convincing nonbelievers that tung orchards and the oil they produced would be the salvation of the region’s economy.³² Charles Goodyear II of the Great Southern

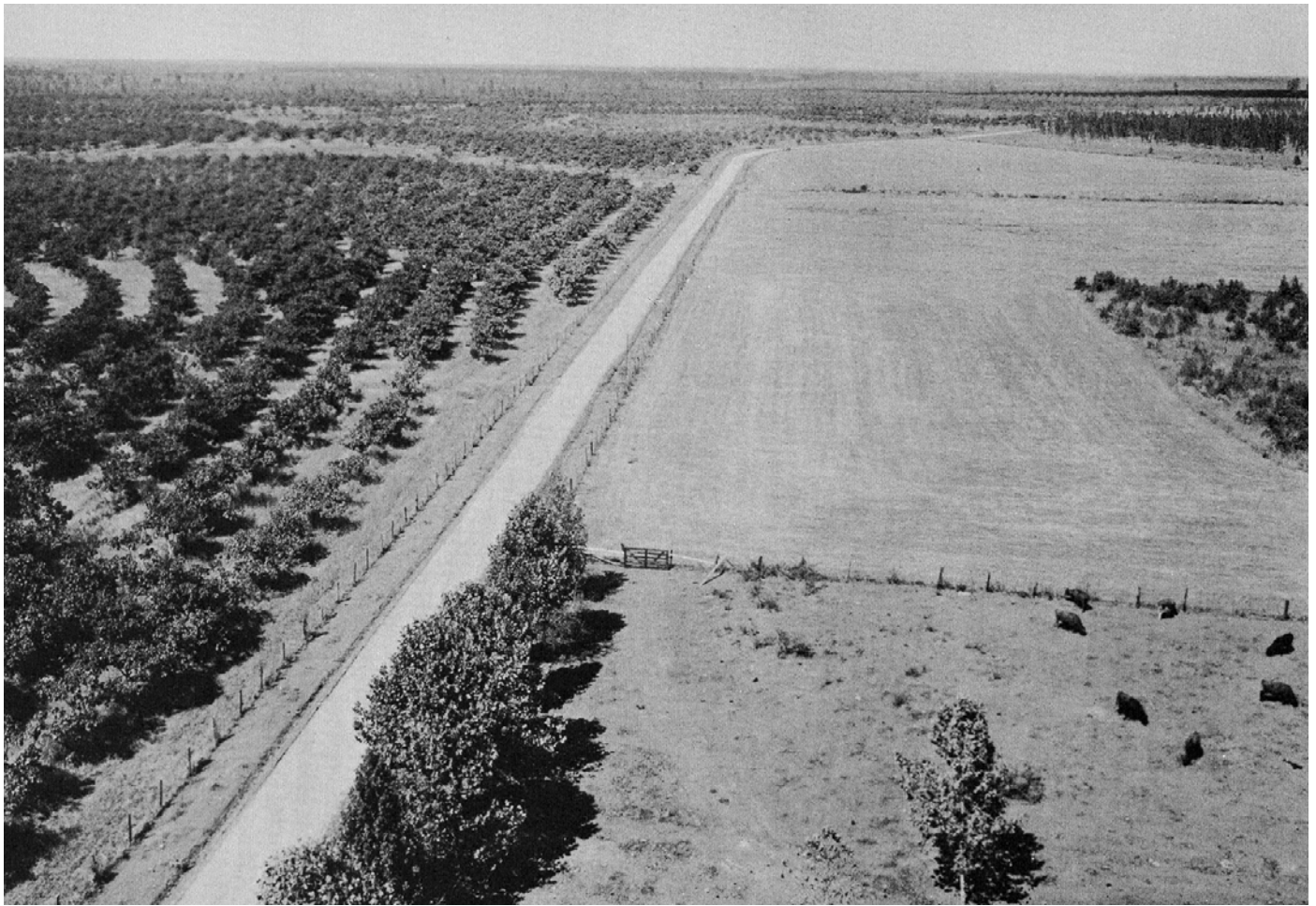


FROM GEOGRAPHICAL REVIEW, VOL. VII (JAN.–JUNE 1919), 82



FROM ECONOMIC GEOGRAPHY, VOL. 16, NO. 3 (JULY 1940), 267

The pine belt (top) stretched from Texas into the Carolinas, but the unique growing conditions of the tung tree limited where it could be planted, shown in the shaded area (bottom).



Charles Goodyear II's Money Hill Plantation had tung orchards "in every direction as far as the eye could see," as well as cattle and longleaf pine plantations. Today, most of the original 12,500 acres are part of a golf course and residential community and the site of longleaf pine reforestation efforts.

Lumber Company hedged his bets during the Great Depression when he established the Money Hill Tung Plantation in St. Tammany Parish. On the 12,500-acre site, he planted tung orchards "in every direction as far as the eye could see" and formed Bogalusa Tung Oil in 1935 to process and sell tung oil.³³ In addition, Goodyear continued reforestation efforts to restore longleaf pine and began cattle operations. In all, more than 500,000 tung trees were planted. Partly in response to the endeavor, the U.S. Department of Agriculture established a Tung Research Bureau in Bogalusa.³⁴ The initial cultivation of tung trees occurred in southern Mississippi in 1925, and about a decade later the merits of raising crops of tung nuts were extolled in the Picayune newspaper.³⁵

International events would increase interest in the U.S. tung oil industry. In 1931 Japan invaded Manchuria, which by year's end was completely controlled by the Japanese. Japan also attacked the major Chinese tung port, Shanghai, in 1932.³⁶ Business observers immediately recognized the threat to American industry if specialty materials such as tung oil could no longer be exported from China.³⁷ In July 1937 Japan expanded the war with China into the central provinces.³⁸

In 1938 the Reconstruction Finance Corporation negotiated a \$25 million loan to the Universal Trading Company of New York, owned by Chinese stockholders. The deal, brokered by Shanghai banker K. P. Chen, allowed Chinese interests to purchase American agricultural and manufactured products, including hun-

dreds of trucks, gasoline, and food, to be paid back largely with Chinese tung oil vital to the U.S. paint and printing industries.³⁹

During these developments more attention was focused on establishing the American tung oil industry. Because a relatively small number of scattered operators in the Gulf South were supplying only one-fifth of American tung oil needs, in 1939 Congress appropriated \$140,000 for the Bureau of Plant Industry and the Bureau of Chemistry to conduct tung research. This effort was designed "to stabilize an infant industry." Four regional research labs were to be built at a cost of \$4 million, and a long-term tung research program was launched.⁴⁰ David Fairchild, who had shipped tung seeds to the United States in the early 1900s, sent a telegram to ATO President J. C. Adderly, congratulating him on the "remarkable growth" of the tung oil industry, but also urging continued investigation into the merits of tung production.⁴¹

Extensive research was begun in 1938 at field labs in Gainesville, Florida; Cairo, Georgia; Fairhope, Alabama (which later moved to Mobile); and Bogalusa, Louisiana (the main U.S. research lab).⁴² Alachua County, Florida, home to Gainesville, claimed 90 percent of U.S. tung oil production in the 1930s. Community pride was such that the city of Gainesville commemorated the first tung oil shipped from there, and a "tung oil parade" was held on the University of Florida campus celebrating that shipment.⁴³

At the fifth annual ATO meeting in 1939, speakers warned potential tung orchard investors that the "new industry is not a



COURTESY OF PATRICIA D. MCCLENDON, [HTTP://FREEPAGES.GENEALOGYROOTSWEB.ANCESTRY.COM/~MCCLENDON/BOGALUSA/BOGALUSA.STORY/](http://FREEPAGES.GENEALOGYROOTSWEB.ANCESTRY.COM/~MCCLENDON/BOGALUSA/BOGALUSA.STORY/)

Charles Goodyear II, who was instrumental in establishing the tung oil industry in Louisiana, stands behind Beatrice Core, the Tung Blossom Queen of Louisiana of 1946, and her court. The women are all daughters of local farmers, a reflection of the importance of agriculture to the region.

game for men and women of limited capital, that it is highly dangerous for amateurs to follow.” They also lamented that the “tung oil boom” had raised the price of poor cut-over pine lands, worth \$7 an acre, to “exorbitant prices” for “city folk” from Chicago, St. Louis, Kansas City, New York, and Cincinnati.⁴⁴

The importance of the tung oil industry to the Gulf Coast economy in the 1930s was captured in a mural painted in 1939 for the Covington, Louisiana, post office. “Tung Oil Industry,” painted by Xavier Gonzalez and funded by the Treasury Department, depicts the use of cut-over timber land for the planting of tung orchards and emphasizes the role of African American workers in the labor-intensive growing and harvesting of the tung nuts.⁴⁵

THE WORLD WAR II ERA

Despite the expansion of the American tung oil industry, in 1938 the United States was still heavily reliant on imports of tung oil from China, which accounted for 99 percent of American tung imports and was worth more than \$20 million. The situation became more critical when frost destroyed about three-quarters of the American tung crop in 1939. Japanese attacks on China exacerbated the crisis: “The cutting off of Shanghai, normally the chief tung-oil outlet, was a blow to the industry; the blockade of the South China coast was a catastrophe.”⁴⁶ By 1940 K. P. Chen’s Chinese-owned Universal Trading Company was ahead of schedule in repaying more than \$2 million of the \$25 million U.S. loan,

largely with shipments of tung oil.⁴⁷ The oil had to be smuggled out of ports such as Foochow, which was recaptured by the Chinese in 1941.⁴⁸ After the Japanese attack on Pearl Harbor in December 1941 brought the United States into the war, business observers noted the obvious probability that consumption of goods made from materials such as tung oil, normally imported from Asia, might be “drastically curtailed.”⁴⁹

By 1942 Chen’s corporation had repaid its loan by exporting to the United States 150 million pounds of tung oil, which was carried down the Burma Road after the eastern China ports were lost. In March 1942, however, Rangoon was captured by the Japanese, leaving the United States “to fend for tung itself.”⁵⁰

In April 1942, *Time* magazine estimated U.S. consumption of tung oil at well over 100 million pounds per year and stated that the oil had no substitutes for its many uses in paints, varnishes, waterproofing, inks, electrical insulation, brakeboards, linoleum, and coating citrus fruit cans. Because of its importance, the oil was deliverable only as a priority item, and essentially all production went to the military. In 1942, 200,000 of the 750,000 acres suitable for tung production in the South were being cultivated.

The entire output of domestic tung oil production went to the Army and Navy for war support, such as the coating of ammunition and the painting of ships, and tung oil processors in the United States, including those at Franklinton, Bogalusa, and Covington in southeastern Louisiana, were called on to expand

production.⁵¹ In China great profits could be realized from smuggling tung oil and other commodities such as tin and tungsten; Chinese and Japanese officers in remote sectors of the country were said to collude to “share fabulous profits.”⁵²

Because of the dearth of tung oil, substitutes such as castor oil were explored. Secretary of Agriculture Claude Wickard announced in his 1942 report to Congress the initiation of a Texas program to plant castor beans in 11 Texas counties. According to Wickard, this was “strictly a defense measure made advisable by the possibility of a lack of shipping to bring in our normal requirements of tung oil from China and castor beans from Brazil and India.”⁵³

Overall, the emerging American tung oil industry initially benefited from government promotion during the war, but it ultimately would be set back by the promotion of substitutes.⁵⁴

POSTWAR TO 1969

In the 1950s, as a result of the U.S. embargo on imports from China, domestic requirements for tung oil were met partially by importing 30 million pounds from South America, mostly from Argentina and to a lesser extent from Paraguay.⁵⁵ Sometimes American policy was contradictory. At one point the United States imposed a stiff import quota on tung oil after funding a program to teach Paraguayans how to grow the crop for the U.S. market.⁵⁶

Foreign imports and a postwar glut of tung oil depressed the market.⁵⁷ Nevertheless, several southern communities remained strongly identified with the tung industry. Picyune, Mississippi, for example, billed itself as the “Tung Capital of the World,” with more than 100,000 acres in the county devoted to tung orchards.⁵⁸ In Bogalusa, Louisiana, in an effort to promote the tung oil industry, Bogalusa Tung Oil sponsored the Tung Blossom Queen of Louisiana contest for a few years following the war. Each spring, a young woman would be recognized in “royal ceremonies, which took place on a raised platform, surrounded by blooming tung trees where once had been a pine forest.” The contest foreshadowed the industry’s fate, lasting only a few years.⁵⁹

In Florida, Jefferson County was the center of production. Homer Formsby began his finishing business in Monticello, Florida, and tung processing mills in the area included the Jumpy Run mill at the southeastern edge of Monticello, Tungston at Capps, General Tung at Lamont, and Len Tung in Tallahassee. Other centers of tung production were around Gainesville and Mariana, Florida; Bogalusa, Louisiana; and Poplarville, Mississippi.⁶⁰ Mills bought up to 400 tons of nuts a day and provided thousands of jobs during the full harvest.⁶¹ It was during this period that tung research also expanded. George F. Potter was given the “Outstanding Research in Tung” award in 1953 by the American Pomological Society, as well as the ATO “Man of the Year” award for 1956. W. Wilson Kilby, in charge of the Experimental Tung Field of the Mississippi Branch Experiment Station beginning in 1946, “devoted nearly an entire lifetime” to tung research and was recognized as the ATO “Man of the Year” in 1965.⁶²

From the early 1950s to 1969, however, domestic tung oil consumption steadily declined, from 72.4 million pounds in 1950–51 to 32 million pounds in 1968–69.⁶³ Factors responsible for the decline included increased competition from synthetic products, lower prices for natural oils generally, and severe freeze damage in four years between 1965 and 1970.⁶⁴ By 1969 only two U.S. Department of Agriculture labs (at Monticello and Poplarville) were still conducting productive research in tung.⁶⁵

HURRICANE CAMILLE AND ITS AFTERMATH

In August 1969 Hurricane Camille slammed into the Gulf Coast. A Category 5 storm—the strongest to directly strike the United States in the twentieth century—its winds were clocked at 200 miles per hour before it destroyed the meteorological instruments tracking its course up the Pearl River in Mississippi. It was responsible for 258 deaths and an estimated \$1.42 billion (in 1969 dollars) in destruction, with \$950 million of the damage occurring in Mississippi and \$350 million in Louisiana. The storm destroyed 35,000 to 40,000 acres of tung trees.⁶⁶ One storm survivor later recalled that Camille leveled every tree in Lumberton, Mississippi.⁶⁷

Camille delivered the coup de grâce to an industry already in crisis from rising labor costs, large government stocks of old crop oil, greatly reduced grower net income from tung, and increasing South American competition. In Jefferson County, Florida, tung producer Fred Laukea said that after Camille, “We tried to truck our nuts to Bogalusa for a year or two, but [it] was a lost cause. Price support of [only] 22 cents per pound left us no margin.”⁶⁸ The era of industrial plantations was over.

In the aftermath of Camille, the federal government paid farmers to clear and burn the ruined tung orchards and plant rye grass for pastures to raise cattle. This remained a primary economic activity in the former tung orchards through the mid-1990s, when other activities, including hobby farms, homebuilding, and strawberry and blueberry farming, became more prevalent. In some areas pines have been planted once again.⁶⁹

Even satsuma oranges have been making a limited comeback. Researchers at the Gulf Coast Research and Extension Center in Fairhope, Alabama, believe that experimental freeze protection systems might create a niche industry for the state’s satsuma growers, who cannot compete with the Florida and Texas growers raising traditional navel oranges and other citrus crops.⁷⁰

With the help of a \$50,000 grant to Auburn University from the U.S. Department of Agriculture, efforts are underway to reestablish the satsuma industry in southern Alabama. Bob Ebel, an assistant professor of horticulture at Auburn, predicted in 2005 that satsumas might be commercially available in supermarkets by 2010, declaring, “If I was a farmer in the southern half of the state, I would seriously consider planting several acres of Satsumas.”⁷¹

THE AMERICAN TUNG OIL INDUSTRY TODAY

In 1970, despite the devastation of Hurricane Camille, W. Wilson Kilby predicted that the tung industry might rise again if additional research could increase production and expand uses for the oil.⁷² In the early 1990s Blake Hanson, the owner of a New York-based company, Industrial Oil Products, purchased the Tung Ridge Ranch in Stone County, Mississippi, and began to process tung nuts at his Christmas Money Mill, near the Stone–Pearl River county line. According to him, remnant tung trees in the area generated 65 tons of nuts for the mill.⁷³ In the mid-1990s tung oil began to be produced in the United States for the first time since 1973. This was due in part to the 1996 Farm Act, which eased restrictions on what crops farmers could plant.⁷⁴ But in 2005, Hurricane Katrina dealt the final blow to the struggling industry. Katrina devastated a large orchard near Lumberton, Mississippi, the source of 15 to 20 percent of the domestic supply of tung oil.

Despite arguments that foreign tung markets were declining and that mechanized harvesting and reduced shipping costs could revive domestic tung production in states like Mississippi, today

tung oil is produced primarily in China, Argentina, and Paraguay, and most U.S. imports come from South America.⁷⁵ Given the “weak agronomic attributes” of the tung tree, with its highly specialized growing requirements and its susceptibility to storms, it seems unlikely that the American industry will return to the glory days of the mid-twentieth century. Today there are only about 5,000 acres of tung trees in the southern United States.⁷⁶ Modern research focuses more on laboratory generation of the key ingredient in tung oil, eleostearic acid, to get the benefits of tung oil without the difficulties of growing the tung tree. The hope is that one day genetically engineered oilseed crops will make this acid a biofuel for vehicles and other machinery and help shift the petroleum-based oil economy to a sustainable, biological one.⁷⁷

The Gulf Coast tung oil industry may be mostly gone, but it should not be forgotten. It helped diversify an agricultural economy based heavily on cotton and revive local communities suffering from the end of the pine logging period. Planting in the cut-over pine lands slowed soil erosion and contributed to a regional paint and varnish industry.⁷⁸ Local events like Picayune’s springtime Tung Blossom 5K Walk and One-Mile Fun Run preserve the memory of a time when the Gulf Coast, especially Pearl River County, Mississippi, was the “Tung Oil Center of the World.”⁷⁹ Synthetic tung oil and other substitutes are available, but Marlyn Holder, a long-time Clinton, Mississippi, handyman and painter, today still yearns for real tung oil in its natural form: “I’m a [house] painter. I found out that I can’t even buy tung oil in gallon containers [any more] but only in quarts and the cost would be great.”⁸⁰ Of the tung tree plantations themselves, Holder echoes the lament of “Botz” Whitney about the loss of stands of longleaf yellow pine: “It’ll never be back anymore, mister.” □

Jeffrey B. Robb earned a master’s degree in library and information sciences from the University of North Texas, and a JD from the University of Texas School of Law. He is a professor of government (legal studies) at Texas Woman’s University, where he teaches courses in environmental history, culture, and law.

Paul D. Travis holds a PhD from the University of Oklahoma. A professor of history at Texas Woman’s University, he teaches nineteenth- and early-twentieth-century U.S. history courses; his research interests include environmental history.

NOTES

1. W. Wilson Kilby, “The American Tung Nut Industry,” *Agricultural Science Review* VIII (Fourth Quarter) 1970: 34.
2. Courtney Carter et al., “Tung Oil: A Revival,” *Review of Agricultural Economics*, Vol. 20, No. 2 (Autumn/Winter 1998): 667.
3. Kilby, “American Tung Nut Industry,” 30.
4. Karen Brown and William Keeler, “The History of Tung Oil,” *Wildland Weeds* (Winter 2005), 6, http://plants.ifas.ufl.edu/misc/pdfs/Tung_Oil_Brown_Keeler-WW-W05.pdf, accessed August 27, 2013; Marco Polo, *The Travels of Marco Polo*, Book Third, Chapter I: “Of the Merchant Ships of Manzi That Sail upon the Indian Seas,” http://www.shsu.edu/~his_ncp/Polo.html, accessed January 7, 2008.
5. Peter Hessler, “Letter from China: Underwater,” *The New Yorker*, June 7, 2003, http://www.newyorker.com/printables/fact/030707fa_fact.
6. George Potter and Harley Crane, *Tung Production*, U.S. Department of Agriculture Farmers’ Bulletin 2031 (Washington: U.S. Government Printing Office, Rev., 1957), 2.
7. “Non-Wood Forest Products from Temperate Broad-Leaved Trees,” Chapter 7, Food and Agriculture Organization of the United Nations,

- <http://www.fao.org/DOCREP/005/Y4367E/y4351eOb.htm>, accessed August 8, 2007.
8. Kilby, “American Tung Nut Industry,” 30.
 9. Carter, “Tung Oil: A Revival,” 668.
 10. Linda Young, “Tung Nuts Could Bring \$20 Million to Stone County,” *Mississippi Business Journal*, December 21, 1992.
 11. “Tung Oil Wanted,” *Time*, April 6, 1942.
 12. K. R. Langdon, “The Tung Oil Tree, *Aleurites fordii*,” *Nematology (Botany Circular)*, No. 45, Nov. 1978, Florida Dept. of Agriculture and Consumer Services, Division of Plant Industry. See also Rachel A. Hutchins, “Tung Tree Extracts Useful for Controlling Termites,” U.S. Patent 6264956, issued July 24, 2001.
 13. Longleaf yellow pine is one of four types of pines that were often referred to as southern yellow pine. The others are loblolly, shortleaf, and slash pines. But it was the virgin forests of longleaf yellow pine that captured the imagination of lumbermen and subsequently offered them a plethora of economic opportunities.
 14. John F. H. Claiborne, “A Trip through the Piney Woods,” in *Publications of the Mississippi Historical Society*, Vol. IX, ed. Franklin L. Riley (Oxford: Mississippi Historical Society, 1906), 523.
 15. Eugene B. Ferris Papers, “Notes on Southern Mississippi,” Department of Archives and History, Jackson, Mississippi.
 16. Henry “Botz” Whitney, interview by Paul D. Travis, Nicholson, Mississippi, summer 1980.
 17. L. O. Crosby, Jr., *Crosby: A Story of Men and Trees* (New York: Newcomen Society in North America, 1960), 14–15, 19. Goodyear Yellow Pine Company later became the Crosby Forest Products Company, the name change reflecting in part the push into nontimber products like tung oil.
 18. L. O. Robbins, interview by Paul D. Travis, summer 1980.
 19. “Turn from Cotton to Orange Growing: Alabama Planters Find Fruit from Japan Thrives on Old Forest Tract,” *New York Times*, April 18, 1915, accessed October 31, 2013, <http://proxy.lib.duke.edu/login?url=http://search.proquest.com/advanced?url=http://search.proquest.com/docview/97703083?accountid=10598>.
 20. W. T. Block, “Early River Boats of Southwest Louisiana,” <http://www.wtblockjr/wtblockjr/sailboats.htm>, accessed January 9, 2008; Simon Citrus Farm L.L.C., “History of Louisiana Satsuma Oranges,” <http://www.satsumafarm.com/history.htm>, accessed January 9, 2008.
 21. Katie Smith, “As a Cash Crop,” *Southeast Farm Press*, January 17, 2001, <http://southeastfarmpress.com/cash-crop>, accessed January 9, 2008; Chuck Woods, “Florida Panhandle Farming, Growing Satsuma Oranges as Alternative Crop,” *Southeast Farm Press*, April 6, 2005, <http://southeastfarmpress.com/florida-panhandle-farmer-growing-satsuma-oranges-alternative-crop>, accessed January 9, 2008; City of Satsuma, Alabama, “About Satsuma,” <http://www.cityofsatsuma.com/AboutSatsuma.html>, accessed January 9, 2008.
 22. For a brief history of expectations for satsuma orange cultivation, see “Turn from Cotton to Orange Growing: Alabama Planters Find Fruit from Japan Thrives on Old Forest Tract,” *New York Times* (April 18, 1915); in addition, see University of Florida, Institute of Food and Agricultural Sciences, <http://edis.ifas.ufl.edu/CH116>.
 23. Kilby, “American Tung Nut Industry,” 30.
 24. Potter and Crane, *Tung Production*; “Plant Hunter,” *Time*, October 17, 1938, <http://www.time.com/time/magazine/article/0,9171,848340,00.html>. Fairchild was responsible for the introduction to the United States of more than 20,000 plants with potential economic importance, such as avocados, mangoes, bamboos, and the flowering cherries that bloom in Washington, DC. The Everglades National Park and the Fairchild Tropical Botanic Garden in Miami are among his legacies. “Everglades Biographies: David Grandison Fairchild,” Everglades Digital Library, <http://everglades.fiu.edu/reclaim/bios/fairchild.htm>.
 25. M. Ogden Phillips, “Tung Oil: Florida’s Infant Industry,” *Economic Geography*, Vol. 5, No. 4 (Oct. 1929), 351.
 26. Kilby, “American Tung Nut Industry,” 30.
 27. *Ibid.*, 34.
 28. “Florida’s Tung,” *Time*, June 6, 1932, <http://www.time.com/time/print-out/0,8816,789328,00.html>.
 29. Eddie M. Bigelow and Susan D. Chamberlain, “Pearl River County, Mississippi Hazard Mitigation and Flood Protection Program,” FENA, Mississippi Environmental Management Agency, accessed August 9, 2007.

30. "Florida's Tung."
31. Kilby, "American Tung Nut Industry," 30–31.
32. See Napier, *Lower Pearl River Piney Woods*, 145.
33. Charles W. Goodyear, II, *Bogalusa Story* (Buffalo, New York: Wm. J. Keller, Inc., 1950), 193.
34. *Ibid.*, 187–89.
35. Kilby, "American Tung Nut Industry," 29.
36. Jonathan D. Spence, *The Search for Modern China* (New York: W. W. Norton & Co., 1990), 391–92.
37. "War Talk," *Time*, February 8, 1932, <http://www.time.com/time/magazine/article/0,9171,74312,00.html>.
38. Spence, *Search for Modern China*, 391–92.
39. "\$25 Million Credits Allowed China by U.S.," *Dallas Morning News*, December 16, 1938.
40. "Tung Oil Study by State, U.S. Experts Asked," *Dallas Morning News*, March 29, 1939.
41. *Ibid.*
42. Kilby, "American Tung Nut Industry," 31.
43. "Tung Oil Parade," Alachua County Library District Heritage Collection, 2002, <http://heritage.acld.lib.fl.us/1101-1150/1134.html>, accessed January 15, 2008.
44. "Tung Oil Study."
45. "New Deal/WPA Art in Louisiana," <http://www.wpamurals.com/louisian.html>; Smithsonian American Art Museum, "Tung Oil Industry," Study for Covington, Louisiana Post Office Mural, 1939, Xavier Gonzalez: http://ids.si.edu/ids/dynamic?container.fullpage&id=http://americanart.si.edu/images/1962/1962.8.30_1a.jpg, accessed August 6, 2013. See also <http://www.mynorleans.com/New-Orleans-Magazine/October-2009/THE-FEDS-quo-BRUSH-WITH-ART/>, accessed August 6, 2013.
46. Joy Hume, "War Hitting American Tung-Oil Interests," *Far Eastern Survey*, Vol. 8, No. 12 (June 12, 1939): 142–43.
47. "Everyday Life," *Time*, March 18, 1940. Chen, educated at the University of Pennsylvania, was described as "work[ing] 24 hours a day at the unglamorous business of cementing U.S.-Chinese trade relations," and as "consider[ing] Chinese repayment of U.S. loans his personal responsibility."
48. "Foochow Recaptured," *Time*, September 15, 1941, <http://www.time.com/time/printout/0,8816,766045,00.html>.
49. "War Needs May Trim Trade Mart," *Dallas Morning News*, December 21, 1941.
50. "Tung Oil Wanted," *Time*, April 6, 1942.
51. "Impetus of War," *Dallas Morning News*, January 19, 1942; Otis A. Rosborough, Jr., "Compass Lake and Tung Oil," Jackson County, Florida, July 29, 2000, <http://www.rootsweb.com/~fljackso/CompassTung.html>, accessed January 9, 2008.
52. "Objective: Limited," *Time*, December 20, 1943, <http://www.time.com/time/printout/0,8816,932633,00.html>.
53. L. T. Easley, "Texas Farmers to Help Bridge Gap in Vital Raw Materials," *Dallas Morning News*, February 21, 1942.
54. Kilby, "American Tung Nut Industry," 30.
55. Potter and Crane, *Tung Production*, 2.
56. "Trade with the Communists," *Time*, June 1, 1953, <http://www.time.com/time/magazine/printout/0,8816,859940,00.html>.
57. "The Heavy Overhang," *Time*, November 7, 1955, <http://www.time.com/time/printout/0,8816,807913,00.html>.
58. "History of Picayune," Picayune Chamber of Commerce, http://www.picayunechamber.org/history_picayune.html.
59. Goodyear, *Bogalusa Story*, 194. The paper industry still sponsors a Paper Queen pageant.
60. "Tung," in "Welcome to Jefferson County, Florida: History," Jefferson County Board of County Commissioners, Jefferson County Planning Dept., and Jefferson County Extension Service, July 10, 2007, <http://www.co.jefferson.fl.us/history>.
61. Young, "Tung Nuts Could Bring \$20 Million to Stone County."
62. Kilby, "American Tung Nut Industry," 29.
63. Jimmy L. Matthews and Abner W. Womack, "An Economic Appraisal of the U.S. Tung Oil Economy," *Southern Journal of Agricultural Economics*, December 1970, 161.
64. *Ibid.*
65. W. Wilson Kilby, "History and Literature of the Domestic Tung Industry," *Mississippi State University Technical Bulletin* 56 (August 1969), 2.
66. "Hurricane Camille: August 5–22, 1969," U.S. Dept. of Commerce, ESSA's Climatological Data, National Summary, Vol. 20, No. 8, 1969, <http://members.tripod.com~littlerosie/camille.html>; Roger A. Pielke Jr. et al., "Hurricane Camille Project Report—Thirty Years after Hurricane Camille: Lessons Learned, Lessons Lost," July 12, 1999, http://sciencepolicy.colorado.edu/about_us/mmet_us/rogerpielke/camille/report.html; Napier, *Piney Woods*, 191.
67. Marilyn Holder, interview by Marilyn D. Holder Murphy Travis, summer 2007.
68. "Tung," in "Welcome to Jefferson County: History"; Holder, interview.
69. "Historic Tour of Henleyfield," Henleyfield Community, Inc., <http://henleyfield.com/tour.htm>; George McNeill, "Wal-Mart Deal Opens Markets for Blueberry Growers," *Mississippi Business Journal*, July 2004. Blueberries were described as "one of the fastest growing crops" and the town of Collins as a "major center for packing and distribution of blueberries." *Ibid.*; L. O. Robbins, interview by Paul D. Travis, summer 1980. Belton Watts, interview by Paul D. Travis, summer 1980, stated that L. O. Crosby put some former mill hands to work picking strawberries; Watts's wife was in charge of instructing workers to properly pack the berries in crates. See also interviews conducted by Paul D. Travis in Napier, *Lower Pearl River's Pineywoods*, 155, 132, and 147.
70. "Mighty A-Peeling! Satsuma Oranges Making a Comeback for Growers and Consumers," Alabama Agricultural Experiment Station News Release—2000, www.ag.auburn.edu/aaes/webpress/2000/satsumas.htm.
71. "Senator Sessions Announces \$50,000 Grant for Satsuma Orange Research at Auburn University," Press Release, U.S. Senator Jeff Sessions (R-Alabama), September 19, 2001; Darryal Ray, "Satsumas by the Ton: Citrus Experiment Still Bearing Fruit," *Neighbors—Alabama Farmers Federation*, December 30, 2005.
72. Kilby, "American Tung Nut Industry," 35.
73. Young, "Tung Nuts Could Bring \$20 Million to Stone County."
74. Lawrence Glaser, "Industrial Uses of Agricultural Materials Situation and Outlook Report," Outlook Report No. (IUS-6), October 1996, <http://www.ers.usda.gov/Publications/IUS6/>.
75. Carter, "Tung Oil: A Revival," 670.
76. "Tung Twister: Powerful Enzymes from Tung Trees Could Turn Plants into Oil-Producing Marvels," U.S. Department of Agriculture, *Agricultural Research Magazine*, August 2007, <http://www.ars.usda.gov/is/AR/archive/au,07/tung0807.htm?pf=1>; "Tung Nuts May Help Engineer Petro Plants," August 2, 2007, U.S. Department of Agriculture, <http://www.statpubl.com/open/268711.phtml>, accessed January 9, 2008.
77. Jay M. Shockey, Preetinder K. Dhanoa, Tammy Dupuy, Dorselyn C. Chapital, Robert T. Mullen, and John M. Dyer, "Cloning, Functional Analysis, and Subcellular Localization of Two Isoforms of NADH: Cytochrome *b₅* Reductase from Developing Seeds of Tung," *Plant Science* 169 (2005): 375–85; "Tung Nuts May Help Engineer Petro Plants," supra note 73. See also Robert Farago, "China Builds Tung Oil Biodiesel Plants," July 15, 2008, <http://www.thetruthaboutcars.com/2008/07/china-builds-tung-tree-oil-biodiesel-plants/>, accessed August 18, 2013; and Paul Rauber, "Solving the Climate Puzzle: One Piece at a Time," <http://www.sierra-club.org/sierra/200911/climate.aspx>, accessed August 18, 2013.
78. "Non-Wood Forest Products from Temperate Broad-Leaved Trees," Food and Agricultural Organization of the United Nations, supra note 7.
79. "Tung Blossom 5K Walk and One Mile Fun Run," Picayune Main Street, Inc., <http://www.picayunemainstreet.com/5k.htm>.
80. Marilyn Holder, interview.

*In need of foresters to manage its timberlands, forest conservation leaders in the province of Quebec decided the best solution was a homegrown one: establish a school of forestry in Quebec City to train its own citizens to manage its forests. The school began with “two seeds thrown to the wind,” which took root and transformed the landscape. The article is adapted from the book *L’enseignement et la recherche en foresterie à l’Université Laval: De 1910 à nos jours* (Teaching and Research in Forestry at Laval University from 1910 to the Present).*

FORESTRY EDUCATION IN QUEBEC

THE FIRST 50 YEARS

The establishment of a school of forestry at Laval University in Quebec in June 1910 was the result of an unexpectedly long process—35 years after the adoption of three pieces of forest protection legislation: in 1868 a law established the minimum diameter for harvested trees; in 1870 a law regulated

fire use in or near forests; and three years later a corps of forest wardens was established. Yet more needed to be done to protect Quebec’s working forests, which were publicly controlled but licensed to companies for logging. In 1882, a North American forestry congress held in Montreal spurred two projects dear to forest activists and preservationists: the creation of forest reserves and the adoption of incentive measures for reforestation. This same congress inspired the creation of Arbor Day in Quebec in 1882, an idea borrowed from the United States, which had been promoting the idea of forest management on public lands for several years. Tree planting and forest reserves were seen as essential elements by most congress participants. Others, however, were more critical. Partisans and promoters of the emerging science of forestry did not consider the adopted meas-

ures a sufficient response to the predicted timber famine.

