

AMERICAN

WINTER/SPRING 2022

FORESTS

**An equine
lifeline brings
hope to a
fire-scarred
watershed**



BREW UP SOME *PASSION*

Want to brew better tea? Start with TAZO Passion. This caffeine-free blend combines crisp, delicious flavors of hibiscus, orange peel and lemongrass for a flavor so good, just one sip will have you head over heels. (Don't say we didn't warn you.)



TAZO® TAZO® TAZO® TAZO® TAZO® TAZO® TAZO® TAZO® TAZO® TAZO®



Departments

2 Offshoots

A word from our president and chief executive officer

4 Treelines

INNOVATION: Planting at higher elevations may help save monarch butterflies.

PLACE-BASED PARTNERSHIPS:

A California community comes together to reforest after wildfire.

MOVEMENT BUILDING: Kesha Braunskill helps push the urban trees movement to the limelight.

PROFILE: How astrophysicist Harriet Natsuyama found a unique path to fighting climate change.

ACTION CENTER: Learn how you can get involved in the 2022 Women's Forest Congress.

MOTIVATIONAL MUSINGS: Inspiring words from those fighting for our forests.

WASHINGTON OUTLOOK: Robust forest policy wins and the rise of leaders, like Rita Hite, infuse new excitement into the field of forestry.

THE UNDERSTORY: How do wood products store carbon for life?

FOREST FOOTNOTES: Exciting developments, outside of American Forests, in the field of forestry.

46 Earthkeepers

PAVING THE WAY FOR WOMEN IN FORESTRY

Mary Wagner has been a champion and inspiration for women in forestry.

48 Last Look

Stunning photography of intricate bark paintings.

BACK COVER FOLD-OUT

Champion Tree Showcase

Ponderosa pine



Features

18 Gisel Garza: Seed hunter

By Lee Poston

How one woman and a pilot program are helping address a nationwide seedling shortage.

24 An equine lifeline brings hope to a fire-scarred watershed

By Lee Poston

Two women and a band of horses bring watershed restoration to fruition after Colorado's devastating 416 Fire.

36 Grafting the future of the ash tree

By Katherine Gustafson

A research biologist is leading the charge to protect species of ash trees from the ravaging threat of the emerald ash borer.

From CEOs to Girl Scouts, women are leading on forests

AS YOU'LL READ in this issue, we're celebrating an exciting development in the world of forest conservation: the first-ever Women's Forest Congress, to take place in 2022.

The Congress is the brainchild of American Forests' Board Secretary Ara Erickson, a respected leader in forestry who envisioned this landmark event by drawing on our organization's proud history of leading American Forest Congresses since the 1800s.

From this inspiration, an organizing committee of women leaders, which includes Rebecca Turner from American Forests, has held successful preparatory events and developed a powerful Congress program that will help consolidate women's progress in forestry, break down remaining barriers, and project women's unique

leadership voice and perspective at a vital moment for America's forests.

Along with a piece on the Congress, this issue of our magazine features many other stories highlighting the leadership of women in the forest movement. Such stories were not hard to find because the field of forestry and forest conservation, once dominated by men, has seen an incredible flourish of female leadership and participation at all levels, from governments to Girl Scouts.

This is great news: We urgently need women's unique skills and perspectives in the forest movement. Women are bringing a new kind of collaborative and inclusive perspective and a fresh spirit for innovation. Whether building coalitions and organizing events like the Congress, or inventing new approaches to forest-climate science, the women in our field

are pairing outstanding technical expertise with the kind of community-building energy that makes anything possible.

Examples of this leadership are everywhere. Vicki Christiansen just wrapped up a successful run as chief of the U.S. Forest Service, and Lisa Allen recently finished her term as president of the National Association of State Foresters. Women are leading august forest organizations such as the Council of Western State Foresters, International Society for Arboriculture, Sustainable Forestry Initiative and Hardwood Federation. And at the start of this year, Rita Hite, my decade-long collaborator in leading the Forest-Climate Working Group, took over as president and chief executive officer of American Forest Foundation — the nation's largest association for family forest owners and a vital partner for American Forests.

I am extremely "forest proud" that American Forests is playing a role in fostering this stronger role for girls and women, including in our own organization. Here at American Forests,



Leaders at the Congressional Wildfire Funding Fix reception in Spring of 2018: (From left to right) Vicki Christiansen, former chief of the U.S. Forest Service; Caitlyn Pollihan, chief executive officer and executive director of International Society of Arboriculture; Danielle Watson, director of policy and public affairs at the Society of American Foresters; Cecilia Clavet, senior policy advisor at The Nature Conservancy; Rebecca Turner, chief strategy officer at American Forests; Mariel Murray, staff chief at Office of Budget and Program Analysis, U.S. Forest Service; and Jaelith Hall-Rivera, deputy chief of state and private forestry at U.S. Forest Service.



In 2020, American Forests partnered with Girl Scouts of the USA to support the launch of the Girl Scout Tree Promise program, an initiative that is empowering scouts — like the Girl Scout Brownie with Girl Scouts of Nation's Capitol pictured here — to help plant 5 million trees over the next five years.

women occupy a majority of staff positions, touching every department and level of leadership. This is the result of an intentional effort to recruit women and create a supportive environment within our organization for women's leadership at all levels.

It's particularly exciting that women's participation and leadership is not just occurring in the professional ranks, but in a range of contexts. Women's participation in college and community college forestry programs is at record levels. We are helping to foster this trend: Eboni Hall, our senior manager of urban forestry education, is taking the lead in expanding forestry education programs at historically black colleges and universities.

Youth are also getting involved. In 2020, American Forests partnered with Girl Scouts of the USA to support the launch of the Girl Scout Tree Promise program. This exciting initiative, which grew up organically from Girl Scouts' environmental concerns, is empowering scouts and volunteers across the country to plant 5 million

trees over the next five years as a way to help combat climate change.

American Forests is helping make sure that the Girl Scout Tree Promise is a high-quality learning and career-exploration opportunity. We have developed an age-appropriate tree planting guide to encourage good forestry techniques and helped identify diverse tree-planting opportunities for the scouts, including partnerships with government agencies.

We need the benefits of forests everywhere for everyone, and we need to create opportunities for everyone to help make this happen. We are not done yet with removing barriers, but I am proud that we are becoming a country where women are leading in the White House, the boardroom, the woods or anywhere else they want to be. Our forest movement is immeasurably better for it. 🌱

Jad A. Daley III

For more news and updates from Jad, follow him on Twitter @JadDaley



EDITORIAL STAFF

Publisher
Jad Daley

Editorial Director
Michele Kurtz

Managing Editor
Ashlan Bonnell

Contributing Editor
Katherine Gustafson

Contributing Writers
Allison Guy, Sara Kangas, Michele Kurtz,
Shanita Rasheed and Jill Schwartz

Art Direction and Design
Brad Latham

American Forests' mission is to restore threatened forest ecosystems and inspire people to value and protect urban and wildland forests.

(202) 737-1944
www.americanforests.org

AMERICAN FORESTS BOARD OF DIRECTORS

Mary Wagner, Chair
U.S. Forest Service (Retired), Ogden, UT

Jeff Elliott, Vice Chair
Iridian Asset Management, Westport, CT

Richard Kabat, Immediate Past Chair
Kabat Company, Washington, DC

Elisa Rapapor, Treasurer
Rapaport Family Charitable Trust, Rockville Centre, NY

Ara Erickson, Secretary
Weyerhaeuser, Seattle, WA

Jad Daley, President & CEO (ex officio)
American Forests, Washington, DC

Holly Beale
Microsoft, Redmond, WA

William H. Bohnett
President, Whitecap Investments LLC,
Jupiter Island, FL

E. Zimmermann Boulos
Office Environments & Services
Jacksonville, FL

Candace Dodson-Reed
University of Maryland, Baltimore County (UMBC)
Ellicott City, MD

William Hazelton
Chubb Group, New York City, NY

David Hunter, Ph.D.
Electric Power Research Institute
Washington, DC

Clara Poffenberger
Clara Poffenberger Environmental
Law & Policy, LLC,
Fairfax, VA

Pamela Tate
Climate Reality Project: Chicago Metro Chapter,
Oak Park, Ill.



INNOVATION

In Mexico, moving a forest to save monarchs

IN MARCH, as the spring sun drives away cold mists from the mountains of Michoacán, Mexico, tens of millions of monarch butterflies begin to wake up. After a long winter sheltering in oyamel firs, the butterflies flutter about like brilliant orange confetti, readying themselves for a migration that will send them fanning out across North America.

It's an "absolutely fantastic" sight, says biologist Cuauhtémoc Sáenz-Romero, researcher at University of Michoacán. Not only do these forests harbor 99% of the world's monarchs, they're doubly valuable as a source of tourism income for local communities. These days, however, a pall is hanging over this vision in orange. The region's climate is rapidly becoming too hot for the oyamel firs, which can only

survive in cool, moist conditions. By the end of the century, Sáenz-Romero says, heat, droughts, storms and pests will have wiped out all oyamel in the Monarch Butterfly Biosphere Reserve — along with their cloaks of oyamel-dependent monarchs.

To save the firs and the butterflies, Sáenz-Romero wants to do something once considered unthinkable: plant a new forest somewhere else. To see the future of Michoacán's oyamel, all you have to do is look up. The mountains' peaks will remain cool and wet, perfect weather for oyamels. In fact, the trees are already reproducing upslope, but Sáenz-Romero estimates they'd have to increase their pace by a factor of 10, or even 100, to keep up with the speed of climate change.

In partnership with local towns and land collectives, including the non-governmental organization "Fondo de Conservación del Eje Neovolcánico," Sáenz-Romero is stepping in to pick up the slack. Last July, his team planted oyamel seedlings across five sites of varying altitudes, four of them on Nevado de Toluca, a higher mountain than the Monarch Biosphere Reserve, and will study their survival over the next few years.

"The challenge is how much we can move the seedlings to a higher altitude without killing them," he says. The hope is that the firs will thrive on even the highest slopes, and that the monarchs can eventually alter their ancient migration routes to follow the oyamel uphill.

This is a first-of-its-kind study in Mexico, and similar research is just beginning to gain ground in other countries. Planting trees at higher elevations or to the north of their natural range — a process called assisted migration — was long taboo in conservation circles. Now, as climate change advances at a breakneck pace, it's swiftly becoming clear that many species will go extinct without active relocation.

Sáenz-Romero is boosting his seedlings' odds by interplanting them with native shrubs in the aster family. Research has found that the shrubs' particularly bushy shape casts shade that protects young oyamel from harsh sun, improving their four-year survival rates from roughly 10% to 90%. This project marks the first time these shrubs have been grown in nurseries or used in reforestation work — adding another layer of complexity, as there is essentially no information about when these plants set seed or even how fast they grow.

American Forests has worked with local partners in Michoacán since 2006, and has planted more than



Monarchs flock to oyamel firs for shelter during the winter months, with the Michoacán, Mexico region harboring 99% of the world's monarchs.



Top: Planting trees at higher elevations or to the north of their natural range is a process called assisted migration. **Bottom left:** This map of Mexico indicates the Trans-Mexican Volcanic Belt (red contour), a mountain range with the highest peaks in all of Mexico and the only option for assisted migration for oyamel fir. This region includes the current planting sites at Monarch Butterfly Biosphere Reserve and at higher altitudes in Nevado de Toluca. **Bottom right:** Biologist Cuauhtémoc Sáenz-Romero showcases one of the best oyamel fir seedlings, emerging from the shade of a mountain juniper.

