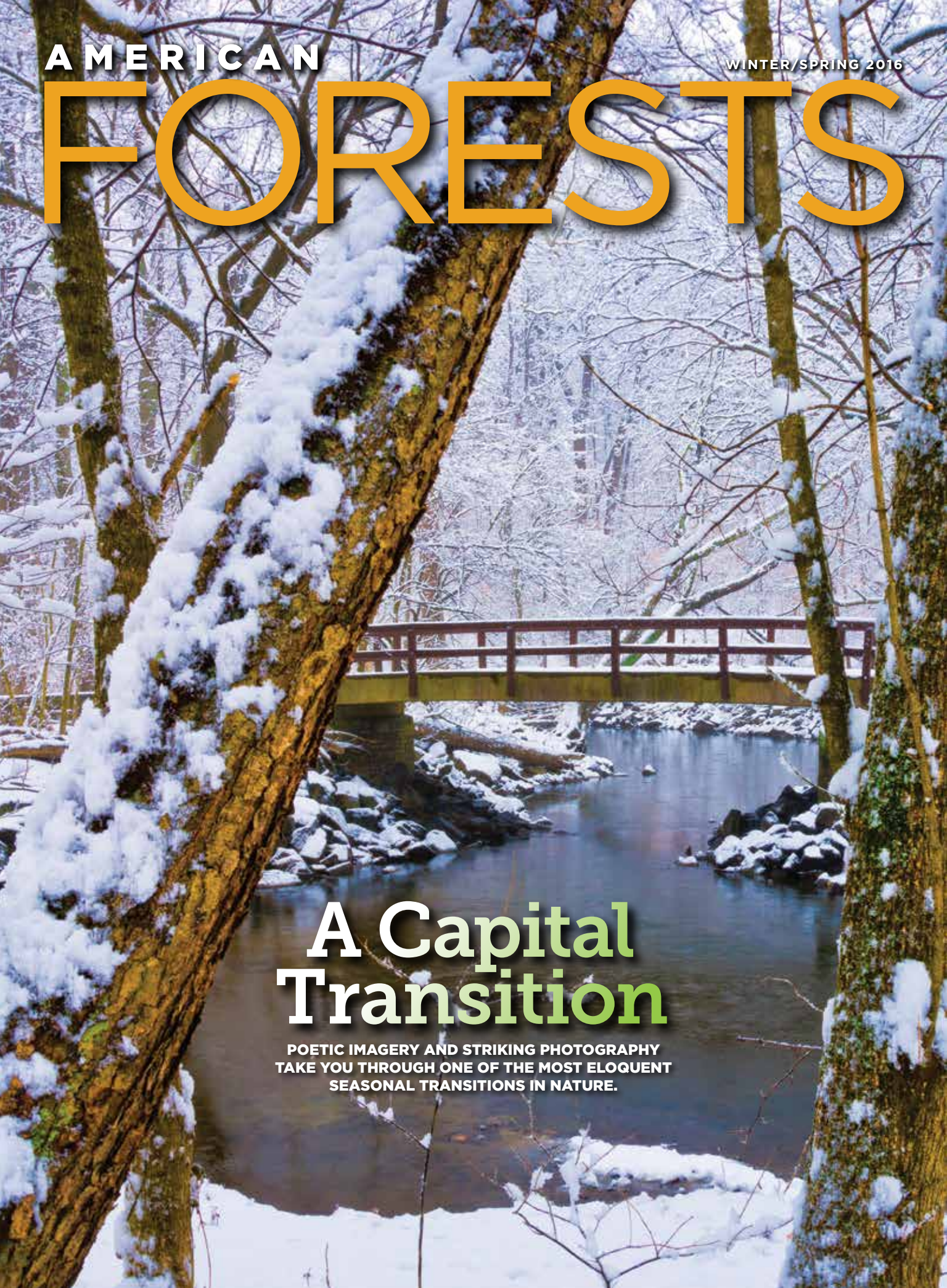
AMERICAN
FORESTS
WINTER/SPRING 2016



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AMERICAN FORESTS



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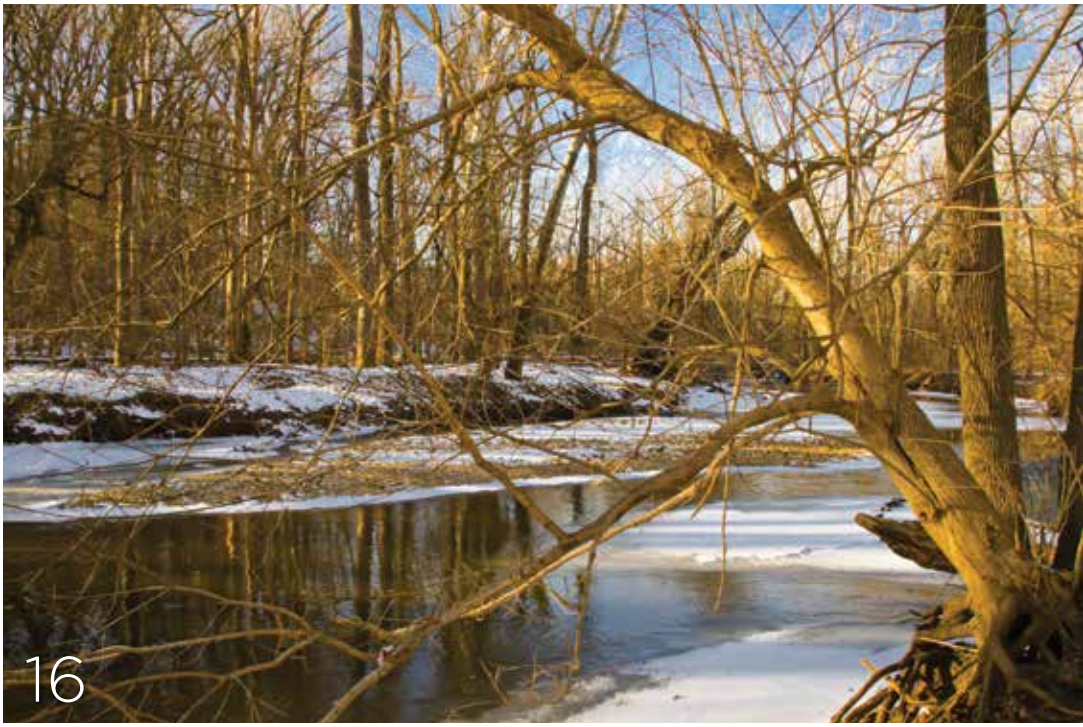

Features

CORRECTIONS
On page 5 of Vol. 121, No. 3 (Fall 2015), the baldcypress in "A soggy situation" is a deciduous conifer, not an evergreen.

American Forests' 50 millionth tree

CHARLEY GALLAY/GETTY IMAGES

50 Million Trees

BY SCOTT STEEN

THERE IS A CHINESE PROVERB that says "The best time to plant a tree is twenty years ago. The second best time is now."

A few months ago, this proverb came alive as I stood on a mountaintop in California to plant a very special tree with the CEO of one of our longtime corporate partners, Eddie Bauer, and their philanthropic ambassador to our partnership, actor Ryan Reynolds.

Ryan, who is known for his work in movies like *Deadpool*, *The Proposal* and *Woman in Gold*, approached Eddie Bauer about a possible partnership to talk about the conservation work we have done together. We jumped at the opportunity. His deep love of nature and commitment to the environment make Ryan a perfect messenger for the important role that forests play in the overall health of the planet.

In 1990, American Forests started the Global ReLeaf program with a simple, compelling mission — to find threatened, ecologically important forests, and to fund tree planting initiatives that make a real difference in restoring these landscapes to health.

In November, on that mountaintop, we planted our 50 millionth tree, 25 years after the program began. To put that number in perspective, 50 million mature trees, laid end to end, could encircle the globe 30 times. Fifty million trees could forest a treeless plot of land nearly eight times the size of Manhattan.