Developments in Canada mirrored those in the United States in other ways. In the middle of the nineteenth century, forests were still abundant in both countries, although signs of potential shortages in some regions fueled the concerns of an eventual general depletion. By the end of the nineteenth century, some parts of each country had to import wood from other regions. Canadian stakeholders, too, wanted guidelines for logging companies to prevent abusive logging that would surely lead to the deterioration of the forest resource. They followed the Americans’ lead by also setting aside lands for protection, introducing innovative forestry practices, and establishing forestry schools. From 1904 and 1908, Quebec began undertaking forest policy reform by creating forest reserves encompassing a total of nearly 430,000

BY CYRILLE GÉLINAS

square kilometers (about 106,000 acres). The Quebec Forestry Service, staffed by professionally trained foresters, was created during this time, too.

TWO SEEDS THROWN TO THE WIND

The forestry movement in Quebec, as in the United States, was originally led by amateurs. Motivated by good intentions, movement leaders were relatively well educated, though mostly in arboriculture and botany; they tended to see trees where they should have considered whole systems. Scientific forest management, introduced to this fertile ground, would correct this reductive approach.

In America, foresters Bernhard Eduard Fernow, Gifford Pinchot, Carl Alwin Schenck, and Henry Solon Graves introduced concepts taught by European foresters. Their knowledge went beyond topics of fire detection and suppression, diameter-limit harvesting, passive conservation through forest reserves, or expensive regeneration based on plantations. Their style of forest management would yield positive financial returns: "Conservation was simply good business," Gifford Pinchot often said.¹ They aimed to restore the commercial value of forests degraded by clearcutting. Their ideas filtered north to Canada, where they found receptive ears.

One listener was Joseph-Clovis-Kemner Laflamme, the rector of Laval University, a minister by training who was devoted to science. He had studied at Harvard University, had taught physics and geology at Laval, and was a member of several learned societies. Moreover, he was very interested in protecting Quebec's forests, had been active in the recently formed Canadian Forestry Association, and had a strong appreciation of the university-level training required of European foresters.

Some 120 miles away, in Montreal, was another receptive set of ears. They belonged to Gustave Clodimir Piché, a young man who had been thinking about the future of forests while he worked in a pulp and paper mill. There he had closely observed the consequences of industrial forestry practices. Piché had read some of Laflamme's articles on conservation, one of which argued that by organizing forest harvesting on a scientific basis, it would be possible to obtain greater yields from the forest rather than from a forest left unmanaged. Training young people to practice forestry soon became Piché's mission. In his member of parliament and in the premier of Quebec he found an amenable audience. Laflamme and others had already persuaded a sympathetic Premier Lomin Gouin, who wished to place professional foresters in charge of Quebec's forests as a way to deal with the corruption that had plagued their administration, to sponsor two students to study abroad.² Shortly afterward, Piché and a fellow student, Avila Bédard, were sent to Yale's school of forestry to learn how to profitably manage Quebec's forests. The future of Quebec's forests now depended upon these two seeds thrown to the wind, in the hope that they would fall on fertile ground.

Though of opposite yet quite complementary personalities, they would form an efficient duo who would long reign over Quebec's forest world, Piché for 32 years and Bédard for 55. Piché was an ambitious, energetic jack-of-all-trades who generated projects at a fast pace. After only a few months at Yale, he was already bombarding the Quebec premier with scientific recommendations for how to restore the province's forests. On his own initiative, he began several plantations and experiments on the acclimatization of exotic tree species. He regularly sent the premier suggestions about books and journals to purchase for the legislative

assembly's library. Between classes, he corresponded with numerous French, American, and Canadian foresters to expand his network of contacts and information. Shortly after graduation in 1905, he wrote a compendium of useful knowledge on topics like the perfect nursery and seed collection for his former employer, the Belgo-Canadian Pulp and Paper Company.

Toward the end of his studies, he made a series of visits to gather ideas that could be adopted in Quebec. His travels took him to the offices of the U.S. Forest Service and the forest products laboratory of Hermann von Schrenk in St. Louis, Missouri. Before coming back home and filling the positions awaiting them, Piché and Bédard spent a year touring Europe's forests. Piché returned with an extensive file of reforms to bring to the management of lands and forests.

In 1908 Piché emerged as a self-confident forester, perhaps a bit arrogant and power hungry for someone not yet 30 years old, loaded with responsibilities. With Bédard, he reorganized the province's Forest Service, promising rapidly improved revenues. Fully aware of the expectations of his benefactors, he knew that failure was not an option. Piché confessed to his wife 25 years later that he had lost sleep over this thought for three months.³

The senior employees of the Forest Service, who were now subordinates to the young newcomers, challenged their views and practices. The new foresters' work and ideas met a lot of criticism. This did not stop Gustave Piché. By the end of 1907, barely six months after returning from abroad, he had compiled a list of the province's indigenous trees and shrubs by both common and scientific name.⁴ Such initiatives contributed to his renown while bolstering the standing and reputation of a profession not yet firmly established in Quebec.

Piché continually reminded the premier of the urgent need to create a forestry school. During the autumn of 1908, as he was planning an inspection program for the next logging season, he suggested to his superior that he bring along some young people who had expressed interest in a forest engineering career, in order to expose them to the work of the forestry service. This idea was well received, in part because it involved no additional expenses. Having spent time in the forest himself, Piché was fully aware of the difficult life in this crude environment; he was hoping to discourage misconceptions about how easy the profession could be. In the fall of 1908, eight students traveled with him or Bédard throughout Quebec's forests. However, that was not sufficient to create a school.

Following his probation year, Gustave Piché wrote a memo in which he bluntly listed what was wrong with the forest administration. To stop the decline of this publicly held resource, he said, concepts of silviculture and scientific management based on solid forest inventories were necessary for forest operations. These changes, he argued, would take place only if the province invested in the creation of a forestry school. To force his superiors to act quickly, he raised the threat of competition. He informed the premier that timber companies were beginning to hire forest engineers to manage their concessions. These graduates were coming from Ontario, New Brunswick, the United States, and Europe, and one of them had already conducted the first forest inventory in Quebec. In addition to competing for the future graduates from Quebec, the situation would leave the agents of the Ministry of Lands and Forests at a disadvantage with private industrial interests seeking to influence policy in the province. As landlord of close to 90 percent of the province's forests, the



THE QUEBEC FOREST HISTORY SOCIETY: GUSTAVE CLODOMIR PICHÉ'S PRIVATE FAMILY COLLECTION

Two seeds in the wind: Gustave Piché and Avila Bédard, photographed while studying at the Yale Forestry School in 1906.

government had to be a leader on the subject, the logging companies being mere tenants on these lands.⁵

On June 4, 1910, the government adopted the law creating the school of forestry at Laval University. A month later, Laflamme, who had also worked tirelessly for several years to establish the school, died at age 60. The school opened its doors two months later. Bédard and Piché constituted the entire faculty.

THE EARLY YEARS OF THE SCHOOL OF FORESTRY

The forestry school appeared as a surprise in the overcrowded university. The frugal management of space and finances that prevailed in the institution was probably even tighter for the foresters, who had not been invited by the university but were ordered there by government. The agreement between the Ministry of Lands and Forests and the university stipulated that the latter would provide space and make its library, laboratories, and museum available to the students. The government would provide funding for the professors, books, and specialized forestry materials and cover the costs of forest outings, but in fact barely provided the funds needed for the training of its personnel—a situation that did not sit well with university officials.

This barely tolerable condition was inappropriate for a school hoping to compete with similar institutions on the continent. The rector increased his pressure on the government and was granted a few thousand dollars more. In return, the government expected that the school graduates collectively bring more than \$100,000 annually to the public treasury through their competence and vigilance on the job.⁶ The training of forest engineers was not simply for the pleasure of instructing them—it had to pay off.

The first two years of the school's operation were rough and awkward. In September 1910, when the school officially opened, its first students were employees of the Forestry Service and were

required to leave the forest, where they had been working, for one or two years. Although now considered students, most of them already occupied important positions in the Forestry Service. Their functions covered a range of tasks from inspectors to district chiefs, but they lacked full qualifications for the positions.

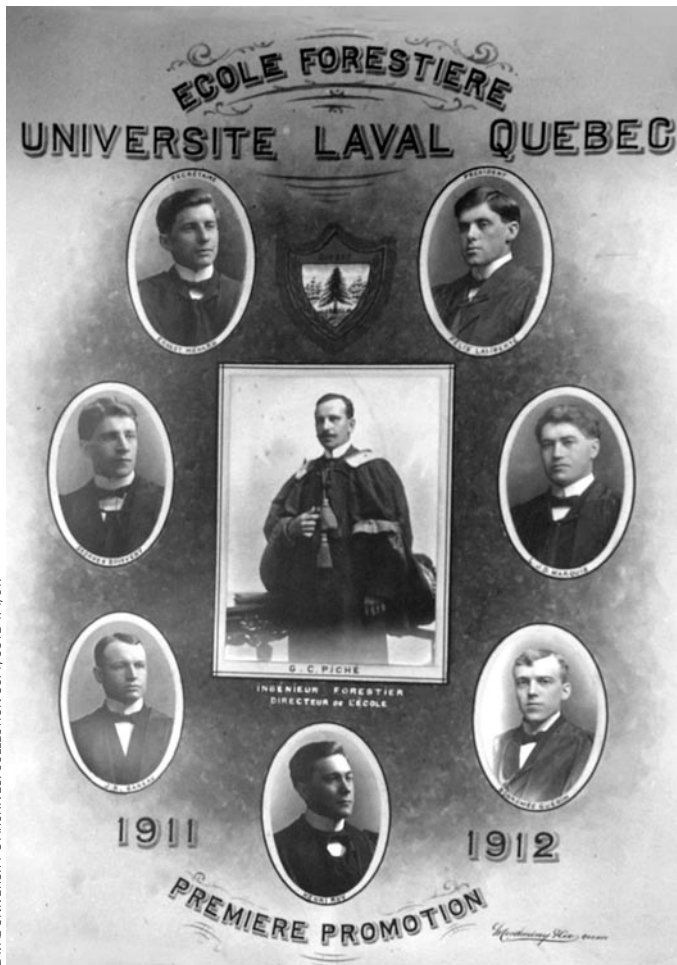
The next class found things to be easier than the previous. However, the ministry, which was the funding agency, did not hesitate to prematurely tap this labor reserve, once again without discharging them from their academic obligations. The arrival of the first graduates in 1912, all hired by the Forestry Service, satisfied the needs of the state, leaving the students in the following years with a more normal course of studies.

From 1911 on, first-year students were in the classroom during September and October. In November they would leave the school and spread out across the province's logging territory, paired with an experienced forest warden in order to learn about the various tasks they would be expected to perform after graduation.

They would return to Quebec City in April for a short period in the classroom, and then leave again for their seedling production training at the Berthierville tree nursery, another project of Piché's. Piché and Bédard, the only two forestry professors, would take them to the forested part of the nursery to teach them dendrology, tree measurement techniques, and silviculture. To complete the year, students would spend the summer months doing forest inventory.

The second year started with practical work in the forest. November would see them back in classes taking a variety of mathematics and science courses, ranging from chemistry to geology, intermingled with forestry courses.

The last year would be devoted to deepening their understanding of forestry matters. Was it sufficient? Yes, without a doubt for the main employer—the government—given the nature of the



The first graduates of the Laval University's School of Forestry. Founding director Piché is in the center.

tasks they were expected to perform after graduating. They fared well in the field and they were able to hold their own in their dealings with the forest companies, although loggers thought they should receive more training in the practical aspects of forest operations, particularly engineering. Improvement in resources and criticism from the industry led to gradual adjustments to the training programs. In the beginning of the twentieth century, the profession was new and was responding to the needs of industry and a rapidly evolving government administration.

The array of responsibilities for the first generation of forest engineers was a heavy burden for inexperienced young men. Fresh out of school, they were entrusted with the management of forest districts, exploration and inventory of remote territories, and resolving administrative and silvicultural problems as they went. They were put in charge of forest wardens, canoeists, *portageurs*, loggers, aboriginal guides—all well adapted to the life in the forest, who took pleasure in testing their young bosses. In the shanties, they had to earn the respect of the local workers who were full of prejudices toward these students, and considered city dwellers to be clumsy, inexperienced, and unadjusted to life in the woods. They were the victims of ridicule and countless jokes; they were openly laughed at, their knowledge deemed useless.

THE MERGER

Because of limited funds, the board of the Forest School arranged with the School of Land Surveying for courses common to both

curricula. From 1916 onward, the two schools functioned together. The provincial government was increasingly conscious of its limited knowledge of the forest inventory under its jurisdiction. When selling timber concessions, which were awarded on an annual basis, government employees could not accurately inform potential buyers about the timber stands. A buyer had to conduct its own inventory or trust the limited information provided by the Ministry of Land and Forests, which was often based solely on surveyors' estimates, and thus risk purchasing a poorly forested lot. The school was still graduating too few forest engineers to handle the workload.

The answer to the problem stood right in front of those seeking a solution. Why not make better use of the surveyors who were sent to explore, delineate, and map the province? These men were accustomed to recording the characteristics of the forest stands they examined. The minister of Lands and Forests decided that these surveyors could learn at least the fundamentals of the forest sciences so that they could identify forest species and provide estimates of forest stands' wood volume.

The school directors developed a three-year curriculum, with some common courses for the two professions. At the end of the second year, the school granted a diploma of surveyor. An additional year was required for students wishing to obtain a forest engineer diploma. This dual qualification would increase the chances for forestry graduates to find employment.

The recruitment of students at the School of Forestry started smoothly. At the opening of the first class in 1910, 12 students enrolled. As the program led to strong employment opportunities, it became more popular. Within two years, 40 students were in attendance. The war and the decline of interest from industry, however, slowed recruitment and registration. In September 1915, the total attendance was down to 21 students, half the 1912 number. During the war, enrollment leveled off and the number of students spread across the three program years varied between 15 and 18. At the end of the war the forestry school did not regain its former popularity. Between 1917 and 1928 it granted only one or two diplomas per year, three in exceptional years, and none in 1926.

A SCHOOL IN DIFFICULTY

Combining surveying and forest engineering was expected to bring new life to the forestry school. The end of the war was expected to be favorable as well. The forestry graduates would finally find the anticipated jobs in an industry undergoing strong expansion. The reality was dramatically different and disappointing. At a time when the state intervened very little in the economy, except through limited incentives, the government reluctantly began forcing industry to hire these professionals. In 1926, it threatened the paper industry by introducing legislation to withhold 90 percent of the provincial timber concessions, to force the timber industry to contribute financially to a school that was of particular benefit to their future. The politicians did not in fact enforce this law; they appeared satisfied with giving notice via this so-called education tax on pulpwood. The 1929 economic crisis postponed any recourse to coercive financial measures.⁷

At the same time the school directors launched a review to determine what was wrong. They decided to make their graduates more attractive to employers, who, according to their analyses, were hiring a few graduates, demonstrating at least a budding interest in professional foresters. The school board presented a

brief to the minister of Land and Forests, identifying the most obvious gaps. The annual budgets were not sufficient to provide for integrating new fields into the program. As a result, the authors of the report asked how graduates could compete successfully with the technicians coming from better-funded schools. The government could not unduly delay setting up laboratories to study wood properties, soils, and forest flora. The teaching of entomology and pathology had to be enriched. The report judged that the time spent in the forest was insufficient. The school could not continue to advertise that it was providing quality training unless it had tenured faculty members, and more of them. The museum could be enriched with more plant collections, and the library was seriously lacking. If the minister agreed to correct these problems, he would ensure “the place it deserves and make it better than all similar schools in Canada.”⁸ The financial crash of 1929 momentarily postponed their hopes, however, and gave the politicians justification to maintain the status quo.

The improvement in the economy during the subsequent years did nothing to change the industry’s mindset. Laval professors and government officials remained irritated by the knowledge that companies doing business in Quebec and in America were making contributions to universities in America but not supporting the forestry school at Laval. On November 30, 1940, a newly elected government implemented the education tax. The measure angered manufacturers, but with business thriving during the war, protests were of short duration. The tax turned the tide. In 1924, 23 French Canadian forest engineers from Laval were employed in the forest industry, compared with 27 English-speaking ones from non-Quebec-based universities.⁹ Seventeen years later, 65 came from Laval and 142 from non-Quebec universities.¹⁰

THE REFORM PERIOD

In December 1941, the minister of Lands and Forests added \$20,000 to the annual grant given to the School of Forestry. There would be no looking back. Each year, the government increased its contribution. It was a period of spectacular developments made possible by an economy boosted by the war and the revenues from the education tax. The growing budget triggered the long-awaited transformations. Starting in 1940, the ministry allocated \$10,000 annually for students deemed qualified to register for graduate studies at American or European universities. The minister wanted this investment to help his department obtain the properly trained personnel needed to establish a forest research center and strengthen the faculty of the school he was supporting financially.

The increase in registrations starting in 1937 and more consistent financial support helped the school to attain the status of a faculty. On November 14, 1945, the school became the Faculty of Surveying and Forest Engineering and moved into a new building built expressly for it.

The additional funding permitted the compressed three-year program to spread over four years. All students took the same courses for the first three years, after which those choosing surveying graduated immediately. An additional year was necessary for those choosing forest engineering.

In 1935, registration was on the rise. The school had a total of 35 students, 44 in 1936, and then 58 in 1937. This time the momentum was real and sustained. However, where forest engineering was concerned, it was not until 1936 that the graduation rate improved beyond a trickle. In 1937 and 1938, respectively, 10 and 12 students graduated in forest engineering. Between 1945 and



LAVAL UNIVERSITY'S ARCHIVES: CD PH—0742/01

Avila Bédard served as a professor from 1910–1954, director of the school of forestry and surveying (1918–1945), and first dean of the Laval University Faculty of Surveying and Forest Engineering (1945–1954). The photograph was taken circa 1924.

1954, the faculty presented annually between 14 and 20 diplomas in this specialty.¹¹

For practical training, the faculty had access to permanent facilities in the Duchesnay Forest Experimental Station, together with government scientists. The library and museum were enriched through purchases and donations. Of particular note, Yale University donated 2,000 forestry volumes in the mid-1940s thanks to Henry Graves, former dean of its forestry school.

The renewed and improved program inspired some to pursue graduate studies in American universities. This became a good test of the quality of their education at Laval. The dean of the Laval forestry faculty was comforted by what he read in the report from American colleagues on recent students who had undertaken graduate studies abroad. “If, in the future, you have other men as good as these two,” wrote C.-L. Metcalf, dean at the University of Illinois, “we shall certainly be pleased to welcome them to do graduate work in the department.”¹²

From Duke University came another confirmation: “Matte made what we consider to be an exceptional record. I doubt if anyone has made a correspondingly good record since our school has been established... We sincerely hope that Mr. Matte can be back with us again this coming year for he is the type of man that we like to have as students.”¹³

Samuel Trask Dana from the University of Michigan, David H. Linder from Harvard, S. A. Wilde from the University of



Wood-technology training was part of the curriculum. Pictured are students in a class on veneer and plywood production under the direct supervision of Professor Marie-Albert Bourget, circa 1950.

Wisconsin, and others provided similar comments. When critics attacked the school, Avila Bédard, who had succeeded Piché in 1918 as director, quoted these flattering testimonies.

STUDENT ENROLLMENT GROWS

After World War II, the positive outlook for forest products resulted in improved job opportunities. The rebuilding of devastated countries caused the demand for wood to soar. Growing wealth in North America raised internal consumption accordingly. Governments and industry became significant employers of forest engineers.

The 1960s marked the end of an era and the disappearance of certain ways of doing things. Technocrats landed in ministries and eliminated the remnants of former administrations. So was it for the Ministry of Lands and Forests. The number of services and personnel substantially increased and Crown land management evolved toward a focus on the public good. The federal government increased its presence in forest research in Quebec, enabling several graduates to find employment in that field. The faculty benefited from these flush times, and the number of professors increased. All in all, the sun was shining in the world of foresters.

In 1960, the undergraduate and graduate programs welcomed 266 students. It was a marked improvement from the 60 or so attending 10 years before. In 1965, students hoping to graduate

with a diploma in either geodesy or forest engineering numbered 358, including 49 pursuing studies at the master's or doctoral levels.¹⁴ That latter number was double the enrollment in 1961.¹⁵

THE PROGRAMS OF STUDIES

Better off financially, the faculty increased its course offerings and the number of professors on staff. The changes in the program during the 1950s were just at the beginning of a period of rapid change. Some subjects took on more importance and new ones entered in the program: wood technology, photogrammetry, multiple-use management, economics, and logging. Ecology found its way in most of the biology-related courses. Gradually, on a trial-and-error basis, the faculty council introduced specialization in the last year of studies. This question was central to all universities: should they stay the course and provide for a general training or boldly move ahead of industries and train "ready-made" specialists? The debate raged for years before being resolved.

Imperceptibly, land surveying moved away from forest engineering. The two groups still shared common courses. However, at the beginning of the third year, students had to select one of the two professions; the dual diploma lost its *raison d'être*.

The master's program began in 1946 and grew rapidly. By the mid-1960s, doctoral studies were being offered. Foreign universities

remained attractive, however, although expensive. Still, the faculty was able to train specialists on site and, in effect, regenerate itself. To meet this demand, the size of the faculty expanded from 43 in 1955 to 77 ten years later.

RESEARCH

In the 1930s, the state established a research organization within the Forestry Service. Its introduction in the forestry school was more timid, waiting until the end of the 1940s and for the return of the graduates with doctoral degrees from American universities. The establishment of the graduate program in 1946 was an important step forward.

In 1954, the Canadian International Paper company donated \$100,000 to help fund research by faculty. The funding was channeled through a newly created organization, the Laval University Forestry Research Fund. In the beginning, this organization funded six projects covering a broad spectrum, from forest fire behavior to vegetative reproduction of commercial species, including also birch mycorrhizae and forest management of private woodlots.¹⁶ At the time, fundamental research was favored. This preference was questioned during the next decade by the funding organizations, which were looking for more immediate returns from the research. The acquisition of woodlands by a group of professors in the mid-1950s for research and educational purposes, followed a few years after by a government grant for a real and large experimental forest, helped facilitate the move toward applied research.

During these exciting and decisive years, the professors began to publish results of their investigations in journals and other scientific publications outside the province, and their articles were well received. What happened in publications was also happening at scientific conferences. During the 1930s, two lecturers, one in pathology and the other in entomology, participated regularly in their specialized American scientific associations. They made well-received contributions to the research community. Twenty years later, it was no longer unusual for Laval professors to make presentations at scientific conferences in various fields of forestry. By the 1960s a faculty member would occasionally cross the ocean to participate in a European forestry meeting. They felt at ease in their dealings with colleagues from other countries. Their work was at an equal footing with that of others and they were confident in submitting it for peer review.

The two seeds thrown to the wind a half-century before had indeed found fertile ground and took firm root. In 1965, the school name was changed to the Faculty of Forestry and Geodesy. Today the Faculty of Forestry and Geomatics at Laval University is the only school of its kind in Quebec, and is the largest one in all of Canada. □

Cyrille Gélinas is a freelance historian in Quebec. The author would like to thank Jean-Claude Mercier and Marie Coyea for providing translation to this article, originally written in French.

NOTES

1. Michael Williams, *Americans and Their Forests: A Historical Geography* (Cambridge, Cambridge Univ. Press, 1989), 420.
2. R. Peter Tillis and Thomas R. Roach, *Lost Initiatives: Canada's Forest Industries, Forest Policy, and Forest Conservation* (Westport, CT: Greenwood Press, 1986), 118.
3. Gustave Piché to his wife, September 4 1932, SHFQ archive fund.
4. Gustave Piché to the minister of Land and Forests, December 30, 1907, BANQ, MTF, E21, S10, General Correspondence, 1846–1954, 1960-01-039/3. Also in: RMTE, DS, vol. 1, no. 3, 1908, appendix 28.
5. In Quebec, the provincial government owns most forestland. According to a system established in 1826, the land was subdivided in blocks of variable sizes. Known as forest concessions, these tracts were granted through auction to forest companies and subject to an annual rent and cutting rights imposed on each log extracted from felled trees. The lease was renewed each year, provided the users had met the conditions of the concession. This system remained in place, with very minor modifications, until 1986.
6. ABNQ (Archives of the National Library of Quebec), MTF (Ministry of Land and Forests), December 30, 1913, E21, series Forest Harvesting Service, S74; subseries 1, Permits and Cutting rights, 1853–1982, 1991-11-001/9, Forestry School.
7. Teaching at the Faculty of Forestry and Geodesy, December 1, 1950, AUL (Archives of Laval University), U502/6/1, 7.
8. Memoir to the Prime Minister Taschereau to raise by \$15,000 the annual grant to the School of Surveying and Forest Engineering, ASQ, Seminary 9-236-58, SHFQ.
9. J.-É. Guay to G. Piché, October 20, 1934, ABNQ, MTF, E21, series Forest Concessions, subseries Forest Service; SSS Files in alphabetic order, 1960-01-038/1279, dossiers can à cir 1919–1937, Forest Service Chief 1934–35, Director of the Research Bureau.
10. J. D. Brûlé to Ferdinand Vandry, May 18, 1951, Teaching at the FFG, U502/6/1, 7.
11. General Directories of Laval University.
12. C.-L. Metcalf to Henri Roy, May 14, 1941, AUL, U571/15-16.
13. C. F. Korstian to Fernand Boutin, June 29, 1943, AUL, U571/15-16.
14. Annual report, Faculty of Surveying and Forest engineering, 1964–65, AUL, U571/17/1.
15. *Ibid.*, 1960–1961.
16. A. M. Parent to Vernon E. Johnson, December 20, 1954, U502/23/4, BA 114.11.

This year marks the 80th anniversary of the establishment of the Civilian Conservation Corps (CCC). It is also the 20th anniversary of AmeriCorps National Civilian Community Corps (NCCC), which is modeled on the CCC.

Unlike the CCC, the NCCC's integrated teams are open to all regardless of race, sex, or income. During their 10-month NCCC term, the 1,200 young adults who serve nationwide each year work in teams of eight to twelve people. Their projects address critical needs related to natural and other disasters, infrastructure improvement, environmental stewardship and conservation, energy conservation, and urban and rural development. To mark these two anniversaries, Forest History Today has asked a recent NCCC member to reflect on her experiences.

FROM THE MOUNTAINS TO THE PRAIRIES

REFLECTIONS ON MY 21 MONTHS WITH AMERICORPS

Two years, 21 months, 5 states, 8 nonprofit organizations. Over 3,000 hours. There is no doubt that the statistics surrounding my two years of service with AmeriCorps National Civilian Community Corps (NCCC) are impressive, even if you have no idea what NCCC does. However, the true impact

of my service goes beyond how many places I went and how many hours I worked. It extends to things such as miles of trail constructed, structures built or renovated, community members assisted with tax returns, acres of land restored, and miles of fencing replaced. What I spent the past 21 months of my life doing reaches past the NCCC taglines of "Getting Things Done for America" and "Serving Communities, Developing Leaders." It reads more like: pronghorn fence modification, forest fire erosion restoration, invasive species removal, and interventions with hospitalized children.

Needless to say, AmeriCorps NCCC puts young people in the position to make a real and tangible difference across this country, from the most crowded schools to the most remote valleys.

When you are placed with NCCC, you don't get to choose your campus. Placement is based on when you will begin your service. As an applicant for the fall term I had two possible fates: Denver or Sacramento. Now, nothing against our West Coast friends but I was really hoping for Denver. Something about the mountains, the snow, and the promise of 300+ days of sunshine really called to me. After spending four years in Vermont for college, Colorado just seemed like a bigger version of a place I loved so much. Bigger mountains, better snow, less rain, more people. So I'm sure you can imagine how happy I was when, after six months of waiting, I was finally placed at the Southwest Region Campus for NCCC.¹

BY CHRISTINE E. AMORESANO



PHOTOS COURTESY OF THE AUTHOR

The author, taking a break from hiking in Paria Canyon, Utah, during her Corps Member (first) year. The team was going in to do second and third treatments of tamarisk removal using a cut-and-spray method with water-safe herbicides and to inspect the effectiveness of previous treatments.

The move out West was a huge transition for me, but one that I accepted with open arms. There are fewer people here per square mile than where I come from in New Jersey. Everyone tends to be friendlier (not that we Jersey residents are mean). The sun shines bright, the sky is bluer (that’s a fact), and the view is gorgeous. Despite my initial issues with the thinness of the air (being a mile high and all), I love how fresh and clean it is. People here are active and engaged in their communities and the environment so, naturally, I followed suit. I spent my first few months hiking, walking, lying in the sunshine, and learning what Colorado was all about, and now I’m here to stay (at least while I finish my master’s degree at the University of Denver).

Serving out of the Denver campus, my projects were more often than not environmental in nature. Of my eight “spikes,” as we call them, five involved working directly on the land in the mountains, desert, and plains of the southwestern United States. NCCC requires a

What I spent the past 21 months of my life doing reaches past the NCCC taglines of “Getting Things Done for America” and “Serving Communities, Developing Leaders.”

It reads more like: pronghorn fence modification, forest fire erosion restoration, invasive species removal, and interventions with hospitalized children.

certain degree of service learning related to each project. Why are we here, who are we helping, what’s the point? I can say with confidence that I am more educated than the average 24-year-old woman on erosion, fire, dams, land usage, and invasive plants.

Requirements aside, my education is in large part due to the enthusiasm and knowledge of the individuals I worked with and learned from. I have learned that there is a huge community of passionate advocates for public lands and their protection. My eyes have been opened to the existence of organizations such as the U.S. Forest Service, Bureau of Land Management, national and state park services, and the U.S. Fish and Wildlife Service, and the relationships among them. I am also familiar with individuals and community organizations working hard to make a difference, from Topeka to the House Rock Valley of northern Arizona.

I have witnessed the struggles and triumphs that come with working on and advocating for the land. How can you cut out a riverside invasive



The pay may be low but some things are priceless, like this view from atop Spencer Trail in Lee's Ferry, Arizona, overlooking the Colorado River and the beginning of Grand Canyon National Park.

species that travels by water if you are only permitted to treat it on one portion of that river? Isn't it amazing how much natural willow has returned to the riverbank? Why remove honeysuckle when it looks so nice? How great to see how much natural light is restored to this part of the forest now! Replacing perfectly good fence in the hot sun is exhausting. Check out that group of pronghorn antelope! The daily "angel on one shoulder, devil on the other" effect of land conservation was not lost on me, even as a lowly volunteer.

However, it is the victories we must take with us as we continue to serve the land. The homeowner who can sleep easier now, knowing that her home is protected from erosion flooding. The mom who can tuck her children in and not worry about forest fires due to surrounding thick vegetation. The youth who can mountain bike after school instead of participating in gang behavior. These are all the result of caring and excited land stewards putting in their time.

Stewardship is perhaps the greatest victory of all. In July 2013 AmeriCorps NCCC Southwest Region graduated 237 members, many of whom I can say with certainty have worked on public lands and will go on to become stewards of these lands through action and word. This is the direct result of 132 sponsoring

The author at her very first outdoor project, an independent service project planting trees at a dog park in Denver.





Not every job was in a scenic location. Here the author takes a breather in an old tub while cleaning out a storage shed at the Mt. Morrison CCC camp in Morrison, Colorado.

organizations putting time and energy into hosting and educating teams about their work. It is the difference that the Grand Canyon Trust makes when they invite a team to view California condors being reintroduced in Arizona. It's the extra effort Volunteers for Outdoor Colorado (VOC) makes when they take time to feed and thank their volunteers, urging them to come back and work with VOC again. It's the opportunity to mountain bike on their newly constructed trail that the City of Casa Grande Parks and Recreation Department gives its volunteers. These organizations are inviting young volunteers to work, learn, and in the case of NCCC, live as part of a community of people who care about their lands.

In my opinion, aside from on-the-ground conservation efforts, creating young stewards who care about public lands is the most important work any of these agencies can be doing. Educating young, open-minded citizens who are still developing themselves and their interests can do wonders for stewardship in our country. Hosting youth volunteer groups can show young people that conservation is more than policy meetings and planting trees. Youth stewardship training is a reliable source of future park rangers, land advocates, and wildland firefighters. I'm not saying every organization needs an AmeriCorps NCCC team to better fulfill its mission (though you should really think about it), but I am saying that my experience with NCCC and the nonprofits I have served has turned me into a young steward of the land, even if that only means reminding my friends to leave no trace when we go hiking. □

AmeriCorps NCCC is administered by the Corporation for National and Community Service. The corporation improves lives, strengthens communities, and fosters civic engagement through service and volunteering. For more information about AmeriCorps NCCC, visit the website, at <http://www.americorps.gov/nccc>.

Christine Amoresano is a 24-year-old graduate student pursuing a master's degree in social work at the University of Denver. She hopes to continue to volunteer on the land and encourages others to do the same.

NOTES

1. The Southwest Region campus in Denver is one of five regional hubs in the United States and serves eight states in the southwest part of the country. The other campuses are located in Perry Point, Maryland; Vinton, Iowa; Vicksburg, Mississippi; and Sacramento, California.

This excerpt from the forthcoming book Hemlock: A Forest Giant on the Edge, by David Foster, director of Harvard Forest, explores the work of Robert Marshall, the famed forester and cofounder of the Wilderness Society, during his time in graduate school at the Harvard Forest. Marshall's ecological understanding of hemlock drew heavily upon forest history.

LESSONS FROM HARVARD FORESTS AND ECOLOGISTS

BOB MARSHALL'S PLOT

The letter was dated April 21, 1924. The recipient—a young man of means and extraordinary ability—was about to graduate from forestry school at Syracuse University. The writer—the director of Harvard's graduate forestry program—lay before his prospective student a remarkable opportunity.

"My dear Marshall," the letter began:

Al Cline gave me your article about the Adirondack Forest Preserve, and I have read it with entire sympathy and agreement. There is no argument about the proposition that to furnish the highest kinds of enjoyment a forest should be left strictly alone. With so little real primeval forest now left, sparing the remnants that still exist in the Adirondacks does not seem too much to ask.