“Our responsibility as researchers is to find ways to plant seedlings today that will be healthy trees in the future. The trees will otherwise die where they are because they cannot walk.”

— CUAUHTÉMOC SÁENZ-ROMERO,
RESEARCHER, UNIVERSITY OF MICHOACÁN

1 million trees to restore monarch wintering grounds. Because the organization has already started planting trees at higher elevations both in Mexico and in the United States, funding Sáenz-Romero’s research was a natural fit. According to Austin Rempel, American Forests’ senior manager of forest restoration, “he’s doing the basic science that could make all other monarch plantings better, not to mention assisted migration work elsewhere in North America.”

Watching climate change upend the natural cycle of forest regrowth

has “been hard to swallow as a biologist,” says Sáenz-Romero. What he learned as immutable fact in his university classes is fast becoming outdated as atmospheric CO₂ levels creep ever upwards. For Michoacán’s forests, the only way to avoid tragedy is to push the oyamel to their limits and hope that they, and the monarchs, can adapt. “Our responsibility as researchers is to find ways to plant seedlings today that will be healthy trees in the future,” Sáenz-Romero says. “The trees will otherwise die where they are because they cannot walk.” 🌱



PLACE-BASED PARTNERSHIPS

How one California community is reforesting after fire

On a fire-devastated hillside in the Sierra Nevada Mountains, California forester Meghan Breniman, with her toddler in tow, coaches landowners on proper planting techniques.

CALIFORNIA FORESTER Meghan Breniman stood in front of a group of landowners on a hillside in the Sierra Nevada Mountains devastated by forest fire. Clutching a tree-planting tool in one hand and her toddler's hand in the other, she coached the group on the proper technique for planting seedlings, demonstrating how to aggressively tamp down the soil around the roots to remove air.

The November educational workshop was part of a new reforestation program founded by a group of community members — including Breniman and her business partner Julianne (Juli) Stewart — in response to the devastation of the Creek Fire, which swept through the Big Creek drainage area 50 miles northeast of Fresno, Calif., in the fall of 2020. The blaze was one of the largest wildfires in the state's history, burning almost 380,000 acres and destroying 853 structures.

Many of the burned-down structures were homes in Shaver Lake, a town known as a destination for mountain sports, and in Auberry, a rural community down the hillside. Breniman's house survived, as did Stewart's — though only barely. Both registered professional foresters, the

two co-own the forestry consulting company Vermilion Resource Management, Inc., based in Shaver Lake.

They knew the area's history had helped create a tinder box. Logging industry practices and long-term mismanagement of the forest on local federal lands, including fire suppression,

created lots of fodder for forest fires and increased the forest fire risk over the past century. In the wake of the Creek Fire, Breniman and Stewart wanted a way to do things differently.

"There were like-minded people who within a week had already started conversations about 'How are we



going to fix this as a long-term effort?” remembers Breniman. Entities were already in place to help with housing assistance, insurance claims and other logistics of rebuilding. But the community also needed reforestation and erosion control.

“People had just lost their homes, and the last thing we needed was for the rest of their properties to wash down the hill or for them to rebuild despite fear of the next wildfire that will come through,” Breniman says.

The solution was the Central Sierra Resiliency Fund (CSRF), a restricted fund under the Central Sierra Historical Society, which Breniman, Stewart and a group of others started as soon as the fire had died down. Jakki McDonald Pucheu, an owner of Shaver Ranch and a descendent of lumberman C.B. Shaver, Shaver Lake’s namesake, was a driving force in establishing the CSRF Council, which administers the fund.

CAL FIRE, the state’s fire-management agency, donated about 4,000 seedlings to jump-start the Fund’s “Seedlings of Hope” program, which provides free seedlings and plant-

“What pushed the resiliency fund through that entire season was knowing that we had the community on our side. With that support in place, we’re here for the long haul.”

— MEGHAN BRENNIMAN, COUNCIL MEMBER, THE CENTRAL SIERRA RESILIENCY FUND

ing tools to landowners in the area. Breniman and Stewart — sometimes with young children in tow — educate participants on how to plant to ensure that the trees can take hold and grow. American Forests also became a donor to the program. The organization had just gotten Intermountain Nursery under contract to produce 40,000 trees for reforestation efforts. Teaming up with CSRF allowed those seedlings to find a home in private landowners’ forests — an option that American Forests is eager to embrace.

CSRF’s long-term goal is to focus more on-site preparation for replanting — that is, clearing away dead forest matter to make way for new growth — and eventually on programs that help landowners thin that new

growth to manage future fire risk. These efforts will contribute to long-term sustainable forest management for the local community.

In the meantime, its members plan to continue planting new trees and growing a sense of community among area residents who are moving back after the devastation.

“What pushed the resiliency fund through that entire season was knowing that we had the community on our side,” says Breniman. With that support in place, she says, “we’re here for the long haul.” 🌱

The Creek Fire was one of the largest wildfires in California history, burning almost 380,000 acres and destroying 853 structures.



MOVEMENT BUILDING

Urban trees are experiencing a moment...and a movement

AS A CHILD, Kesha Braunskill foraged for sassafras and blueberries near her home in rural Long Island, N.Y. Fishing trips with her father often provided dinner. And her family, intimately connected to the outdoors, had a special cultural reverence for trees.

But in college she realized not everyone was familiar with the bounty and beauty of the natural world that had nourished her childhood, espe-

cially people from urbanized areas.

Now Braunskill is a leader in a national movement to create healthy urban forests that provide myriad benefits for city-dwellers. As Delaware's urban community forestry state coordinator, she coaches residents on the value of planting and taking care of trees, which absorb carbon, reduce storm water runoff, filter pollutants and cool neighborhoods.

"We're talking about an awesome

resource, something sometimes people never have even thought about," says Braunskill, who stresses that every person and tree can have an impact. "Trees are essential."

Urban trees are having a moment, one that Braunskill has witnessed on a national scale. She is a founding member of the stakeholder council of the It.org US Chapter, which aims to increase the number of trees on the planet and prevent the loss of trees already in the ground. The global initiative has set a goal to conserve, restore or grow 1 trillion trees by 2030, in both large landscapes and urban areas.

In the United States, cities, states and other entities have already pledged to plant a total of 1.2 million trees. Braunskill's Delaware was the first state to make a pledge, followed by others including Hawaii and Washington.

Meanwhile, growing support for the concept of Tree Equity has fueled the urban forestry movement as well. Tree Equity aims to bring the benefits of trees to communities at greatest risk of climate impacts, many of which lack trees because of historical discriminatory investment practices.

"There's a realization that trees are more than a nice-to-have, they're a need-to-have," says Kevin O'Hara, the lead for It.org US Chapter for American Forests, which co-leads the group. "The impact of trees is something people can measure and feel." 🌱



Above: Kesha Braunskill, Delaware's urban community forestry state coordinator, helps schoolchildren plant a tree outside St. Anne's Episcopal School in Middletown, Del. Braunskill is a national leader in creating healthy urban forests and is the former co-chair of It.org US Chapter's urban forestry work group. **Right:** Delaware Forest Service staff, including Braunskill, and a volunteer plant trees in Haynes Park in Wilmington, Del.





DONOR PROFILE

One astrophysicist's unlikely journey to helping fight climate change

AS AN ASTROPHYSICIST, Harriet Natsuyama spent her entire career focused on the stars. Even when she retired and turned her attention to understanding the prehistoric carving of giant stones, the answers were in the sky.

But it was while investigating one of these megaliths in Japan that she had an earthly epiphany. The stone grouping, chiseled more than 5,000 years ago to chart the course of the sun with incredible precision, was framed by soaring Japanese cedars. Not far was a stream, the source of life for these trees and the ancient people who predicted the summer and winter solstices. Natsuyama became fascinated with the forests and rivers she saw through the train window on her twice-yearly research journeys to the mountains of central Japan.

"It was then that I realized how important trees are," she says, recalling that first trip to the Kanayama

Megaliths site a decade ago. "They give us pure water, pure air, they keep the temperatures cool."

Back in her Los Angeles home, Natsuyama was already concerned

about the climate crisis. So she decided to donate to American Forests, which believes creating healthy forests is essential to slowing climate change. She is now a member of American Forests' Sequoia Circle, individuals who make annual donations of at least \$1,000.

Natsuyama grew up and went to school in Hawaii, where her grandparents had immigrated from Japan. Eventually, her career in astrophysics took her to California and Japan, where she taught and wrote more than 200 journal articles and seven books.

Since retiring, Natsuyama has co-authored a book exploring the Kanayama Megaliths, discovered in the 1990s, and the people who created them. One thing she's sure of: They cared for each other and the world around them.

"You have this wonderful feeling of being in a nurturing environment," she says of the natural surroundings that have inspired her. "Being in these forests, you can't help but feel spiritual. It's everywhere." 🌿

Above: (From left to right) Harriet Natsuyama stands with co-researchers of the Kanayama Megaliths, Yoshiaki Kobayashi and Shiho Tokuda, at the megalith grouping known as Iwaya-Iwakage. Below: Two Japanese sugi (*cryptomeria japonica*) trees flank the Kanayama megaliths.



ACTION CENTER

Joining a network of women foresters



Women are an increasingly critical part of the forestry workforce. In October, the Women's Forest Congress will dive into women's perspectives related to the forest sector.

FORESTRY HAS LONG BEEN a male-dominated field. But women have always been an essential part of the workforce, with more joining the field and rising up through the ranks over the years. They are also helping each other do so. More than 300 women in the field have been convening virtually over the last few years to discuss a variety of topics, such as issues unique to BIPOC women working in forestry. They exchange ideas and stories on social media and share resources and academic research about why more women foresters are needed.

In October, many of them will gather in Minneapolis for the multi-day Women's Forest Congress, an event led by and for people who identify as women and open to all allies to attend. The event will dive into issues related to equity and inclusion, women as catalysts for change, recruitment and retention of women, and the biggest challenges related to the forest sector. It will be the first time since the first Forest Congress was held in 1882 that women's perspectives will be front and center.

There are many ways to get involved in this network. You can join

one of the four working groups, which focus on planning virtual events and the Minneapolis gathering, promoting the network, engaging stakeholders and creating content. Between working group meetings, you can join the conversation on social media, using **#womensforestcongress**. Last, but certainly not least, you can come to the Congress this fall. We hope to see you there. 🌱

To learn more visit <https://womensforestcongress.org/>

JAMES FOGUTH / AMERICAN FORESTS

Let Forests Be Your Legacy

With a Gift
that Costs You
Nothing Now

We all want to be remembered as someone who made a difference in our world. **YOU CAN!** — by leaving a gift to American Forests in your will, trust or by beneficiary designation. It's easy to do, and your gift costs you nothing today.

We can help you decide on a gift that's right for you. To discuss the best gift option for you or to notify us of a gift you have made, please contact Sarah Mitchell, Director of Donor Experience and Engagement, at 202-737-1948 or smitchell@americanforests.org.

Use our new FreeWill tool at www.americanforests.org/evergreensociety



MOTIVATIONAL MUSINGS



Hilary Franz
@Hilary_FranzCPL

“It’s not enough to just prevent our forests from burning down — we also need to prevent our forests from converting to concrete and reintroduce urban forests where they once were.”