And, while 50 million might be a hard number to wrap your head around, the reality is this: every one of these trees matters. Each one is helping to clean our air and water. Each one provides oxygen for us to breathe. Each one provides food and shelter for wildlife. And, when combined together in a forest, their impact is exponentially greater.

We chose to plant our 50 millionth tree with Eddie Bauer for a number of reasons, but primarily because they are one of our most committed partners. They are a living example of the Chinese proverb. The legendary clothier began planting trees with American Forests 20 years ago. Since then, we have planted more than 6.5 million trees together in more than 150 forest restoration projects.

> "The best time to plant a tree is twenty years ago. The second best time is now."

Much of our partnership with Eddie Bauer during the past 20 years focused on restoring forests that have been profoundly damaged by wildfire, which is the reason we chose the Mountain Communities Wildfire ReLeaf project as the site of this historical tree planting.

In the early 2000s, the communities around San Bernardino Mountain watched as waves of pine beetles made their way across the terrain, turning beautiful pine forests red as the trees lost their needles and died.

And then, to add insult to injury, the great Fire Siege of 2003 struck. Fifteen separate wildfires raged throughout Southern California that October. On San Bernardino Mountain alone, 90,000 acres of forest burned. Within a 25-mile radius, 60,000 people were evacuated.

When they returned, 450 homes had been destroyed and thousands of people were left homeless. Their beautiful mountain forest was reduced to fields of blackened shards. The diverse wildlife vanished. And, the tourist economy, based on the community's natural beauty, vanished with it.

But, the people who lived in this mountain community reacted in a remarkable way.

They decided to rebuild not just their homes, but to rebuild the forest itself.

New organizations were born and new alliances formed. Neighbors, businesses, Boy Scouts, college students and even the tourists themselves were enlisted to collect seeds, prepare soil and plant trees. Distant communities got in on the action. And, from the very beginning, American Forests joined hands with these families, friends and neighbors to help bring this forest back to life.

With funding from American Forests, the community has planted 400,000 trees so far, with more to come. Cheryl Nagy, one of the leaders of this effort, told me that without American Forests' involvement, this work probably wouldn't have been possible.

This is at the core of what American Forests does. We find important projects that can make a significant difference in real places and to living things. Then, working with local teams who know the "ground truth" of a place, we create positive and lasting change. We do this because, quite simply, forests are essential for supporting life on our planet.

As we planted American Forests' 50 millionth tree on that chilly November day, I recognized that this was not only a symbol of the work we had done during the past 25 years, but more importantly, a symbol of the work that remained. Because, while the best time to plant a tree may be 20 years ago,

The second best time is *now*.

AMERICAN FORESTS

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

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Q&A

ASK A CONSULTING ARBORIST

Buried roots

Q: After construction on my property, the contractor piled some of the dirt and dense clay near a large live oak tree. The fill encroaches 4 to 5 feet under the tree's large canopy but is still probably 20 feet from the trunk. The area where the fill encroaches under the canopy is approximately **1/8 of the space under the tree canopy. Is the 7/8 of unencumbered root system sufficient for the tree to live, or is 1/8 coverage from the fill going to hurt/kill the tree?**

A healthy live oak tree on residential property

CITYOFSTPETE VIA FLICKR

A: Usually the maximum area of roots that is allowed to be damaged at one time from root cutting, compaction or otherwise before expecting dieback in a tree is 10 to 20 percent. The description of impacts you state should be acceptable, given the rest of the root area is not being impacted. You can look up CRZ (Critical Root Zone) areas and issues on the Internet if you want to follow up more about root impacts and how to reduce damages to trees.

Answered by Consulting Arborist John Harris of Hollywood, Fla.; www.landscapeeconomics.com; (954) 986-9405

Pruning purple plums

Q: I have an ornamental purple leaf plum tree that has become infested with what I believe to be borers. Many tiny holes (pinprick size) cover some limbs. Many of the holes ooze sap, so the tree is covered by little globules of sap. The limbs worst hit have no leaves. How can I save the tree?