Your argument gave me a thought about a project, which I have long had in mind, and which might interest you for your investigative work next autumn at Petersham [Massachusetts]. Not far from there is at least one considerable tract of virgin forest

which is gradually being cut in small areas. How would you like to make a detailed study of the origin and maintenance of the virgin forest, with special reference to what might be called the chronological order in which the several species and elements of the stand came in? This sort of study I think will be very useful as a background for the forest management of the future, and unless we make it soon the opportunity will be gone...

Very truly yours,

Richard T. Fisher¹

BY DAVID R. FOSTER



COURTESY OF THE HARVARD FOREST

Bob Marshall (center) with Harvard Forest researchers at the Adams Fay lot experiment in 1924. Faculty included Rupe Gast (second from left), Al Cline (with machete), and Richard Fisher (far right).

When Bob Marshall rejected Richard Fisher's offer to study the ancient old-growth white pine and hemlock forest on Pisgah Mountain in New Hampshire, the Harvard Forest director must have been dumbfounded. But, however surprising the decision was, given Marshall's already clear passion for wildland forests, the choice was consistent with the young man's life plan. Ironically, the alternative path that he followed as a graduate student—working on a timber harvesting study—led to a research approach that others would later apply successfully at Pisgah. Marshall's work also did as much as any study to reinforce Fisher's belief in the value of forest history to ecology and scientific forestry.

Marshall's answer shocked Fisher because the professor had every reason to expect that his new graduate student from Syracuse University would be enthralled to spend his days amidst the ancient trees in the rugged New Hampshire landscape. Through their prior meetings and correspondence leading up to his acceptance in the graduate program at Harvard, Marshall had shared with Fisher many thoughts on forestry, conservation, and the value of forest reserves. In his essay on the Adirondack Reserve for a course in silviculture, Marshall had stated that the "finest formal parks, the most magnificent artificially grown and cleaned woods, can not compare with the grandeur of the primeval woodland. In these days of over civilization it is not mere sentimentalism which makes the virgin forest such a genuine delight." The paper had earned the eager and innovative student an A, along with a

measure of scorn from some in the more timber production-oriented sector of the forestry school.

Moreover, Fisher knew a bit about Marshall's extraordinary background as the son of one of the leading civil rights attorneys in America, a prominent man in New York's Jewish community, who fought to protect the poor, the immigrant, and the defenseless in venues ranging from the local courthouse to the U.S. Supreme Court. Among the defenseless and voiceless clients championed by Louis Marshall was nature. Through the years while visiting his spectacular Adirondack camp, Louis had witnessed the devastation driven by greed and wrought by ax and fire to the lakeshores and mountain slopes of upstate New York. Impassioned by these insults to the environment, armed with knowledge derived as a founder, major funder, and board chair of the New York State College of Forestry at Syracuse University, and equipped with an orator's skill and expansive legal mind, he had championed the defense of one of the most important conservation documents in America—Article Seven of the New York Constitution. This legal document included the "forever wild" clause that made the Adirondack State Park the first designated wilderness in the country and protected its land from further logging. Fisher certainly knew that Bob Marshall had wild forest running in his veins.

Fisher also had keen reasons for disappointment. Marshall showed the potential for greatness, graduating near the top of his class with a degree in forestry from Syracuse in 1924 and supported



Bob Marshall (right) and fellow students with their field vehicle at the Adams Fay lot in 1924.

by rave recommendations from his professors and dean. Fisher was keen to get real scientific research initiated at Pisgah, and this new candidate promised to bring considerable woods skills along with proven writing and computational abilities. Since the successful campaign to purchase and protect the ancient forest, Fisher had conspired with John Phillips, a national leader in forest and wildlife conservation, to establish a small endowment to pay the annual taxes on the tract and support a scholarship for research into the history, dynamics, and ecology of the old-growth forest. Though the fund was growing, its income remained inadequate to cover the desired field studies. But Marshall had means; he was the sole member of the incoming class at the Harvard Forest who took no salary and required no scholarship. He could freely attach to any project and might jump-start the old-growth effort. And, he had one last trait that augured success in the rugged and remote New Hampshire mountains. Bob had a passion for hiking and a knack for navigation. With brother George and guide Herb Clark, he was well on his way to becoming the first of the “46ers”—individuals who had reached the summit of each of the forty-six Adirondack peaks exceeding 4,000 feet. Marshall’s fanaticism for distance hiking was already well established and his life list of twenty-, thirty-, and forty-mile treks was lengthy and growing. Bob would not need any hand-holding in the confusing topography around Pisgah Mountain. The match between the man and the Harvard Forest’s newest project seemed perfect.

A WELL-DEFINED LIFE PLAN

Yet, unbeknownst to Fisher, by age nineteen Bob Marshall had already developed a remarkably well-defined life plan and one that did not allow for wilderness studies at Harvard. His scheme had emerged in general terms on trips to the family’s Adirondack camp and had been first articulated in the starkly simple prose of a high school writing assignment. Over the years the plan was honed through endless letters and discussions with his father and became elaborated into a well-defined course of action. As he had written in that high school essay, more than anything else Marshall wanted to be a forester. As passionate as he was about wilderness, he had precocious insight; he recognized that society had a more pressing immediate need, one made clear from the vistas he gained atop nearly every Adirondack mountain peak. The United States needed to learn to manage its forests better and more sustainably in order to generate a renewable supply of a precious commodity and to protect the associated resources of water, wildlife, and human well-being. Marshall also understood keenly that society would be willing and able to carve large wilderness areas out for protection only if the bulk of the country’s forestland was productive and well managed. Finally, he was his father’s son, deeply earnest in his pursuits, beholding to an ethic of work, responsibility, and caring for the neglected, and already emerging as an insightful, strategic, and politically minded thinker. He recognized that his greatest hope of working the system for good and of advancing the cause of wilderness and all that was abused by society would come from a powerful platform within that system. He was not about to veer off headstrong into a wilderness campaign. And, he was not going to fritter away his hours alone in the woods simply figuring out how nature operated. Bob Marshall never delved into casual pursuits. When he hiked at his blistering pace, he always chased a destination, a distance goal, and a personal milestone. He was no sauntering Thoreau who mused over plants, scenery, or natural history.

No, Marshall’s decision to attend graduate school was shrewdly calculated to advance his life goals; his thesis project would fit that grand scheme and position him for a job in the world’s pre-eminent forestry institution—the U.S. Forest Service. It would focus on forestry and advance his expertise in silviculture and systems of tree harvesting, areas in which his background was thin and Fisher’s expertise was already legendary. It would also base him in Petersham, where he could benefit from association with other students, faculty, and the frequent visitors from other universities, state agencies, the Forest Service, and Europe who appeared on the doorstep of the Harvard Forest headquarters and shared their stories and camaraderie in the small Forest community. There the stream of conversations would advance his knowledge and broaden the web of contacts that he could draw upon for the rest of his life. Through this path, Marshall sought to build on the foundation he had established at home in Manhattan, at Syracuse, and in the Adirondacks to reach a prominent rank in national forestry. Once there he could achieve the multiple goals that inspired his daily and lifelong efforts: promote good forestry and resource use, advance the cause of wilderness, make a difference to society and nature, and live up to his father’s expectations. To reach that elevated platform, he needed skills, credentials, and connections.

Louis Marshall’s reputation and the family’s place in society ensured strategic and powerful connections; adding Harvard to this arsenal was a significant step, and the younger Marshall clearly

planned to utilize his year in Petersham and Cambridge effectively. The four years of classes at Syracuse, summers at the university's Cranberry Lake Ranger School, and a top score on the civil service exam guaranteed him a posting with the U.S. Forest Service that might be improved through strategic graduate work. A detour through Harvard would produce more options and connections and ultimately lead to a more rapid trajectory through the agency. As he wrote to his father in one of their near daily exchanges, "It is generally considered that advanced training will lead to greater opportunities and a faster pace through the forest agency. Harvard is the best place in the country to get that training along Silvicultural and Management Lines...and Fisher...is generally recognized as the foremost silviculturalist in the United States."

Once there, Bob just needed to capitalize fully on the assets represented by the university, Richard Fisher, and the Harvard Forest. With a solid forestry project, perhaps crowned by a publication, he could get on with his life's ambition. In recent months he had mulled over these topics endlessly with friends, Syracuse faculty, and even the dean. But, from the correspondence that they had maintained since the death of Bob's mother, it was clear that for both father and son, the project at Harvard was much more than a single study. Great as Pisgah and the old-growth topic may have been, the project was not the goal. Rather, it was the means and one more deliberate building block toward future success.

All of this is not to say that the year at the Harvard Forest was spent in single-minded and somber pursuits or that the young forester did not develop a passionate love for the place, the people, and his experience. Quite the contrary. As he put it in a letter home to his father, "[Y]ou will note that everyone except the Director is a Syracuse man. Six of us live together in a very large old farmhouse which also contains the office. We have more room than we know what to do with. For once I think there will be plenty of room even for my junk. I have a tremendous writing table 6 x 3, a typewriting table, dresser, closet and limitless floor space all to myself. We cook our own meals which are therefore uniformly excellent, far better than the regular restaurant hash."

In Petersham, Marshall bunked and enjoyed countless exploits with his closest college chum, Neil Hosley. He forged lifelong friendships with faculty members Al Cline and Rupe Gast and fellow students. He also emerged as both the prankster wit of Community House and the grand chronicler of all of their exploits and accomplishments, all the while ratcheting his career forward and maintaining a daily stream of letters home. The experience also left an enduring appreciation for the "sagacious wisdom" and kindness of R. T. Fisher. From his extracurricular writings and the impish grin adorning his mug in nearly every photo, Marshall thrived in the close community of foresters in Petersham. This mixture of companionship and humor emerged in many realms, including the acknowledgments in his thesis.

I am also much obliged to Messrs. Arthur Davis, Fred Goulet, and Otis Goulet for their cooperation while felling timber. It was necessary to study the stumps on several sample plots while the timber was being cut. The three choppers went to considerable trouble to avoid dropping trees on me while I was engaged in this work.²

Marshall's curious personal habits of self-evaluation and documentation attest to the importance of his year with hemlock and Harvard. Annually, beginning in 1928 when he was 27 and continuing until his sudden death in 1939, Marshall systematically

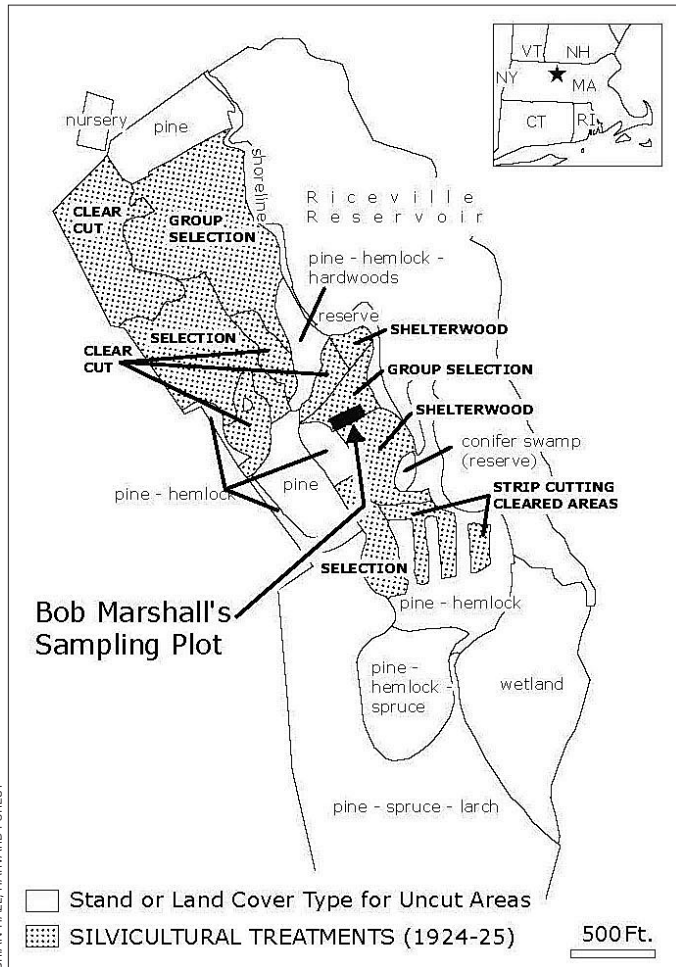
reevaluated his place in life through a series of life lists of "favorites" that he maintained in almost every conceivable category—friends, books, months, places, professional men, women, authors, and more. His favorite "causes" at his death as enumerated in this life list, as well as in his will, were the Wilderness Society, union labor, the advancement of American Indians, and the Harvard Forest. Indeed, Marshall regularly ranked the Harvard Forest, Professor Fisher, and those summer months of fieldwork alongside students, faculty, and the Harvard Forest Woods Crew at the very top of his life list. This is all the more remarkable given the breadth of experience that this determined man was able to cram into his short life. He grew up in Manhattan, explored Alaska's Brooks Range thoroughly, lived with northern Indians and Eskimos, and hiked the wild mountains of the West vigorously; throughout his life he made a point of searching out and meeting Supreme Court justices, Civil War generals, great scientists, and scholars; and he worked alongside the likes of Hart Merriam, Gifford Pinchot, Aldous Murie, and Aldo Leopold. But every January in his adult life when Bob sat back to wrack his brain and rework his hand-scrawled life lists in order to update them with the most recent year's experience, his mind faithfully returned to Petersham. There, in a project focused on logging and hemlock, he bonded with a team of men from many different walks of life and was inspired by a bespectacled gentleman who shared his love for the wild and its lessons for conservation.

THE GRANDEST OF EXPERIMENTS

Marshall's project was part of the grandest of the large long-term experiments that Richard Fisher established, one that is a magnificent precursor to the large, long-term manipulations that constitute the Harvard Forest Long Term Ecological Research program today. Following Fisher, we now undertake 50-year projects, such as pulling down two acres of forest to simulate a hurricane, warming the forest with miles of heating cable in the soils to mimic climate change, spraying nitrogen onto acres of pines and hardwoods to simulate the effects of increasing acid rain, and alternately girdling or harvesting hemlock to contrast the effect of an insect infestation with that of salvage logging.

In the design of his big forestry study, Fisher sought to contrast the ecology of hemlock and white pine and evaluate the effectiveness of different ways of promoting each of these species through logging. Although these two dominant conifers are similar in their longevity and abundance in old-growth forests, they contrast strongly in their growth rates, shade tolerance, and timber value. The study sought to investigate whether it was possible to purposefully manipulate their growth and relative abundance by harvesting the stands in very different ways.

By coincidence, the site the Harvard group selected for the experiment in that summer of 1924 belonged to the New England Box Company, whose owners—the Dickinson brothers—were already thick in negotiations with Fisher over the sale of the Pisgah tract. The so-called Adams Fay parcel, named for previous owners, adjoins the Tom Swamp tract of the Harvard Forest and occupies an extraordinary site, a flat outwash plain that was thickly and rather uniformly covered with hemlock and pine. The remarkable homogeneity of the sandy site was ideal for experimentation because it allowed nearly identical plots to be assigned to different harvesting treatments for comparison with each other and with additional plots that would be left intact and unharvested as controls. The treatments covered the range of common commercial



The Adams Fay lot of the Harvard Forest showing the layout of the large experiment with its many types of harvests. The plot that Marshall dissected in detail is blackened in the center of the area.

logging practices along with some experimental approaches.

This project actively engaged Richard Fisher and senior scientist Rupe Gast, a brilliant though eccentric quantitative ecophysicist. The tree felling, hauling, and associated work was all undertaken by the Harvard Forest woods crew, assisted by the graduate students and supervised by the faculty. Al Cline was newly hired as lecturer and straw boss, having just received his own graduate degree from Syracuse, a convenient decision given that the incoming graduate students were all from his former department.

Marshall dived in with the group, contributing to diverse aspects of the experiment, from laying out plots, measuring timber volumes, and marking trees to hauling cordwood and burning brush. But his separate project also played a key role in framing the larger study. Marshall sought to document hemlock's growth patterns and its unique ability to hunker down for decades in the deep shade, eking out an existence and barely growing, and then to capitalize on the death of surrounding trees with a burst of new growth. Though ultimately focused on hemlock, Marshall began by comprehensively dissecting all the trees on his eighty-by-two-hundred-foot plot to shed light on the history of the entire forest. Fisher and his colleagues used these initial insights to expand their understanding of the differences between pine and hemlock and sharpen their hypotheses concerning how the forest would develop following each of the different treatments.

Although Fisher may have been accustomed to applying his natural history skills to interpreting the long-term history of the forests that he studied, Marshall took the art of forest reconstruction and refined and formalized it to the level of science. In his efforts, Marshall was guided closely through regular meetings with Fisher, daily exchanges with Cline in the woods and dorm where he lived with his fellow students, and intense strategy discussions with Rupe Gast. Gast devoted extensive time to providing the young student with the background in the physics, meteorology, and electronics he needed to evaluate the environment and growth of plants. (In later years, Gast came to exert a major influence on Marshall's decision to attend Johns Hopkins University for his doctoral work and on his thesis research on the growth and physiology of spruce at treeline in alpine Alaska.) Marshall also benefited from daily exchanges beneath the conifers with the Harvard Forest woods crew of veteran loggers and farmers, who shared great depths of local knowledge. Through the process of working out the history of the Adams Fay area, Marshall developed, refined, and unified all the major steps to forest reconstruction that were subsequently applied by generations of Harvard Forest students.

The scientific approach to forest history that emerged that summer was remarkably straightforward: scour the landscape for every scrap of information from living and dead plant material, the soil, human artifacts, and the local topography, and then integrate this with information from more typical historical sources, such as interviews, newspapers, census data, correspondence, deeds, and other records. Marshall systematically dissected the forest applying these diverse approaches. He cored trees and sectioned decaying logs to establish tree ages and growth records; he examined uprooted mounds and moss-covered stumps and attempted to reconcile these clues on past disturbances with his tree records; and he ferreted through archives, libraries, and notes from interviews with previous owners and loggers to provide context and fill in gaps in the story emerging from the woods. Every evening, save the few that they spent at movies in the adjoining mill town of Athol or on Bob's infrequent trips back to Manhattan, he sat alongside the others at two lengthy tables in the large living room of the Harvard Forest headquarters and dorm, compiling notes, computing figures, or chatting about work, life, and their futures.

The 1927 publication of "The Growth of Hemlock before and after the Release from Suppression" in the *Harvard Forest Bulletin* earned Marshall a footnote in the history of science. But his failure, and that of his mentors to document the approach he developed and its value to ecology and conservation, is a stunning lapse by someone so focused on fame and his career. It would be a half-century before two articles in the journal *Ecology*³ exposed the science world to the field and laboratory methods developed by Marshall and employed ever since by Harvard researchers to reconstruct nature's history. Those papers brought historical ecology into the limelight and earned it a solid place in the discipline, but even their authors appear to have been unaware that the techniques had been forged in the Petersham woods on what we now call the Bob Marshall plot.

Marshall's efforts resulted in a comprehensive chronology of tree growth and response to wind and repeated harvesting. As revealed in the opening of his *Harvard Forest Bulletin* article, Bob Marshall relished this trip back in forest history and his newfound ability to extend the record back before the area's colonial settlement.



COURTESY OF THE HARVARD FOREST

The Harvard Forest Woods Crew during the experimental harvest on the Adams Fay lot (1924). From left: Harry Upham, Rodney Stevens, and Burt Upham.

The history here considered commenced 272 years ago, at the time of the inception of the oldest element in the stand of 1924. In 1652, a year before Cromwell became Lord Protector of England, and thirty years before William Penn crossed the Atlantic, a hemlock seed germinated in the dense shade of the virgin forest and a tree commenced its long life of suppression. The history of the stand previous to 1822 can only be conjectured. The forest probably consisted principally of white pine, with considerable hemlock, and a sprinkling of chestnut, beech, yellow birch, and red oak. It was no doubt autochthonous in character. When one element dropped out, either the surrounding trees seeded in the spot or advance growth reproduction replaced the dead tree. But only the most shade-tolerant species could possibly survive with the slight amount of light which penetrated the canopy. Therefore, the understory consisted chiefly of that extremely shade-enduring species, hemlock, which, though it grew on the average about an inch in a century, was nevertheless able to maintain life. It was only when some natural catastrophe made a small opening in the forest that the trees had an opportunity to grow to a large size. No doubt the majority died after years of stunted existence. Frequently in larger openings the less tolerant white pine would seed in and overtake the slower growing hemlock. Then another period of suppression would ensue.

A REMARKABLE SPECIES

One consistent and abundant element through time was hemlock, whose persistence Marshall came to attribute to a combination of the species' remarkable physiology and the complete absence of fire. He noted that, while white pine was favored whenever big holes were created in the canopy and the soils were disturbed, hemlock prevailed under most other conditions. What Marshall and the Harvard group learned that summer took them a long way toward explaining hemlock's great abundance on the site and success in the region. From the tree-ring records, he documented that hemlock persisted under heavy shade, displaying minute rates of growth under conditions that the sensors built and deployed by Rupe Gast showed as supporting less than three-tenths of one percent of ambient sunlight. Marshall's data also revealed that hemlock was able to increase its growth rate tenfold or more whenever more light became available. In contrast to most species, which lose or never display this flexibility, hemlock could bounce back repeatedly until it either became a dominant tree or was taken down by a violent wind gust or a two-man saw. Whereas white pine had a boom-and-bust behavior in which it dominated after major disturbances through prolific seed production, long-distance dispersal, and rapid growth, hemlock employed a strategy of stealth and persistence. It invaded slowly,



COURTESY OF THE HARVARD FOREST

Cross-section of a large hemlock analyzed by Bob Marshall on the Adams Fay lot (1924). The dense rings in the center adjacent to the knife show that the tree grew in the shade for 108 years until the overstory was harvested around 1840 when the rings widen abruptly. The wood exhibits cracks along the radii and shake between the rings.

hunkering down, biding its time, and continually leveraging its position in the woods.

From the growing appreciation of hemlock's ecology and the site's history emerging from Marshall's plot, Fisher developed some guiding hypotheses for the big experiment. He proposed that in the absence of fire, both hemlock and pine would persist on the site indefinitely, as it appeared that they had for thousands of years. But the relative amount of each would depend strongly on the scale of disturbance. White pine would secure a great foothold when intense windstorms or clearcuts opened the canopy broadly. Hemlock would establish in the understory of pine forests and be favored by lengthy periods with few large disturbances. Then, with the death of every pine from lightning, selective harvesting, or senescence, hemlock would increase toward a dominant position. The larger context of this experiment as it pertained to Marshall's specific focus on the release of hemlock from suppression is laid out nicely in his 1927 article:

In the autumn of 1924 the Harvard Forest marked for cutting a lot owned by the New England Box Company which contained a stand unusual in northern Massachusetts. It was composed of dense, almost pure, white pine and hemlock with very little ground

cover or advance growth hardwood. The composition ranged from pure hemlock to nearly pure pine. But of special interest was the fact that the entire area was thickly sprinkled with old pine stumps which clearly testified that years before a heavy softwood cut had been made on the same area. Now as a general rule the forests which have followed nineteenth century softwood logging operations have resulted both in a conversion and a marked deterioration of type. But here softwood had followed softwood, and furthermore the new stand had both a large volume and excellent form. What was the history which had caused this anomaly? It was in answer to this question that the present study was undertaken. Almost as soon as the first hemlocks had been felled, it was noticed that at the center of every stump there was a core of wood from one to five inches in diameter which frequently had taken one hundred or more years to grow. At the outside of this core there was a very abrupt change in growth rate, and for a period of years rings from one-eighth to one-fourth of an inch thick were found. Coinciding in point of time with this acceleration in growth were old scars, evidently caused by logging. The obvious explanation was that a previous stand had been cut, and the consequent infusion of light had released the long stunted hemlocks from suppression.

The hypotheses laid out by Fisher and supported by Marshall's work were tested directly in the large experiment, which sought to guide harvesting in the real world of commercial forestry. The experiment would put these ideas to the test by establishing a gradient of disturbance size and intensity through different patterns of harvesting. The specific harvesting approaches included *selection cutting*, in which the canopy was thinned of one-quarter to one-half of its stems presumptively to increase hemlock; *shelterwood harvests*, in which the initial thinning was followed in a few years by removal of the remaining overstory to allow the release of hemlock and the establishment of many pines; *strip cuts*, which removed alternating sections of forest, producing strong gradients of shade to full sun that favored both species; and sizable *clearcuts*, which exposed large areas to direct sunlight and overwhelmingly favored the establishment of white pine. Working alongside the Woods Crew, the students would measure the trees in each area before and after every harvest. The entire group would then stack and haul the wood and cart and burn the branches. At the end of the day, the scientists and woodsmen parted ways. The students and younger mentors like Cline would retreat to the headquarters for dinner, their skulls sessions, data analysis, and evening pranks. Gast lived off-site with his family, while Fisher maintained homes in both Petersham and Weston, a wealthy Boston suburb, and so was an episodic visitor.

From the evidence in photographs, journals, and letters along with a distinctive reduction in the frequency of Marshall's correspondence home, the summer presented a thoroughly exhausting, stimulating, and engaging experience for the close-knit group in Petersham. Through the fall they conducted fieldwork, wrapping up the slash burning and wood hauling in midwinter while the woods crew and horses worked the mill and reduced the logs to large and well-ordered stacks of lumber. As the winter turned into a muddy spring and summer approached, the students completed their studies. Many stayed on for a second summer or more as they sought jobs, tied up loose ends, or established careers at the Harvard Forest, as Neil Hosley and Al Cline did. Marshall followed a unique path, however. He pushed off immediately following the semester's end, having completed his work on schedule and

successfully converting his original Forest Service offer into a posting in Missoula. If he had glanced back on his way out west, he would have realized that in launching his career, he had contributed to an experimental legacy for future generations, established a fundamental historical approach for ecology, and advanced the knowledge of a critical forest species.

DEATH AND DESTRUCTION

The future did not play out for the Harvard Forest or for the group of students as they may have envisioned in their year together. But many of their lives remained intertwined, and nearly a century later their insights, methods, and approach to science-based silviculture have been fully vindicated. Their legacies certainly persist. Bob Marshall worked from a distance to publish his master's thesis three years later, and his career advanced on a meteoric trajectory grounded in ambition, rare talent, boundless energy, and important connections. He died just fourteen years after departing Petersham in a train heading to Washington, D.C., likely of heart failure; at 39, he was chief of the U.S. Division of Indian Forestry and founding board member of the Wilderness Society. He had looked back annually to that grand summer as he updated his life lists. He also maintained contact with Professor Fisher and figured strongly in the lives of his friends Hosley and Cline. The grand experiment on the Adams Fay lot was resampled three times while Fisher was alive, keeping Cline and a regular stream of new graduate students busy.

Yet, like so much of the scientific infrastructure established in the woods during the first quarter-century at the Harvard Forest, the big experiment was abandoned following the 1938 hurricane. The neat experimental design of harvests was shredded, initially by the wind that flattened the remaining hemlock and pines and then by salvage logging that left the landscape covered with stumps, skid trails, charcoal mounds, and the residue from a portable sawmill.

Russell Lutz and Al Cline capture the scene and response to the 1938 hurricane in the publication that brought the big silvicultural study to a close.

The stand left after the cutting of 1935 was completely blown down by the hurricane of September 1938. The stumpage was sold to a private operator. Because of the tangled condition of the trees, oftentimes piled in criss-cross fashion to a depth of twenty feet, no attempt was made to control the cutting or the extraction; the logging was done at the discretion of the operator. The logs were hauled on scoots by tractors. Although the logging was done in the winter, there was very little snow on the ground; consequently much of the remaining organic layer was broken up and mixed with the mineral soil, particularly along the many skid trails. After logging was completed, the slash was ricked and partly burned. The hurricane and attendant logging operation caused heavy damage to the reproduction; much of it was broken by falling trees or knocked down in the course of logging. Fortunately there was a good crop of pine seed on the trees when the hurricane struck. With the improved seedbed conditions brought about by the second shelterwood cutting and the further scarification of the soil caused by cleaning up after the hurricane, a fairly abundant new reproduction started in 1939.⁴

It was more than three-quarters of a century before the next group of faculty and students refocused on the work that Marshall,

Fisher, and the crew had initiated. Though it was challenging for us to relocate Marshall's original plot, given the intervening damage and regrowth, a group that included students Alex Ireland and Ben Mew eventually succeeded by using the original maps and locating persistent landmarks and features that Bob Marshall had surveyed so carefully.⁵ We also revisited and reimagined the original experiment, though the well-conceived cutting patterns cannot be discerned on the landscape today. Eight decades after the hurricane, the forest is now inspiring in many ways. And, thanks to financial contributions by Marshall and other alumni, the Adams Fay lot was purchased from the New England Box Company and now belongs to the Harvard Forest. Its forest condition repeated the historical pattern that Marshall reconstructed and Fisher predicted. Despite the vicissitudes wrought by wind and ax, both hemlock and white pine continue to dominate the site. The hypothesis rooted in forest reconstruction has been supported, and Bob Marshall's historical methods have been in active use ever since. □

David Foster is an ecologist and faculty member at Harvard University and author of several books on New England's forests. He has served as the director of the Harvard Forest's 3,750-acre ecological laboratory and classroom in central Massachusetts since 1990. David is also Principal Investigator for the Harvard Forest Long Term Ecological Research program. Supporting and additional information on Bob Marshall, forest history, and hemlock are available on the Harvard Forest website, at <http://harvardforest.fas.harvard.edu>. This excerpt is reprinted with permission of Yale University Press.

NOTES

1. All unpublished documents may be found in the Harvard Forest Archives.
2. R. Marshall, "The Growth of Hemlock Before and After the Release from Suppression," *Harvard Forest Bulletin* 11(1927): 7.
3. J. D. Henry, J. M. A. Swan, "Reconstructing Forest History from Live and Dead Plant Material—An Approach to the Study of Forest Succession in Southwest New Hampshire," *Ecology* 55: 772–83; and C. D. Oliver and E. P. Stephens, "Reconstruction of a Mixed-species Forest in Central New England," *Ecology* 58: 562–72.
4. R. J. Lutz and A. C. Cline, "Results of the First Thirty Years of Experimentation in Silviculture in the Harvard Forest, 1908–1938. Part II. Natural Reproduction Methods in White Pine–Hemlock Stands on Light, Sandy Soils," *Harvard Forest Bulletin* 27: 1–69.
5. A. W. Ireland, B. J. Mew, and D. R. Foster, "Bob Marshall's Forest Reconstruction Study: Three Centuries of Ecological Resilience to Disturbance," *Journal of the Torrey Botanical Society* 125(2008): 411–22.

This year marks the 50th anniversary of the establishment of the Pinchot Institute for Conservation and the donation of the Pinchot family home Grey Towers to the U.S. Forest Service. In the following essay, historian and Pinchot biographer Char Miller discusses how the Institute is applying Gifford Pinchot's principles to contemporary environmental issues. It is adapted from Seeking the Greatest Good:

The Conservation Legacy of Gifford Pinchot, his new history of the Institute, and is published with kind permission of the University of Pittsburgh Press.

MAKING COMMON CAUSE FOR CONSERVATION

*THE PINCHOT INSTITUTE AND GREY TOWERS
NATIONAL HISTORIC SITE, 1963–2013*

The challenge, and it will continue to be a challenge, is how do we keep things in balance. How do we support a community, how do we keep an industry alive, and then how do we do that in a sustainable fashion so that at the end of the day your ecosystem remains intact.” —*Catherine Mater*¹

It comes down to the land, its health and viability, its capacity to regenerate and sustain its ecological relationships, and its integrity. If salubrious and energetic, then the communities depending on the land—biotic and human—will flourish. If not, then the consequences could be destabilizing.

That was the message Gifford Pinchot's parents conveyed to

him on his 21st birthday when they presented him with a copy of George Perkins Marsh's *Man and Nature*, a clarion call for an informed, conservation stewardship that James and Mary Pinchot promised to enact on the many cutover acres surrounding their just-opened Grey Towers estate in Milford, Pennsylvania. Aldo Leopold made a similar claim in *A Sand County Almanac* (1949)

BY CHAR MILLER



FOREST HISTORY SOCIETY PHOTO COLLECTION, FHS6520

President Kennedy waving to the crowd during the Pinchot Institute dedication ceremony at Grey Towers. Chief Ed Cliff stands behind the podium.

about the pressing need for a self-conscious ethic, the best definition of which, he suspected, was “written not with a pen, but with an axe. It is a matter of what a man thinks about while chopping, or deciding what to chop. A conservationist is one who is humbly aware that with each stroke he is writing his signature on the face of his land.” This sensitive engagement required as well a sense of one’s small place within the long sweep of time, an insight Leopold voiced in 1907 while participating in the Yale Forest School summer camp at Grey Towers; he was happy to “pick up the axe again,” he wrote his mother, and “while I am biting into the heart of a big pine or chestnut, to think that each chip is like a chip cut out of the interval between Now and Then.” Some of those intervals are more pivotal than others, President John F. Kennedy asserted in 1963 as he accepted Grey Towers on behalf of a grateful nation and dedicated the Pinchot Institute for Conservation to carry on the conscientious work the Pinchot family had been pursuing since the late 1880s. As the president noted, there are eras that especially require the presence of purposeful actors, and the early 1960s appeared to be one of them: “For our industrial



PINCHOT INSTITUTE FOR CONSERVATION

economy and urbanization are pressing against the limits of our most fundamental needs: pure water to drink, fresh air to breathe, open space to enjoy, and abundant sources of energy to release man from menial toil.”²

Figuring out how American society could resolve these interrelated challenges was the Pinchot Institute’s original mission, a mission that was not always realized during its first three decades of existence. Once a unit of the U.S. Forest Service, and thus subject to the vagaries of congressional funding and shifts in agency focus, it is now a nonprofit think-and-do tank working in close partnership with Grey Towers and the Forest Service, a collaborative model that since the early 1990s has allowed it to come more into its own. Its success in

this regard, I argue in my new book, *Seeking the Greatest Good: The Conservation Legacy of Gifford Pinchot*, which probes the organization’s activism over the past half-century, has been an innovative effort to devise, implement, and assess strategies for carrying out cooperative conservationism on federal, state, tribal, and private lands—and even abroad—with the goal of ensuring ecological resilience across time.³

to come more into its own. Its success in this regard, I argue in my new book, *Seeking the Greatest Good: The Conservation Legacy of Gifford Pinchot*, which probes the organization’s activism over the past half-century, has been an innovative effort to devise, implement, and assess strategies for carrying out cooperative conservationism on federal, state, tribal, and private lands—and even abroad—with the goal of ensuring ecological resilience across time.³

GREY TOWERS PROTOCOLS

That aspiration dates back to 1991, when a small gathering of “farmers and philosophers, foresters and theologians” met at Grey Towers because they “wanted to look over the edge, into the distance to see if we could come up with some common ideas about future stewardship of the land.” Out of their concerted efforts emerged the Grey Towers Protocols, a set of principles that were designed to speak to what its authors believed was the third stage in the “history of Americans’ relationship to their lands and natural resources.” The first—the getting and taking—had led to the violent subordination of native peoples and the equally devastating and rapid clearing away of forests and other resources to fuel what in time became the agricultural and industrial revolutions of the nineteenth century. The second had been born in response to the first: as habitats disappeared, hunters and anglers fought to protect woodland, meadow, and marsh; as large mammals and avian life were extirpated, in their defense women and men banded together to form the Audubon Society and similar grassroots organizations; and local needs for clean water or flood protection or fire control led still others to advocate for national forests, parks, and refuges. One result of this agitation was the passage of the Creative Act of 1891, which marked the creation of the nation’s first forest reserves (later renamed national forests). This law’s centennial, and a reappraisal of its significance, had brought the conferees to Grey Towers to hammer out a new approach to resource management for a new century.⁴

Out of their deliberations emerged the four main planks of the Grey Towers Protocols⁵:

1. Land stewardship must be more than good “scientific management”; it must be a moral imperative.
2. Management activities must be within the physical and biological capabilities of the land, based on comprehensive, up-to-date resource information and a thorough scientific understanding of the ecosystem’s functioning and response.
3. The intent of management, as well as monitoring and reporting, should be making progress toward desired future resource conditions, not achieving specific near-term resource output targets.
4. Stewardship means passing the land and resources, including intact, functioning forest ecosystems, to the next generation in better condition than they were found.