HILARY FRANZ, WASHINGTON COMMISSIONER OF PUBLIC LANDS, TWITTER

“We need more of us, and more of us that look like the communities we serve. We have to formulate relationships. We can’t just walk in, plant a tree and walk away.”

KESHA BRAUNSKILL, URBAN FORESTRY COORDINATOR WITH THE DELAWARE FOREST SERVICE, *THE WASHINGTON POST*

“Racism and other forms of discrimination [continue to play] a role in where trees are located, [which] impacts the health and wellbeing of communities along racial and economic lines.”

AMELIA ROSE, EXECUTIVE DIRECTOR OF GROUNDWORK RHODE ISLAND, *RESURGENCE.ORG*



Asia Downtin
@arbol_y_agua

“I’m most motivated and remain inspired to continue in my work because of my community of peers in urban forestry. I’m in awe of the array of perspectives, skills and areas of expertise that my colleagues possess and their collective ability to collaborate in ways that continue to promote equitable access to quality urban forest resources.”

ASIA DOWTIN, ASSISTANT PROFESSOR OF URBAN FORESTRY AT MICHIGAN STATE UNIVERSITY DEPARTMENT OF FORESTRY, TWITTER



Eboni Hall, Ph.D.
@EHallPhD

“Tree planting is a solution to climate change. The right trees planted in the right places need the right politics to engage the right people.”

EBONI HALL, SENIOR MANAGER OF URBAN FORESTRY EDUCATION AT AMERICAN FORESTS, TWITTER



Sen. Debbie Stabenow
@SenStabenow

“Our decisions today directly impact our children and grandchildren. Just imagine three times as many wildfires, floods and droughts.”

U.S. SEN. DEBBIE STABENOW, OF MICHIGAN, TWITTER



Rita Hite, a well-seasoned forestry leader, has been appointed president and chief executive officer of the American Forest Foundation.

WASHINGTON OUTLOOK

An exciting time for forests: New legislation and new leadership

IT'S NEVER BEEN a more exciting time to lead a forestry organization in the United States. That's because America's forests have never seen such robust legislative and financial support as they are getting right now. This support comes from the November passage of the infrastructure package, containing more than \$8 billion in forestry provisions for mostly public lands, and pending legislation that would provide billions more to advance reforestation, forest maintenance, wildfire suppression, green jobs creation and more. That includes incentives for private forest

landowners who implement climate-smart practices.

These investments make Rita Hite's ascension into the role of president and chief executive officer of the American Forest Foundation (AFF) in January extremely timely. AFF advocates on behalf of, and empowers, the nation's 21 million family forestland owners to tackle critical conservation issues by taking action in their 290 million acres of woods.

Hite, AFF's first female president and CEO, is well-suited for the task: not only did she serve as AFF's executive vice president of external relations

and policy prior to her presidency, she also co-chairs and co-founded the Forest-Climate Working Group (FCWG) with Jad Daley, American Forests' president and CEO. FCWG is a coalition of more than 80 entities from across the forestry sector, united to advocate for the role of forests within climate change mitigation.

"What I'll be doing over the next couple of years is scaling AFF's work with landowners to make a meaningful difference on climate change, wildfire resilience and biodiversity protection by empowering family landowners to take action in their woods," Hite says. "We have to change how we're doing our work with landowners to get beyond the current landowners that we're serving. We have to serve the underserved landowners, those that haven't been at the table and haven't been supported in doing this important conservation work."

“What I’ll be doing over the next couple of years is scaling AFF’s work with landowners to make a meaningful difference on climate change, wildfire resilience and biodiversity protection by empowering family landowners to take action in their woods.”

— RITA HITE, PRESIDENT AND CEO, AMERICAN FOREST FOUNDATION

Hite has also helped build the Forests in the Farm Bill Coalition, a 100-plus member coalition that is gearing up to work on its fifth farm bill together, and says she’s proud of how the bills have evolved to recognize forests as critical rural infrastructure.

“At the end of the day, what’s going to make us successful as a sector is that we connect the work we do with people, whether that’s the landown-

ers we serve or the people that are impacted by the efforts of landowners around climate or wildfire or watershed restoration,” Hite says. “What I see is a sector that’s positioned to have an incredible impact on really important issues we’re facing as a nation and as a world. We’re stronger and better together.” 🌿



Above: Pictured here in Alaska in 2016, Hite and her family share a special connection to Alaska’s forests. They named their dogs Tongass and Chugach.

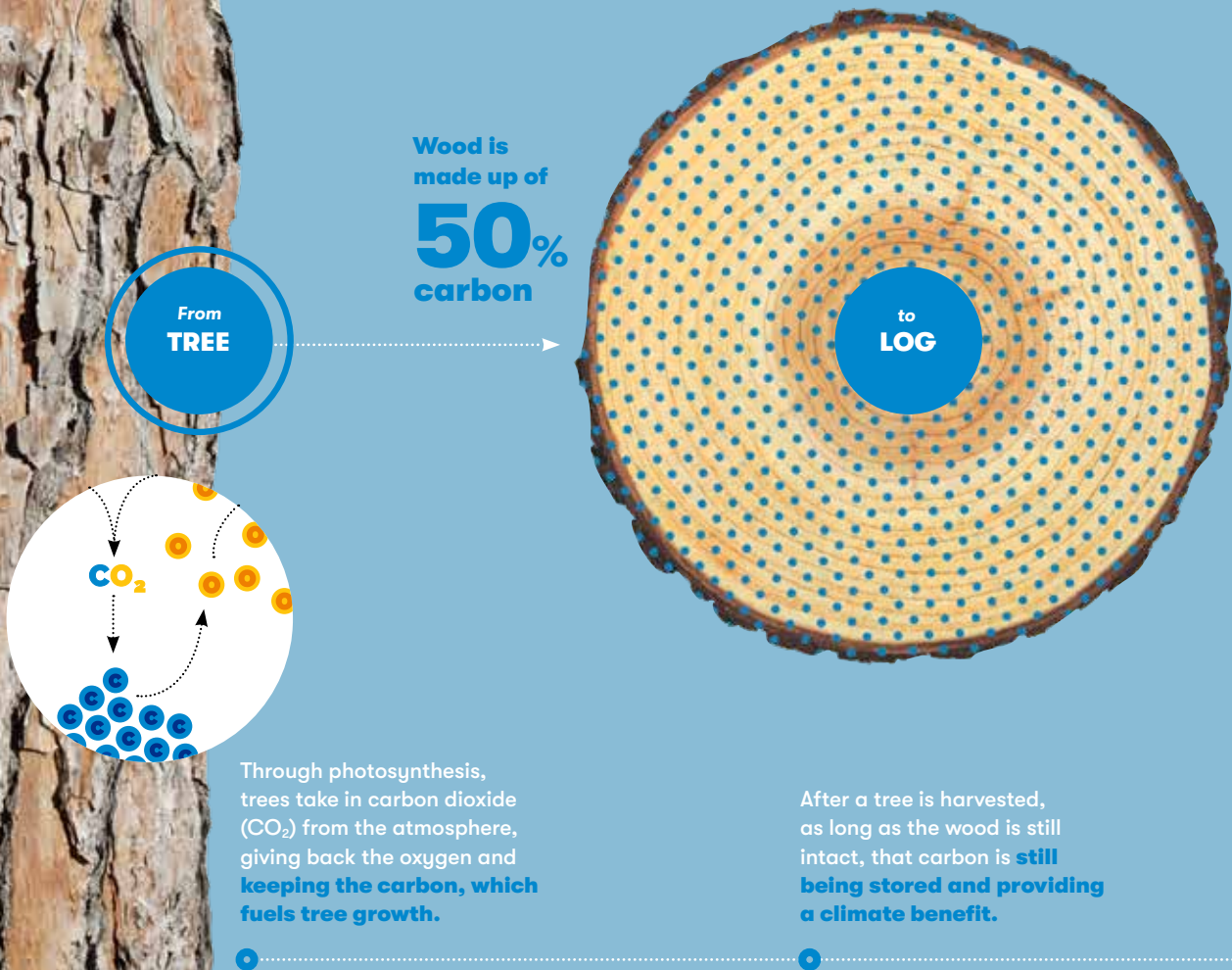
Below: Forest owner Susan Benedict, of Pennsylvania, meets with a forester to discuss how she can meet her personal goals and help with conservation.



THE UNDERSTORY

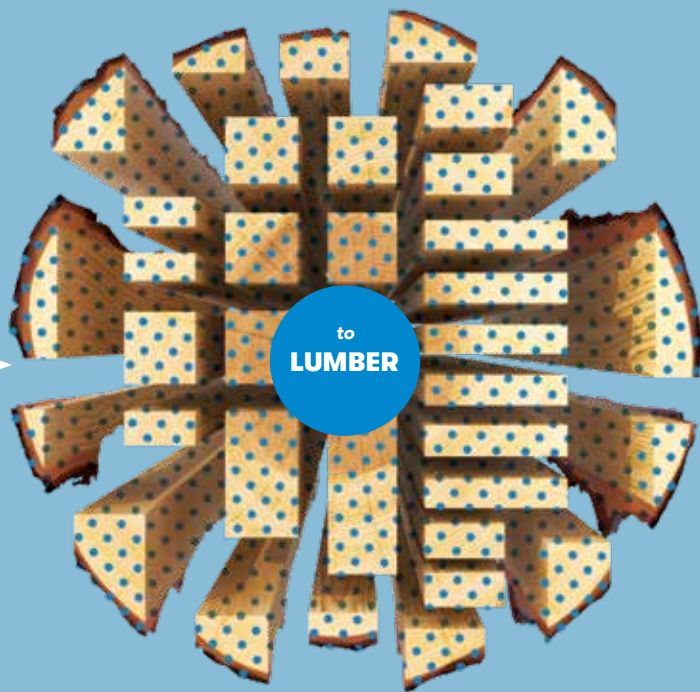
Storing carbon for life

Forests store carbon. And so do products made from trees. Combined, United States' forests and wood products sequester and store 16% of nationwide emissions from burning fossil fuels. The longer wood products last, the more effective they are at helping to slow climate change.



Sustainable forestry, in which we grow more wood than we harvest and manage for long-term healthy forests, and increasing wood use are important pathways for climate action.

The U.S. has committed to reducing emissions to at least 50% below 2005 levels by 2030. To meet this goal, we must pull more carbon out of the atmosphere — and trees are our best technology to do that.



to
LUMBER



to
BUILDING

Wood products, including lumber, currently hold 108.5 million tons of CO₂ equivalent, **accounting for 14% of the annual climate benefit** we get from our forests.

Using more long-lived wood products, like building materials, from sustainably managed forests could increase our forests' climate benefits by 10%.

Investing in greater wood use has various cross-cutting benefits:

1

Wood products help support a variety of jobs, from forestry to manufacturing to architecture.

2

Manufacturing processes for wood building materials emit less carbon than those for non-wood building materials.

3

Demand for harvested wood products can drive sustainable forestry, keeping forests as forests.

FOREST FOOTNOTES

Thirty percent of tree species globally are at risk of extinction

According to a recent report from Botanic Gardens Conservation International, almost a third of all tree species — 17,500 in total — are at risk of disappearing from the wild, largely due to tropical deforestation and forest degradation. Though tropical forests have the highest numbers of at-risk species, temperate areas are not exempt, with many species of maple and oak struggling to survive. Due to comparatively robust forest protection and endangered species laws, the United States has few trees in imminent danger of extinction. Hard-to-control threats such as invasive pests, disease and climate change are, however, rapidly eating into the populations of trees, ranging from ashes and beech in the eastern U.S., to whitebark pines in the western part of the country.



Hard-to-control threats, such as invasive pests, disease and climate change, are rapidly eating into populations of trees, like whitebark pines, pictured here, in the western part of the country.



The Dixie Fire scorched nearly 1 million acres, making it the largest single fire in California history.

Canyon National Parks. Foresters staved off flames through back burns, brush clearing and by wrapping the sequoias' bases in heat-resistant foil. The size and ferocity of these fires underscores the urgent need to scale up "fuel reduction" projects that address dense, dry underbrush and small, sickly and overcrowded trees. The Caldor Fire offered yet more proof of the value of these projects. Patches of forest with completed fuel reduction work saw modest flames that left behind living trees and patches of grasses and shrubs.

2021 drought and wildfire season underscore urgent need for forest health projects

This year saw record-breaking drought across much of the western U.S. And the climate crisis subsequently ignited another unparalleled wildfire season, with California again bearing the brunt of the flames. The Dixie Fire scorched nearly 1 million acres, making it the largest single fire in the state's history, while the 221,000-acre Caldor Fire came within miles of the thousands of homes and business in South Lake Tahoe. The KNP Complex Fire, though comparatively small, menaced General Sherman and other famed old-growth sequoias in Sequoia and Kings

Risk of ADHD may be lower for children who grow up around nature

Researchers from Aarhus University in Denmark investigated whether having green space around a child's home affected the likelihood of receiving an attention deficit hyperactivity disorder (ADHD) diagnosis. The reason why some children develop ADHD is still not entirely understood, but researchers found an association with access to green space. Children who are less exposed to nature in their neighborhood from 0 to 5 years old, have an increased risk of receiving an ADHD diagnosis when compared to children who have been surrounded by more natural features, according to the study. The researchers' findings are a result of examining data on more than 800,000 people born between 1992 and 2007. These findings seem to support results from previous studies of the potential role of nature in ADHD risk.



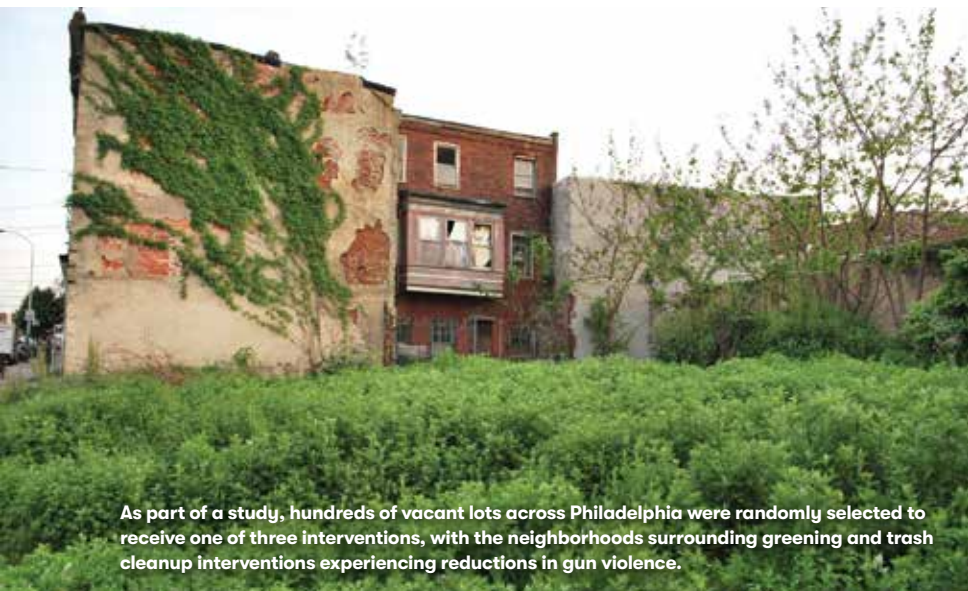
Children who are less exposed to nature in their neighborhood from 0 to 5 years old have an increased risk of receiving an ADHD diagnosis.

The connection between cleaner, greener neighborhoods and crime reduction

We do not hear enough about how environmental design reduces crime. In big cities throughout the U.S., neighborhoods with fewer trees or unkempt green spaces often have higher rates of crime. One of those cities is Philadelphia. But the Pennsylvania Horticultural Society in partnership with the University of Pennsylvania is exploring the role place-based investment plays

in improving community safety. Hundreds of vacant lots across the city were randomly selected to receive one of three interventions: clean and green intervention, trash cleanup only or no intervention at all. The researchers found that the neighborhoods surrounding both the greening and trash cleanup interventions experienced reductions in gun violence, with the greatest drop in crime being in poorer neighborhoods. People living around the greened vacant lots also reported feeling less depressed, showing that making neighborhoods cleaner and greener improves mental health. The results indicate that communities with the highest need may benefit the most from green investment. 🌱

As part of a study, hundreds of vacant lots across Philadelphia were randomly selected to receive one of three interventions, with the neighborhoods surrounding greening and trash cleanup interventions experiencing reductions in gun violence.





GISEL GARZA: SEED HUNTER

BY LEE POSTON



Gisel Garza, American Forests' project manager for the Rio Grande Valley, collects fruits from a Manzanita (Barbados cherry) tree.

LIKE MOST HUNTERS in the Rio Grande Valley of Texas, Gisel Garza rises early and heads out to the forest in search of prey. But instead of deer, feral hogs or wild turkeys, Garza is looking for species like Barbados cherry, Texas ebony and fiddlewood.

Garza is a seed hunter. And even though the survival of the forests and their wildlife depends on her efforts, few people do what she does, and there are not enough seeds in nurseries. That's a big problem.



“Overall, regardless of the level of difficulty when collecting seeds, it’s a very rewarding process, especially when we see the seeds that we collect planted and grown into seedlings that can be used for restoration of our thornforests.”

—GISEL GARZA, PROJECT MANAGER FOR THE RIO GRANDE VALLEY, AMERICAN FORESTS

Located where Texas’ Gulf Coast meets the border with Mexico, the Rio Grande Valley is characterized by dense, shrubby thornforests known as Tamaulipan thornscrub. These rugged-looking trees harbor a dazzling array of species — more than 1,200 plants, 530 birds and 300 butterflies, in addition to the United States’ only population of ocelots — an endangered species. The forests are threatened by development and climate change — only 10% of them remain.

Seedlings are desperately needed to restore the 85,000 acres of thornforest in the Valley that have been identified as a high priority for reforestation. It would take 85 million seedlings to reforest that many acres, a number that would take 166 years to grow at the current rate of production among nurseries.

At the national level, the seed shortage is even more dire. A 2021 study co-led by American Forests concluded that meeting national reforestation goals of 64 million acres by 2040 would require increasing the number of seedlings produced each year by 1.7 billion — a 2.3-fold increase from current production levels. For that reason, American Forests sees the Rio Grande Valley seed collection work as a pilot project in what will hopefully be a national model for addressing the seedling shortage.

So Garza spends her days traveling the Valley’s backroads scouting for seeds ripe for harvesting. She’s looking for about 30 types of flowering trees and shrubs, including Wright’s acacia, Texas persimmon, snake eyes and guayacan (soap bush). She travels among the trees on foot or sometimes — to reach those high branches — uses the back of her trusty Ford pickup.

She usually collects on protected federal lands, helping to meet the U.S. Fish and Wildlife Service’s regional seed-collection goals, but more recently has also begun working with private landowners interested in conservation. She has also teamed up with the State of Texas to collect on state-owned lands. Garza takes the seeds she collects to the Fish and Wildlife Service nursery in Alamo, Texas, where she processes them for storage until the next year’s

planting season. It’s essential to remove the pulp, or separate the seeds from their pods, and then store them at the right temperature and moisture conditions. If the collection location is too far away from Alamo, she will sometimes process them at home before transporting them to the nursery.

Before any of that work takes place, Garza seeks out potential collection locations with the goal of finding as many different parent plants as possible to increase genetic diversity. Understanding the phenology — or life cycle — of specific plants in relation to how they are influenced by climate variations over time is critical to this work.

“An essential step before collecting seeds is to scout for plants that we could potentially collect from in the future and document their phenology,” she says. “If we know for example that certain species are producing flowers at a certain time, then we can follow up with these plants to see if they produce fruits.”

Garza’s ties to the Rio Grande Valley are deep — she was born and raised here and is passionate about saving it for future generations. She joined American Forests in June after completing her master’s degree in biology at the University of Texas Rio Grande Valley, where she researched plant pathology, endangered plant conservation and climate change modeling.

Her connection to the area gives her a passion for the work, even though it can be hard due to harsh weather extremes or thorny species like Wright’s acacia: “Overall, regardless of the level of difficulty when collecting seeds, it’s a very rewarding process, especially when we see the seeds that we collect planted and grown into seedlings that can be used for restoration of our thornforests.”

The University of Texas Rio Grande Valley is a partner in the seed-collection project that includes American Forests and the Fish and Wildlife Service. The university hosts a research training component called “Empowering Future Agricultural Scientists” that gives undergraduates field and lab experience related to food security, the environment and climate change.

Facing page:
Top left: Freshly picked Guayacan fruits await processing. Guayacan, or soapbush, is native to the Rio Grande Valley of Texas and Northern Mexico. Its root bark is often used as soap in Mexico, hence the nickname.
Top right: Garza, a lifelong native of the area, leads American Forests’ efforts to address the critical shortage of seeds necessary to restore the Valley’s thornforests.
Bottom: Harvesting seeds, such as these Manzanita (Barbados cherry) seeds, is the beginning of a long process. They need to be washed, have the surrounding pulp removed, and dried prior to storage.





“If you don’t have the seeds, there’s no restoration efforts, so by having Gisela out there doing the seed collection, we’re meeting that challenge head on.”

—BRIAN KITTLER, SENIOR DIRECTOR OF FOREST RESTORATION, AMERICAN FORESTS

Brian Kittler, American Forests’ senior director of forest restoration, sees huge potential in scaling up the Rio Grande Valley seed-collection project. He envisions a “Seed Collection Corps” that will deploy seed hunters in priority locations around the country. One of those is the Western U.S., where record-breaking fires and climate change-induced drought have left states, such as California, Oregon and Washington, with vast landscapes needing reforestation and little-to-no seed available to do this.

California, for example, is facing a potentially catastrophic shortage of seeds and collectors. Only a handful of contractors in California collect pine cones, and a recent spatial analysis from CAL FIRE indicates there aren’t nearly enough cone seeds to reforest recent burn scars. To reforest just 25% of private, non-industrial forests that have recently burned, the state needs to collect over 69,000 bushels of cones. At the current rate of collection, it will take almost 200 years for that amount of seed to be gathered. But, as Kittler says, “They don’t have the people to collect the seed, and cone quality is increasingly variable and infrequent.”