The Pinchot Institute adopted these principles as its guiding philosophy, an embrace that was not coincidental—V. Alaric Sample, then on the staff of the Conservation Foundation and later to become the Pinchot Institute for Conservation’s executive director, served as the conference amanuensis and authored its summative essay, *Land Stewardship in the Next Era of Conservation*.

The new focus on ecosystems as the baseline for management came with a significant challenge: would these principles work on the ground in real time? Ecosystem management, in short, may be a scientific notation but its success depends as much on site-specific biota as it does on place-based human concerns that are social, economic, and cultural in origin and articulation. This meld added a political dimension and aspirational component to the work to come, for as “important as these principles might be in guiding the physical activities of resource managers on the land,” Sample observed, “they may be even more valuable as a means for resource managers to communicate a vision of stewardship and personal responsibility to society at large, helping a



FOREST HISTORY SOCIETY PHOTO COLLECTION, FHS5551

President Kennedy prepares to unveil the dedication plaque. From left: Secretary of Agriculture Orville L. Freeman, Forest Service Chief Edward Cliff, President John F. Kennedy, Gifford Bryce Pinchot, and Pennsylvania Governor William W. Scranton.

fragmented public to recognize that our economic well-being as well as our environmental health rests on our being able to pull together rather than pull apart.”⁶

Trying to stitch together the American polity has been a difficult, onerous, and not always fruitful operation, but that did not and does not mean the effort is misguided—just that it has been and will remain incomplete. More measurable and perhaps more fulfilling has been the work itself, as suggested in four case studies of the Pinchot Institute’s projects in forested watersheds in North and South America. Each initiative has responded to the ethos embedded in the Grey Towers Protocols. Each is committed to resolving a local, land-based community need. Each has attempted to develop a broad coalition in its support. Because these projects are often operating under the radar and on private lands, their managers, researchers, and supporters have been able to develop their objectives outside the oft-contentious national debates about economic development versus environmental protection. As these initiatives have been transplanted from their sites of origin, they are helping to make less central those furious arguments that since the late 1960s frequently have defined the American environmental culture.⁷



COURTESY OF SANDRA ANAGNOSTAKIS

The bur of the American chestnut, seen open here. The Pinchot Institute is one of several organizations working to reintroduce the tree.

A NEW PINCHOT ERA BEGINS

That a Pinchot is involved in two of these projects offers a compelling storyline. It is just not a role that Peter Pinchot thought would be his. “For the first thirty years of my life, I resisted a Pinchot career in forestry,” he confessed in a 1999 speech to the National Leadership Team of the U.S. Forest Service. “It seemed far too daunting to be in my grandfather’s shadow. But eventually the green conservation blood got the best of me.” In 1997 he completed a master’s degree in forestry at the Yale School of Forestry and Environmental Studies, which his progenitors had established. When, two years later, he officially joined the Society of American Foresters, an institution his grandfather Gifford Pinchot had also founded, he laughed: “My last defense was punctured. I am afraid I am a fallen man.”⁸

What he fell into was the felt need to reconceive conservation from the ground up. His reconceptualization would take into account the late-twentieth-century shift away from a commodity-based approach often associated with his grandfather’s defining notion of the foresters’ creed: “The greatest good of the greatest number in the long run.” It would make use, too, of Aldo Leopold’s land ethic, which depended on an alteration in the “role of Homo sapiens from conqueror of the land-community to plain member of it.” Taking seriously the fundamental change in the relationship between Americans and nature was an essential precondition to rethinking how the Forest Service might better steward the national forests and grasslands. By the mid-1960s, Peter Pinchot argued,

most Americans were “living in urban and suburban areas and had little daily dependence on nature for their livelihood” and thus had “no direct exposure to the raw products of forests”; for them, the “idea of managing forests for a sustainable flow of commodities no longer had much personal meaning.” These urbanites found more resonant the new environmental ethos pitting “environmental protection and wilderness preservation against the economic thrust of natural resource productivity.”⁹

Pinchot was not the first to argue that this dynamic had put the Forest Service on the defensive. The resolution he proposed to the agency’s leaders—that it use the 193 million acres under its stewardship to protect the planet’s diminishing biodiversity and provide ways for city residents “to reconnect to the wildness of real natural landscapes”—was also in line with then-Chief Michael Dombeck’s convictions. One of the chief’s goals, dubbed “forest to faucet,” had been developed to enhance citizens’ realization of how deeply connected they were to the forested watersheds that supplied much of their potable water (in the American West, for instance, upwards of 30 percent of water supplies flow off national forests and grasslands). “We can leave no greater gift for our children,” Dombeck asserted, or “show no greater respect for our forefathers, than to leave [the] watersheds entrusted to our care healthier, more diverse and more productive.” What Peter Pinchot brought to the twenty-year conversation about how the Forest Service might regain its one-time relevance and centrality was the argument for a communitarian approach to landscape management.¹⁰

This new paradigm called on foresters “to reexamine some of our core assumptions.” To reduce the pressure on forests “while we develop the scientific knowledge of how to preserve biodiversity in working landscapes,” Pinchot urged his professional peers to push the wood products industry to develop sustainable substitutes for “virgin wood fiber for reading materials, house construction, and packaging.” Coupled with that charge was a more radical argument. The “model of multiple-use may have outlived its utility,” he affirmed, especially when logging would devastate already-identified “biodiversity hotspots, where a majority of the world’s species are found.” Pinchot proposed developing a zoned approach to timber management. Taking biodiversity-rich areas completely out of production and transferring that work to locales “of low priority for biodiversity conservation,” where it would be possible to “maximize fiber production to meet economic demands,” made good sense. Recognizing too that private lands must also contribute to this recovery process, he suggested that it would be critical to develop “community-based programs that would provide incentives for neighboring landholders to restore and sustain species diversity on their lands.”¹¹

REGENERATING THE MILFORD EXPERIMENTAL FOREST

It was in that latter context that Peter Pinchot would test his arguments. Teaming up with his family, and with financial support and technical advice from the Forest Service and the Pinchot Institute, he returned to the Milford Experimental Forest that his great-grandfather James Pinchot had established at Grey Towers in 1903 to facilitate the field training of Yale forestry students. As reconceived in 1999, the site’s mission targeted ecological restoration and community forestry. This orientation was a result of two central concerns that Pinchot and his collaborators hoped to address. Milford and the Pocono Mountains of northeastern Pennsylvania were quickly becoming a site for second homes, whose construction was fragmenting large ownerships and eroding the area’s biodiversity. This demographic and biological challenge came coupled with a political one—how to engage residents old and new, year-round and seasonal, about the need to preserve the “esthetics and environmental quality of the region” that the growing tourist and recreational economy both depended on and threatened. Given that “there are probably only one or two decades of opportunity to conserve enough of the landscape in blocks of continuous forestland to sustain the diversity and richness of the forest and river ecosystems,” the Pinchot family placed a conservation easement on the bulk of its 1,400 acres, including the experimental forest, along the Sawkill River. Doing so allowed the Pinchots to “stimulate a regional dialog about stewardship and to create a pattern of collaboration between private and public landowners that can begin to reverse the trend towards fragmentation of the forest.”¹²

As transformative were the management strategies Peter Pinchot established for the site. Among the problems confronting eastern woodlands were overabundant white-tailed deer, which in Milford as elsewhere had cleared away the forest understory. A two-year deer population study recommended a “large, managed hunt” to cull the herds on the property. Aware that the experimental forest could not solve the deer problem on its lands alone, Pinchot worked with scientists at Pennsylvania State University, the Pennsylvania Game Commission, and local hunting clubs “to develop a community-based deer management program with



PINCHOT INSTITUTE FOR CONSERVATION

Leila Pinchot, great-granddaughter of Gifford Pinchot, at a chestnut restoration planting on the Beaver Run Hunting and Fishing Club, a Common Waters Fund site in Pennsylvania.

adjacent private and public landowners so that we can collectively manage deer at the landscape scale.”¹³

Reintroducing the American chestnut locally has led to the creation of a similarly broad network of allies. The Forest Service and the Pinchot Institute, as well as the American Chestnut Foundation and the Connecticut Agricultural Research Station, have contributed time and expertise to the Pinchot family’s effort to bring back what had been the area’s dominant tree species, and whose nuts once lay thick on the ground. But sometime around 1900, the chestnut blight fungus (*Diaporthe parasitica*) was brought to North America and began to decimate the species; it continues to thwart efforts to return to the canopy a species once praised as the sequoia of the East. That moniker also has been a source of hope. Because the American chestnut “is a charismatic species,” Peter Pinchot suggests, “the act of its restoration can help catalyze community stewardship of the regional forest.”¹⁴

At the Milford Experimental Forest, the restoration effort has taken a two-pronged approach: the development of an Asian-American hybrid chestnut bred to be blight resistant, scientific experimentation that the American Chestnut Foundation and the Connecticut Agricultural Research Station conducted. The second critical need has been to figure out how to reintroduce this species into the mature eastern forests from which the chestnut has been absent for a century or more. Early tests at Milford demonstrated how difficult this process would be. White-tailed deer browsed on chestnut seedlings and sprouts and the blight continued to cut back the regenerative capacity of older trees. Subsequent efforts

appear to be more a bit more successful, as fencing and hunting have kept deer populations under control. Harvesting of sunlight-blocking maples has opened up the canopy and other silvicultural treatments are being assessed for their efficacy. Among those doing this vital assessment work is Leila Pinchot, Peter Pinchot's daughter, another forestry graduate from Yale. After completing her PhD at the University of Tennessee in 2011, she was hired by the Forest Service and the Pinchot Institute to conduct an ongoing series of chestnut restoration experiments in the Milford forest. This acorn did not fall too far from the family tree.¹⁵

SECURING BETTER HEALTH CARE IN ECUADOR

David Smith, who had conducted some of the initial restoration studies on the Milford Experimental Forest, decided to transplant the Pinchot family restoration work abroad. When he left Pennsylvania in 2001 to serve as a Peace Corps volunteer in the northwestern Ecuadoran community of Cristóbal Colón, set within in the wet, tropical foothills of the Andes, he carried with him Gifford Pinchot's *Primer of Forestry* (1899). Among that text's central points was the enduring impact that "destructive lumbering" can have on sustained forestry. It injures young growth, Pinchot wrote, "provokes and feeds fires," and can "annihilate the productive capacity of forest land for tens or scores of years to come." To counter this destructive process required the adoption of more conservative methods of forestry "to draw from the forest, while protecting it, the best return of which it is capable of giving."¹⁶

The conditions Smith encountered on the ground in Ecuador seemed similar to those Pinchot had encountered in the American West a century earlier. Home to 300 families that own more than 100,000 wooded acres in the Rio Canandé watershed, Cristóbal Colón is a poor town in good measure because its residents are unable to sustainably manage their timber resources. Smith's economic analyses indicated that commercial agents were paying roughly 10 cents per foot for rough boards: "Even when farmers cut as many trees as they can, their families still make considerably less than \$1,000 per year selling their lumber wholesale." This exploitation of people and land was compounded by forest clearing, which left behind unstable soil on treeless slopes; subsequent erosion undercut the families' ability to supplement their income through agriculture. Hoping to restore the ecosystems and the community's economic viability, Smith reached out to the Pinchot family. Peter and his family began working in Cristóbal Colón to knit together an international coalition. The Pinchot Institute, the U.S. Peace Corps, the U.S. Forest Service, and Fundación Jutan Sacha, the largest nongovernmental conservation organization in Ecuador, collaborated with this isolated rural community to "sustain forestlands in that region and spark economic development."¹⁷

Community leaders, Peace Corps volunteers, and Pinchot Institute staff at the founding of the EcoMadera community forestry project in Ecuador. Peter Pinchot is in the center.



The EcoMadera project is in the town of Cristóbal Colón, which sits in the foothills of the Andes Mountains.

From this collaboration emerged a fundraising effort that purchased "appropriately scaled tools to allow the community to begin producing finished wood products," among them a portable bandsaw that increased the marketable yield from each tree cut (and thus decreased the number that needed to be harvested). In addition to requisite technical training, the cooperating institutions have provided education in marketing, business management, and wood products development. Through the 2004 establishment of



a communally owned corporation, EcoMadera Verde, Cristóbal Colón's residents began to turn out hardwood flooring, molding, and furniture, all higher-end products generating more profit than sawn boards. In subsequent years, the focus has shifted to creating balsa wood products, and Peter Pinchot has been particularly interested in the manufacture and sale of wood blades for wind-energy turbines. "By creating many new community jobs and providing families with a market for sustainably produced timber," Pinchot wrote in language his grandfather would have approved, "EcoMadera is creating an economic alternative to pervasive forest exploitation."¹⁸

Recovering the viability of the Rio Verde Canandé's forested watershed has been bound up with a concerted effort to sustain its residents' health. Much of the initial work revolved around developing a more sustainable economic market for forest products. But rural poverty also has health care implications. For many in Cristóbal Colón, "the forest serves as a kind of health insurance": when one of its 3,000 residents "becomes sick or suffers an accident, the forest resources are harvested to pay for medical care." Data from a survey, developed in conjunction with residents, revealed high child mortality rates and widespread malaria, typhoid, dysentery, and other diseases, often alongside malnutrition. Securing better health care was hindered by a series of interlocking geographic, economic, and social barriers: the Rio Canandé watershed had no health care workers or clinics, the nearest medical facility was eight miles distant, and that clinic itself was understaffed and underresourced.

In 2008 EcoMadera, with the support of the Ecuadoran Ministry of Health and the Pinchot Institute, raised funds to build, furnish, and equip Cristóbal Colón's first health care clinic and secure a full-time nurse and part-time physician. "Health is a basic human right and a goal onto itself," wrote Ariel Pinchot, one of Peter Pinchot's children and coauthor of the study. "However, good health is also vital from a systemic perspective, without which poverty alleviation and natural resource conservation cannot occur. Healthy families and healthy forests are intimately connected, and one cannot hope to achieve either without addressing health conditions and the degradation of natural resources concurrently."¹⁹

HUMAN CONSERVATION IN OREGON

Ariel Pinchot's paternal great-grandparents made similar claims 80 years earlier. As part of their response to the devastation of Pennsylvania's forest cover and the economic collapse of the Great Depression, Governor Gifford Pinchot and the commonwealth's First Lady, Cornelia Pinchot, promoted what they called "human conservation." Simply put, there could be no economic recovery if the working and living conditions of the state's most impoverished residents were not stabilized, and there could be no sustained recovery if Penn's Woods were not regenerated. Social justice, economic development, and public health went hand-in-hand, they argued, an argument as true in Pennsylvania in the 1930s as it is in twenty-first-century Ecuador.²⁰

These intertwined aspirations are shaping the Pinchot Institute's work in Vernonia, Oregon, a community of 2,300 residents inhabiting a narrow valley in the Coastal Range through which the flood-prone Nehalem River flows. Located in Columbia County, in the northwest corner of the state, Vernonia is "a gritty little timber town that was once home to the largest electric sawmill in the world"; the name of its high school athletic teams, the

Mighty Loggers, recalls the community's original economic base. Although surrounded, as county commissioner Tony Hyde observes, by "28 miles of forests in all directions," Vernonia confronts double-digit unemployment and a high level of poverty; resource rich, the community is decidedly cash poor. This imbalance is not unusual among rural, mountainous, and forested communities scattered across the nation. It shares as well another dilemma facing these towns: a little over half of the forests in the United States are privately owned, the majority of these lands are the property of individuals or families, and nearly 50 percent of these owners are over 62 years old. It is this aging population that in Vernonia and elsewhere controls a significant portion of the country's forested ecosystems. Over the next two decades, some portion of these lands will be sold to sustain their owners' health and welfare. As in Ecuador, timber will serve as a form of health care insurance. Upon their owners' deaths, these woodlands may be sold to pay off debts or transferred to the next generation.²¹

The implications of this developing situation drive the research of Brett Butler, a social scientist working for the U.S. Forest Service. He and his colleagues have identified ownership patterns across the country, surveyed current owners about their intentions for the wooded lands they own, and assessed their future management plans and prospects for the sale, bequest, or donation of these properties. The key, Butler argues, is to understand how family forest owners perceive their lands:

Despite what some of us might have learned in forestry school, timber production is not the primary reason that families own land. Rather, the most important reasons ... are related to the aesthetics and privacy the land provides and its importance as part of their family legacy. "Aesthetics" is shorthand for the enjoyment owners get from many facets of the land—the trees, the wildlife, everything about it. Many owners have a primary or secondary residence on their land and greatly value the privacy and solitude their forests provide. "Legacy" is their ability to pass the land on to the next generation: many owners have inherited the land from their parents or other relatives and would like to do the same for future generations.

But will they hand off their legacy to their progeny, and will these legatees be willing and able to maintain these woods as woods? With an estimated 6,000 forested acres a day being sold off in the United States—and this may be just the beginning of what is predicted to be the largest intergenerational land transfer in American history—the shift in ownership could constrain the capacity of these woodlands to provide essential ecosystem services, including carbon sequestration, amid a changing climate.²²

These linked and troubling issues serve as the foundation of the Forest Health–Human Health Initiative that the Pinchot Institute launched in Vernonia in 2010. Senior Fellow Catherine Mater surveyed the parents and the rising generation about how they expect to manage their legacy properties. Her interviewees confirmed Butler's studies indicating that health care, and its costs, were their number-one worry. This was compounded in Vernonia, where 80 percent of the parents and their adult children interviewed did not have "long-term health insurance and no plan in place to address this health care need." Instead, both cohorts expected to use timber resources to pay for emergency or sustained care.²³

Those same trees could offer a different, more sustainable resolution. Oregon State University researchers inventoried the lands in question and discovered that "a majority of these forests are at

an opportune time in their growth cycle from a carbon storage perspective, with more than 5,000 acres of these coastal Douglas-fir dominant forests being comprised of trees 30 years old or younger.” Asked whether they would consider participating in a “carbon for health care program”—the landowners would manage their woods to increase their carbon storage potential, and outside investors would purchase this increase in the form of carbon credits, providing an income stream targeted for the owners’ health care—the majority of those Vernonians surveyed expressed considerable interest. The Forest Health–Human Health Initiative was born.²⁴

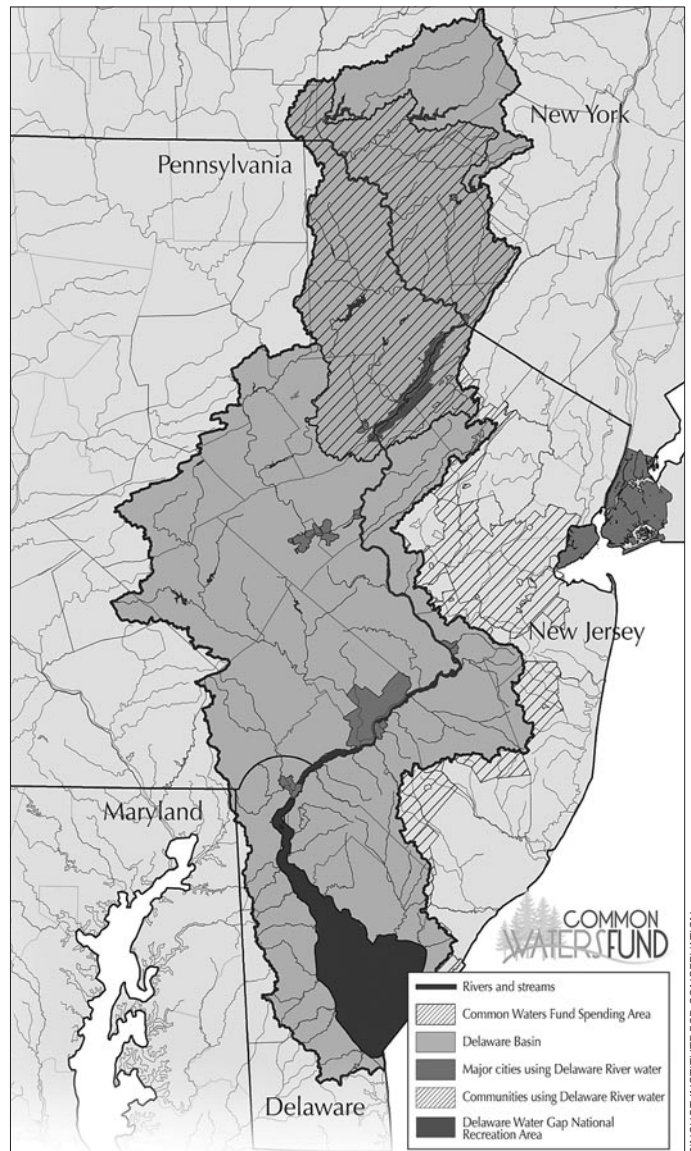
It is the first project in the nation that exchanges forest carbon for direct payments to landowners and surrounding communities. With seed funding from the U.S. Department of Agriculture, Regence Blue Cross Blue Shield, and the Kelley Family Foundation, the Pinchot Institute has entered into a memorandum of understanding with the American Carbon Registry to serve as an official site for carbon credits in the pilot project and developed a specialized debit card, called the ATreeM card, coded so that carbon-credit dollars can be used only for health care expenses. As of early 2013, the Institute was in the final stages of developing marketing portfolios for carbon investors from the health care sector, such as hospital systems, health-care insurance companies, and pharmaceutical corporations. “We believe investors will be willing to pay more for carbon credits,” Mater has noted, “that are linked to quantifiable social benefits coming in the form of direct payments to health care accounts for landowners and rural communities.” If so, then projects weaving together ecosystem services, public health, and rural sustainability could prove a dynamic combination transferable to other regions and conditions.²⁵

WATER CONSERVATION IN THE NORTHEAST

A similarly complex connection between environmental health, water quality, and landscape restoration informs Common Waters, an initiative that seeks to address a critical challenge facing the sprawling 13,500-square-mile watershed of the Delaware River. The region is imperiled because the “great forested landscapes of the Northeast and the critical watersheds they contain are facing death by a thousand cuts.” Metropolitan New York and Philadelphia have continued to sprawl outward toward such communities as Milford, in northeastern Pike County, Pennsylvania. That is not the only reason that the local forests are being harvested and bulldozed. Private woodlands owners along the upper Delaware, like their peers in Columbia County, Oregon, are older and likely to cut timber to pay for health care costs or unexpected expenses. Land sales and the resulting parcelization are decreasing tree cover, adding to water treatment costs downstream. Conversely, extending forest cover has clear benefits: “For every 10 percent increase in forest cover in the headwase, water treatment costs are decreased by 20 percent.” To secure this savings requires that those who own woodland and those who need clean water realize their shared interest in these paired resources.²⁶

The Pinchot Institute has been the coordinator of the project since 2007; ever since, it began enlisting support for the Common Waters Fund from

The Delaware River supplies more than 16 million people with pure drinking water.



The Delaware River Basin drains approximately 13,500 square miles in five states.





Under the direction of Al Sample (left), the Pinchot Institute has evolved into a nonprofit think-and-do tank by getting out on the land.

more than 40 state, county, and town agencies, regional authorities, nonprofits, land trusts, and foundations. The Common Waters idea emerged from an initial request of the Pinchot Institute to facilitate a meeting between the Delaware Water Gap National Recreational Area and adjacent property owners. The park's leaders realized that their management decisions depended on how the park's neighbors were managing their lands, but none of the various entities or individuals were talking to each other. The conversation began at Grey Towers that fall, and the assembled group decided that the Chicago Wilderness project offered the best template for the Delaware watershed initiative. The Chicago Wilderness project embraces a tristate area, covering portions of Wisconsin, Illinois, and Indiana, and has built a 260-member coalition binding together urban and rural interests. Its mission is "to restore local nature and improve the quality of life for all living things, by protecting the lands and waters on which we all depend," and its actions testify to the capacity of voluntary partnerships to transcend political, social, and demographic boundaries and implement essential environmental protections.²⁷

This bottom-up strategy is in marked contrast to the top-down bioregional agencies that the federal and state governments promoted in the 1950s and 1960s. Such intergovernmental ventures, such as the Delaware River Basin Commission that President Kennedy signed into law in 1961, left "political actors free to play their own game without the counterweight of a focused public opinion." Shifting away from this insular orientation has immense appeal to Eric Snyder, planning director of Sussex County, New Jersey, who decries the "Balkanized land-use decision-making environment" in which he and his colleagues for too long had operated. "We've so many agencies involved and each has its own

legislative mandates [and] limits of jurisdiction. It's really difficult for anything other than chaos to come out of it. In Common Waters, we've got some people with the right idea," a more nimble approach that can "break down some of those barriers."²⁸

To nurture such regional collaborations, the Pinchot Institute has raised money to underwrite the Common Waters Partnership and the eponymous fund. Realizing, in the words of former Grey Towers director Edgar Brannon, that "the health of our regional economy is very much tied to the quality of the living environment," the fund commenced investing its dollars—to date more than \$700,000 has been released—as incentives to promote "water-friendly" forest management, underwrite conservation easements to preserve forest cover, and improve the "finances of forest ownership so families can afford to keep their forests as forests." As in Ecuador and the Pacific Northwest, the ambition of the Common Waters project is to sustain the land and the people who make it their home.²⁹

The project's advantages for the Carr-Dreher Farm in Sterling, Pennsylvania, are a case in point. The 79-acre family-owned forest, sitting on one of the highest points of the Pocono Mountains, is draped over two ridges and lies within the upper reaches of Butternut Creek. The site's elevation is one factor complicating its restoration: high winds and ice storms periodically damage the upcountry woodlands, already weakened from insect infestations and extensive deer browsing that has eliminated natural regeneration. Moreover, the landscape has been a working blue-stone quarry since the early twentieth century. With the death of the family patriarch, ownership passed to his two daughters and their families, who then faced a difficult dilemma—either sell off the land and forgo its future income, or try to restore it despite their lack of resources. The county forester, who was linked into the Common Waters project, made it possible for the family to take the path of most beneficence. After a formal assessment of their property's damaged condition, and following a successful application for Common Waters dollars, the Carr-Dreheres were able to hire a consulting forester to develop a stewardship plan. With additional funding and tax relief from a variety of county, state, and federal entities, they are clearing away rock and logging debris and controlling invasive species to encourage the regeneration of the native maple-beech-cherry forest. For all the satisfaction that family has gained in repairing the land and its integrity one acre at a time, it has also derived satisfaction knowing that these environmental gains are not theirs alone. Their commitment upstream, in the words of Gary Carr, has given "the gift of guaranteed clean water to the millions downstream in the Delaware Valley whom we will never know or meet."³⁰

Proponents of EcoMadera and the Forest Health–Human Health Initiative could easily echo this assertion, which also undergirds much of the Pinchot Institute's recent activism. Weaving together different coalitions to meet the diverse needs—technical, environmental, social, and financial—of the residents of Cristóbal Colón, Vernonia, and the headwaters of the Delaware River has strengthened biotic and human communities. In one sense that end result is a far cry from the Pinchot Institute's original mission of the 1960s, which was framed around the need to advance conservation education in the immediate aftershock of Rachel Carson's *Silent Spring*. Yet it is also consistent with the larger idea of helping Americans comprehend their obligation to enhance the health of people and places, make the planet more habitable, and ensure a new greatest good for the long run. □

Char Miller is the director of the Environmental Analysis Program and the W. M. Keck Professor of Environmental Analysis at Pomona College. "Common Cause" from Seeking the Greatest Good: The Conservation Legacy of Gifford Pinchot, by Char Miller, ©2013. Reprinted by permission of the University of Pittsburgh Press.

NOTES

1. Catherine Mater, interview by Kristin Doran, WVIA, April 23, 2012.
2. Char Miller, *Gifford Pinchot and the Making of Modern Environmentalism* (Washington, DC: Island Press, 2001), 55–56; Aldo Leopold, *A Sand County Almanac, and Sketches Here and There* (1949, New York: Oxford University Press, 1970), 69; Curt Meine, *Aldo Leopold: His Life and Work* (Madison: University of Wisconsin Press, 1988), 72; John F. Kennedy, "Remarks of the President at the Pinchot Institute for Conservation Studies," September 24, 1963, http://www.foresthistory.org/ASPNET/Places/GreyTowers/JFK_speech.pdf, last accessed July 16, 2013.
3. Char Miller, *Seeking the Greatest Good: The Conservation Legacy of Gifford Pinchot* (Pittsburgh: University of Pittsburgh Press, 2013).
4. V. Alaric Sample, *Land Stewardship in the Next Era of Conservation* (Milford, PA: Grey Towers Press, 1991), vii–x; Char Miller, *Public Lands, Public Debates: A Century of Controversy* (Corvallis: Oregon State University Press, 2012), 1–5; Harold K. Steen, *The Origins of the National Forests* (Durham, NC: Forest History Society, 1992); John Reiger, *American Sportsmen and the Origins of Conservation* (Corvallis: Oregon State University Press, 2000).
5. Sample, *Land Stewardship in the Next Era of Conservation*, ix, 31–2.
6. *Ibid.*, 32.
7. Michael P. Dombeck, Christopher A. Wood, and Jack E. Williams, *From Conquest to Conservation: Our Public Lands Legacy* (Washington, DC: Island Press, 2003); and Richard L. Knight and Courtney White, eds., *Conservation for a New Generation: Redefining Natural Resource Management* (Washington, DC: Island Press, 2000) speak to the need to implement a more cooperative approach to land management across different land types and ownerships.
8. Peter Pinchot, "Adapting the Legacy of Gifford Pinchot: From Utilitarian to a Communitarian Paradigm," Speech to USDA Forest Service: National Leadership Team, Madison, WI, October 26, 1999.
9. *Ibid.*
10. "Forest Service Chief Shifts Focus to Clean Water," *Spokane Spokesman-Review*, March 3, 1998, <http://m.spokesman.com/stories/1998/mar/03/forest-chief-shifts-focus-to-clean-water-dombecks/>, last accessed July 16, 2013; see also Dombeck, et al., *From Conquest to Conservation*.
11. Peter Pinchot, "The Perennial Challenge for Forestry: Sustaining Biological Capital," *Journal of Forestry* 98(11)(November 2000): 64.
12. Peter Pinchot, "Bringing Forestry Back to the First Yale Camp and Bringing the Conservation Debate Back to Grey Towers," *Yale F&ES Centennial News*, Fall 1999, 14–16; "The Milford Experimental Forest: A Conversation with Peter Pinchot," *Milford Magazine*, August 2002, 18–19, 21.
13. Pinchot, "Bringing Forestry Back to the Yale Camp," 14–15.
14. *Ibid.*, 15.
15. Steve Grant, "Blight Fight," *Hartford Courant*, July 11, 2007, http://articles.courant.com/2007-07-11/features/0707110743_1_american-chestnut-foundation-chestnut-trees-connecticut-agricultural-experiment-station; Michael J. Coren, "An American Classic in Yale's Forest," *Yale Alumni Magazine*, November/December 2010, http://www.yalealumnimagazine.com/issues/2010_11/lv_chestnut016.html; "History and Research Converge in American Chestnut Restoration," *USDA Blog*, July 5, 2012, <http://blogs.usda.gov/2012/07/27/history-and-research-converge-in-american-chestnut-reintroduction-2/#more-41395>, last accessed July 16, 2013.
16. Gifford Pinchot, *A Primer of Forestry* (Washington, DC: Government Printing Office, 1899), 65–66.
17. "Tropical sustainable forestry: a new community forestry program in northwestern Ecuador," *Pinchot Letter* 8(1)(Spring 2003): 1–4.
18. Peter Pinchot, "Demonstrating Sustainable Community Forestry in Ecuador," *Pinchot Letter* 15(3)(Fall 2010): 1, 3–10. In an interview with Kristin Doran, (March 16, 2012, WVIA), Peter Pinchot drew an even tighter connection to his grandfather's conception of community-based forestry: "EcoMadera is 100 percent in the mold of the Gifford Pinchot tradition of figuring out how to make forestry work in different environments for the people ... to make it work economically, and to make it work in the long run for the long-term sustainable management of the forest."
19. Ariel Pinchot, "Connecting Human Health and Forest Conservation in the Rio Verde Canandé Watershed," *Pinchot Letter* 15(3) (Fall 2010): 10–11.
20. Miller, *Gifford Pinchot and the Making of Modern Environmentalism*, 316–19.
21. State Senator Betsy Johnson, interview by WVIA; Tony Hyde quoted in Brian A. Kittler, "Rebuilding a Greener Community through Creative Partnerships," *Pinchot Letter* 16(3) (Fall 2011): 8–10; Brett J. Butler, "Family Forest Owners of the United States, 2006," *General Technical Report NRS-27* (Newtown Square, PA: U.S. Department of Agriculture-Forest Service, Northern Research Station, 2008), <http://www.treesearch.fs.fed.us/pubs/15758>, last accessed October 29, 2012.
22. Brett J. Butler, "Family Forest Owners Rule!," *Forest History Today*, Spring/Fall 2011, 87–91; Catherine Mater, V. Alaric Sample, Brett J. Butler, "The Next Generation of Private Forest Landowners: Brace for Change," *Pinchot Letter* 10(2)(Winter 2005): 1–4; "Q&A With Catherine Mater," *ibid.*, 14–16.
23. Catherine Mater, "Linking Forest Health and Human Health in America's Private Woodlands," *Pinchot Letter* 14(2)(Spring 2009): 11–12.
24. *Ibid.*; Brian A. Kittler, "Rebuilding a Greener Community through Creative Partnerships," *Pinchot Letter*, 8–10; "Cemetery is testing ground for carbon valuation," *Daily Astorian*, September 1, 2011, http://m.dailyastorian.com/mobile/article_1f687b50-d4c3-11e0-ae9c-001cc4c03286.html, last accessed November 3, 2012.
25. "Cemetery is testing ground for carbon valuation," *Daily Astorian*, September 1, 2011; "The Forest Health Human Initiative," and related survey results, <http://www.pinchot.org/gp/FHHHI>, last accessed November 3, 2012; Catherine Mater to Char Miller, August 2, 2012, e-mail communication.
26. Rebecca Sanborn Stone and Mary L. Tyrell, "Motivations for Family Forestland Parcelization in the Catskill/Delaware Watersheds of New York," *Journal of Forestry* 110(5)(July/August 2012): 267–74; "UN Water Day: Securing the future of the Delaware River," *Hunterdon (NJ) County Democrat*, March 23, 2012, http://www.nj.com/hunterdon-county-democrat/index.ssf/2012/03/un_world_water_day_securing_th.html, last accessed November 3, 2012.
27. On the relationship between headwater forest management and the Chesapeake Bay, see the special issue of *Pennsylvania Forests* 100(2)(Summer 2009): 18–32, <http://www.wbsrc.com/documents/pa%20forests%20summer%202009.PDF>, last accessed November 14, 2012; "Commonwaters: From the Upper Delaware to the Water Gap," http://www.pinchot.org/gp/Common_Waters_Forum, last accessed July 16, 2013 (see especially the Common Waters Forum Report).
28. *Ibid.*; Charles H. W. Foster, *Experiments in Bioregionalism: The New England River Basins Story* (Hanover and London: University Press of New England, 1984), 173–76; Daniel Press, "Environmental Regionalism and the Struggle for California," *Society and Natural Resources* 8(5)(1995): 288–306; James J. Parsons, "On 'Bioregionalism' and Watershed Consciousness," *Professional Geographer* 37(1)(February 1985): 1–8.
29. Long-term sustainability of local ground and surface waters is being severely tested as energy companies drill countless hydraulic fracturing wells across the Delaware River watershed. Aware that this posed a huge challenge to its restorative work on these same lands, the Pinchot Institute has been active in the regional dialog, which often erupts into furious debate: "The Marcellus Shale: Resources for Stakeholders in the Upper Delaware Watershed Region," 2011, http://www.pinchot.org/PDFs/Pinchot_Marcellus_Shale_BMPs.pdf, last accessed November 14, 2012; "Commonwaters: From the Upper Delaware to the Water Gap," http://www.pinchot.org/gp/Common_Waters_Forum, last accessed November 3, 2012.
30. Gary Carr to Char Miller, November 8, 2012, e-mail communication; Gary Carr to the Pinchot Institute, June 25, 2012, in author's possession.