Further north in south-central Oregon’s Fremont-Winema National Forest, the prolonged drought and ongoing climate change have reduced seed production in forests to near zero. The last large cone collection was 35 years ago, and recent fires have burned more than 643,000 acres, which are unlikely to regenerate naturally. “We are losing seed sources,” Kittler says. “The scale of these forest fires means they are burning or nearly burning critical seed sources for entire seed zones.”

The good news is that Kittler and his team are working on a long-term strategy to address this shortage — of both seeds and the people to collect them — with a goal of dramatically increasing the

awareness and potential solutions around the issue nationwide. Currently, American Forests has six seed-collection agreements in four states — Texas, Idaho, Montana and California — with plans to develop a much broader strategy. And in Texas, Kittler notes, the organization has also partnered with the Fish and Wildlife Service to seek out and boost supplies of climate-resilient seeds.

Congress has also addressed the shortage, primarily through the REPLANT Act, a part of the bipartisan Infrastructure Investment and Jobs Act that lifts the cap on the Forest Service’s Reforestation Trust Fund. The infrastructure bill also earmarks \$200 million in funding to bolster the

National Seed Strategy for Rehabilitation and Restoration managed by federal land agencies. One proposed solution to address a shortage of seed collectors is a revival of the Civilian Conservation Corps, which employed 3 million people during the Great Depression to plant trees, build trails and pursue other outdoor vocations.

Kittler sees seed collection as the foundation of the conservation plan in the Rio Grande Valley and anywhere else that restoration

is taking place. “If you don’t have the seeds, there’s no restoration efforts, so by having Gisela out there doing the seed collection, we’re meeting that challenge head on,” he says.

Garza agrees, and points out why, even in the face of daunting challenges, her job is so meaningful: “I’ve grown up seeing forested areas torn down, so it means a lot to be able to help conserve the areas that remain and potentially plant areas that have been lost here in the Valley.” 🌱

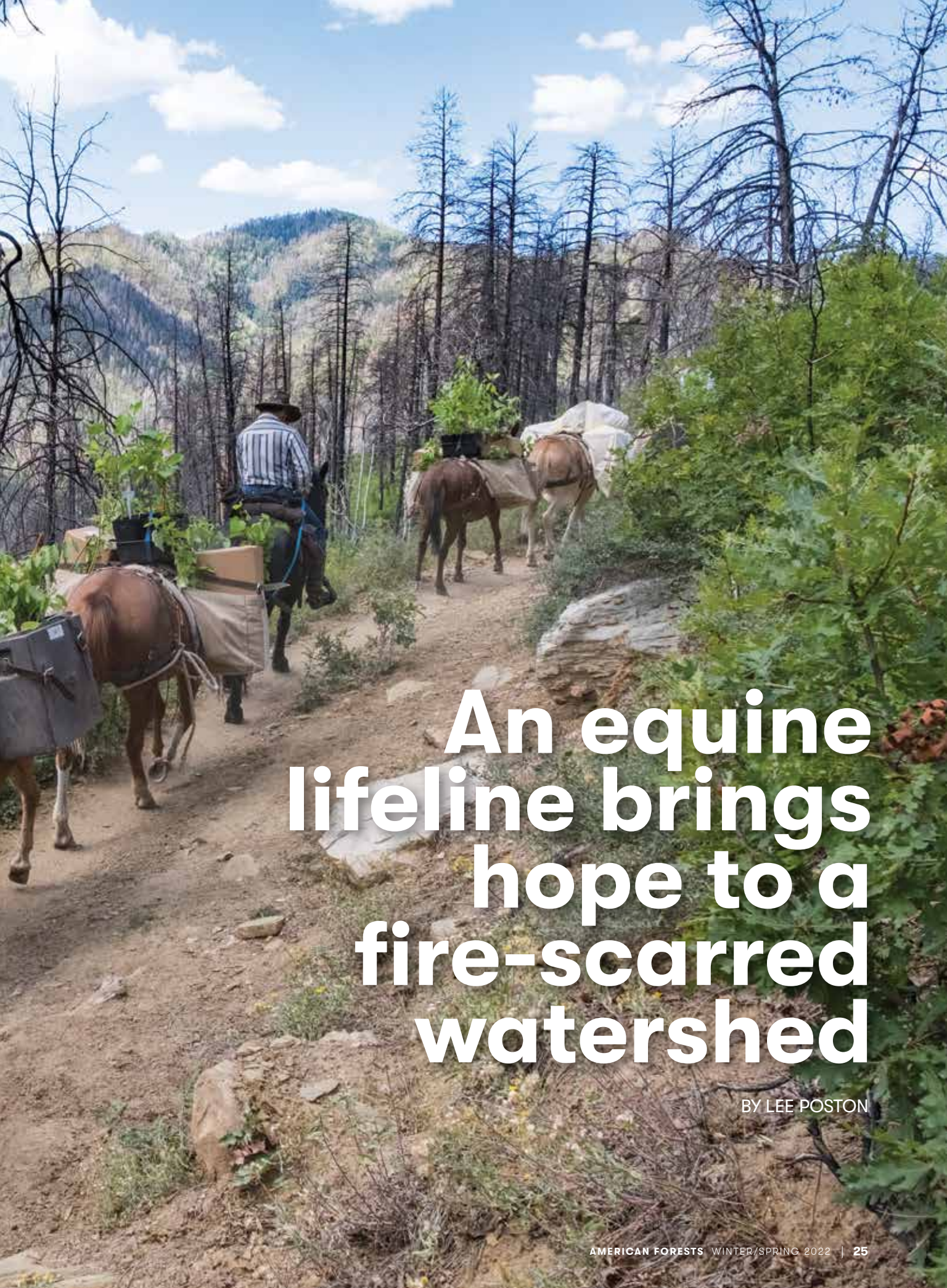


A great kiskadee eating Manzanita (Barbados Cherry) fruit. When seeds pass through the bird and fall into the soil, they sprout and help restore the Tamaulipan thornforest.

Facing page:
Top: With only 10% remaining, the Rio Grande Valley’s thornforests are increasingly threatened by development and climate change. Over the past 22 years, American Forests has planted more than 2 million thornforest trees and other native plants across more than 4,000 acres of former agricultural land. Bottom: Garza and Chrissa Browder-Long with the Student Conservation Association load seedlings at the Marinoff Nursery in Alamo, Texas. Looking on are Mitch Sternberg (left) and Rene Ruiz (right) of the Fish and Wildlife Service, which runs the nursery.

Lee Poston is a communications advisor who works with mission-driven organizations and writes from University Park, Md.



A photograph showing a person on a horse leading a pack train through a fire-scarred forest. The person is wearing a striped shirt and a hat, and is riding a dark horse. The pack train consists of several horses carrying large packs. The forest is filled with tall, thin, blackened trees, and the ground is covered in dry grass and small plants. The sky is blue with some clouds.

An equine lifeline brings hope to a fire-scarred watershed

BY LEE POSTON



“THE WHOLE WATERSHED JUST GOT TOASTED. The fire was so hot. And a big part of Dutch Creek — where the trees died — died from radiant heat. They didn’t even get burned. It was just so hot, it cooked the needles off ‘em.”

Gretchen Fitzgerald is reflecting on the 416 Fire of 2018, a conflagration inside Southwest Colorado’s San Juan National Forest that left Dutch Creek with no seed-bearing conifers. While she speaks, she loads hundreds of plants onto six horses at the Lower Hermosa trailhead, carefully ensuring they are evenly balanced and will survive the trip ahead. The goal is to plant thousands of trees and shrubs in the decimated area six miles inside the forest to eventually provide much-needed shade to the creek, a way of cooling the water temperature, maintaining the snowpack, reducing erosion and protecting water supplies and trout populations downstream.

Pages 24-25:
Packhorses
transport tree and
shrub seedlings
along the fire-
scarred Hermosa
Creek Trail in
Colorado’s San Juan
National Forest.
Above: U.S. Forest
Service Hydrologist
Joni Vanderbilt
(left) and Forester
Gretchen Fitzgerald
load riparian shrubs
onto horses for
transport to the
planting site.



to transport thousands of plants deep inside a forest.

The unconventional planting is part of a comprehensive project supported by Salesforce, which is also restoring several natural springs and supporting research to learn about the 416 Fire's impact on tree regeneration.

The horses, provided by a local outfitter, seem largely unfazed, except for one dapple gray mare who gets a little skittish once the plants are loaded. The main challenge is preventing the horses from eating the plants on their neighbors' backs, a problem solved by covering the plants with tarps.

They won't be the only ones trekking to Dutch Creek today. They will be followed by a planting crew in matching khaki shirts, heavy hiking boots and bright yellow hard hats, each shouldering a full pack and carrying a hoedad — a three-foot, L-shaped tool used to dig planting holes.



Alternating between jocularity and intensity, Fitzgerald has an ease in her actions and a determination in her manner that suggest she has done this before. In fact, she's been doing this for decades, having helped plant more than 2 million trees in the San Juan National Forest during her career.

This time is a little different, though, for two reasons. First, it's her final goodbye to the San Juan National Forest since taking a new job as an ecosystem staff officer in the Sequoia National Forest last winter. Before leaving, she handed the project over to Hydrologist Joni Vanderbilt, but was able to return to see its completion.

Second, using horses to pack in seedlings is not the way it's usually done. Most tree-planting projects take place within a mile of a road because it can be expensive and time-consuming

The crew is from the Southwest Conservation Corps (SCC), an organization that provides young adults, youth and veterans with service and educational opportunities on public lands across southern Colorado and northern New Mexico. This crew will be doing the bulk of the planting over the next week. But first they need a pep talk and a little instruction.

"You want to swing it like an axe — you don't want to go like this," Fitzgerald says, demonstrating a rigid chopping motion with a hoedad.

Austin Rempel, American Forests' senior manager of forest restoration, demonstrates correct planting technique to Isabel Slaymaker (left) and Ember Adkins (right) of the Southwest Conservation Corps (SCC).



“Because you don’t have any balance or control and you’ll fall over.”

Fitzgerald tells them why they are heading to Dutch Creek: With no seed-producing conifers left there, no conifer forest will exist unless they plant it. “We want to get some conifers up there in little islands so that they’ll create more seed and start repopulating that forest in 50 years.”

She explains that they will be planting 3,000 Ponderosa pines, Colorado blue spruce and Douglas-fir. A further 216 shrubs — alder, red osier, dogwood and serviceberry — will be planted by Vanderbilt’s hydrological team.

Fitzgerald stresses the importance of planting them firmly and deeply enough to avoid “j-rooting” (curling the root) and making sure there’s no root visible above the ground. “It’s better to go deeper than too shallow. Do microsite planting. Plant on the north to northeast side of the tree. That’s where the snow’s going to hold the longest so it’s going to be the moistest, coolest place. I’d say plant a tree by every dead tree, and you’ll be golden, within sight of the creek.”

“This will become second nature by the end of tomorrow,” Austin Rempel chimes in. As American

Forests’ senior manager of forest restoration, Rempel has been working closely with the U.S. Forest Service on this project for months, including helping provide some of the funding. He’ll oversee much of the initial planting for the first four days, providing guidance to the SCC crew and planting as many trees as he can himself.

It’s time to hit the trail. They all head out of the parking lot to the trailhead covered by an archway of trees and quickly disappear around a curve.

A CATASTROPHIC FIRE? YES AND NO.