Biographical Portrait

THE MATTOONS AND McLEANS

DEEP FORESTRY ROOTS

by Andy Mason

Shirley Ann Mattoon was there on September 24, 1963, joining the large crowd that welcomed President John F. Kennedy to Milford, Pennsylvania, and Grey Towers for the dedication of the Pinchot Institute. On this day, Gifford Pinchot's ancestral home, was given by the Pinchot family to the American people and is now managed as a national historic site by the U.S. Forest Service. Known to her friends as "Sam," now 88 years old, Shirley was a celebrity at the 50th anniversary of the 1963 dedication. She had many other stories to tell us about that day and her family of foresters with connections

to Pinchot as we sat and enjoyed appetizers and sipped wine on a beautiful moonlit fall evening on the lawn in front of the Grey Towers mansion.

Sam's husband, John A. Mattoon, a second-generation forester and U.S. Forest Service employee, was also there in 1963 with just a few things on his mind. John worked for the national "I&E" office (Information and Education office, known today as the Office of Communication and Conservation Education), and with the chief of I&E (his boss) on assignment in Europe, John had a major role in coordinating the president's visit and the event.

When he retired in 1983, John Mattoon had more than 40 years of federal service that began in World War II, when he served as a naval aviator flying the Curtiss Helldiver bomber with the 88th squadron on the aircraft carrier USS *Yorktown*. For several heroic actions in the Pacific, he earned two Distinguished Flying Crosses and two Air Medals. He graduated from Penn State University before the war and received a master's degree from the Yale School of Forestry in 1950.

Early in his distinguished natural resources career, in the 1950s, John Mattoon was district ranger on national forests in



COURTESY OF THE MATTOON FAMILY

Sam Mattoon identifies herself in this 1963 photo of President John F. Kennedy at Grey Towers.

Colorado, Oregon, Utah, and Washington. He transferred to the Washington Office, where he worked closely with Forest Service artist Rudy Wendelin and others to help promote Smokey Bear into the icon it remains today. While in Washington, Mattoon and Wendelin also worked together to design the agency's shoulder patch that was used beginning in 1963 until the early 1970s.

After 24 years with the U.S. Forest Service, Mattoon transferred to the Bureau of Land Management (BLM) and continued his work to promote conservation and educate the public about it. He had a major role in developing the advertising campaign for Johnny Horizon, BLM's very successful symbol of the late 1960s and early 1970s that encouraged litter cleanup and brought attention to air and water pollution and other issues. He also worked for the U.S. Fish and Wildlife Service and ended his federal career in the Department of the Interior working on the Alaska pipeline and the Endangered Species Act, among other issues. When he retired in 1983, his colleagues presented him with a framed simulated press release that described how he was widely admired throughout his long career by coworkers, the conservation community, and the news media for his "outstanding personal and professional integrity, unswerving loyalty, and dedication to open communication."

The forestry roots of the Mattoon family go deep. John Mattoon's father, Merwin "Chic" Mattoon, was also a Yale Forestry School graduate (class of 1914) and the



COURTESY OF THE MATTOON FAMILY

Sam Mattoon (right) stands with Margie Mattoon Cox (John Mattoon's sister) at the 1963 dedication.

first forest supervisor of the Pisgah National Forest in North Carolina. The Pisgah was the first national forest established under the Weeks Act of 1911 and included a portion of the Biltmore Estate, where Gifford Pinchot first put scientific forestry to work in America. The first school of forestry in the United States—the Biltmore Forest School—was also there, now preserved as the Cradle of Forestry in America National Historic Site.

And the family roots go even deeper. Merwin Mattoon married Marguerite McLean of Simsbury, Connecticut, Gifford Pinchot's birthplace and early childhood home. Pinchot was close friends with

another McLean family member, George P. McLean. Gifford and George were said to be "soulmates" and loved the Simsbury woods. George would gain fame as governor of Connecticut and a three-term U.S. senator. Gifford also knew George's brother, John B. McLean; the two reportedly met in 1895 to help establish the Connecticut Forestry Association. Merwin was also personal friends with Gifford Pinchot and would fish with him as well as with L. L. Bean. Both Merwin and Marguerite Mattoon are buried in the Hop Meadow cemetery at Simsbury. William "Bill" Cox, grandson of Merwin, great-grandson



COURTESY OF THE MATTOON FAMILY

Fellow employees show off their new Forest Service shoulder emblems with John Mattoon (center) at the Pisgah Ranger District, Pisgah National Forest, 1963.



Singer *Burl Ives*, broadcaster *Arthur Godfrey*, and Secretary of the Interior *Wally Hickel* follow *John Mattoon* (far right) at a *Johnny Horizon* publicity event on the National Mall in Washington, D.C., in 1970.

of John B. McLean, and nephew of John and Sam Mattoon, lives in Simsbury.

The Mattoon family tree includes yet one more forester: *Wilbur Reed Mattoon*, Yale Class of 1904. Known as *W. R.* or “*Matty*,” he was one of the first extension

foresters who worked throughout the South to promote farm forestry and the possibilities of growing timber in that region. He is recognized for many publications and speeches and as one of the best writers in the Forest Service on forestry

matters¹. One example of his work is “*Forestry Lessons on Home Woodlands*” (USDA Department Bulletin No. 863), issued in 1920.

Through their associations with *Gifford Pinchot*, the U.S. Forest Service, other conservation agencies and organizations, the Yale School of Forestry, and a love of the woods, the *Mattoons* and *McLeans* certainly had a role in shaping early forestry and conservation in the United States. Thanks to *Sam Mattoon* and her family, we have now quilted these two families into that rich history. □

Andy Mason recently retired as director of the USDA National Agroforestry Center. This article was prepared with the aid of *Shirley Ann “Sam” Mattoon*, *Bill Cox*, and *Margie Mattoon Cox*. *Tom Thompson* and *Karl Brauneis* (both foresters and U.S. Forest Service retirees) also made important contributions to this story.

NOTES

1. Elwood L. Demmon, interview by Elwood R. Maunder, February 13, 1959, Forest History Society, Durham, NC.



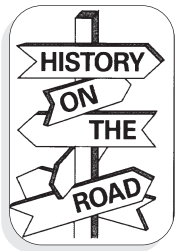
“*Party on Big Levels Federal Refuge—May 1939*” is written on the back of this photo, along with the following identifications: “*Standing (left to right): T. E. Clarke, Leo Couch, E. Addy, Dr. Jackson, C. O. Handley, Carl Nolting, M. A. Mattoon (tall man wearing a vest), R. M. Evans, D. J. Woolley, and H. S. Mosby. Bottom Row (left to right): B. C. Park, G. L. Varney, A. L. Nelson, S. P. Goodloe, Dr. H. L. Shantz, and Mr. Thornton.*”

HISTORY ON THE ROAD

CHARCOAL AND UTAH'S EARLY MINING INDUSTRY

By Douglas H. Page Jr., Sarah E. Page, Thomas J. Straka, and Nathan D. Thomas

Photographs by Douglas H. Page Jr.



One of the American West's oldest and best-known industries is mining, but an associated industry, just as old, has been largely forgotten. Mining required smelters, and smelters required fuel. That fuel was charcoal for much of the 1870s and 1880s, until the railroads could supply coal and coke. Producing charcoal was a profitable industry, and powerful people made fortunes from it while exerting huge influences over smelter operations. Nell Murbarger, a prolific chronicler of the West, called it "reviled, greedy, troublesome, wasteful and corrupt."¹ Smelters in Utah resulted in large clearcuts around kilns, created a labor class of woodcutters

tied to charcoal markets,² and devastated the pine nut crop, a food staple of Native Americans.³

Little precious-metal mining occurred during the early days of white settlement in Utah. Mormon leader Brigham Young discouraged it in favor of farming, light industry, and mining for industrial uses, like salt, coal, and iron. This changed in 1862, when Colonel Patrick Connor and the Third California Volunteers established Camp Douglas, overlooking Salt Lake City, to secure the overland mail routes. Relations between the U.S. government and Mormon leaders had been tense for several years. Some felt Connor was there more to keep watch on the Mormons than to oversee the U.S. mail route. Indeed, Connor was anti-Mormon and set out to "Americanize" Utah, calling Mormons "a

community of traitors, murderers, fanatics, and whores."⁴ He anticipated that Utah's gold and silver would encourage a massive flood of "gentiles" (non-Mormons) to weaken the Mormon church's influence, and perhaps some of the wealth would also benefit the colonel and his friends. Connor encouraged his men to prospect.⁵

Utah's precious-metal mining history starts with a discovery of silver in Bingham Canyon (now primarily known for copper production) in the Oquirrh Mountains about 20 miles southwest of Salt Lake City. Soon Connor's troops found gold and silver in nearby areas. Brigham Young was not happy and questioned the government's motives: "Were they really here to protect the mail and telegraph lines, or to discover, if possible, rich diggings in our immediate vicinity?"⁶ The West Mountain Quartz



A handful of wooden buildings and kilns are all that remain of the once bustling town of Piedmont, Wyoming. Visitors should beware that some sites like the town of Piedmont are on private land.

Mining District was established, but a gold rush did not ensue. Utah's treasures were buried deep, and it would take large investments of capital and technology to reach them. From 1863 to 1869 mining was limited in Utah by high transportation and labor costs, a scarcity of charcoal, and the lack of experienced miners.

The completion of the transcontinental railroad in 1869 transformed the region: the mining boom Brigham Young had feared began, and gentiles swarmed into Utah. Soon spur railroad lines were rushing to the newly established mining towns. Improved smelting techniques were developed almost at the same time the central Great Basin ores were discovered. These ores were "refractory" or "rebellious"—complex ores that had to be dry-crushed and roasted with salt, a time-, labor-, and wood-intensive process, before amalgamation would occur and the valuable elements could be extracted.⁷ Coal, which produces high heat, was not yet available in mining districts, however. Miners turned to a local source of fuel, pinyon pine-juniper forests, and converted the wood into charcoal, which produces double the heat of seasoned wood and is essentially pure carbon.⁸ In 1869 Carl A. Stetefeldt designed a furnace that increased the efficiency of the smelting process and used considerably less labor and a third less charcoal. The Stetefeldt furnace significantly boosted the profitability of central Great Basin mining operations.⁹

Early mining districts were on either side of Salt Lake Valley: the Bingham, Ophir, and Mercur districts were in Oquirrh Mountain canyons, and the Big and Little Cottonwood, Thaynes, and American Fork were in Wasatch Mountain canyons. The Tintic District was just south of the Oquirrh Mountains. Farther south, major mining districts included the San Francisco, Iron Springs, and Silver Reef.¹⁰ Railroad spurs ran south to the mining areas, and by 1872 a few mining areas, mainly those in the Oquirrh and Wasatch mountains, were considered fully developed and productive.¹¹ By then there were 21 smelters in Utah, all located near mining activity: 4 were near Salt Lake City and 1 at a transportation hub, Corinne, north of the city. The others were south of Salt Lake City, with 7 in the Oquirrh Mountains (5 near Ophir and 2 near Stockton), 7 in the Wasatch Mountains (3 near Cottonwood, 2 near Bingham, and 2 near American Fork), and

2 near Tintic.¹² All these areas had charcoal kilns to support the smelters.

CHARCOAL PRODUCTION

Charcoal is made by partially burning wood in the absence of oxygen. This "carbonization" involves the regulation of air flow to the burning wood. Volatile gases from the wood are burned, leaving almost pure carbon. Charcoal has great advantages over wood in the smelting process: not only does it burn twice as hot as wood, it is also lighter than wood and thus cheaper to transport to the smelter.

Most charcoal was made in earth "pits," a misnomer, since a charcoal pit is entirely above ground. Its base was a flat, cleared space about thirty to forty feet in diameter. Wood was carefully stacked into a free-standing structure of logs that leaned

inward. The pit was covered with soil to limit air so that the wood would not be fully consumed by the fire. The size of pits varied. Most charcoal was produced in pits of 100 cords that burned out in about 15 to 20 days and yielded about 2,500 to 3,500 bushels.¹³

Charcoal kilns, usually constructed of brick or stone in the shape of a beehive, were more efficient than earth pits, and drafts could be better controlled to enhance quality. A kiln might hold 35 cords of wood. Short sections of logs split lengthwise were cut from nearby forests and hauled to the kiln site, which was usually located between the wood source and the smelter to minimize overall transportation cost of the heavy wood and lighter charcoal. Vents controlled the burning rate. Charring and cooling would take around



DOUG PAGE

two weeks. If the kiln was opened too soon or on a windy day, spontaneous fires could rapidly destroy the new charcoal. The description of the Frisco kilns (below) gives additional detail.

All the lead-smelting furnaces of the Great Basin used charcoal as fuel. Charcoal's price ranged from 15 to 34 cents per bushel (1.59 cubic feet). The lowest price was at the American Fork and Tintic districts in Utah, which had abundant timber, and the highest at Little Cottonwood District, where charcoal had to be shipped in from Truckee, California. Utah charcoal was mainly produced from pinyon pine, but where this preferred species was not available, juniper, aspen, mountain mahogany, and other species were used. Experienced Italian charcoal burners at Eureka, Nevada, produced the best product; the poorest product, with waste reaching 15 percent, came from places in Utah that were forced to use small timber. The fuel value of a ton of coke, which was derived from coal, was equivalent to about 200 bushels of charcoal. Diminishing timber supply in Utah caused wood prices to increase, and as the Utah Southern Railroad extended southward, coke eventually became the preferred fuel for the smelters.¹⁴

FOREST DEVASTATION

A mining community quickly developed a demand for wood: insufficient charcoal could close a smelter or mining district. Mining required timber for tunnels and shafts, buildings, and heating as well as for the smelters. Harvesting the surrounding forests could devastate forests near the development, and often for miles around the mining activity. Franklin Hough's first *Report upon Forestry* (1878) noted the forest clearing in Utah:

The mining operations of the Wahsatch and other ranges have created a new and extensive demand for timber and especially fuel. The consumption of charcoal in the smelting-furnaces of the Territory is becoming every year of practical importance, and the difficulty of procuring it an increasing item of expense. According to the Deseret Agricultural and Manufacturing Society, for 1875, the amount of charcoal made in the Territory during the year was 8,674 tons, valued at \$132,837.50. It is chiefly used in the silver smelting-furnaces of the valley, and the timber mostly used for this

purpose is the quaking [aspen]. This timber grows at the upper levels in the valleys, and well up to the timber-line... Since the opening of numerous mines in the Great and Little cottonwood cañons, or rather on the dividing ridge that separates them, the timber has found a local demand which is hastening its destruction. In a recent visit to this country, an instance of random destruction came under notice, which cannot be regarded as unusual in the mining region of the West. The supply having failed in the Little Cottonwood, an adventurer had come over the snow-clad divide in the basin at the headwaters of the Great Cottonwood, and cut down a million feet or more of valuable pine, as a speculation, but failing to realize from sales, it was left to rot on the ground. The rings of growth on one of the stumps thus cut, showed the age of the tree to have been over four hundred years, which may be regarded as about the usual period required for timber to grow to its greatest dimensions in these high altitudes.¹⁵

Mines and smelters used the nearest available timber, and by 1882 the supply of mining timbers and wood for fuel and charcoal had become a limiting factor at some mines. As distance to the timber increased, so did the cost of timber. Timber became a valuable commodity, sparking conflicts over its control. In his last *Report upon Forestry* (1882), Hough describes the abuses on federal lands:

As for the right of property in the timber of the mountains, few questions have hitherto been asked, and it has been taken from the public lands wherever found. Excepting to the very limited extent to which efforts for its protection have recently been made by the agents of the Department of the Interior, no returns have ever been made as to the amount taken, and but a feeble income, as compared with consumption, has been derived from the penalties received on account of this spoliation of timber upon the public lands. As a rule, the first who came had the first chance, and in some cases an understanding was had between different operators by which each was to have the exclusive cutting upon certain portions without hindrance from the other. In other instances a collision of interests has arisen, which, as both

parties were alike trespassers before the law, could scarcely be settled by the court, or otherwise than by appeal to force. Instances of bloodshed and violence have happened time and again from the efforts of parties to monopolize the timber, or to exclude competitors, and in other cases immense quantities of trees have been felled for speculative purposes, either to secure a right of possession, [which] might be sold at an advance, or to supply a perspective demand that never came. In both cases, large quantities thus felled have sometimes been left to rot upon the ground. In the other cases, the disappointed contestant for an opportunity to cut timber has revenged his fancied injury by maliciously setting fire to the timber of his rival, and thus a hundred-fold greater damage has been done to this country than if both had done their utmost toward depleting the forests by the usual operations of lumbering.¹⁶

By the late 1880s the damage from the charcoal industry was well noted in government reports. The charcoal burners were likened to criminals:

From the best information obtainable, it is believed that the charcoal burners of the Rocky Mountain region are doing immense injury to the forests. They draw their supplies of wood almost wholly from the public domain, and although they profess to make large use of dead timber, there is no doubt that the growing forests are largely encroached upon by them. A person well informed upon this subject recently expressed himself thus: "The charcoal burner is the most conscienceless violator of law we have, cutting everything down to poles 2 inches in diameter. He leaves behind him barrenness and desolation. The traffic in charcoal is so exhaustive upon the forests, and so injurious to the best interests of the State, that wherever permitted it should be done under a license only, by the giving of a bond, and by the rigid enforcement of conditions and penalties. There are no reasons why the charcoal burner should longer be allowed to prey upon the timber and young forest growth. On the contrary, many strong and urgent reasons exist for limiting his operations."¹⁷

Real control of the federal forest lands did not occur for another twenty years until the Forest Reserve Act of 1891 and the Organic Act of 1897 set the stage for the



Two of the original four kilns built just east of Leamington remain alongside Highway 132.

first true efforts to designate and manage the public lands that would be allocated to forest production. Gifford Pinchot's U.S. Forest Service took control of federal forest land and its recovery from earlier abusive practices.

CHARCOAL INDUSTRY ROAD TRIP

A visit to Salt Lake City offers an opportunity to visit some of Utah's old charcoal kilns, along with the associated mines and ghost towns.

Leamington or Morrison Charcoal Ovens

Two of four charcoal kilns remain near Leamington, in central Utah. Built for George Morrison in 1882 after the railroad arrived in 1879, they supplied the Ibx smelter two miles to the northwest until at least 1895, after which the smelter shut down because of a lack of ore; presumably the kilns soon ceased operating.¹⁸ This is the most accessible of the kilns but not the most exciting. They are on the side of a paved highway and can be visited by taking a back way to the Frisco kilns via Delta, Utah.

Wood was cut in the nearby canyons to the east (one is named Wood Canyon) and hauled by horse or mule, one quarter

of a cord per animal, to the canyon mouth. With four mules and three trips per day, one man could transport three cords per day. The wood then moved by wagon or cart to the kilns. The historical marker reads, "Standing inside the oven or outside looking to top of Wood Canyon, one can almost hear the sound of axes, of men and mules, wagons and trains."

Directions: From Interstate 15, take Exit 225 at Nephi and drive west on UT-132 for 27.5 miles; kilns are in the right-of-way on the north side of the highway. (Web directions: <http://binged.it/XuUxg2>.)

Frisco Charcoal Kilns

Southwest of the Leamington kilns are the Frisco kilns, in the San Francisco Mountains that gave the kilns their name. Two prospectors accidentally discovered silver-bearing ore in 1875, and Frisco was founded in 1876. The prospectors mined for a short while and sold out for \$25,000, thinking they had made a great deal. Under new ownership the claim became the Silver Horn and produced ore worth \$100 a ton; by 1879 it was the richest silver mine in the world.¹⁹ New mines were scattered all over the area, and smelters and charcoal kilns quickly followed throughout the district. The Frisco Mining and Smelt-

ing Company built the five kilns at Frisco.²⁰ The town of Frisco was a classic mining boom town: "Frisco became as wild and tumultuous a town as any in the Great Basin...and the wildest camp in Utah. Twenty-one saloons had so many killings the undertaker's wagon made daily rounds."²¹ After the Silver Horn had a major cave-in in 1885, Frisco started to decline; in 1894 most of the mill works were destroyed in a fire. Nonetheless, the mines are rich enough to support some level of activity even today.²²

Pit production of charcoal was used in the district, but the cone-shaped kilns were built to produce a higher grade of charcoal. A government report described the Frisco kilns in detail:

Charcoal burning.—Thirty-six beehive charcoal kilns supply the furnaces of the district with fuel. They were in eight groups, under separate individual management, at places where wood was accessible, and at distances of from 6 to 18 miles from Frisco. Some pit coal is burned in the [Wah Wah] Mountains, but it is sold for 1 or 2 cents per bushel less than kiln coal, as the latter is cleaner and of better quality. The kilns are made of granite float found in the neighbor-



Frisco's five kilns built in the foothills of the San Francisco Mountains are situated with what remains of the town of Frisco.

hood and a lime mortar. They are of various sizes, from 16 to 26 feet in diameter. It is the rule in this section to make the height of the kiln equal to the diameter. The thickness varies from 18 to 30 inches at the base and from 12 to 18 inches at the summit. There are two openings, closed by sheet-iron doors, one at the ground level, 4 by 6 feet, and the other in the side two-thirds of the distance to the apex, 3 by 4 feet. There are also three rows of vent holes, 3 by 4 inches, near the ground. The rows are about 18 inches apart, having vent holes 3 feet apart in each row. The kilns cost from \$500 to \$1,000 each and last a very long time if used regularly. The 16-foot kiln holds about 15 cords and the 26-foot kiln 45 cords. Sometimes the wood is piled radially, but generally very closely in cordwood fashion. The wood is all piñon pine, and is cut all seasons by Mormons at \$1.25 per cord. It is brought from 1 to 4 miles by sledges or wagons to kilns for from \$1.50 to \$2.50 per cord. The kilns are fired in the center at the bottom (though sometimes at the top), and the fire is drawn to the top by leaving a small unsealed space around the upper door. This is then closed entirely, and the fire is regulated by the vent holes. The

duration of burning is from three to seven days and of cooling from three to six days. Charring, which includes packing the wood in the kiln and drawing the coal, is usually done by contract and costs from 2¾ to 3½ cents per bushel for hauling, depending on the distance. The price received is 18 cents per bushel. Kiln brands are paid from \$2 to \$2.75. The labor required averages one man per kiln per 24 hours.²³

Directions: Starting in Milford at the junction of Highways 21 and 257, go west on Highway 21 for 14.0 miles to Frisco Summit. Turn right onto the dirt road. The road can be rough, so park low-slung vehicles here and walk. The kilns are visible to the west. Walk or drive west 0.3 mile to a junction with the old railroad grade. The kilns are clearly visible from this point. Park or continue walking 0.3 mile northwest along dirt roads to the kilns. (Web directions from Milford to Frisco Summit: <http://binged.it/VnnQWh>.)

Directions to Frisco Cemetery: Return to Highway 21 and go southwest another 0.6 mile to the historical marker and picnic table on the right. Take the road on the left (south side) of the picnic table for 0.5 mile west to the cemetery. (Web directions

from Frisco Summit to Frisco Historical Marker: <http://binged.it/1ctY4rn>.)

If you are planning to proceed to Old Iron Town or Leeds from Frisco, you may want to go back through Milford, Minersville, and Cedar City.

Old Iron Town (Iron City) Kiln

Iron City was a Mormon-sponsored mining town. The iron resources of Iron County were well known to the early Mormon settlers, and Brigham Young was supportive of a town built around an industrial metal; it was precious metals he did not want mined. The Union Iron Company was organized in 1868, and by the time of the 1870 census, the population was nearly 100 and the town had a post office. By 1871 a 2,500-pound furnace was operational, and in 1873 a blast furnace was built. There were two charcoal kilns and a charcoal house.

Iron production was so great that Iron City was dubbed the "new Pittsburgh in the desert."²⁴ Between 1874 and 1875, five to seven tons of pig iron were produced daily, enough over the course of a year to meet Utah's annual needs, 1,000 tons, plus supply much of the needs in all the adjoining states and territories. However, there were transportation problems. In 1874 the

cost of freighting iron to Salt Lake City was \$40 per ton. The railroad had lower freight rates from the East and eastern iron was cheaper. The furnace closed in 1876 because of a lack of financing, competition from other Utah iron works, and a federal tax of a half-cent per bushel of charcoal and 15 cents per load of wood. Today one can see the ruins of the town and furnace, including the furnace chimney and one charcoal kiln.²⁵ Old Iron Town is administered by the Frontier Homestead State Park Museum in Cedar City (the theme of the museum is Utah's early iron industry).

Directions: From Interstate 15, take the UT-56 exit at Cedar City and follow UT-56 west for 19.7 miles, turn left onto Old Irontown Road (paved), and continue for 2.7 miles, where the road makes a sharp left into the Old Iron Town Ruins parking lot. The state park has restrooms, a covered picnic area, and interpretive trails. (Web directions: <http://binged.it/XuU0ul>.)

Silver Reef or Leeds Creek Charcoal Kiln

Continuing south on I-15 will bring you to the Silver Reef kiln. The history of Silver Reef begins in the 1860s, when a prospector found a small amount of silver in sandstone. He ignored it, since it was commonly known that silver did not form in sedimentary rock like sandstone. Out of curiosity, he came back in the early 1870s and struck a rich claim. Others soon followed. By 1875 Silver Reef was a boom town, with a mile-long paved main street and a boardwalk on each side. The peak years of mining activity were 1878 to 1882, but by 1884 most of the mines had closed because silver prices dropped on the world market, the mine suffered water problems, and ore quality declined.²⁶ Some of the ghost town remains adjacent to new homes, and the old Wells Fargo building is now a mining museum with artifacts from both Silver Reef and Frisco.

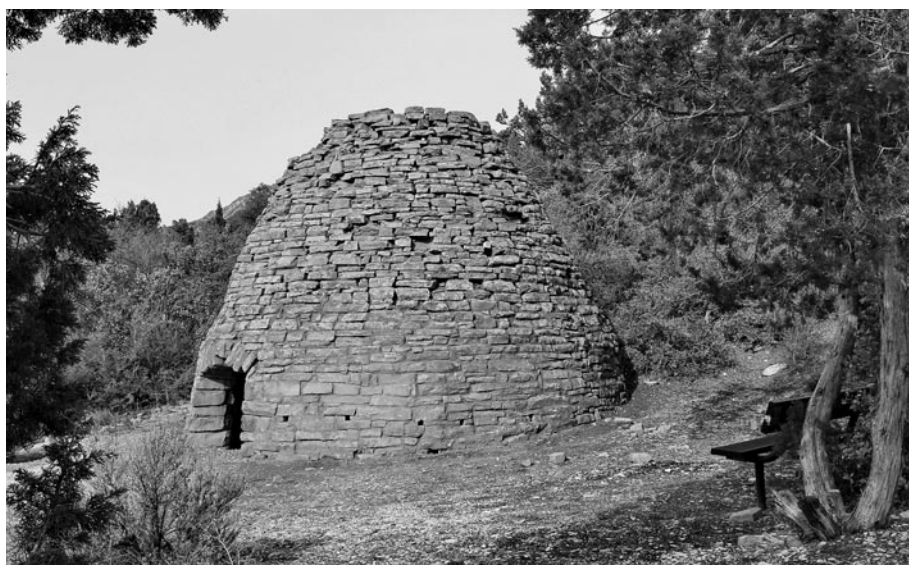
Italian and Swiss immigrants to the Great Basin brought kiln construction and charcoal-making skills with them from the old country. One sandstone-and-mortar kiln, constructed along Leeds Creek around 1885, has a Roman arch and is located 1.5 miles west of Italian Wash—two clues that it was built by Italian stone masons. Aside from its entryway arch, it is traditional beehive style, measuring 20 feet at the base and 25 feet in height. Charcoal production was for the smelter to the southeast. The nearby Pine Valley



An interpretive walk leads by the foundations of the iron forge at Old Irontown.



The oldest surviving Wells Fargo Express building now serves as the Silver Reef Museum.



Built from sandstone, this kiln provided charcoal for the mines at Silver Reef.



Visitors at the Piedmont kilns offer a sense of scale.

Mountains provided the pinyon pine and gambel oak for fuel.

Directions: This site is in the Dixie National Forest. From southbound Interstate 15, take Exit 23 (Leeds–Silver Reef), turn west on Silver Reef Road (if northbound, take Exit 22 and follow UT-228 for 1.7 miles and turn left onto Silver Reef Road), continue for 0.7 mile; the road name changes to Oak Grove Road. (You will pass a road on the left that leads to the ghost town and Wells Fargo museum, a side trip you should not miss.) At 1.5 miles the road crosses a creek and turns to dirt and gravel. At mile 2.1, bear right, staying on Oak Grove Road, and park in the Children’s Forest parking lot at mile 4.2. Follow the gravel footpath northeast to the kiln. (Web directions: <http://binged.it/VxxbX9>.)

Piedmont (Wyoming) Kilns

The headwaters of the Bear River are in northeastern Utah. The river flows north into Wyoming and then straddles the Utah, Wyoming, and Idaho borders, eventually turning south and draining into the Great Salt Lake. Forests at higher elevations were a source of lumber, railroad ties, mine timbers, and wood for charcoal. Harvesting started about 1870, and the principal species were lodgepole pine and Englemann spruce. These Wyoming kilns have a Utah connection: the charcoal was consumed

by ore smelters in Utah and Colorado.²⁷

Logging on the Upper Bear River from 1879 to 1900 was a huge operation. Most of the timber was floated down the river or transported by flume to a large sawmill on the Bear River at Evanston, Wyoming (near the Utah border). Thirty-six miles of flume flowed from the mountains of Utah north to Hilliard, Wyoming, about 14 miles southeast of Evanston and on the main line of Union Pacific Railroad. The main trunk line was 30 miles long, about half in Utah and half in Wyoming. Both timber (for railroad ties) and cordwood for the kilns traveled on the flume. When the price of cordwood dropped, the flume was sold and eventually dismantled.

Twelve charcoal kilns were constructed in the immediate vicinity of Evanston, fed by four-foot long cordwood floated down the Bear River. The charcoal industry flourished at Hilliard during the late nineteenth century. Hilliard had more than 30 kilns constructed from rock; these were fed by the flume.²⁸ Two kilns were built about five miles south of Hilliard on Sulphur Creek, and another five kilns were constructed at Piedmont, Wyoming, about 12 miles northeast of Hilliard. The Piedmont kilns were supplied by wagon or sled.²⁹ Three have been restored, one has only foundation walls, and of the fifth, nothing but a circle remains, visible only with high-

resolution aerial photography.

Directions: From Salt Lake City, take Interstate 80 east for 80 miles to Evanston, Wyoming. Continue past Evanston to Exit 24 (Leroy Road) and turn right (south) onto graveled Piedmont Road (County Road 173). At 1.75 miles, cross County Road 180 and continue south on Piedmont Road toward Trout King Lake. The kilns and interpretive site are on the east side of Piedmont Road 6.8 miles farther on. Remains of the town of Piedmont are scattered along the road to the southwest for another half-mile; they are on private land and can be viewed only from the road. Following County Road 173 (the old railroad grade) southwest for about 15 miles takes you through Hilliard and connects to Wyoming 150, which leads back to Evanston. (Web directions: Piedmont to Hilliard: <http://binged.it/1fX6bfN>; Hilliard to Evanston: <http://binged.it/1fX5FOV>.)

Nevada Charcoal Kilns

If after making the Utah circuit you have not had your fill of kilns, close to the Utah-Nevada border are some of the best-restored charcoal kilns in the Great Basin—the Ward charcoal kilns near Ely, Nevada. These and other Nevada kilns were described in an earlier article in this journal.³⁰ This is an overnight trip, four hours each way, but two major Nevada gambling cities and Great



A few remains of Piedmont are still nearby, including the old cemetery. Tombstones tell a story of personal hardship.

Basin National Park (including Lehman Caves) are on the route. From Salt Lake City, take Interstate 80 west for about 120 miles to Wendover, Nevada, and then another 120 miles on US 93 south to Ely. The kilns are 16 miles south of Ely (Web directions: <http://binged.it/16TKyZJ>), and the main entrance to Great Basin National Park is 62 miles southeast of Ely in Baker, NV.

Douglas H. Page Jr. is the Southwest Utah Zone Forester for the Bureau of Land Management in Cedar City, Utah, and Communication Chair for the Intermountain Society of American Foresters. Sarah E. Page is an archaeologist for HDR Environmental, Operations and Construction, Inc., in Salt Lake City. Thomas J. Straka is a professor in the School of Agricultural, Forest, and Environmental Sciences at Clemson University in South Carolina. Nathan D. Thomas is an archaeologist for the Bureau of Land Management in Cedar City.

NOTES

1. Nell Murbarger, "Charcoal: The West's Forgotten Industry," *Desert Magazine* 19 (June 1956): 4–9.
2. Thomas G. Alexander, "Generating Wealth from the Earth," in Colleen Whitley (ed.), *From the Ground Up: The History of Mining in Utah* (Logan, UT: Utah State University Press, 2004), 37–57. Charcoal burner labor relations in nearby Great Basin areas are also discussed in Thomas J. Straka, "Tom Straka on Chris Kreider's 'Ward Charcoal Ovens' and Nevada's Carbonari," *Environmental History* 11 (April 2006): 344–49.
3. Thomas J. Straka, "On Joe Pachak's 'Living Well

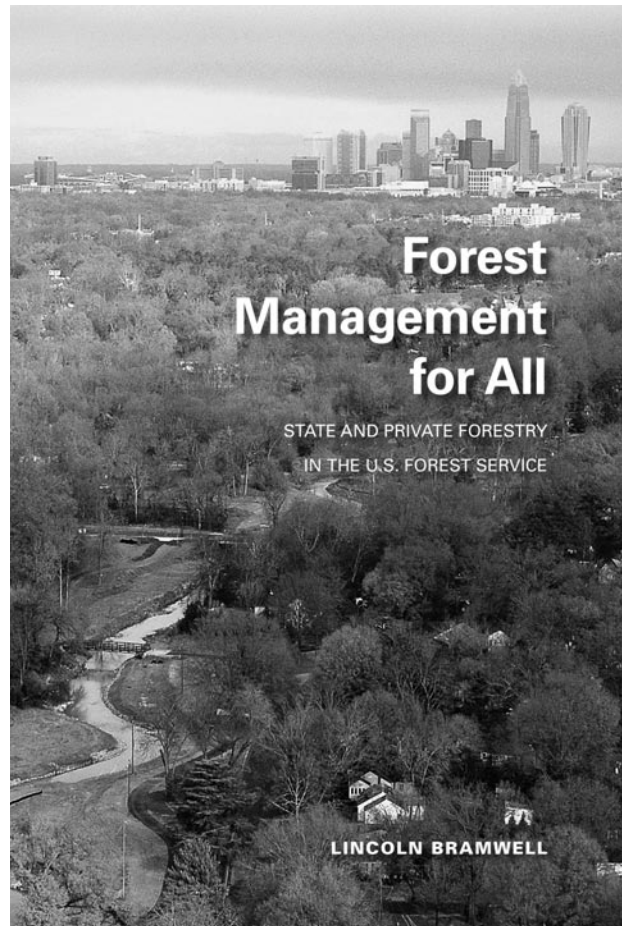
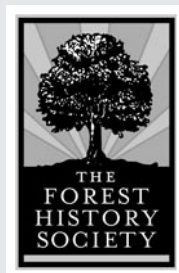
Because of Mother,'" *Journal of the West* 46 (Winter 2007): 3–6.

4. Dennis L. May, *Utah: A People's History* (Salt Lake City: University of Utah Press, 1987), 114–17.
5. Hubert Howe Bancroft, *The Works of Hubert Howe Bancroft. Volume XXVI. History of Utah, 1540–1886* (San Francisco: The History Company, 1889), 740–50.
6. Brigham D. Madsen, "General Patrick Edward Conner: Father of Utah Mining," in Colleen Whitley (ed.), *From the Ground Up*, 58–80.
7. James A. Young and Jerry D. Budy, "Historical Use of Nevada's Pinyon-Juniper Woodlands," *Journal of Forest History* 23 (July 1979): 115.
8. James A. O'Neill, "Central Nevada's Charcoal Industry," *Central Nevada's Glorious Past* 9 (May 1986): 12–15.
9. James A. Young and T. J. Svecar, "Harvesting Energy from 19th-Century Great Basin Woodlands," in *Proceedings: Ecology and Management of Pinyon-Juniper Communities within the Interior West* (Proceedings RMRS-P-9), Steven B. Monsen and Richard Stevens (comps.), 15–18 September 1997, Provo, UT (Ogden, UT: USDA Forest Service, Rocky Mountain Research Station, 1999), 47–50.
10. Publications are available online with maps and photographs of the major mining districts. Carl L. Ege, *Selected Mining Districts of Utah*, Miscellaneous Publication 05-5 (Salt Lake City: Utah Geological Survey), 58–80. Available at http://ugspub.nr.utah.gov/publications/misc_pubs/MP-05-5.pdf.
11. Rossiter W. Raymond, *Statistics of Mines and Mining in the States and Territories West of the Rocky Mountains* (Washington, DC: Government Printing Office, 1872), 218–23.
12. Rossiter W. Raymond, *Statistics of Mines and Mining in the States and Territories West of the Rocky Mountains* (Washington, DC: Government Printing Office, 1873), 329.
13. Thomas J. Straka and Robert H. Wynn, "Pit Production of Charcoal for Nevada's Early Smelters," *Central Nevada's Glorious Past* 29 (2010): 12–16.
14. Rossiter W. Raymond, *Silver and Gold: An Account of the Mines and Metallurgical Industry of the United States, with Reference Chiefly to the Precious Metals* (New York: J. B. Ford and Company, 1873), 379–409.
15. Franklin B. Hough, *Report upon Forestry* (Washington, DC: Government Printing Office, 1878), 593–97.
16. Franklin B. Hough, *Report upon Forestry* (Washington, DC: Government Printing Office, 1882), 6.
17. Edgar T. Ensign, "Report on the Forest Conditions of the Rocky Mountains, Especially in the State of Colorado, the Territories of Idaho, Montana, Wyoming, and New Mexico," in B. E. Fernow, *Report on the Forest Conditions of the Rocky Mountains, and Other Papers*, Department of Agriculture Division of Forestry Bulletin No. 2 (Washington, DC: Government Printing Office, 1888), 77–79.
18. Historical Marker Database, 2013, *Morrison Charcoal Ovens 1882*. Information from historical marker available online at <http://www.hmdb.org/marker.asp?marker=34859>.
19. Martha Sonntag Bradley, *A History of Beaver County* (Salt Lake City: Utah State Historical Society, 1999), 118.
20. Phillip F. Notarianni, "The Frisco Charcoal Kilns," *Utah Historical Quarterly* 50 (Winter 1982): 40–46.
21. Frank Robertson, quoted in the *Desert News*, 8 September 1969, cited in Bradley, *History of Beaver County*, 119. Robertson is the author of *Boom Towns of the Great Basin*.
22. Stephen L. Carr, *The Historical Guide to Utah Ghost Towns* (Salt Lake City: Western Epics), 109–11.
23. B. S. Butler, *Geology and Ore Deposits of the San Francisco and Adjacent Districts, Utah*, United States Geological Survey Professional Paper 80 (Washington, DC: Government Printing Office, 1913), 114.
24. Kerry William Bate, "Iron City, Mormon Mining Town," *Utah Historical Quarterly* 50 (Winter 1982): 47–58.
25. Carr, *Historical Guide to Utah Ghost Towns*, 59.
26. *Ibid.*, 138–42.
27. L. J. Colton, "Early Day Timber Cutting along the Upper Bear River," *Utah Historical Quarterly* 35 (Summer 1967): 202–208.
28. Different sources report different numbers of kilns at Hilliard. Colton, "Early Day Timber Cutting along the Upper Bear River," 207, reported that 32 kilns were located there. However, Elizabeth A. Stone, *Uinta County: Its Place in History* (Laramie, WY: Laramie Printing Company, 1924), 178–81, and Margaret M. Lester, *From Rags to Riches: A History of Hilliard and Bear River, 1890–1990* (Evanston, WY: First Impressions, 1992), 7, both reported 36 kilns.
29. Carr, *Historical Guide to Utah Ghost Towns*, 149–50.
30. Thomas J. Straka and Robert H. Wynn, "History on the Road: Charcoal and Nevada's Early Mining Industry," *Forest History Today* Fall 2008: 63–66.

New from the Forest History Society...

Established in 1908 at the height of the conservation movement by Forest Service Chief Gifford Pinchot, the State and Private Forestry branch was created to help sustain the nation's forests as well as to protect communities and the environment from such things as wildland fires, insects, and disease. One of five branches within the U.S. Forest Service, State and Private Forestry does not manage a land base; rather, it provides expertise, programs, and funds to help other owners conserve and manage their forestlands. It reaches across the national forest boundaries to work cooperatively with other federal agencies, states, tribes, communities, nonprofit organizations, and private landowners. In other words, State and Private Forestry helps support forest management for all.

Forest Service historian Lincoln Bramwell engagingly captures the branch's history, demonstrating why, time and again, State and Private Forestry was able to overcome numerous challenges to its purpose—and at times its existence—to become the federal leader in providing and coordinating technical and financial assistance to landowners and resource managers. In doing so, says Bramwell, State and Private Forestry became indispensable to “the Forest Service’s mission to focus the nation on the value of forest conservation.”



Forest Management for All

State & Private Forestry
in the U.S. Forest Service

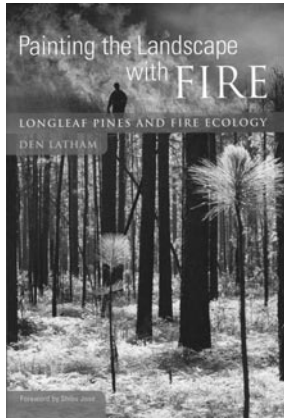
Lincoln Bramwell

\$10.95 paper + shipping and handling
(Discounts for bulk orders)

To order, visit us at
www.ForestHistory.org/publications
or call the Forest History Society
at 919/682-9319

BOOKS AND FILMS OF INTEREST

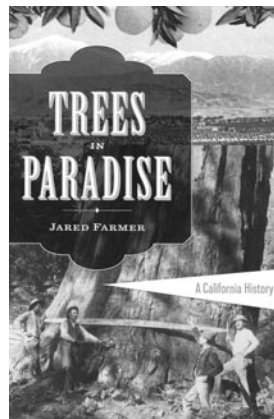
by Eben Lehman and James G. Lewis



Longleaf pine forestland once covered wide swaths of the southeastern United States, but nearly 100 million acres of the original longleaf forest has been lost; today this forest type covers only about three percent of its former range. The importance of managing and conserving the remnants of this ecosystem is the subject of Den Latham's *Painting the Landscape with Fire: Longleaf Pines and Fire Ecology* (University of South Carolina Press, 2013). A nature writer who lives in South Carolina, Latham details the importance of fire—which was militantly suppressed throughout much of the twentieth century—for promoting healthy longleaf pine forests. Without fire, the forests become dominated by thick hardwoods, which destroy the balance of the longleaf ecosystem. Today, low-intensity prescribed burns reduce longleaf's competition, keep an open canopy for sunlight, and maintain native grasses. Quail, wild turkey, and the red-cockaded woodpecker depend on the longleaf forest environment and also benefit from the prescribed burns. Latham reveals all this through fascinating interviews with foresters, fire managers, conservation groups, geologists, and wildlife biologists. They discuss the importance of the species as well as the challenges of working to sustain the long-term health of this ecosystem. Focusing on the Sandhills region of South Carolina, Latham takes the reader alongside fire crews performing prescribed burns, wildlife biologists working to save

endangered species, and many others who spend their days in the longleaf forest. Latham's work showcases the seriousness of promoting the stability of our longleaf forests, as well as the significance of fire in that process. As a whole, the book provides an insightful tour of the longleaf ecosystem, while also demonstrating the value of supporting its conservation and proper management. (EB)

California, well known as a source of fruits, nuts, vegetables, and wine, is also home to some of the world's largest, tallest, and oldest trees. In *Trees in Paradise: A California History* (W. W. Norton and Company, 2013), Jared Farmer explores the creation of this landscape alongside one hundred and fifty years of California's social and political history. Farmer follows the state's growth and development from the start of the gold rush in the mid-nineteenth

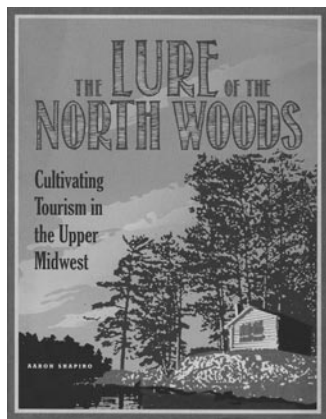


century through the beginning of the twenty-first century. Attracted by California's valuable natural resources, new settlers began to transform the state's natural landscape in significant ways. Rivers were dammed, swamps were drained, and most significantly, new plant species were introduced. Some trees that eventually became icons of California—citrus, eucalyptus, and palm—are actually nonnative species. The book is organized into four parts, each of which pairs a tree type with “a cluster of ideas and a facet of the

California Dream.” Part One looks at the state's giant sequoias and redwoods, which were clearcut by logging companies and later became the battleground for environmental showdowns. Part Two is devoted to eucalyptus trees, which were originally imported from Australasia, and explores the “themes of immigration, naturalization, nativeness, and alienness”: like the humans who brought them, eucalypts are either “naturalized” trees or invasives, depending on whom you ask. Part Three is about citrus, which offers a chance to discuss labor and the agricultural economy in the nation's most populous and urbanized state. Part Four looks at palms and their use as ornamental additions to California's built environment and as a symbol of the state itself. The study of each tree provides a new perspective on the history of the state and how human-altered landscapes created a place viewed as an almost mythical land. Farmer also shows the importance of interactions to the study of California as a place—the interactions between native and nonnative species, between domesticated nature and the wild, between settlers and a new landscape, and all the associated biocultural exchanges that helped turn California into an American symbol of paradise. (EB)

At the turn of the twentieth century, much of northern Minnesota, northern Wisconsin, and Michigan's Upper Peninsula had been deforested by massive logging operations and further stripped of natural resources by mining companies. Unsuitable for agriculture, the Upper Midwest region instead turned to tourism as a means of economic revitalization. This shift in focus is the subject of *The Lure of the North Woods: Cultivating Tourism in the Upper Midwest* (University of Minnesota Press, 2013), by Aaron Shapiro. The book demonstrates how local and state governments, along with federal agencies, partnered with private interests to promote tourism to the North Woods over the first half of the twentieth century. The terms

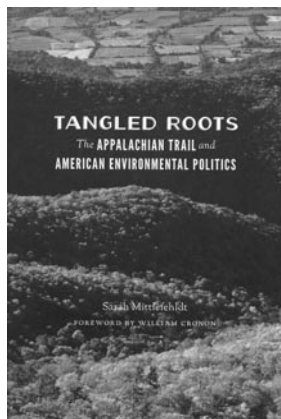
by which we determined the worth of forestland were also significantly altered during this period. Americans came to view nature as a place of leisure rather than a physical commodity because of the promotion of sound forest conservation principles that also allowed for human use. The U.S. Forest Service began to adopt new land-use policies that integrated recreation into forest management strategy. Thanks to the influence of men such as Arthur Carhart, the agency worked to achieve compromises between industry and recreation interests. These compromises helped ensure the preservation of the aesthetic qualities of forest landscapes, which in turn created an opportunity for tourist development. Shapiro looks at how these developments began to shape the North Woods as a true tourist destination.



He documents the creation of tourist facilities, the people who began vacationing in the area, and the way the region was portrayed in promotional materials. Accompanying the text are numerous historical photographs and illustrations of families on vacation, outdoor recreational activities, and examples of promotional imagery. The story of how tourism altered the natural environment is also the story of a unique set of partnerships—how local, state, and federal governments, tourist boosters, hunters and anglers, wilderness advocates, conservationists, and many others all came together to shape the future of the North Woods. (EB)

Another example of the wedding of conservation and outdoor recreation in America is the Appalachian Trail. Stretching more than 2,000 miles from Georgia to Maine, the trail has demonstrated its enduring power: each year, millions of people walk at least a small part of it. The trail's location, close to the East Coast's

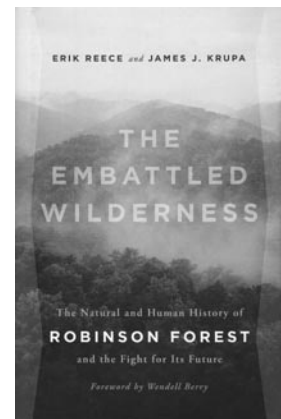
many densely populated areas, provides people a convenient retreat into a wilderness environment. How this trail came to be is the subject of Sarah Mittlefehldt's *Tangled Roots: The Appalachian Trail and American Environmental Politics* (University of Washington Press, 2013). The trail began as the vision of Benton MacKay, a forester and wilderness advocate, and local hiking groups in the 1920s and 1930s. Organized under the Appalachian Trail Conference, these local groups eventually created a continuous trail, built shelters, and published maps and guidebooks. There were struggles along the way, though. Mittlefehldt explores the sometimes contentious dynamics between rural residents and urban-based hiking enthusiasts. As interest in outdoor recreation exploded during the second half of the



twentieth century, use of the Appalachian Trail skyrocketed. The trail was eventually brought under federal protection in 1968 with the National Trails System Act, which placed it under the National Park Service. This brought new controversies over the reach of the federal government; eventually the Appalachian Trail Conservancy took over its management. Mittlefehldt's narrative deals with many important themes of twentieth-century American environmental politics, including issues relating to public-private partnerships, controversies over federal power, land management strategies, and the effects of growth on outdoor recreation. The book also reveals the collaborations that have made the trail a long-term success story. Local grassroots work by volunteers and nonprofit organizations combined with government protection have helped secure the Appalachian Trail and its corridor. Mittlefehldt brings first-hand knowledge to the subject: as part of her research she made a thru-hike in 2007, and her trail

experience informs an already engaging narrative. (EB)

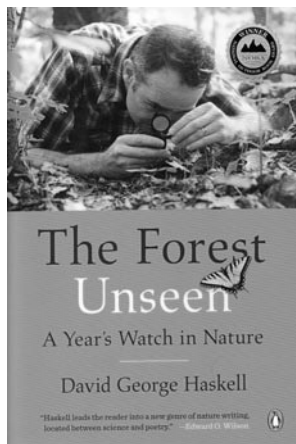
Nearly a century ago, a large tract of logged-over land was donated to the University of Kentucky to be used for the "practical demonstration of reforestation" and "the betterment of the people of the mountain region of Kentucky." The natural and human history of this landscape is the subject of *The Embattled Wilderness: The Natural and Human History of Robison Forest and the Fight for Its Future* (University of Georgia Press, 2013), by Erik Reece and James J. Krupa. The authors, both professors at the University of Kentucky, provide a concise history of the forest ecosystem of southeastern Kentucky. They alternate chapters: Krupa focuses on the geological and ecological history of the area, and



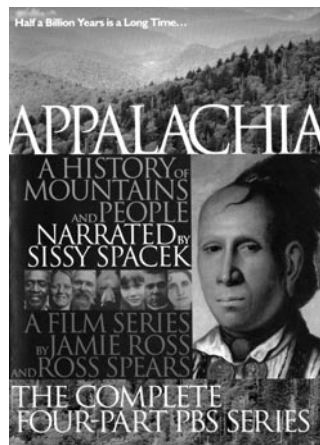
Reece details the forest's human history, from early settlers of the late eighteenth century to the present day. The human imprint on the landscape includes logging by the Mowbray and Robinson Company of Cincinnati, which hauled out 100,000 board feet of timber a day during the 1910s and had virtually cleared the terrain of trees by the early 1920s. Having no further use for the land, the company gave it to the University of Kentucky, with the stipulation that it be used as a practical demonstration of reforestation. As the forest grew back over the twentieth century, the landscape became one of the most biologically diverse in North America. More recently, though, the university sold mineral rights to portions of the forest, allowing areas to be clearcut for coal-mining operations. Lush forest areas now stand surrounded by areas made barren by strip-mining. Krupa and Reece reveal the environmental consequences of these operations while stressing the importance of maintaining distinct research forests like the Robison. This

discussion also provides insight on how we define the value of forests. Although places like the Robinson Forest certainly have economic value in terms of their natural resources, they are also outdoor classrooms that offer invaluable knowledge on forest ecosystems to students and researchers. (EB)

Southwest of the University of Kentucky's Robinson Forest, in a forest owned by the University of the South in Tennessee, biology professor David George Haskell decided to establish a mandala—a circle about the size of a hula hoop, enclosing one square meter—in an old-growth forest and study the spot almost daily for one year. What this otherwise nondescript piece of land revealed to him, and what he shares with us, is elegantly captured in *The Forest Unseen: A Year's Watch in Nature* (Viking Press, 2012). Though the geographic scale is small and intimate, Haskell's perspective and observations in many ways are global and universal. In addition to being a biologist, Haskell is a published poet, and he applies a poet's insights and sensibilities whether he is talking about the life of a salamander or the place of the chainsaw in forest manage-



ment. Haskell structured the book somewhat like Aldo Leopold's *A Sand County Almanac*, though instead of a chapter for each month, he divides the year into days (with 43 chapters in all). Most chapters use the natural history of an animal or plant as a departure point for a discussion of larger issues like forest ecosystem health; others directly address human presence and consequences for the forest and natural world. The author's observations and reflections lead him to ask questions for all to contemplate. (JL)



The Appalachian region is the subject of a four-part environmental history series produced for PBS. *Appalachia: A History of Mountains and People* (Agee Films, 2009) weaves together human history and natural history to tell the story of the planet's oldest mountain range and its many inhabitants since the beginning of time. Historians, foresters, novelists, biologists, geologists, and others share their understanding and knowledge of America's first colonial frontier, which in many ways and places remains a colony, with its people and natural resources exploited for the benefit of remote landowners nearly 500 years after the first Europeans visited the region looking for gold. The history of the land and its occupants—and the ever-changing relationship between the two—is complex, and the series does not shy away from delving into those complexities, whether it is the geological history of how the mountain chain was formed or how white settlers went from being romanticized and revered to pitied and mocked in the span of a few short decades. This very thorough treatment is suitable for all regardless of their connection to the region because its recurring themes of conquest and development can be found in the history of so many places. With its four one-hour segments and the online educational component that is being developed, this film should be of particular interest and use for educators. (JL)

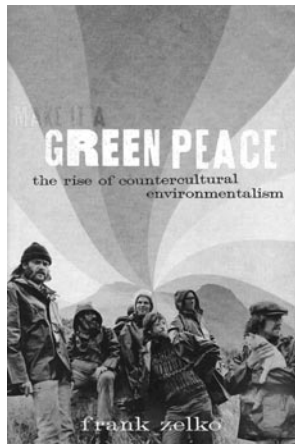
During President Richard Nixon's administration, the federal government's approach to the environment dramatically shifted: the Environmental Protection Agency was created, and landmark legislation—including the National Environmental Policy Act, the Clean Air Act, and the Endangered Species Act—was passed. Although Nixon's motives were mainly

political, his actions were influenced by strong public sentiment for environmental protection. Instead of forging a partnership between the Republican Party and environmental advocates, however, the new regulations ultimately mobilized industry and politically conservative groups against further government action. In *Open for Business: Conservatives' Opposition to Environmental Regulation* (MIT Press, 2012), Judith A. Layzer traces the history of how business and conservative interests have fought the expansion of government regulations in areas such as pollution control and the conservation of natural resources from the 1970s to today. By highlighting the economic costs of environmental regulation, they have



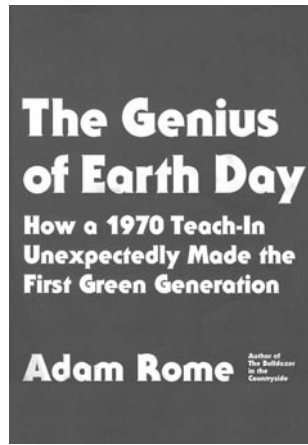
turned environmentalism into a controversial issue for the American public. Layzer's work is organized chronologically, with individual chapters on the administrations of Ronald Reagan, George H. W. Bush, Bill Clinton, and George W. Bush. The political treatment of acid rain and climate change are examined, as are changes in media that have helped bolster a committed conservative constituency nationwide. Although the environmental framework set under Nixon remains in place, Layzer argues that conservative political forces have succeeded in relaxing enforcement and limiting expansion of regulations while changing the terms of the national debate over the environment. Overall, Layzer's work is an essential read for those interested in environmental issues and contemporary politics. (EB)

One of the leading environmental groups that conservatives loathe is the subject of *Make It a Green Peace! The Rise of Counter-cultural Environmentalism* (Oxford, 2013),



by Frank Zelko. This well-researched narrative is the first objective history of Greenpeace, which began as a small group of activists and grew into one of the most famous—or infamous—environmental advocacy groups in the world. Zelko places the formation of Greenpeace within the context of 1960s counterculture and the peace movement, documenting the young organization’s radicalism and direct-action campaigns. During the early 1970s this included acting as human shields to protect seals in Newfoundland and harassing Soviet whaling boats off the coast of California. The aggressive confrontational style resonated with the era’s counterculture ethos, especially in Vancouver, British Columbia, the organization’s early base of operations. Ironically, an organization that traced its roots to the counterculture movement acquired a more corporate structure in the 1980s. But Greenpeace also transformed the existing framework of environmental protest, using direct action to cast activities like whaling and sealing as morally reprehensible acts. As the group grew into a global force, the scope of its actions increased. One campaign was against French nuclear testing in the South Pacific, which required coordinated work among activists from many different countries. Zelko does not shy from discussing conflicts within the group over certain direct-action approaches. Although the influence of the peace movement on the organization’s founders is undeniable—they came from a pacifist Quaker tradition—questionable actions by members began to push the boundaries of what was an acceptable form of protest. (EB)

The rising environmental consciousness that led to the establishment of Greenpeace, as well as the conservative backlash documented in *Open for Business*, first



emerged on a national scale in 1970, when Americans held the first Earth Day. Most people today know it as an annual event to celebrate environmental protection, but few know the full story of the event’s origin and influence. Now they can, through Adam Rome’s *The Genius of Earth Day: How a 1970 Teach-In Unexpectedly Made the First Green Generation* (Hill and Wang, 2013). Characterizing Earth Day as “the most famous little-known event in modern American history,” Rome sheds new historical light on the event by looking at its role in building an organizational structure for future environmental activism. Earth Day 1970 inspired an entire generation of activists who went on to forge, shape, or influence environmental policy over the coming decades. In his study, Rome looks beyond Gaylord Nelson, the Wisconsin senator whose call to action led to the first Earth Day, and documents the work of the numerous organizers who planned and executed the various events throughout the country. These events—teach-ins, demonstrations, parades, concerts—differed from place to place in their size and scope. At the University of Michigan, thousands packed the basketball arena for a kickoff to an environmental teach-in. In New York City, a stretch of Fifth Avenue was closed to traffic to help New Yorkers imagine a city without automobiles. Though the effort was decentralized, the sheer number of events and participants made Earth Day a powerful national force and served to create a new framework for environmental leadership in cities throughout the country. (EB)

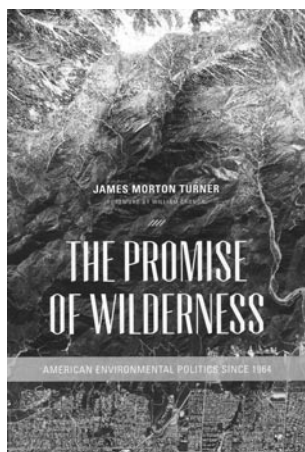
The first Earth Day succeeded in part because momentum for action had been building throughout the 1960s. Early in the decade, for example, in Milford, Pennsylvania, President John F. Kennedy



dedicated the Pinchot Institute for Conservation Studies at Grey Towers, the family home of Gifford Pinchot, the first chief of the U.S. Forest Service. Pinchot’s son donated the home and surrounding property to the agency his father once oversaw to serve as the institute’s headquarters and a meeting place for research and collaboration on the ethical and efficient management of America’s natural resources. The intertwined history of the landscape and the institute that bears his name is the subject of historian and Pinchot biographer Char Miller in *Seeking the Greatest Good: The Conservation Legacy of Gifford Pinchot* (University of Pittsburgh Press, 2013). Miller details the events surrounding the institute’s creation in 1963, amid an emerging environmental consciousness. The Pinchot Institute began as a partnership between the Forest Service and the Conservation Foundation, a New York City–based outfit dedicated to research and study of natural resources management with a conservation emphasis. Things changed, though, after the Conservation Foundation moved to Washington and ended its collaboration, and federal funding issues threatened the institute’s survival. This ultimately led to new collaborations and a sharpened focus as the institute’s policymakers turned their attention to more modern and relevant issues—and in 1995 dropped the word “studies” from its name to reflect the shift to more practical work and its reconstituting as an independent nonprofit corporation. The institute has focused on watershed protection, environmental health, air and water pollution, hydraulic fracking, and international forest management, among other topics. Through all the challenges the Pinchot Institute has faced, it has continued to honor Pinchot’s legacy by producing

publications and pursuing projects that promote management of the American environment for its use by future generations. Miller's lively writing style makes for an effortless read and provides new insight into the evolution of modern environmental policy debates. (EB)

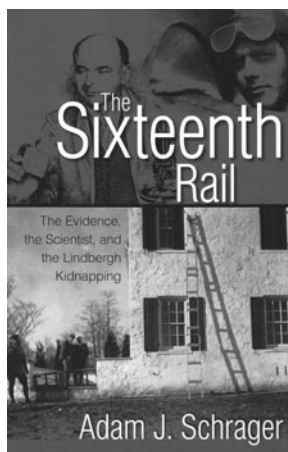
Since the passage of the Wilderness Act of 1964, the total size of designated wilderness areas in the United States has grown dramatically, to well over 100 million acres, and wilderness issues have remained at the forefront of American environmental and political debates. The history of the modern wilderness protection movement can



be found in James Morton Turner's *The Promise of Wilderness: American Environmental Politics Since 1964* (University of Washington Press, 2012), the 2012 winner of the Charles A. Weyerhaeuser Book Award. Turner writes that "wilderness is not simply a place or an idea; it is also a political process," and his narrative weaves through the political changes following the Wilderness Act's passage. Wilderness protection initially benefited from bipartisan legislative support but became an increasingly polarizing political topic beginning in the 1970s. Alaska was a focal point of environmental politics, with battles over the Tongass National Forest and the Arctic National Wildlife Refuge, as well as debates over roadless areas in national forests and the use of Bureau of Land Management lands. Later debates addressed logging and grazing reform and the protection of the northern spotted owl. Despite the clashes of environmentalists with officials over local issues, Turner emphasizes the pragmatic approach of successful wilderness advocates, such as the Wilderness Society. Through negotiation and compromise, the wilderness system has continued to

grow over the past 50 years. Wilderness and public land policy have remained central to American environmental discourse: no other issue has remained so relevant to environmental politics. Well researched and thorough, the book provides the definitive account of the modern wilderness protection movement in America. This is a must-read for those interested not just in environmental history but also in American political history over the second half of the twentieth century. (EB)

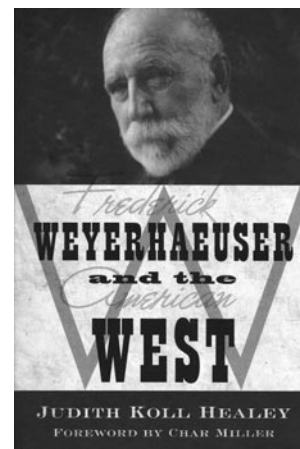
On the evening of March 1, 1932, world-famous aviator Charles Lindbergh's infant son was kidnapped from his home in New



Jersey. The investigation that followed became one of the most well-publicized crime stories of the century. Ultimately, Bruno Richard Hauptmann was convicted of the crime, based in large part on forensic work done on the wooden ladder left at the scene of the crime. This fascinating investigation is the focus of Adam J. Schrage's new book, *The Sixteenth Rail: The Evidence, the Scientist, and the Lindbergh Kidnapping* (Fulcrum, 2013). The central figure in Schrage's narrative is Arthur Koehler, who at the time of the kidnapping was a wood identification expert at the U.S. Forest Service's Forest Products Laboratory in Madison, Wisconsin. Through detailed analysis worthy of an episode of *CSI*, Koehler traced the wood to its source and ultimately matched one of the ladder rungs with a board in Hauptmann's attic. Schrage details this groundbreaking wood forensic work, revealing the crucial role Koehler played in the investigation and conviction of Hauptmann. Koehler's work also was important to the future of forensic science. Overall, Schrage provides an engrossing retelling of the investigation by Koehler

and the trail leading to Hauptmann. If this story seems familiar, you may have read "CSI Madison, Wisconsin: Wooden Witness," by Amanda Ross, on the Forest History Society's blog *Peeling Back the Bark*. The post provides a nice overview of the investigation and offers links to primary documents; it is online at <http://fhs.archives.wordpress.com/2009/03/31/csi-madison-wisconsin-wooden-witness>. Ross's post, which Schrage cites as a source, was later adapted for the Spring/Fall 2010 issue of *Forest History Today*. (EB)