The 416 Fire started on June 1, 2018, 10 miles north of historic Durango, the largest municipality in southwest Colorado’s La Plata County. The name derived from the Dispatch Incident Number assigned to the fire. Allegedly sparked by burning embers from the Durango & Silverton Narrow Gauge Railroad, a National Historic Landmark that is a major tourist draw in the region, the wind-driven fire quickly spread to the nearby San Juan National Forest.

By the time the fire was fully contained on July 31, it had burned more than 54,000 acres,

Facing page: Dutch Creek, a tributary of Hermosa Creek that ultimately flows into the Animas and San Juan Rivers, passes through a valley full of charred trees that were devastated by the 416 Fire of 2018. Below: A drone photograph of Dutch Creek shows the devastation to the area’s conifers from the 416 Fire.







including Dutch Creek, a tributary of the Hermosa Creek that feeds into the Animas and San Juan Rivers. It was one of the largest wildfires in Colorado history and has had lasting impacts on the economy of Durango and Southwest Colorado due to evacuations of more than 1,000 homes; closure of businesses and tourist attractions such as Purgatory Ski Resort; and the cancellation of Silverton's famed July 4th fireworks.

Before the fire, Dutch Creek had a reputation as the most productive tree-growing area in the forest, home to several "Champion Trees" — the largest of their kind in the state. Most of the watershed's trees were killed, eliminating the shade needed to keep water temperatures livable for trout and choking the stream with soil that washed in from charred mountainsides denuded of tree canopies and roots.

While it did produce serious damage in Dutch Creek and elsewhere, the 416 Fire was actually a mixed-severity fire that overall was quite healthy

for the landscape, says James Simino, district ranger for Columbine. "We got a pretty good mosaic burn in an area that hasn't seen fire in a long time. The critical piece for Dutch Creek is that it had a high-severity burn in there. It took out the seed sources to germinate naturally or regenerate vegetation naturally."

Simino stresses the importance of Dutch Creek to downstream users since it feeds into Hermosa Creek,

which is essential for agricultural irrigation.

"Anything we can do to get good vegetative cover back in that area is really important. It prevents sediment from going downstream."

Julie Korb, a fire and forest ecology professor from Fort Lewis College in Durango, has similar impressions of the fire, noting that only 3% burned at high severity like in Dutch Creek. With support from American Forests and Salesforce, Korb has been studying the 416's post-fire regeneration, setting up 90 permanent research plots within the burn area at different levels of burn severity.

Three years after the fire, she is seeing very low conifer regeneration across the 416 Fire scar, and almost none in high-severity burn areas such as Dutch Creek. Non-conifer species, such as aspen and shrubs, however, are coming back strong in all locations due to underground root sprouting. That's why it's important to restore the conifers.

"It's called Dutch Creek, but the Forest Service calls it 'Dutch Oven,' because it got so hot."

—AUSTIN REMPEL, SENIOR MANAGER OF FOREST RESTORATION, AMERICAN FORESTS



"Plantings like those in Dutch Creek are critical to maintaining watershed health long-term and also maintaining forest cover in areas that burned as high severity," she notes.

CAMPING IN AN OVEN

It takes the crew about three hours to reach the campsite, long after the horses have offloaded their seedlings and begun heading back. The



A Colorado blue spruce seedling recently planted next to a dead tree to increase survival chances.



Left: Emma Bernstein uses a hoedad to dig a hole next to a burned tree for planting a blue spruce. Bottom: SCC crew members (from left to right) Isabel Slaymaker, Nate Knaver and Ember Adkins stretch out before a long day of planting.

crew drop their packs in a gently sloping meadow wedged between dramatic mountainsides split down the middle by the burbling Dutch Creek. Charred and dead trees are everywhere, some of them already fallen.

There won't be any planting today, but Rempel gives them a briefing for the next day before they make camp. "Look for inspiration" in terms of where to plant trees, he says, while noting that the

Ponderosa pines need to go higher up on the slope while the Douglas-fir and blue spruce should be closer to the river. "It was a big fire, and you are standing in the very worst of it," he adds. He points down the valley and describes how Dutch Creek is famous in the Forest Service because this is where their biggest trees are.

"Down that way was the biggest blue spruce in Colorado. And, unfortunately, it burned along with another Champion Tree," he says wistfully. "It's called Dutch Creek, but the Forest Service calls it 'Dutch Oven,' because it got so hot."

UP AND AT 'EM

It's around 6 a.m., with temperatures in the low 40s and several hours before sunlight hits the valley floor. The SCC Crew have already scarfed down their breakfast and coffee and are doing their morning calisthenics and safety check. Energetic and enthusiastic, they are amped up and ready to get going.

The crew members each choose a species to plant, load up their panniers and spread out across the valley. River Curry





Left: Vanderbilt (right), discusses riparian shrub planting with Slaymaker (left) and Bernstein (center) of the SCC.

“The fact that we plant the baby trees next to these huge trees that were once giants and have died, it’s kind of cool that they provide the shelter that the little babies need to grow.”

—EMMA BERNSTEIN, CREW MEMBER, SCC

takes Ponderosa pine and spends the next eight hours moving across a steep slope with the agility of a mountain goat.

Rempel spends the morning darting up and down the valley. He alternates between giving planting tips to the crew, explaining the history and

science behind what they’re doing, and trying to plant as many seedlings as possible. “These are grown from seeds that Gretchen collected from the trees in this area before they burned,” he says. “With these big fires, we’re losing entire genetic strains of trees, so we’re lucky to have this seed, and we’re lucky to have these seedlings.”

Crew members Emma Bernstein and Isabel Slaymaker, working as a team planting blue spruce, pause to ponder the deeper meaning behind their work. “I feel like I really care about them, they’re sweet, cute little baby trees,” Slaymaker says. “It

feels exciting putting new life into the forest.”

“The fact that we plant the baby trees next to these huge trees that were once giants and have died, it’s kind of cool that they provide the shelter that the little babies need to grow,” Bernstein adds. “It’s like even though they’ve died, they’re still producing new trees and repopulating the forest.”





CHANGING THE FACE OF FORESTRY AND CONSERVATION

It's no coincidence that this particular SCC group came together. They found each other on a job board dedicated to connecting LGBTQ+ individuals and proudly call themselves "The Queer Crew." They say it's important for them to have a place where they feel comfortable, are not judged and can show the world that the traditional straight, male-dominated world of forestry and conservation is evolving.

"I've worked and recreated in a lot of outdoor spaces, and it is very male-dominated," says

Slaymaker. "And this crew, it's been really amazing, because we're all queer, and we come from different backgrounds, but we have certain shared identity and experience that we're able to really talk about, in a serious way, as well as joke about. I'm empowered. And I have this confidence. I definitely think by letting go of some of that, we are serving the forest better, and doing better work."

"I've had outdoorsy jobs, where I felt like I had to hide a part of me," adds Nate Knaver. "And it's really nice to feel completely comfortable and also represent a new queer crew in outdoor jobs. I'm noticing it more frequently."

Fitzgerald unpacks shrub seedlings after transporting them via horseback to Dutch Creek. The seedlings will be kept cool and moist next to the river prior to planting by the hydrology team.





Forest Service Field Technician Joseph Bogart plants riparian shrub seedlings in Dutch Creek.

A HOMECOMING OF SORTS

In her new job in the Sequoia National Forest, Fitzgerald oversees wildlife, vegetation, range management, hydrology and GIS work. While she no longer works on the San Juan National Forest, she wanted to return here to see the completion of a project conceived three years ago in the ashes of the 416 Fire. While working on the Burned Area Emergency Response (BAER) Team, Fitzgerald recognized both the challenges and the opportunities in reforesting Dutch Creek.

“It’s a lot of effort for a small area, but to be able to go in, so far from the road and address a high impacted area — it was the area of biggest concern for sure,” Fitzgerald says. “I was developing it in my mind, but never really thought we would do it, because it’s a little impractical. So, I’m super excited that we’re doing it and that Joni took it on.”

The intense work began in December 2020, when funding from the Forest Service and American Forests was approved. Fitzgerald and American Forests have a long history — the organization funded her first and last planting projects in the San Juan National Forest and is now supporting her newest work protecting sequoia trees in California.

Given that this project is ultimately focused on protecting Dutch Creek and several springs in the area, it was natural that a water expert like

Vanderbilt would lead the project after Fitzgerald moved on.

The riparian shrubs that Vanderbilt and her team are planting will improve water quality downstream, especially in the Animas River, a “gold medal” fishery that is home to rainbow trout, Colorado cutthroat trout and San Juan cutthroat trout. The San Juan lineage was previously thought extinct until it was “re-discovered” using advanced DNA testing.

“The riparian plants do a lot to improve the water quality of our streams,” says Vanderbilt, who in her spare time plays mandolin in the San Juan String Band with two other colleagues. “[The water temperature] is going to be elevated for a while, but, hopefully, the riparian species will shade it, give it a little protection from the heat and then it will be a great input into the Hermosa for the fish and water users downstream.”

The one thing she is concerned about overall is how dry conditions could affect the seedlings. With a recent heatwave and no rain in sight, she’s worried about the seeds making it until winter, when they are protected from harsh conditions by entering dormancy. “It’s been a hot September, the soils are dry and it’s going to be warm, so [the seedlings] are not going to be dormant,” she says. “There’s always something to worry about!”



A WILD RIDE

With planting going at full speed, by day three it's time for a new batch of seedlings to arrive. Because the new deliveries are needed further down the valley than the first batch, the horses need to take a short cut directly to the planting locations. So instead of gently descending into the valley to the campsite, they take a sharp turn down a steeper hillside.

With each rider leading a second packhorse with a rope, they descend through the charred forest with the panniers full of fresh seedlings bouncing from side to side. Just before they reach the valley floor, they hit a particularly steep section and dust begins flying in a frenetic few seconds of action that wouldn't look out of place in a John Wayne movie.

Once down, the team members unload the new arrivals, then tie the horses up and let them feed on the bushes. However, one grey horse with the fitting name of Dutch seems particularly agitated, loudly neighing at the next horse over before delivering a brutal two-hoofed kick to its haunches. The first pack of horses were provided by an outfitter, but these are Forest Service horses usually reserved for more routine range management activities. Several of them are formerly wild mustangs, including two that have only just been "gentled" (trained to be responsive to commands).

Range Specialist Technician Sean Kelly, a former marine, hunting guide and ski lift operator, says he and his team have been preparing the horses all summer for this trip. He watched the 416

Fire burn for weeks from his former work location on the Carson National Forest. After moving to the San Juan National Forest in spring 2021, he began talking with Vanderbilt about Dutch Creek and offered to do the work.

"Packing trees was a new one for me, as you saw with them poking all over the place," he laughs.

Before heading back to Hermosa with the horses, Fitzgerald takes time to check on the work of the SCC crew. Always the teacher, she corrects their hoedad technique, planting locations and spacing selection, not hesitating to tell them firmly but gently if they are doing it wrong. They pepper her with questions about Dutch Creek, the 416 Fire and her new job in Sequoia National Forest. "It's really fun having everybody up here, and it's kind of a crazy idea to come up here to plant trees," she says. "But it's really fun to see it happen."