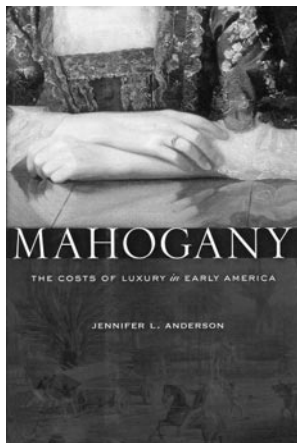
Many know the name Weyerhaeuser, but few know the full story of the man who



founded what is still one of the world's largest forest products companies. In her new biography, *Frederick Weyerhaeuser and the American West* (Minnesota Historical Society Press, 2013), Judith Koll Healey provides a detailed look at one of the pre-eminent industrial titans of the late nineteenth and early twentieth centuries. Frederick Weyerhaeuser arrived in the United States as an eighteen-year-old German immigrant in the decade before the Civil War. He worked various jobs before finding his true calling at a sawmill in Rock Island, Illinois. From there a combination of hard work, shrewd partnerships, and farsighted decision making led to success. Weyerhaeuser began operating his own mill, expanding into the timberlands of Wisconsin and Minnesota before ultimately purchasing 900,000 acres of land in Washington State for just \$5.4 million. Healey's book is more than a business history. Painting a full portrait, she emphasizes the importance of family to Frederick Weyerhaeuser and describes his relationships with his wife, Sarah, and his children and grandchildren. She also provides insight into his eventual commitment to

conservation in the interest of securing a reliable timber supply for the long term. Making use of newly available personal papers from the Weyerhaeuser family archives, the book is accompanied by transcripts of correspondence between Frederick Weyerhaeuser and friends, business associates, and family members. Overall, Healey produces a fascinating tale of a man who not only grew his own fortune but also helped grow an industrializing, expanding country. (EB)

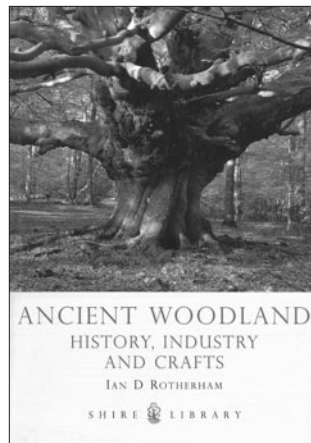
At the peak of its use in the mid-eighteenth century, mahogany wood could be found in the fashionable furniture of homes



throughout colonial America. In addition to furniture, mahogany was used for other artisan works and for more practical things like shipbuilding and construction. The wood's unique physical and aesthetic properties sent demand skyrocketing over the eighteenth century, resulting in a scarcity of mahogany from the Caribbean and Central America a century later. The rise and decline of the mahogany trade in the Americas is detailed in Jennifer L. Anderson's *Mahogany: The Costs of Luxury in Early America* (Harvard University Press, 2012). Unlike other tropical commodities, such as sugar, coffee, or bananas, mahogany does not grow well outside its natural environment: it could not be cultivated in agricultural plantations to meet the demand. The international mahogany trade had detrimental consequences for the Caribbean islands of Jamaica, Cuba, the Bahamas, and Hispaniola, as well as parts of Central and South America, causing environmental degradation from deforestation while taking an enormous social toll because of its connections with slave labor. Anderson explicates the interwoven threads of the mahogany wood marketplace, look-

ing at the relationships among colonialism, slave labor, and a limited natural resource and showing how consumer demand for a luxury product in North America and Europe permanently shaped the social, culture, and environmental character of foreign lands. (EB)

The woodlands of Great Britain are true cultural landscapes, shaped by thousands of years of natural and human history. The story behind the formation of these unique landscapes is told in Ian Rotherham's *Ancient Woodland: History, Industry and Crafts* (Shire Publications, 2013). Rotherham writes that "to walk through an



ancient wood is to tread in the footsteps of the ghosts of those who once lived and worked in the medieval and early industrial countryside." His history of the wood pasture tradition in Britain touches on royal forests, wooded commons, and deer parks. He looks at how extractive industries and the local harvesting of woodland products defined these landscapes over time. He examines not only the places themselves but also the people who lived in and directly interacted with these parks, forests, commons, and coppice woods. These ancient forests are full of fascinating human history. Rotherham writes, "If trees have survived from centuries past, then they surely tell a story of woodland origins and management traditions." Only 60 pages long and heavily illustrated, *Ancient Woodland* provides an excellent overview of the historical uses of wood for building materials, charcoal manufacturing, wood-bark tanning, and other industries. Small-scale crafts, such as the making of baskets and brooms, are also examined. (EB)

Also from Britain comes the Botanical Series, published by Reaktion Books. Each

entry in this impressive series combines the latest scholarship in horticulture and botany with cultural and social histories of trees, flowers, and plants to offer a natural history of each species. Titles about trees include *Oak* (Peter Young), *Pine* (Laura Mason), *Yew* (Fred Hageneder), *Bamboo* (Susanne Lucas), and *Willow* (Alison Syme); other titles include *Geranium*, *Lily*, and *Grasses*. The authors come from varied backgrounds: Young is an independent scholar who has written for Reaktion's Animal Series; Mason has published on food history and culture; Lucas is executive director of the World Bamboo Organization and a horticulturalist and landscape gardener;



Hageneder has written extensively on the natural and cultural history of trees; and Syme teaches in the Departments of Art and Visual Studies at the University of Toronto. Each brings a fresh perspective to the topic and makes the subject matter accessible and a pleasure to read. The format of each book is the same: after examining the species' natural history in a global context, the author then traces its cultural history from ancient times to the present before discussing current environmental conditions and threats. Each book is sumptuously illustrated with about 100 images (usually an even split between photographs and drawings) packed into about 200 pages. One wishes the books were in a large format so that the lush color photos would have the room they deserve, but the six-by-nine-inch size helps keep the hardcover edition affordable, at \$27. Each book contains a handy history timeline and list of additional readings in the back. More than the handful of listings on the "Associations and Websites" page would be helpful and welcomed, however. Minor quibbles aside, the books are informative and ideal for classroom use. (JL) □

From the Forest History Society...

The story of the forests in Southeast Alaska mirrors human interest in economic development. The forests were utilized primarily to meet local needs by natives and early white settlers. As the commercial fishing industry grew, they used logs and lumber for salmon cases, fish traps, and piling. High-quality Sitka spruce logs supported the manufacture of airplanes during World War II and eventually round logs were marketed overseas.

But it was the indefatigable pursuit of a pulp and paper industry in Southeast Alaska during the 20th century that led to high-intensity logging and controversy over such utilization. The establishment of wood pulp mills beginning in 1954 in Ketchikan and then Sitka, and lasting more than four decades, exposed the environmental and economic limitations of an integrated wood products industry in Alaska.

Tongass Timber traces the history of these efforts, their motivations, and resulting impacts. It is the human story behind the economics. This background reveals the forces that influence the present choices about forest management in Southeast Alaska.

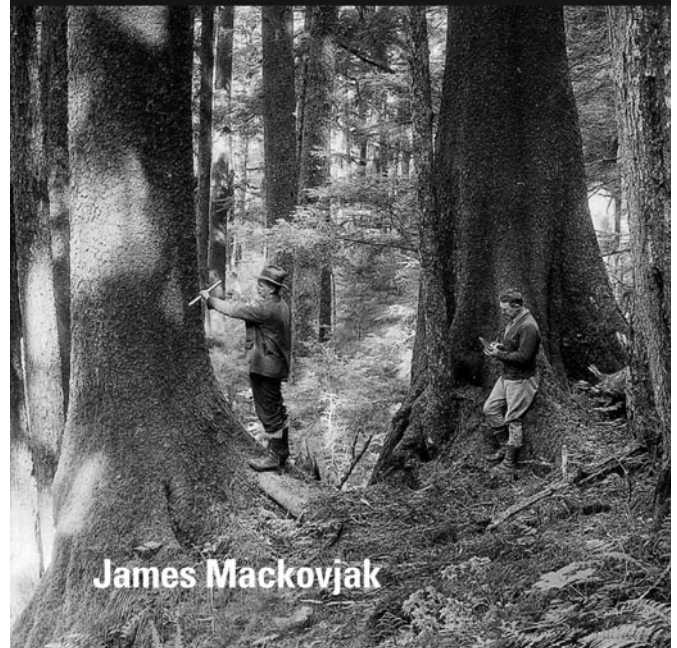
Soft cover; 386 pages; 77 photos/figures
ISBN-13: 978-0-89030-074-9
\$19.95 + shipping and handling



To order, contact the Forest History Society
at 919/682-9319, or order online
at www.foresthistory.org.

TONGASS TIMBER

A History of Logging & Timber Utilization in Southeast Alaska



James Mackovjak

“This book’s saga is a fascinating case study of the dynamics of change in this bit of the real world.... If this book had been available when I started my work in and about Alaska, it would have been a much-used reference kept close at hand.”

—George Rogers, advisor to five Alaska governors

MARK YOUR CALENDAR

FOREST HISTORY SOCIETY BOARD OF DIRECTORS MEETING

October 25–26, 2013. Alexandria, LA.
Contact: Steven Anderson at stevena@duke.edu or
919-682-9319.

LYNN W. DAY DISTINGUISHED LECTURESHIP 2013

November 7, 2013. Durham, NC. Speaker: Dr. David Cleaves,
Climate Change Adviser to the Chief of the U.S. Forest
Service. Co-sponsored by the Forest History Society.
Information at: www.foresthistory.org/Events/lecture.html.
Contact: Jamie Lewis at jglewis@duke.edu.

ASSOCIATION FOR CANADIAN STUDIES IN THE UNITED STATES

November 19–23, 2013. Tampa, FL. Theme: Canada in the
Hemisphere. Information at: acsus.org/display.cfm?id=386.

FOREST HISTORY SOCIETY OF ONTARIO

February 20, 2014. Alliston, Ontario. Annual meeting.
Contact: jessicak@oforest.ca.

AMERICAN SOCIETY FOR ENVIRONMENTAL HISTORY

March 13–16, 2014. San Francisco, CA. Annual meeting.
Theme: Crossing Divides. Information at: [aseh.net/
conference-workshops/2014-conference-san-francisco](http://aseh.net/conference-workshops/2014-conference-san-francisco).
Contact: Lisa Mighetto at director@aseh.edu.

FOREST HISTORY ASSOCIATION OF ALBERTA

March 19, 2014. Edmonton, Alberta. Annual meeting.
Information at: <http://albertaforesthistory.ca/>.

NATIONAL COUNCIL ON PUBLIC HISTORY

March 19–22, 2014. Monterey, CA. Annual meeting.
Theme: Sustainable Public History. Information
at: ncph.org/cms/conferences/2014-annual-meeting.

FOREST HISTORY SOCIETY BOARD OF DIRECTORS MEETING

April 25–26, 2014. Durham, NC. Contact: Steven Anderson at
stevena@duke.edu or 919-682-9319.

WORLD CONGRESS OF ENVIRONMENTAL HISTORY

July 7–14, 2014. Guimarães, Portugal.
Theme: Environmental History in the Making.
Information at: www.wceh2014.ecum.uminho.pt/.

FOREST PRODUCTS SOCIETY

August 1–12, 2014. Quebec City, Quebec, Canada.
International convention. Information at:
www.forestprod.org/ic/about.php.

IUFRO WORLD CONGRESS

October 5–11, 2014. Salt Lake City, UT. Theme: Sustaining
Forests, Sustaining People: The Role of Research.
Information at: www.iufro2014.com.

SOCIETY OF AMERICAN FORESTERS

October 5–11, 2014. Salt Lake City, UT. Partnering with the
Canadian Institute of Forestry / l'Institut forestier du Canada
(CIF/IFC), co-located with IUFRO World Congress.
Information at: www.xcdsystem.com/saf/site14/.

WILDERNESS 50

October 15–19, 2014. Albuquerque, NM. Celebrating 50 Years
of American Wilderness—National Wilderness Conference.
www.wilderness50th.org/index.php. See website for other
events around the country.

WESTERN HISTORY ASSOCIATION

October 15–18, 2014. Newport Beach, CA. Information at:
westernhistoryassociation.wildapricot.org/conferences.

LYNN W. DAY DISTINGUISHED LECTURESHIP 2014

November 2014. Durham, NC. Co-sponsored by the Forest
History Society. Information at: [www.foresthistory.org/
Events/lecture.html](http://www.foresthistory.org/Events/lecture.html). Contact: Jamie Lewis at
jglewis@duke.edu.

AMERICAN SOCIETY FOR ENVIRONMENTAL HISTORY

March 18–22, 2015. Washington, DC. Annual meeting.
Theme: Turning Protest Into Policy: Environmental Values
and Governance in Changing Societies. Information at:
<http://aseh.net/conference-workshops/dc-conference-2015>.
Contact: Lisa Mighetto at director@aseh.edu.

WESTERN HISTORY ASSOCIATION

October 21–24, 2015. Portland, OR. Information
at: westernhistoryassociation.wildapricot.org/conferences.

AMERICAN SOCIETY FOR ENVIRONMENTAL HISTORY

March 29–April 3, 2016. Seattle, WA. Information at:
aseh.net/conference-workshops/2016-conference-seattle.
Contact: Lisa Mighetto at director@aseh.edu.

*For the latest listings, please visit our “Conferences” page at:
www.foresthistory.org/Events/conferences.html.*

ANNUAL REPORT 2013

From the Chair

Hayes Brown

I would like to express my appreciation to the FHS board of directors for electing me to serve as its chair. I trained as a forester but have practiced law in Birmingham, Alabama, for 28 years. During my career as an attorney, I have been privileged to handle some of the most important issues that my clients face, and I will bring the same sense of responsibility to my term as chair. I approach my term aware of the great opportunities that lay before us, honored to lead the board as we deal with many challenges.

Many years ago, I was introduced to the Forest History Society through Doug MacCleery's book *American Forests: A History of Resiliency and Recovery*, part of our Issues Series. It put into words what I thought I knew but couldn't articulate at the time. Now full of annotations, underlining, and notes, I've kept it nearby on a shelf in my office ever since. Reading it was when I first knew that FHS had something special to offer. What I have learned about the Society since then has confirmed that initial impression and only served to convince me further that the Society plays a vital role in preserving the story of human interaction with the environment.

In my first year as a board member, during a tour of the Alvin J. Huss Archives, FHS librarian Cheryl Oakes showed me a lantern slide of a scene depicting logging practices in the 1800s. Next to that was a floppy disk. Next to that was a magnetic tape recording. Next to that was a handwritten letter. Next to that was a black-and-white photograph.

Today the explosion of new media threatens to overwhelm the resources of companies, agencies, and individuals, each faced with the responsibility to house their records. Yet the challenges are the same as the day the Society was established in 1946: These records will one day be the only account of their organization's imprint on the forest and the environment. Who will bear the responsibility to maintain these records in a professional manner?



Will these records be available to be reviewed by scholars and others interested in accurately telling the story of forest and environmental history? After nearly 70 years, the answer is still the same. The Forest History Society is who the forest and conservation community turns to for protecting these materials and has a long track record of making them available for visiting scholars, researchers, and other interested parties. If the Society did not fulfill this vital role, many of these valuable records would be lost forever.

Critical to fulfilling that role is making sure our physical plant will be able to serve the needs of the forest and conservation community and researchers who study it for many years to come.

But our current facility cannot meet our future space requirements. So, in order to be prepared for the responsibilities that lay before us, the board of directors has voted to proceed with plans to secure a new facility to meet the needs of the Society. I hope we can count on you to join us in making this ambitious goal a reality.

To our good fortune, outgoing board chair Michael Kelly has agreed to remain involved by filling the vital role as chair of the Campaign Planning Committee, a role that will utilize his many talents. All of us owe a great debt of gratitude to Michael for his able leadership from 2010 to 2013. By approaching every matter with conscientiousness, Michael brought a sense of professionalism and active involvement that brought out the best in everyone. This will serve him well in his new role, and it is a standard I hope to maintain.

Please consider how your life has been enriched by an understanding of forest history. Then, resolve to help further the goals of the Society by helping us financially and in other ways. Your support is essential to fulfilling the need to preserve forest history. Please feel free to contact me at hbrown@hayesbrown.com with any of your thoughts and suggestions. □

TREASURER'S REPORT

The Forest History Society continues its mission to preserve and help people use the documents of forest and conservation history with professional dedication and effectiveness. The Society's board of directors and staff have worked hard to maintain the accomplishment of our mission in the midst of significant challenges in donor and financial markets during fiscal year July 1, 2012, through June 30, 2013.

Net assets at June 30, 2013, increased to \$7,735,418 from \$7,215,827 for the previous year end. This is an increase of \$519,591, generally attributable to an increase in the value of investments which have been affected by general market increases during this period. During the fiscal year, the board's investment strategy was continued at 70 percent equities and 30 percent fixed income and real estate investments. Cash and cash equivalents decreased to \$240,551 from the prior year's balance of \$310,897, a decrease of \$70,346. The Society's investment advisor is Bernstein Global Wealth Management.

For the year ended June 30, 2013, the Society's auditors, Koontz, Wooten & Haywood, LLP, expressed an unqualified opinion on the financial statements, which they stated present fairly the financial position of the Society in conformity with accounting principles generally accepted in the United States. The complete financial



Henry I. Barclay

statements, along with our federal Form 990, are available for review in the offices of the FHS by appointment during normal business hours.

Since its fiscal year ended, the Society's financial footing has improved (as a result of the improving financial markets), the Society is debt free, and owns its facilities. The Society's offices were affected by a fire in the fall that has disrupted the operating environment. While the Society anticipates that its costs in restoring its operating facility and operations back to normal will be substantially covered by insurance, some additional expenses or capital costs may be incurred in this process.

The board is focusing, among other matters, on growing the membership and donor base of the Society as well as creating improvements to storage, availability, and accessibility of the Society's rich archival collections. The continued success of the annual fund and other fundraising efforts has strengthened our ability to focus on our core missions with due attention to emerging priorities. As a unique organization in the forest and conservation community, we are strategically positioned for success and a bright future of contributions to FHS members and societal concerns. □

FOREST HISTORY SOCIETY, INC.

Statement of Financial Position ■ June 30, 2013 (with comparative totals from 2012)

Assets	June 30, 2013	June 30, 2012
CURRENT ASSETS		
Cash	\$ 240,551	\$ 310,897
Accounts receivable	70,691	14,421
Pledges receivable	7,115	57,246
Inventory	26,600	22,289
Prepaid expense and deposits	40,716	38,814
Total current assets	385,673	443,667
INVESTMENTS	7,331,409	6,704,408
PLEDGES RECEIVABLE DUE AFTER ONE YEAR		490
LAND, BUILDING & EQUIPMENT, NET OF DEPRECIATION	100,254	110,714
TOTAL ASSETS	\$ 7,817,336	\$ 7,259,279
Liabilities & Net Assets		
CURRENT LIABILITIES		
Accounts payable	\$ 44,630	\$ 6,261
Accrued expense and withholding	37,288	37,191
Total current liabilities	81,918	43,452
NET ASSETS		
Unrestricted		
Undesignated	210,847	258,066
Designated—operations	124,697	125,990
Endowment earnings (losses)	(100,256)	(161,771)
Building and equipment	110,253	115,670
Total unrestricted	345,541	337,955
Temporarily restricted		
Operations	89,252	96,949
Endowment earnings	908,302	398,610
Total temporarily restricted	997,554	495,559
Permanently restricted—endowment	6,392,323	6,382,313
Total net assets	7,735,418	7,215,827
TOTAL LIABILITIES & NET ASSETS	\$ 7,817,336	\$ 7,259,279

Contributions and Project Sponsors

Thank you for generously supporting the Forest History Society!

THIS LIST INCLUDES GIFTS FROM JULY 2012 THROUGH JUNE 2013

INDIVIDUALS

\$10,000 and up

Mrs. Frederick W. Davis
Frederick K.W. Day
Vivian W. Day
Lucy Rosenberry Jones
Mrs. Sharlene Nelson
Mr. & Mrs. Edward W. Phares
Stanley Timblin
George H. Weyerhaeuser Sr.
Penelope P. Wilson

\$5,000 to \$9,999

Hayes D. Brown
Stan Day Jr.
Frank A. Dottori
J. Carter Fox
Kent Gilges
L. Michael Kelly
Robert Sivertsen
Robert M. Weyerhaeuser
W. T. Weyerhaeuser

\$2,500 to \$4,999

Henry I. Barclay III
Carrie Farmer
A. J. Huss, Jr.
Peter Stein and Lisa Kashdan
Michael Anthony Melchioris
Bond Starker
Larry W. Tombaugh
R. Scott Wallinger
Mark Wilde
Ed Wilson

\$1,000 to \$2,499

Steven & Diane Anderson
Patty Bedient
Tom Birdzell
Mrs. Susan Bonsall
Arthur W. Cooper
Thomas Dunlap
Elise R. Donohue
Kenneth Fisher
Kent Gilges
William H. Greer Jr.
Dwight Harrigan
Joy N. Hodges
Douglas Hutton
Charles E. Klumb
L. Keville Larson
Douglas W. MacCleery
Stuart McCampbell

Kathleen McGoldrick
Peter Mertz
Susan Ferriers Moore
Robert J. Olszewski
Nicole W. Piasecki
Dick L. Porterfield
Kurt S. Pregitzer
Robert H. Rumpf
Charles M. Tarver
Richard Tucker
Charles A. Weyerhaeuser
F. J. (Rick) Weyerhaeuser
F. T. Weyerhaeuser

\$500 to \$999

Charles W. Bingham
Terry S. Collins
Joann Cox
W. Neil Crosby
William L. Driscoll
James Fickle
Donald W. Floyd
Betsy Jewett and Rick Gill
John P. McMahon
Jeffrey Stine
James T. Tweedie
Henry Weyerhaeuser

\$250 to \$499

Douglas C. Allen
David Andres
Kenneth Armson
Lowell E. Baier
Bill Baughman
Marvin D. Brown
Norman L. Christensen Jr.
Mrs. Truman W. Collins
Richard Connor Jr.
Mary Coulombe
John G. Dennis
Jay Gruenfeld
Yvan Hardy
Dudley Hartel
Robert Healy
Michael A. Hinchey
Abigail Kimbell
Brooks Mendell
Peter J. Murphy
Jean M. Pablo
William Siegel
Rudy C. Sparks
Frank E. Taylor
Jack Ward Thomas
Charles Thompson
Douglas Turner

Alice N. Wellman
Dale L. Wierman

\$100 to \$249

Bill Alexander
Mike Apsey
Daina Apple
Bill Ardrey
David Ashcraft
Iris W. Baird
Carl Jay Bajema
Peter G. Belluschi
Michael Bentinck-Smith
James Bibler
Theodore Binnema
Harold C. Blanchard
Gary Blank
Richard P. Blankenship
Bill Botti
Wade Boyd
Edgar B. Brannon Jr.
Frederick S. Broerman
David Brooks
George W. Brown III
Robert E. Buckman
Steven G. Burak
Ann Forest Burns
Richard L. Bury
Timothy Cannon
Lenford C. Carey
Richard D. Carson
Mason Carter
Theodore Cart
John P. Case
Stan Chester
Starling Childs
Kent P. Connaughton
James Coufal
Knight Cox
D. M. Crutchfield
Charles B. Davey
Alexander T. Davison
R. Alexander Day
Don Dierks Jr.
Robert M. Dixon
Warren T. Doolittle
Tony Dorrell
Dennis Dykstra
Paul F. Ehinger
Eric L. Ellwood
Elizabeth F. Engle
Gerald L. Eoff
Scott & Julie Ernest
James J. Farrell
Troy Firth

Susan Flader
Donald Flora
Victor L. Ford
Clark Forrest Jr.
Joe Fox
Jerry F. Franklin
Sture Franzen
John F. Freeman
David Fuller
Kenneth P. Funderburke Jr.
Herman William Gabriel
Russell T. Graham
John D. Gray
William B. Greely
Jim Guldin
David F. Gunderson
W. D. Hagenstein
W. G. Hallstrom
Harry L. Haney Jr.
Leif C. Hatlen
Gard Hellenthal
Robert Hendricks
Jeanne M. Higgins
Steven W. Howes
Myles R. Howlett
Joseph H. Hughes
Tres Hyman
Timothy A. Ingraham
Norman E. Johnson
Lucinda Jones
Scott Jones
Timothy A. Kaden
Clyde R. Kalahan
Robert C. Kellison
Brendan Kelly
Ed Kessler
Thomas Kent Kirk
Virginia Kopp
Michael Kudish
C. Fred Landenberger
John W. Langdale Jr.
Lyle Laverty
Sarah Lawson
Robert O. Lehrman
Douglas Leisz
James Levitt
Peter MacDonald
Barry MacLean
Jim Mackovjak
Elizabeth Madison
John May Sr.
James L. McConnell
Norman R. McDowell
Mrs. John R. McGuire (Marjory)
J. Gage McKinney

J. T. McShan
 W. H. Meadowcroft
 Thomas and Catherine Mentele
 Robert Mezger
 Joseph S. Micallef
 Herman L. Miller
 Frank 'Char' Miller
 Michael Moore
 John J. Natt
 Corbin L. Newman Jr.
 Tom Nygren
 Chadwick Dearing Oliver
 David Oxley
 Zachary Parisa
 Richard J. Pfilf
 John A. Pitcher
 James R. Pronovost
 Thomas L. Reveley
 Eugene S. Robbins
 Peter G. Robinson
 Robert W. Rose Jr.
 Michael Rosen
 Al Sample
 John Sandor
 H. Phillip Sasnett
 Sheafe Satterthwaite
 Thomas D. Saunders
 Fred Schatzki
 Judy Schutzka
 David W. Scott
 Malcolm G. Sears
 Roger Sedjo
 Wenonah M. Sharpe
 Bartow S. Shaw Jr.
 James F. Shotwell Jr.
 John T. & Linda T. Sigmon
 Jim Sitts
 David Wm. Smith
 Michael P. Smith
 Richard Smith
 James R. Soeth
 Harold K. (Pete) Steen
 Robert E. Stevenson
 Neil Straka
 Randall Stratton
 Kenneth O. Summerville
 Gordon Terry
 Gerald Thiede
 C. A. "Buck" Vandersteen
 Frank H. Wadsworth
 Allan West
 W. F. Wieger
 Bruce Wight
 Darryl Wimberley
 Steve and Betty Woodard
 David W. Woodmansee
 Adam Zimmerman
 Hans Zuuring

ASSOCIATIONS, CORPORATIONS, AND FOUNDATIONS

\$10,000 and up

Edwin W. & Catherine M. Davis
 Foundation
 Frederick K. W. Day Revocable Trust
 Lucy Rosenberry Jones Charitable Trust
 Weyerhaeuser-Day Foundation

\$5,000 to \$9,999

The Carol and Carter Fox Family Fund
 of the Community Foundation
 The Charles A. Weyerhaeuser
 Memorial Foundation
 Cherbec Advancement Foundation
 The Forestland Group
 The George Kress Foundation Inc.
 Green Bay Packaging, Inc.
 International Paper

\$2,500 to \$4,999

Forest Investment Associates
 The John and Ruth Huss Fund of the
 Saint Paul Foundation
 The Kelly Charitable Fund at Schwab
 Charitable Fund

\$1,000 to \$2,499

American Forest Foundation
 Appalachian Society of American
 Foresters
 Buchanan Forest Management
 Cashdan/Stein Great-Grandmother
 Fund, Vermont Community Foundation
 Elise R. Donohue Charitable Trust
 The Frederick & Margaret L.
 Weyerhaeuser Foundation
 Green Diamond Resource Company
 International Forest Products
 Corporation
 Mason Charitable Trust
 Menasha Forest Products
 Murray Pacific Corporation
 Starker Forests, Inc.
 Walter S. Rosenberry III Charitable Trust
 The Westervelt Company

\$500 to \$999

American Forest and Paper Association
 LandVest Timberland Inc.
 Lyme Timber Company
 Molpus Woodlands Group
 Muslow Oil and Gas
 Plum Creek Foundation
 Thompson Tree Farm

\$250 to \$499

Bill Hanks Lumber Company
 Forestry Suppliers, Inc.
 Goodson's All Terrain Logging Inc.
 Harrigan Lumber Co., Inc.
 JEA Lands, LP
 Lampe & Malphrus Lumber
 Company Inc.
 Larson & McGowin, Inc.
 MHAworks Architecture
 Michigan Forest Association
 NCASI
 Potlatch Corporation
 Random Lengths Publications
 Scotch Plywood
 Southern Region Forest Service
 Retirees Association

\$100 to \$249

Burns Forest Products, Inc.
 Contentnea Forestry Consultants, Inc.
 Deutsche Banc Americas
 Greater Kansas City Community
 Foundation
 Lone Rock Timber Management
 Company

INSTITUTIONAL MEMBERS

Alabama Forest Owners' Association
 American Antiquarian Society
 American Forests
 Appalachian Society of American
 Foresters
 Association of British Columbia Forest
 Professionals
 Association of Consulting Foresters
 Auburn University School of Forestry
 and Wildlife Sciences
 The Billings Farm Museum
 Clemson University, Dept. of Forestry
 and Natural Resources
 Cradle of Forestry in America
 Interpretive Association
 The Danish Museum of Hunting and
 Forestry
 Duke University Nicholas School of the
 Environment
 Forest Fire Lookout Association
 Forest Resources Association
 Horry-Georgetown Technical College,
 Forestry Department
 Joseph W. Jones Ecological
 Research Center
 Louisiana Forestry Association
 Marsh-Billings-Rockefeller National
 Historic Park

Mississippi State University,
 Forestry Department
 Morrison County Historical Society
 National Association of University
 Forest Resources Programs (NAUFRP)
 National Museum of Forest Service
 History
 New Hampshire Timberland
 Owners Association
 North American Wholesale Lumber
 Association (NAWLA)
 North Carolina Museum of Forestry
 North Carolina State University
 Department of Forestry and
 Environmental Resources
 North Carolina Forestry Association
 Oklahoma Forest Heritage Center
 Oregon Department of Forestry
 Oregon Forest Resources Institute
 Pennsylvania Department of Natural
 Resources Bureau of Forestry
 Society of American Forestry:
 Triangle Chapter
 Stephen F. Austin, Arthur Temple
 College of Forestry
 Sustainable Forestry Initiative Inc.
 Université Laval, Faculté de foresterie,
 de géographie et de géomatique
 University of Florida, School of Forest
 Resources & Conservation
 University of Maine,
 School of Forest Resources
 University of Minnesota,
 Department of Forest Resources
 University of Toronto, Faculty of Forestry
 University of Tennessee - Knoxville,
 Department of Forestry, Wildlife
 & Fisheries
 University of Georgia, Timber
 Mart South
 University of Idaho College of Natural
 Resources
 USDA Forest Service - Rocky Mountain
 Region
 Virginia Tech. Forest Resources &
 Environmental Conservation
 Vrbovec Museum of Forestry
 & Woodworking Industry
 Wisconsin Department of Natural
 Resources-Division of Forestry
 World Forestry Center

Gifts to the Forest History Society Library

July 1, 2012, to June 30, 2013

Anderson, David: 1] 100 or so unbound issues of "Forest Echoes." 2] Buckner, John W. *Cap Gates's Tent City: A History of Crossett, Arkansas*. 3] Buckner, John W. *Wilderness Lady: A History of Crossett, Arkansas*.

Benson, Mark: 2 cartons: films (18) corporate and government films, mostly from the 1950s and 60s.

Campbell, Anne W.: Materials collected by Campbell's father, Walter J. Damtoft, including: 3 framed photographs, 5 maps, 16 publications from pamphlets to books.

Carter, Mason: 3 CDs containing MP3 audio files and Word doc transcriptions of oral history interviews with: Billy C. Bond, James W. Martin, and Phillip Woods. Interviews were conducted in 2012 as part of research for a book on the impact of forestry on the South in the latter half of the 20th century.

Ervin, Carol: Ervin, Carol. *The Girl on the Mountain*. s.l.: The Author, 2012.

Gaston, Bibi: Gaston, Bibi. *The Loveliest Woman in America*. New York: Harper Collins, 2008.

Godden, Jack A.: Circular #L-2, detailing how boundary marking is done on the Cumberland National Forest, April 23, 1957. 12 pp.

Harrigan, Virginia S.: 1] Shell, Dan. "101 Years and Growing: Alabama's Scotch Lumber Co." *Timber Processing* (February 1989):16–20. 2] Shell, Dan. "101 Years and Growing: Alabama's Scotch Lumber Company, A Tradition in Forestry." *Alabama Forests* (July–August 1989):8–13. 3] "Dwight Harrigan and the Sawmill Business." *Alabama Forests* Vol. 50 (Spring 2006):8–11. 4] "Clarke County, 1991 Forestry Capital of Alabama" calendar with historic photos and brief history of Scotch Lumber Co. 5] "Sawmill Days in Fulton" flyer for 100th Anniversary, 1989. 6] "Scotch Lumber Company: 100 Years of History," special section of *The Clarke County Democrat* from Sawmill Days 1989.

Haugh, Teresa: 2 copies: *Regional Foresters of the Alaska Region, 1905–2012*. U.S. Forest Service, Alaska Region, 2012.

Holmgren, Pat: 4 cartons of records of International Society of Tropical Foresters, dating from the late 1980s to 2007: 8 CDs or DVDs produced wholly or in part for ISTF: 1) The Caribbean Forester, The International Institute of Tropical Forestry. 2) "Fire Control in Forests and Wildlands." 3) "The Best of ISTF News & ISTF Noticias, 1980–2004." 4) "People and Forests, FAO Participatory Forestry Publications." 5) *Unasylva* 1947–2006. 6) "Financial Analysis Software for Reduced Impact Logging." 7) "Forest Production for Tropical America," by Frank Wadsworth. 1997. 8) "Monitoring the World's Forest Resources."

Hopper, Robert: Approximately 150 pages of correspondence to and from staff of the Southern Pine Association, mostly the New Orleans office, dating from 1930–40 and dealing with freight transportation concerns.

Joslin, Les: Joslin, Les. *Uncle Sam's Cabins: A Visitor's Guide to Historic U.S. Forest Service Ranger Stations of the West*. Rev. ed. Bend, OR: Wilderness Associates, 2012. xiv + 319 pp.

Kantola, Kristi: Hakala, D. Robert. *Forest Naturalists on Land and Sea: The First Decade of Interpretive Services in the Alaska Region, 1962–1971*. Juneau: U.S. Dept. of Agriculture, Forest Service, Alaska Region, 1995. 75 + [70] pp.

Lampe, Ross: Lampe, Ross W. *The History of the Guy C. Lee Company and Lampe & Malphrus Lumber Company*, Smithfield, NC: The Author, 2012.

Leary, Rolfe A.: 7 items related to the development, by John Krajicek of the U.S. Forest Service, of the concept of crown competition factor.

Lehrman, Robert: 1 carton archival materials generated or collected by Dr. Lehrman while president of the American Forest Institute from 1979–1984.

Long, Lucinda M.: 1] Platt, Rutherford. *The Great American Forest*. 2] Simpson, Charles D. and E. R. Jackman. *Blazing Forest Trails*. 3] Fisher, Jim. *Starker Forests: The Legacy of T. J. Starker*. 4] Williams, Gerald W. *Selected References Concerning the USDA Forest Service*. 5] McCulloch, Walter F. *The Forester on the Job*. 2nd ed. 6] VHS copy of *Cradle of Forestry in America*. 7] Davis, Kenneth P. *Forest Fire Control and Use*. 8] Allen, Shirley Walter and Grant William Sharpe. *An Introduction to American Forestry*. 3rd ed.

McLane, Dennis: McLane, Dennis. *Seldom was Heard an Encouraging Word: A History of Bureau of Land Management Law Enforcement*. Guthrie, OK: Shoppe Foreman, 2011.

Meagher, Michael D.: Burch, W. G. and M. D. Meagher. *Alan Lindsay Orr–Ewing: The Father of Forest Genetics in British Columbia*. Victoria, BC: Forest History Association of British Columbia, 2012.

Melchioris, Tony: 1] *Where the Future Grows: A History of Weyerhaeuser Company*. Tacoma, WA: Weyerhaeuser Company, 1989. 2] *A Celebration for Generations to Come: Fifty Years, 1941–1991*. Montesano, WA: Clemons Tree Farm, 1990.

Parr, Matt: Meine, Curt, ed. *Aldo Leopold: A Sand County Almanac and Other Writings on Ecology and Conservation*. New York: The Library of America, 2013.

Pinchot Institute for Conservation: "Seeking the Greatest Good: The Conservation Legacy of Gifford Pinchot." DVD of film documenting Pinchot's lifelong promotion of practical conservation and the work of the Pinchot Institute.

Purdy, Tim I.: 1] Purdy, Tim I. *Red River: The Turbulent Thirties*. Susanville, CA: Lahontan Images, 2012. 2] Purdy, Tim I. *Red River: End of an Era*. Susanville, CA: Lahontan Images, 2013.

Rawcliffe, MacKenzie: 1 scrapbook in binder: newspaper clippings, magazine articles, newsletter items related to the American Tree Farm System dating from the late 1990s.

Sellers, Terry Jr.: 1] *Plywood and Adhesive Technology*, by Terry Sellers Jr. 1985. Marcel Dekker, Inc. New York. 661 p. 2] Publications of Terry Sellers, Jr. 1958–1999. (bound volume) 3] Publications of Terry Sellers Jr., 1995–2005. (bound volume) 4] "Modifications of Phenolic Resin with Organosolv Lignins and Evaluation of Strandboards made by the Resin as Binder." Doctoral dissertation of Terry Sellers, U. of Tokyo, Japan. 1993. 148 p. 5] Resume of Terry Sellers Jr. (09/2010). 6] *Lignin-Adhesive Research for Wood Composites*, Mississippi State / Forest Products Laboratory. 7] *Resin-Adhesive Research for Wood Composites*, Mississippi State / Forest Products Laboratory. 8] Koch, Peter. *Eastern Hardwoods Growing On Southern Pine Sites* (3 vol.). 9] *Wood Technology Chemical Aspects*. American Chemical Society. 10] *Kenaf Properties, Processing and Products*. 11] Sellers, Terry. "Gluing of Eastern Hardwoods: A Review," USDA

Forest Service bulletin. 12. Sellers, Terry. *Iron Butterfly*. Montgomery, AL: Donnell Group, 2008. 286 p. ill., maps, ports.

Stuart, Gordon: 1] photocopy of: Smith, Geo. Otis. "Preliminary Statement on White Mountains, New Hampshire." U.S. Geological Survey Report #13. June 4, 1912. 19 pp. 2] ca. 20 loose pp. photocopies of repeat photos of hydrological gauging stations on land proposed for White Mountains National Forest; topographical maps of various watersheds; and comparative data from the original survey report in 1912. All collected by Gordon Stuart in preparing his article on the topic—"The Streamflow Study that Created the White Mountain National Forest," by Gordon W. Stuart and Livia Crowley, *Historical New Hampshire*, Volume 66, No. 1, Summer 2012. 3] Photocopy of DRAFT: Leighton, M. O., A. C. Spencer and B. Mackaye, et al. *The Relation of Forests to Stream Flow*. U.S. Geological Survey, 1913.

Terney, Regis E.: 1] National Archives and Records Service, Office of the Federal Register. 1976. Public Law 94-588, 94th Congress. The National Forest Management Act of 1976. Slip Law Format. Washington, DC. 16 pp. National Archives and Records Service, Office of the Federal Register. (Annotated Pamphlet 6"x9"). 2] National Archives and Records Service, Office of the Federal Register. 1976. Conference Report, House of Representatives, The National Forest Management Act of 1976. Report 94-1735. Washington, DC. 40 pp. National Archives and Records Service, Office of the Federal Register. (Pamphlet 6"x9"). 3] National Archives and Records Service, Office of the Federal Register. 1996. Conference Report, Senate, Federal Lands Forest Health Protection And Restoration Act. Report 104-321. Washington, DC. 24 pp. National Archives and Records Service, Office of the Federal Register. (Pamphlet 6"x9"). 4] Wilkinson, Charles E.; Anderson, Michael, H. 1985. "Land and Resource Planning in the National Forests." *Oregon Law Review* 64 (1&2), 380 pp. 5] Camp, Clapp, Cook, Foster, Granger, Kneipp, Loveridge, Rachford, Tinker, 1936–1938. Copies of "Memoranda on Land Use Planning." USDA Forest Service. Approximately 170 pages. April 21, 1936 to April 26, 1938.

Trommer, Gerhard: 1] Trommer, Gerhard. "In Relationship to Aldo Leopold—Arnold von Vietinghoff-Riesch and Naturschutz in Germany." Lecture from the Symposium "Aldo Leopold and his Land Ethic and Influence in Germany and in the United States." Oct. 26–29, 1994. The Max Kade Institute for German-American Studies, University of Wisconsin. 2] Trommer, Gerhard. "Wilderness in Germany." European Society for Environmental History, Sept. 5–8, 2001. University of St. Andrews, Scotland. 3] Trommer, Gerhard. "Die Gila Wilderness—erstes Wildnis-Schutzgebiet in den USA." *Nationalpark* 2/99: 36–39. Trommer, Gerhard. "Weltanschauliche Aspekte zum Landbau in Bildungsvorstellungen aus der Nahe zur Biologie." *Rundgesprache der Kommission für Ökologie*, Bd. 7 (1993):193–201.

Ward, Neil A.: 1] Bryant, Ralph Clement. *Logging: The Principles and General Methods of Operation in the United States*, First Edition (John Wiley & Sons, Inc., 1914). 2] Brown, Nelson Courtlandt. *Logging Principles and Practices in the United States and Canada* (John Wiley & Sons, Inc., 1934). 3] Koroleff, A. *Pulpwood Cutting: Efficiency of Technique* (Canadian Pulp and Paper Association, 1941). 4] Matthews, Donald Maxwell. *Cost Control in the Logging Industry* (McGraw-Hill Book Company, Inc., 1942). 5] Bruce, Donald and Francis X. Schumacher. *Forest Mensuration* (McGraw-Hill Book Company, Inc., 1942). 6] Wackerman, A. E., W. D. Hagenstein, A. S. Mitchell. *Harvesting Timber Crops* (McGraw-Hill Book Company,

Inc., 1949). 7] Boyce, John Shaw: *Forest Pathology*, Third Edition (McGraw-Hill Book Company, Inc., 1961). 8] Felt, Margaret Elley. *Gypso Logger* (The Caxton Printers, Ltd., 1963). 9] Conway, Steve. *Logging Practices: Principles of Timber Harvesting Systems* (Miller Freeman Publications, Inc., 1976). 10] American Pulpwood Association, Inc. *Timber Harvesting*, Fourth Edition (The Interstate Printers & Publishers, Inc., 1988). 11] Clarkson, Roy B. *Tumult on the Mountains: Lumbering in West Virginia, 1770–1920*. 1964. 12] McCulloch, Walter F. *The Forester on the Job*. 2d ed. Corvallis, OR: O. S. C. Cooperative Association, 1955. 13] Brown, Nelson Courtlandt. *Logging Transportation: The Principles and Methods of Log Transportation in the United States and Canada*. John Wiley & Sons, 1936. 14] Brown, H. P., A. J. Panshin, and C. C. Forsaith. *Textbook of Wood Technology*, Vol. 1. McGraw-Hill, 1949. 15] Harlow, William M. and Ellwood S. Harrar. *Textbook of Dendrology*. 4th ed. McGraw-Hill, 1958. 16] American Pulpwood Assoc. *Timber Harvesting: A Textbook*. Interstate Printers, 4th ed. 1988. 17] Pearce, J. Kenneth and George Stenzel. *Logging and Pulpwood Production*, Ronald Press, 1972. 18] Canadian Pulp & Paper Assoc. *Pulpwood Hauling with Horse and Sleigh*. C. P. & P.A., 1943. 19] Canadian Pulp & Paper Assoc. *Pulpwood Skidding with Horses*. C. P. & P. A., 1943. 20] Walbridge, Thomas A. "The Design of Harvesting Systems and Machines for Use in Pulpwood Stands of the Tennessee Valley as Dictated by Intensive Forest Management." Dissertation, University of Michigan, 1960. 21] Silversides, C. R. *Construction and Maintenance of Forest Truck Roads*. Canadian Pulp & Paper Assoc., 1949. 22] Brown, Nelson C. *Logging: The Principles and Methods*. John Wiley, 1934. 23] Brown, Nelson C. *Logging: The Principles and Methods....* John Wiley, 1949. 24] Streyffert, Thorsten. *World Pulpwood: A Study in the Competitive....* Almqvist & Wiksell, 1968. 25] Rossnagel, W. E. *Handbook of Rigging: For Construction and Industrial Operations*. McGraw-Hill, 1964. 26] Samset, Ivar. *Winch and Cable Systems*. Martinus Nijhoff, 1985. 28] Koroleff, A. *Logging Mechanization in the U.S.S.R.* Pulp and Paper Research Institute of Canada, 1952.

Westbrook, Christopher L.: *The Ranger School: A Century in the Forest*. Eds: Jim Coufal, Arnie Lanckton, Brad Woodward. Wanakena, NY: The Ranger School, 2012.

Williams, Susan W.: 1] "Mahogany Name Controversy," by Bruce Lamb, reprinted from *Economic Botany*, Vol. 22, No 1, Jan–Mar 1968. 2] A small brochure from the Ichabod T. Williams & Sons—with the names of the hardwood veneers they could supply. 3] A small brochure "Mahogany 'The World's Finest Cabinet Wood' in new fashion finishes"—showing illustrations of the various mahogany finishes and the names of the members of "The Mahogany Association, Inc." 4] A small lithography print of the L. T. Williams & Sons logo—an elephant standing on a globe of the world. 5] Two B&W photographic prints of members of the Mahogany Association, Inc., at meetings in Chicago in January of 1948 and 1949. 6] A copy of the May 1938 Hardwood Record, documenting "A Century of Leadership in Fine Woods—Ichabod T. Williams & Sons." 7] A copy of a brochure "Fine Hardwood Veneers for Architectural Interiors" AIA – No. 19F – October 1960. From the Fine Hardwoods Association, 666 Lake Shore Drive, Chicago, IL. Showing the Figured Rosewood used at the Four Seasons Restaurant, New York, NY, among other interiors. 8] *Mahogany Antique and Modern*, edited by William Farquahar Payson, with illustrations. 1926 by E. P. Dutton & Company. 9] A portfolio about the Ichabod T. Williams & Co., "After 88 Years Carteret—1838–1926." 10] *The Mahogany Book*, 7th ed. □

AWARDS AND FELLOWSHIPS

The Forest History Society awards program enables the Society to recognize research and writing in forest and conservation history and to stimulate further research into our understanding of the relationships between people and forests. High standards for selection reflect equally upon the recipient and the Society. Awards and fellowships are fully supported by endowment. The following is a list of awards for 2013.

LEOPOLD-HIDY AWARD

The Aldo Leopold–Ralph W. Hidy Award honors the best article published in the journal *Environmental History* during the preceding year. The award is presented jointly by the American Society for Environmental History and the Forest History Society, and is judged by the editorial board of the journal. The 2013 recipient is **Cynthia Radding** for the article, “The Children of Mayahuel: Agaves, Human Cultures, and Desert Landscapes in Northern Mexico” (January 17:1, 84–115).

Radding brings together research in ethnobotany, ecology, and history to show the mutually reinforcing relations between humans and agaves. Its theoretical framework integrates three foundational concepts relating to the production of space, the evolution of life-forms, and the creation of desert landscapes. Centered on the relations between the agave family of plants and both indigenous and colonial populations in northern Mexico, this study challenges the conventional distinction between wild and cultivated plants and addresses different modes of cultural diffusion between Mesoamerica and the arid lands of the Sonoran and Chihuahuan deserts. Its aim is to relate the botanical complexities of the Agaveae to the development of different systems of knowledge and cultural beliefs relating to the plant and to the historical communities that have intervened in its cultivation and distribution.

The members of the editorial board noted that Radding’s article is a masterful analysis that blends indigenous ecological knowledge with modern-day ecological and social theory to help us rethink several foundational categories in environmental history. But this is also a carefully researched article based on creative readings of primary and archival sources as

well as a rich array of secondary literature. Radding’s article underscores that the so-called “Columbian Exchange” was a far more complicated and nuanced process than we’ve originally believed. Finally, Radding does what environmental historians do best—tracing how the contingent material world and an evolving human world constantly entangle over time and space.

THEODORE C. BLEGEN AWARD

The Theodore C. Blegen Award recognizes the best article in the field of forest and conservation history that is not published in *Environmental History*. Articles are submitted by editors of scholarly journals and a panel of judges selects the winner based on contribution to knowledge, strength of scholarship, and clarity and grace of presentation. This year, the award went to **Richard Rajala** for “‘Streams Being Ruined from a Salmon Producing Standpoint’: Clearcutting, Fish Habitat, and Forest Regulation in British Columbia, 1900–45” published in the winter 2012/13 issue of *BC Studies: The British Columbian Quarterly* No. 176: 93–132.

This article provided detailed and insightful information into the competing interests of the forest and fishing industries in the early 1900s in British Columbia and the inability/paralysis of the governmental entities involved to resolve this problem. The author conducted careful documented research into the dynamics of this period and also provided background before 1900 and in recent times to help the reader understand the inherent conflict. The early discussions of “multiple use” and the failure of this concept to take hold were especially interesting.

CHARLES A. WEYERHAEUSER BOOK AWARD

The Charles A. Weyerhaeuser Award rewards superior scholarship in forest and conservation history. Awarded biennially prior to 2004, this annual award goes to an author who has exhibited fresh insight into a topic and whose narrative analysis is clear, inventive, and thought-provoking. The 2013 recipient is **James Morton Turner** for *The Promise of Wilderness: American Environmental Politics since 1964* (Seattle: University of Washington Press, 2012).

This book presents a new look at the role of wilderness in the American environmental movement, particularly in the ways that “old” ideas about wilderness continued to influence environmental politics after the passage of the Wilderness Act of 1964. It provides a much-needed survey of one of America’s longest-running environmental battles—the designation of wilderness areas on our nation’s public lands. Turner complements the recent scholarship on events leading up to the Wilderness Act by analyzing wilderness politics since that milestone, including useful treatments of the Sagebrush Rebellion and the spotted owl controversy. It makes a clear case that historiographical debates about the idea and reality of wilderness are far from dead; in fact, this book could likely revive the conversation about wilderness among American environmental historians.

F. K. WEYERHAEUSER FOREST HISTORY FELLOWSHIP

The F. K. Weyerhaeuser Forest History Fellowship is awarded annually to a student at the FHS university affiliate, Duke University, whose research is historical in nature and related to forestry, land use, or the environment. Criteria include overall significance and quality of presentation.

The 2013 F. K. Weyerhaeuser Fellowship was awarded to **Ansel Bubel**. Bubel, a master’s candidate at the Nicholas School of the Environment, submitted his research on “Restoring the Forests of Lewis and Clark.” Mr. Bubel’s research will create a forest management plan and a simulation model for forest restoration in the Sitka spruce forest of northwest Oregon. The project has broad application to forest restoration practices in the Pacific Northwest. His particular project is historically significant in seeking to restore a coastal Oregon landscape to the condition described by Lewis and Clark more than two hundred years ago.

Contemporary researchers note that restoration is frequently challenged by unclearly defined targets and inadequate long-term monitoring among many other factors. Yet, Bubel’s project is well posed and is in an excellent position to succeed. The goal is clear, and there exists strong infrastructure in place to monitor the

process and to continue the project over the years needed to reach its goal.

ALFRED BELL TRAVEL GRANTS AND VISITORS

Alfred D. Bell Jr. travel grants are awarded to enable researchers to use the FHS library and archives. Recent Bell Fellows include:

Dr. Jonathan Beever, a graduate student in philosophy at Purdue University, used FHS collections to explore cross-currents between environmental philosophy in Europe and America. While at FHS on a Bell Fellowship he looked for evidence of influences on American foresters, including Aldo Leopold, who traveled to Germany during the mid-1930s on trips sponsored by the Oberlaender Trust. He examined the papers of Clarence Forsling and Leon Kneipp as well as publications from the era.

Zachary Gardner, a doctoral candidate in history at Georgetown University, tried to discover what made working for the U.S. Forest Service so appealing to young men in the first decades of the twentieth century. He examined oral history transcripts, correspondence, and forestry school alumni publications.

Devon McCurdy, a PhD candidate in history at the University of Washington, explored tensions between rural and urban Portland, Oregon, during the 1980s and 90s with an emphasis on the forest products industry. He wanted to ascertain whether the balance of political power shifted during that time period and received a Bell Fellowship to use the records of the American Forest and Paper Association and the American Forest Council.

Dr. Char Miller, Director of Environmental Analysis Program and W. M. Keck Professor of Environmental Analysis at Pomona College, visited FHS as part of research on a book-length history of the Pinchot Institute for Conservation. He used the collections at FHS to learn more about early (pre-1960) conservation education efforts, especially by the U.S. Forest Service, and was pleased to find material on the Youth Conservation Corps.

Dr. Sarah Mittlefehldt, an assistant professor of Environmental Studies and Natural Resources Management at Green Mountain College in Vermont, received a Bell Fellowship to support a new project exploring the history of wood-to-energy initiatives in the late twentieth century as American forests became re-envisioned as a source of fuel and energy. The terms “biomass” and “bioenergy” may be new, but the

use of wood for fuel has a long history.

Jason Newton, a PhD candidate in history at Syracuse University, used oral histories and the Forests in Fiction collection to help him understand why loggers in the Northeast did not organize unions as often or as early as their counterparts in the far West and Lake States. The working title for his dissertation is “Forging Titans: Men and Myth in the Working Forests of America, 1850–1950.”

Karen Bradshaw Schulz, a Koch-Searle Fellow at New York University School of Law in New York City, received a Bell Fellowship to explore the development of forest certification by the American Tree Farm System, one of the first examples of sustainability certification anywhere. This is part of her ongoing research in environmental law.

Other researchers who used the library and archives:

Dr. Brett Bennett, who is an Australian Research Council Postdoctoral Fellow at the University of Western Sydney, spent about eight days at FHS completing the manuscript for his book on the global history of forestry. This is Dr. Bennett’s third visit to FHS, a resource he finds to be unmatched anywhere in the world.

Willa Brown, a PhD candidate in history at the University of Virginia, spent a few days at FHS working on her dissertation. Part of her study involves lumberjacks in the Minnesota/Wisconsin/Michigan Northwoods in the late nineteenth and early twentieth centuries and their lingering use as icons long after the hand-logging era had passed. She found the Forests in Fiction and oral history collections to be particularly helpful.

Kevin Burke, a PhD student in anthropology at the University of Pennsylvania, was beginning dissertation research on the political ecology of land use in the Research Triangle area of central North Carolina. His interest stems from viewing attempts to restore remnant tree species to their former status and what that tells us about constantly changing relationships between humans and nature.

FHS hosted a visit by six staff members of the Chapel Hill office of the **Conservation Fund**. The Conservation Fund is involved in forest management, agricultural land use change, fostering sustainable natural resource use, and preserving historic sites. Their staff member responsible for web site development found the historic photo collection to be impressive and

the person managing GIS projects was intrigued by some of our early maps.

Joann Cox, president of the Society of American Foresters, visited FHS to see for herself the records of the national SAF and to learn about needs for their care and improved access. FHS has served as the official archives of the SAF since 1965 and the collection has grown to be the largest in the Archives, filling 338 linear feet of shelves.

Dr. Russ Lea began his career as a professor of forestry, soil science, and ecology but moved fairly quickly into academic administration, serving as vice president for research at the University of North Carolina and associate vice chancellor for research at North Carolina State University. He is now CEO of NEON, Inc. a continental-scale ecological observation system for examining critical ecological issues. He visited FHS for a tour of historical resources and a discussion on ways that we might collaborate in the future.

Pam McElvey, an independent researcher from Oberlin, Ohio, is writing a biography of John Jay McKelvey, a lawyer in New York City who served for many years as the attorney for the National Wholesale Lumber Dealers Association (NWLDA). FHS is the official repository for the archives of NWLDA’s successor the North American Wholesale Lumber Association and Pam found useful information in its records.

Dan Richter, professor in the School of the Environment at Duke University, brought his fire ecology class to visit as their last session of the semester. They got a brief introduction to the collections, received copies of FHS publications including the Issues Series booklet *America’s Fires: A Historical Context for Policy and Practice* by Stephen J. Pyne, and viewed the FHS film *Up in Flames: A History of Fire Fighting in the Forest*. The film, produced in 1983, proved enlightening for the development of firefighting technology and the fact that so much has changed in regard to fire policy since its making.

Volney White is a U.S. Forest Service volunteer interpreter at the oldest USFS research facility in the country, Ft. Valley Experiment Station in Flagstaff, Arizona. During her visit to FHS, Volney used the collection of USFS Organizational Directories to locate listings for various station personnel throughout the twentieth century. She was also able to find a listing for her father Volney Marx Douglas, who worked in Region 3 during the 1930s. □

PUBLICATIONS OF THE FOREST HISTORY SOCIETY

These are books and films resulting from Society programs.
To purchase a copy, please visit www.ForestHistory.org/Publications.

From THE FOREST HISTORY SOCIETY

Issues Series—\$9.95 each

America's Fires: A Historical Context for Policy and Practice, Stephen J. Pyne

America's Forested Wetlands: From Wasteland to Valued Resource,
Jeffrey K. Stine

American Forests: A History of Resiliency and Recovery,
Douglas W. MacCleery

Canada's Forests: A History, Ken Drushka

Forest Pharmacy: Medicinal Plants in American Forests, Steven Foster

Forest Sustainability: The History, the Challenge, the Promise,
Donald W. Floyd

Genetically Modified Forests: From Stone Age to Modern Biotechnology,
Rowland D. Burdon and William J. Libby

Newsprint: Canadian Supply and American Demand, Thomas R. Roach

Wood for Bioenergy: Forests as a Resource for Biomass and Biofuels,
Brooks C. Mendell and Amanda Hamsley Lang

Other Publications

*A Hard Road to Travel: Lands, Forests and People in the Upper Athabasca
Region*, Peter J. Murphy, et al., cloth \$49.95, paper \$29.95

Bringing in the Wood: The Way It Was at Chesapeake Corporation,
Mary Wakefield Buxton, cloth \$29.95, paper \$19.95

Common Goals for Sustainable Forest Management, V. Alaric Sample
and Steven Anderson (eds.), \$24.95

Cradle of Forestry in America: The Biltmore Forest School, 1898–1913,
Carl Alwin Schenck, \$10.95

Evolution of Tropical Forestry: Puerto Rico and Beyond,
Frank H. Wadsworth, Free + \$5.50 S/H

Encyclopedia of American Forest & Conservation History, \$250.00/set
Forest Aesthetics, Heinrich von Salisch, trans. by Walter L. Cook Jr.
and Doris Wehlau, \$24.95

Forest and Wildlife Science in America: A History,
Harold K. Steen (ed.), \$14.95

*Forest Management for All: State and Private Forestry in the
U.S. Forest Service*, Lincoln Bramwell, \$10.95.

Forest Service Research: Finding Answers to Conservation's Questions,
Harold K. Steen, \$10.95

From Sagebrush to Sage: The Making of a Natural Resource Economist,
Marion Clawson, \$9.95

Ground Work: Conservation in American Culture, Char Miller, \$19.95

Millicoma: Biography of a Pacific Northwestern Forest,
Arthur V. Smyth, \$12.95

Pathway to Sustainability: Defining the Bounds on Forest Management,
John Fedkiw, Douglas W. MacCleery, V. Alaric Sample, \$8.95

Plantation Forestry in the Amazon: The Jari Experience, Clayton E. Posey,
Robert J. Gilvary, John C. Welker, L. N. Thompson, \$16.95

*Proceedings of the U.S. Forest Service Centennial Congress: A Collective
Commitment to Conservation*, Steven Anderson (ed.), \$24.95;
also available on CD with bonus material

The Chiefs Remember: The Forest Service, 1952–2001, Harold K. Steen,
cloth \$29.00, paper \$20.00

The Forest Service and the Greatest Good: A Centennial History,
James G. Lewis, cloth \$30.00, paper \$20.00

*Tongass Timber: A History of Logging and Timber Utilization in Southeast
Alaska*, James Mackovjak, \$19.95

View From the Top: Forest Service Research, R. Keith Arnold,
M. B. Dickerman, Robert E. Buckman, \$13.00

For a list of oral history interviews available for purchase, visit:
www.foresthistory.org/Publications/oralhist.html or call 919/682-9319.

With DUKE UNIVERSITY PRESS

*Changing Pacific Forests: Historical Perspectives on the Forest Economy
of the Pacific Basin*, John Dargavel and Richard Tucker, cloth \$39.95,
paper \$14.95

David T. Mason: Forestry Advocate, Elmo Richardson, \$8.00

Bernhard Eduard Fernow: A Story of North American Forestry,
Andrew Denny Rodgers III, \$21.95

Sustained-Yield Forestry, Harold K. Steen, \$21.95

Origins of the National Forests: A Centennial Symposium,
Harold K. Steen, cloth \$31.95, paper \$16.95

*Changing Tropical Forests: Historical Perspectives on Today's Challenges in
Central and South America*, Harold K. Steen and Richard P. Tucker,
cloth \$31.95, paper \$16.95

With UNIVERSITY OF GEORGIA PRESS

Crusading for Chemistry: The Professional Career of Charles Holmes Herty,
Germaine M. Reed, \$36.00

With UNIVERSITY OF WASHINGTON PRESS

George S. Long: Timber Statesman, Charles E. Twining, \$30.00

Phil Weyerhaeuser: Lumberman, Charles E. Twining, \$25.00

Jack Ward Thomas: The Journals of a Forest Service Chief,
Harold K. Steen (ed.), \$30.00

The Forested Land: A History of Lumbering in Western Washington,
Robert E. Ficken, \$25.00

The U.S. Forest Service: A History (Centennial Edition), Harold K. Steen,
cloth \$40.00, paper \$25.00

With UNIVERSITY OF NEBRASKA PRESS

*This Well-Wooded Land: Americans and Their Forests from Colonial Times
to the Present*, Thomas R. Cox, et al., \$27.95

With GREENWOOD PUBLISHING GROUP, INC.

Beyond the Adirondacks: The Story of St. Regis Paper Company,
Eleanor Amigo and Mark Neuffer, \$35.00

*Lost Initiatives: Canada's Forest Industries, Forest Policy and Forest
Conservation*, R. Peter Gillis and Thomas R. Roach, \$40.95

With CAROLINA ACADEMIC PRESS

*A Forestry Revolution: The History of Tree Improvement in the Southern
United States*, Bruce J. Zobel and Jerry R. Sprague, \$14.95

With UNIVERSITY OF MAINE PRESS

Aroostock: A Century of Logging in Northern Maine, Richard W. Judd,
cloth \$27.95, paper \$17.95

With ISLAND PRESS

The Conservation Diaries of Gifford Pinchot, Harold K. Steen (ed.),
cloth \$29.00, paper \$17.95

AVAILABLE VIDEOS FROM FHS ON DVD AND/OR VHS

The Greatest Good: A Forest Service Centennial Film (2005) (\$18.00)

Timber on the Move: A History of Log-Moving Technology (1981) (\$25.00)

Up in Flames: A History of Fire Fighting in the Forest (1984) (\$25.00)



The Forest History Society is a nonprofit educational institution. Founded in 1946, it is dedicated to advancing historical understanding of human interactions with forested environments. The Society is a membership organization; dues range upward from \$65 annually.

Officers

- Hayes Brown, chairman
- Kent Gilges, vice chairman
- L. Michael Kelly, immediate past chairman
- Henry I. Barclay III, treasurer
- Steven Anderson, secretary and president

Board of Directors (Fall 2012–Fall 2013)

- Henry I. Barclay III, Lehmann, Ullman and Barclay LLP, Birmingham, AL*
- Hayes Brown, Monroe, Trippe & Brown LLP, Birmingham, AL*
- Doug Decker, Oregon Department of Forestry, Salem, OR
- Kent Gilges, Conversation Forestry, LLC, Canandaigua, NY*
- Joy N. Hodges, W. H. Hodges and Co., Inc., Alexandria, LA
- Douglas Hutton, King Motion Picture Corporation, Edmonton, AB
- Richard Judd, University of Maine, Orono, ME
- L. Michael Kelly, Forest Investment Associates, Atlanta, GA*
- Russ Lea, NEON, Inc., Boulder, CO
- Douglas W. MacCleery, (ret.) USDA Forest Service, Alexandria, VA
- Tony Melchior, (ret.) Weyerhaeuser Company, Federal Way, WA
- Susan Moore, (ret.) Georgia-Pacific Corporation, Wicomico Church, VA
- Rob Olszewski, Plum Creek, Marietta, GA
- Edward W. (Ned) Phares, University of Georgia, Athens, GA
- Kurt Pregitzer, University of Idaho, Moscow, ID
- Daniel deB. Richter, Duke University, Durham, NC
- Tom Rosser, Canadian Forest Service, Ottawa, ON
- Roger Sedjo, Resources for the Future, Washington, DC
- Michelle Steen-Adams, University of New England, Biddeford, ME
- Peter R. Stein, Lyme Timber Company, Hanover, NH
- Rick Titcomb, Weyerhaeuser Family Foundation, Seattle, WA
- Richard P. Tucker, University of Michigan, Ann Arbor, MI
- Edward Wilson, Outdoor Underwriters, Columbia, SC
- Chris Zinkhan, The Forestland Group LLC, NC

*member, executive committee

USDA Forest Service Liaison

- Allison Stewart, Grey Towers
- National Historic Landmark, Milford, PA

National Park Service Liaison

- Donald Stevens, National Park Service, Omaha, NE

Emeritus Members of the Board

- Charles S. Peterson, St. George, UT
- Herbert I. Winer, New Haven, CT

Staff

- Steven Anderson, president
- Andrea H. Anderson, administrative assistant
- Katherine M. Cox, assistant director for administration
- Dave Gunderson, library volunteer
- Eben K. Lehman, technical archivist/librarian
- James G. Lewis, historian
- Cheryl P. Oakes, librarian
- Maggie A. Powell, administrative assistant

Senior Research Fellow

- Edgar B. Brannon, Brannon and Associates, Inc.
- Gil Latz, Indiana University–Purdue University Indianapolis

Distinguished Scholar

- Claire Williams

2013 F. K. Weyerhaeuser Forest History Fellow

- Ansel Bubel

JOIN THE FOREST HISTORY SOCIETY

*or become a joint member
of the American Society for Environmental History
and the Forest History Society*

Name _____ Title _____
 Company/Institution _____
 Address _____
 City/State/Zip _____
 Work phone () _____ Home phone () _____
 E-mail _____
 Employer _____
 Date of Birth _____

PLEASE ENROLL ME AS A MEMBER IN THE FOLLOWING CATEGORY:

- FHS Individual** **FHS Student:** \$30.00
 \$65.00
 \$100.00 **Institution:** \$150.00
 \$250.00
 \$500.00 **Joint ASEH/FHS Memberships:**
 \$1000 and up \$41.00 student \$106.00 individual

STATISTICAL DATA

Which of the following best describes your employment setting?

- College or university
- Federal government
- State/local government
- Private industry
- Consultant/Self-employed
- Historical Society
- Association or foundation
- Museum or library
- Other nonprofit
- K–12 school
- Retired
- Unemployed

Which of the following best describes your current position?

- Research/educator
- Field forester/technician
- Staff specialist
- Mid-level management
- Upper-level management
- Private landowner
- Journalist
- Student
- Other _____

Which of the following best describes your field of expertise?

- Anthropology
- History
- Sociology
- Forestry
- Wildlife
- Ecology
- Economics
- Journalism
- Education
- Archeology
- Other _____

Which of the following best describes your level of education?

- Less than high school
- High school
- College (BA/BS)
- Master's degree
- Doctoral degree

PLEASE PAY IN U.S. FUNDS

Enclosed is my check or money order.
 Charge \$ _____ to my credit card.
 Visa MasterCard American Express Discover
 Card # _____
 Expiration Date _____
 Signature _____

PLEASE MAIL YOUR CHECK AND THIS FORM TO:

Forest History Society
 701 William Vickers Avenue
 Durham, NC 27701
 919/682-9319
 www.ForestHistory.org

Financial information about this organization and a copy of its license are available from the State Solicitation Licensing Branch at 919/807-2214. The license is not an endorsement by the state.



THE FOREST HISTORY SOCIETY

701 William Vickers Avenue
Durham, North Carolina 27701

www.ForestHistory.org

Address Service Requested

NONPROFIT
U.S. POSTAGE

PAID

RALEIGH, NC
PERMIT #2172

BELOW: *Christine Amoresano takes in the view from atop Spencer Trail in Lee's Ferry, Arizona, overlooking the Colorado River and the beginning of Grand Canyon National Park. To learn more about this image, see page 32.*



Visit the Forest History Society anytime online at www.ForestHistory.org.