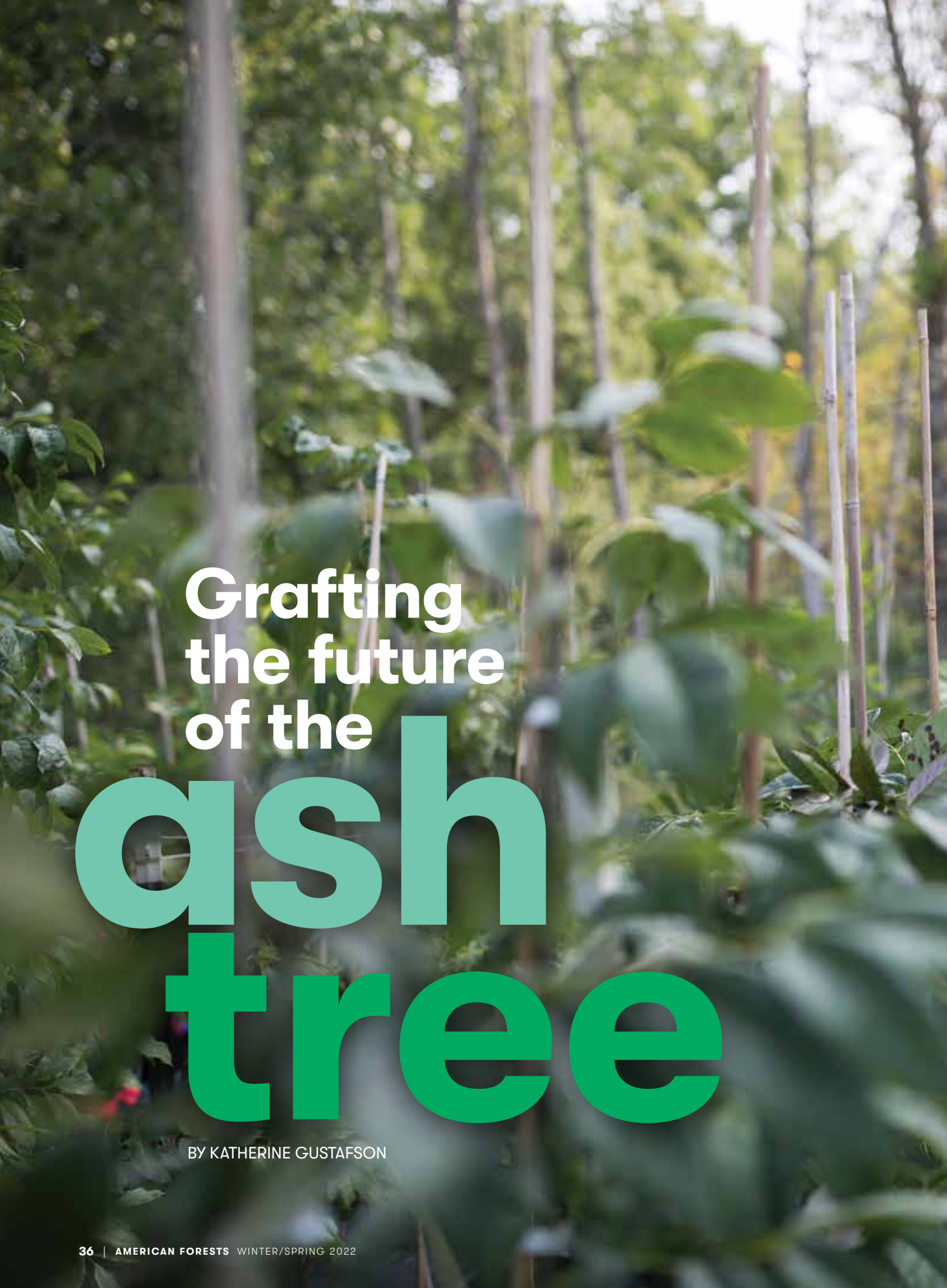
As Rempel collects GPS data of the new plantings, he expresses confidence that the three years of planning and hard work will eventually pay off.

"We're providing a seed source for the future," he says. "This will be the core island of trees that will eventually spread and have the genetics here. These trees will defend and protect Dutch Creek. They will grow fast if they survive. This is an extremely productive area, and I hope these trees will do well." 🌱

Lee Poston is a communications advisor who works with mission-driven organizations and writes from University Park, Md.

Fitzgerald packs in a new supply of tree and shrub seedlings on horseback along the Hermosa Creek Trail.





Grafting the future of the ash tree

BY KATHERINE GUSTAFSON



JENNIFER KOCH, a research biologist with the U.S. Forest Service's Northern Research Station in Delaware, Ohio, carefully peels back the outer layer of the bark of an ash tree with the tip of a grafting knife. The work is slow; she must be gentle or risk severing the tiny, wormlike white larvae that she is trying to find underneath.

These larvae are the offspring of an insect native to Asia called the emerald ash borer (EAB), which is surprisingly beautiful for a pest responsible for the brutal devastation of one of the most common tree species in the United States. The slim, half-inch-long insect's bright, metallic-green wings overlay an orangey-crimson abdomen — a festive combination that belies the destruction these insects are bringing to ash trees from Maryland to Wisconsin.

**Research Biologist
Jennifer Koch inspects
cuttings and leaves of
ash trees at the Forest
Sciences Laboratory in
Delaware, Ohio.**



The pest appeared in the U.S. in 2002, and began decimating Detroit's tree canopy. Since then, the EAB has destroyed hundreds of millions of trees nationwide. Jeff Hafner, director of municipal consulting for Rainbow Treecare in Minneapolis-St. Paul, and a certified arborist, watched in horror as the pest swept across Michigan and Ohio. In Minnesota, authorities targeted ash trees for removal, but the size of the coming onslaught overwhelmed some cities' ability to manage.

"A lot of the cities in Minnesota increased their condemnation policies to enforce more rapid tagged tree removal," he says. "We've seen cities that have had to abandon their tree condemnation protocol because they just don't have enough staff to tag all the trees that need to be removed."

In the context of such a major threat, Koch's bioassay is part of an effort to stave off the extinction of this pervasive and important tree species — a project called Roots of Rock on

which American Forests is collaborating with a range of partners. The effort aims to change the way we approach tree cultivation in the face of a changing climate and the pest outbreaks and forest fires fueled by it. Ultimately, scientists hope to breed trees that will withstand the EAB assault over time.

THE BEST MEASURE OF RESISTANCE

Once Koch has peeled the top layer of bark away, it's clear that the impact of these tiny larvae isn't tiny at all: Underneath is a network of tunnels etched into the wood — called a gallery — that indicates the pathways that the larvae have taken over for the last year or two since their parents deposited their eggs on the bark. The larvae feed on the tree's vascular tissue, disrupting its ability to transport water and nutrients to its branches, a process that kills it, usually in as little as 5 to 7 years.

Scientists believe that the EAB kills nearly all of the ash trees it infests, though it has become clear that some put up a fight and don't die quite

Below top: Larvae of the emerald ash borer (EAB) can be seen under the bark of an infested ash tree. Below bottom: EAB collected from a trap at a research test planting site. Researchers monitor EAB population levels at sites where trees have shown high levels of resistance to the infestation.



A gallery, or network of tunnels, on an ash tree shows where the EAB larvae have burrowed.





Ash trees in an LED light treatment chamber in which high-intensity and various wavelengths of light are tested to see if they can induce ash seedlings to flower early. Getting ash trees to flower as much as 17 years earlier than usual could accelerate the breeding process and help save the species.

as quickly as others. These trees, referred to as “lingering ash,” are scarce and have managed to survive the fatal attack of EAB. The goal of the research is to identify what defense responses these trees mount against the larvae that allows these rare trees to survive. Such insight will help accelerate the process of breeding, producing trees with even more resilience to EAB.

Trees that show some resistance may still die from EAB infestation, but they live longer. If 1 in 4 larvae dies at a young age due to the tree’s natural defenses, that tree sustains 25% less damage from larval feeding and can, thus, potentially live 25% longer than other trees.

The process of the bioassay — one of several techniques the scientists are using — involves putting eggs on the bark of the ash trees, where they hatch within 48 hours and burrow in. After two weeks, scientists mark those that have hatched and circle their entry holes. Eight weeks later, once the larvae have had a chance to feed, the scientists dissect the tree starting at the holes to see the gallery. When they find a larva, they take its weight and examine its development and health. If a larva

appears unhealthy or the galleries immediately around the larvae are darkened in color and tissue from the tree is encasing the larvae, it’s a sign that the tree is putting up resistance to the pest.

“The best measure of resistance that is most reproducible is the number of tree-killed larvae,” says Koch. “If they have partial resistance, they live longer than the majority of ash trees in the stand, but they can still be attacked by EAB and may die. Through breeding these select

Scientists believe that the emerald ash borer kills nearly all of the ash trees it infests. But some, referred to as “lingering ash,” don’t die as quickly.

lingering ash trees, we can increase the number of larvae that the seedlings of two lingering ash parents are able to kill and, thus, increase their resistance to EAB.”

This painstaking effort to look at the inner workings of this pest seems to be paying off, providing a way to cultivate trees that are better able to withstand a climate-altered future where pest outbreaks like the EAB are sure to be increasingly common.



“Our program has shown that we can create improved populations that can survive and continue to evolve and save the species,” says Koch. “We’ve developed these techniques and shown that these processes work.”

THE IMPORTANCE OF HEALTHY ASH

As one of the most dominant native genera of trees in North America, ash is essential for environmental benefits, Tree Equity and industry uses. These trees help maintain a healthy environment; the widespread mortality of the species resulting from EAB infestation is altering the carbon cycle and shifting water resources. The program’s name, Roots of Rock, is a nod to the vital importance of ash trees to the music industry, which makes instruments out of ash wood. And ash’s decline is also affecting urban areas, where this common tree type provides shade and clean air to neighborhoods around the country.

“Here you have a species that is not only native to North America, but found in almost every state throughout the nation,” says Eboni Hall, senior manager of urban forestry education at American Forests. “Ash is a keystone species that’s invaluable to its surroundings. It’s important in terms of climate change and providing co-benefits. That’s where we’re starting to see some of the negative implications and consequences of losing this species.”

Hafner agrees that ash has tremendous benefits for urban communities, though many of those advantages are taken for granted. “I am always sad to lose big, mature trees from communities because it’s the trees’ proximity to people that gives maximum benefit,” he says. “I think the good news is that this issue is impacting so many people that there is opportunity to highlight tree benefits which may have been invisible to people for a long time.”

As a common tree that can typically thrive in the urban jungle, ash is a critical species for efforts to advance Tree Equity, which is the equitable distribution of trees in urban areas to ensure that all people can benefit from them. American Forests’ work on this front includes using a Tree Equity Score to determine which neighborhoods need more trees and to target those areas for planting.

Once those trees are in the ground, it’s essential that they are able to survive so that the investment pays off and future generations can experience the benefits trees provide. There’s a similar calculus that goes into reforestation efforts after wildfire — the last thing conservation-



ists want is to plant trees to restore fire-ravaged forests only to have them destroyed by pests.

“We’re thinking through every piece of Tree Equity,” says Ian Leahy, vice president of urban forestry at American Forests. “We’re not looking for people to make investments in Tree Equity in a community and then a pest comes through and wipes all the progress out.”

The difference between a tree that has been struck by EAB, pictured at the top, and one that is healthy, pictured at the bottom, is striking.

Tree Equity and reforestation work is only as good as the health of the trees being planted, so it's a worthy goal to find varieties of ash that are as resistant as possible to diseases and pests. Although ash trees can temporarily be protected by applying insecticides — as Hafner works with city leaders to do in Minnesota — the only long-term solution for restoring ash populations internationally is to breed ash trees for resistance to EAB.

THE ROOTS OF ROCK PROJECT ROCKS

Accordingly, the work Koch and her team are doing is the initial stage of a multi-part effort to get ash trees with some amount of resistance to EAB into the ground in order to identify and cultivate those that are most resilient. Koch's team selected and bred green ash trees that showed signs of resistance, and some of them were able to kill more than 95% of the EAB larvae in bioassays.

The next phase is to see how these EAB-resistant trees perform in urban planting environments, where the trees will be exposed to more realistic conditions than they are in greenhouse tests, where they are grown in a controlled



In Seymour Woods State Natural Area in Delaware, Ohio, Koch and her team use metal tags to identify and monitor trees that appear to have some natural resistance to EAB and merit further testing.

environment. American Forests is partnering with the Forest Service, Holden Forests & Gardens, Washington & Jefferson College, The Greening of Detroit, Wholesale Trees Inc., Wayne State University, and the Detroit Department of Neighborhoods to orchestrate this project.

At the Forest Sciences Laboratory, technician Dave Carey cuts into an ash tree using a draw knife to expose the serpentine-shaped damage caused by EAB feeding under its bark, called a "gallery."





These ash trees on a plot at the Forest Sciences Laboratory have shown partial resistance to EAB infestation and are used as a source of genetic material for additional experimental plantings.

A first planting of 150 trees, each around 4 or 5 years old and 5 feet tall, went into the ground in spring of 2021 in a nursery in Virginia Park, an urban site in Detroit. A second planting of trees about 2 years old and 2 feet tall occurred at Detroit's Palmer Park, Eliza Howell Park and The Greening of Detroit's Meyers Nursery at Rouge Park in late 2021. The trees were planted in pairs — one tree of each pair with genetics that make it susceptible to EAB and the other tree with genetics that show some resistance — providing the first chance to see a direct comparison between the two types.

"They're urban pilot plantings," says Mary Mason, a geneticist with the Forest Service who is working on the project. "We know some of them won't make it, but we hope a few will. We'll get a little bit of data out of it."

NEW USES FOR AN ESTABLISHED APPROACH

That data will move forward the work of selecting trees with pest-resistant genetics. The scientists are careful to clarify that there's no such things as "immune" trees; there are only trees that can kill enough larvae to reduce the threat and prolong the tree's life.

By selecting these trees and propagating them through grafting, the project can increase the frequency and level of EAB-resistance within



American Forests and partners conducted plantings of EAB-resistant trees at Detroit's Palmer Park, Eliza Howell Park and The Greening of Detroit's Meyers Nursery at Rouge Park in late 2021.



the population, and little by little the resistance can grow stronger over time through natural selection. Once the effort produces trees that are clearly more pest-defensive than others, those exemplars can be used to develop regional clonal seed orchards where genetically improved seeds can mass produce the more resilient trees for urban plantings and reforestation work.

This approach is not new; the history of tree improvement programs like this goes back decades at the Forest Service. A program to increase resistance in all white pine species in the U.S. to a disease called white pine blister rust has been running for some 50 years. That work provided proof of concept, and the need for this work has only increased as climate change has become an increasingly dire threat. In a changing climate, diseases are emerging more often and more virulently.

Accordingly, American Forests will also support research efforts, technology transfer projects and downstream restoration activities for other threatened keystone species, such as Eastern hemlock, American beech, American

“We’re not looking for people to make investments in Tree Equity in a community and then a pest comes through and wipes all the progress out.”

—IAN LEAHY, VICE PRESIDENT OF URBAN FORESTRY, AMERICAN FORESTS

elm and American chestnut in national forests and in urban areas. These future projects will use the knowledge gained from the work on EAB.

One example of such an effort is the Great Lakes Basin Forest Health Collaborative, a network of partners assisting with all the different aspects of resistance breeding. Members of this network are currently taking the activities of Koch’s EAB project and expanding them to develop seed orchards to supply EAB-resistant seed for restoration in various regions of the country. When appropriate, once enough research has been done to map the path forward,

BE A GIANT

Join the Sequoia Circle

Your annual leadership gift of \$1,000 or more makes you a giant for American Forests.

Forests rely on keystone tree species — such as the giant sequoia — to stay healthy and resilient. In the same way, American Forests relies on our keystone supporters — Sequoia Circle members — to advance our mission with leadership-level gifts.

Become a Sequoia Circle member today at americanforests.org/sequoiacircle
Questions? Contact Sarah Mitchell, Director of Donor Experience and Engagement,
at smitchell@americanforest.org or 202-737-1948.





Koch is determined to make sure ash survive. “Our program has shown that we can create improved populations that can survive and continue to evolve and save the species,” she says.

similar efforts will be focused on American beech and Eastern hemlock.

BENEFITING FUTURE GENERATIONS

Roots of Rock and related efforts are serving to accelerate discovery of genetic resistance to pests and diseases, as well as amplifying the story of how climate change is increasing the prevalence and strength of such threats.

By supporting the fight against EAB and other damaging pests, American Forests and its partners are bringing solutions to the ground

level and finding ways for reforestation efforts to have the greatest possible longevity.

“The benefits of planting trees won’t be realized until later for future generations,” says Leahy. “This way, the trees will actually be able to mature and will be able to deliver on their promise of helping those who need them most.”

That’s a goal worth grafting for. 🌱

Katherine Gustafson is a freelance writer specializing in helping mission-driven changemakers like tech disruptors and dynamic nonprofits tell their stories.

PLEASE DRINK RESPONSIBLY. BULLEIT DISTILLING CO, LOUISVILLE, KY.

BULLEIT

BOURBON

DISTILLED AND AGED IN THE BULLEIT FAMILY TRADITION

BULLEIT® BOURBON
FRONTIER WHISKEY

KENTUCKY STRAIGHT BOURBON WHISKEY
PLEASE DRINK RESPONSIBLY

FRONTIER

WHISKY



Paving the way for women in forestry

VICKI. Lenise. Angela. Leslie. Mary Wagner was in good company when she started working as the associate chief for the United States Forest Service in 2011. She was surrounded by women leaders, which was somewhat surprising in a field that had always been dominated by men.

She felt an instant bond with these women, due in large part to the common personality traits they shared, like listening with empathy and not being competitive.

“They were my sounding board, my rock, my confidantes,” says Wagner. “And it was good to have a network of people who see the world like I do and challenge me when they see it differently...Being associate chief could be lonely at times. But they gave me courage.”

With that type of support, combined with her forestry smarts and experience, Wagner was able to accomplish a lot during her five-year stint as associate chief, the Forest

Service’s number two position. For example, she helped write the Forest Service’s five-year strategic plan, a document known for clearly explaining the role of the agency in sustaining forests nationally. She traveled to places like China and Brazil to advance partnerships related to saving forests worldwide. She introduced safety as a core value at the agency and helped create a more diverse workforce.

Wagner retired from the Forest Service in 2016, after 34 years of service. But she hopes that the agency’s trend of being more inclusive — in part by letting women and people of color rise in the ranks and be heard — will continue. They bring new perspectives to the agency and the forestry sector, she says.

“Peoples’ backgrounds and wiring impact how the agency approaches things.”

And she hopes these women will be as lucky as she was in being supported almost from the moment she started her decades-long career in forestry. It began in a small office in a small Idaho town, where most of her co-workers were men. But they welcomed her, as well as the opinions she voiced at meetings. They added her to the leadership team when she worked in the Sawtooth National Forest. One of them even organized a women in leadership conference for foresters. In the 1980s, that was an anomaly.

“It was a formative experience,” says Wagner, who had “director” and “deputy” in her title several times, before becoming associate chief. “I did not realize the importance of it until years later. Those men gave me opportunities most women in forestry did not have at the time.”

Wagner is still active in forestry, even though she is no longer a government employee. In September, she was elected



Mary Wagner pauses to take a selfie along the trail to Cliff Lake in August 2020, while on a camping trip in the Wasatch-Cache National Forest in her home state of Utah.



In October 2020, Wagner took a camping trip in the Great Basin National Park in Nevada. Here, she poses next to a pine along the Bristlecone Pine Interpretive Trail.

as the chairperson of the American Forests Board of Directors. She has served on the board since 2017.

She says she is excited about the opportunity to work with another cadre of strong women leaders, like fellow board member Ara Erickson of Weyerhaeuser and American Forests Senior Director of Urban Forestry Maisie Hughes.

“They will confront issues like sustainability and equity,” she says. “They will move the ball down

the field. That’s what we need now in forestry.” 🌿

“It was good to have a network of people who see the world like I do and challenge me when they see it differently.”

— MARY WAGNER, RETIRED ASSOCIATE CHIEF, U.S. FOREST SERVICE

last look



FIFTY FORESTS



Top: The bark of a longleaf pine found in Georgia, oil painted on canvas panel in 2020.

Middle: The bark of a live coastal oak found in Pasadena, Calif., oil painted on canvas panel in 2016. Collection of Laguna Art Museum, Laguna Beach, Calif.

Bottom: The bark of a black oak found in Yosemite National Park in California, gouache painted on wove paper in 2020.

ARTIST KRISTIN LEACHMAN is exploring the human world's relationship with trees, and by extension, with all of nature. Her current project, *Fifty Forests*, looks at the "self-organizing patterns in trees" with intimate paintings of the formations and structures of their bark. She began in 2010 in her adopted home state of California and plans to travel to forested and deforested sites on protected and unprotected lands in all 50 states.

"By transcribing the unspoken language of the structural integrity and biological resilience of trees, my paintings explore the intersection of painting and the natural world, as well as themes of representation and abstraction," writes Leachman. They are "meant as a contribution to the urgent conversation around our changing climate."

New works depicting an old-growth longleaf pine forest in southwest Georgia will be presented in *Kristin Leachman: Longleaf Lines* at the Georgia Museum of Art in Athens, Ga., from July 23, 2022 to Feb. 5, 2023.





Give the Gift of Trees

Plant trees to commemorate any joyous occasion,
such as a **birthday**, **wedding**, **graduation** or **retirement**.

Celebrate a beloved friend or family member on
Mother's Day, **Valentine's Day**, **Christmas** or **Hanukkah**
and preserve the health of the planet for the future.

Find out how at
www.americanforests.org/ways-to-give/gift-of-trees

Gift includes personalized certificate
for your recipient.





1220 L Street NW Suite 750
Washington DC 20005

NONPROFIT
U.S. POSTAGE
PAID
AMERICAN
FORESTS

Membership has its benefits

Join American Forests

With a membership gift of \$25 or more, you'll receive the following benefits:

- **Satisfaction and Pride.** Know your gift will be used wisely to restore America's forests to health and resiliency.
- **Annual Membership Card.** Carry this with you to signify your commitment to American Forests.
- **Magazine Subscription.** Read and share our award-winning, colorful and informative publication.
- **Merchandise Discounts.** Shop with periodic members-only discounts from our Corporate Partners.
- **Invitations to Special Events.** Be the first to be notified about special events and volunteer opportunities in your area.
- **Insider Updates on Our Work.** Stay informed about the impact your gifts are having on our critical work and progress.

Make a difference for forests and the world.

Become a member today!

www.americanforests.org/ways-to-give/membership