A: There can be many insects and borers that affect plum and fruit trees. If the borers wound the trees, there can be sap bleeding or oozing. The branches that have no foliage can be checked to see if they are alive by scratching the thin bark away with a thumbnail. If green cambium is beneath, the branches are alive. If the branch is dried and hard, and bark can't be scratched like a wooden dowel, the branch is dead and can be pruned any time. If branches that have sap oozing are mostly dead, they can be pruned off. If the shape of the leaf crown is so badly deformed by pruning, it may make sense to remove the tree.

Answered by Consulting Arborist Gordon Mann of Auburn, Calif.; www.mannandtrees.com; (650) 740-3461

The foliage on a healthy purple leaf plum tree

YOKO NEKONOMANIA VIA FLICKR

ELI SAGOR VIA FLICKR

Two ash trees on residential property displaying different health conditions

Don't judge a tree by its leaves

Q: The ash in front of our home in Monmouth County, N.J., is listing, and the ground opposite the list is mounding. We fear the tree will eventually fall. It's a huge tree that shades the house, and we love it. We have been told by tree professionals the tree needs to be taken down, although it looks healthy. We'd hate to lose her. Anything we can do?

A: Unfortunately, tree "health" is a bit more complex than a tree's outward appearance. A tree that appears to be green and flourishing can also possess hidden structural defects so serious that failure is imminent. With large trees, the consequences of a complete failure can be severe, causing extensive property damage and/or personal injury (or worse). I recommend that you follow the guidance of the tree professionals that have assessed the situation firsthand.

Answered by Consulting Arborist Jason Miller of Cinnaminson, N.J.; www.treeres.com; (609) 284-6009

Sap crack

Q: Our maple tree's trunk appears to be splitting. Is it just growing, or is there something wrong with our tree?

A: The maple could be suffering from "frost cracking" caused by severe cold that literally pops open the trunk when it has sap in it. If the damage appears to be very bad and looks to have happened over several years, the tree will suffer decay and possibly other damage from insects and disease and will probably never be healthy or structurally strong. Damage is likely to continue, as the maple species is prone to this type of damage. The tree should be considered for removal and replacement with a more adaptable species.

Answered by Consulting Arborist Donald H. Godi of Lakewood, Colo.; www.dhgainc.com; (303) 989-2853

Frost crack damage on a red maple

ELI SAGOR VIA FLICKR

MARYJANEPOPPINS VIA FLICKR

Cherry tree branches covered in ice

Cherry Tree-sicle

Q: There is a limb on my tree that appears to be dying from the trunk out. It has a few leaves that look like insect damage but nothing major, but the leaves on the limb are shriveling up. The rest of the tree looks healthy. I'm concerned it will affect the rest of my tree. This is the second season with this tree, and it didn't flower last year. I live in Ohio so winters can be harsh. How can I take care of this limb and properly feed the tree to give it the best chance possible?

A: In Ohio, cherry trees have been hit hard the last two winters. I have seen many cherry trees this spring only half leafed out or in severe decline. If you only have one limb dying out of many, it could be a number of things. It sounds like it may be a vascular issue where the tree is not able to get the water and nutrients to the limb, causing the limb to die.

Also, check that the trunk and limbs do not have borers on them. This would exhibit as small, pencil-sized holes that have goo or sap oozing from them, or frass (sawdust-like particles), at the base. I would continue to keep the tree watered sufficiently and baby it as much as possible. Cherry trees can sometimes be considered high maintenance trees in our area, as many things can go wrong or attack these trees.

Answered by Consulting Arborist Chris Ahlum of Dublin, Ohio; www.ahlumarbor.com; cahlum@ahlumarbor.com

American Forests thanks the American Society of Consulting Arborists for responding to readers' tree care questions. Ask your questions at www.americanforests.org/consulting-arborists.

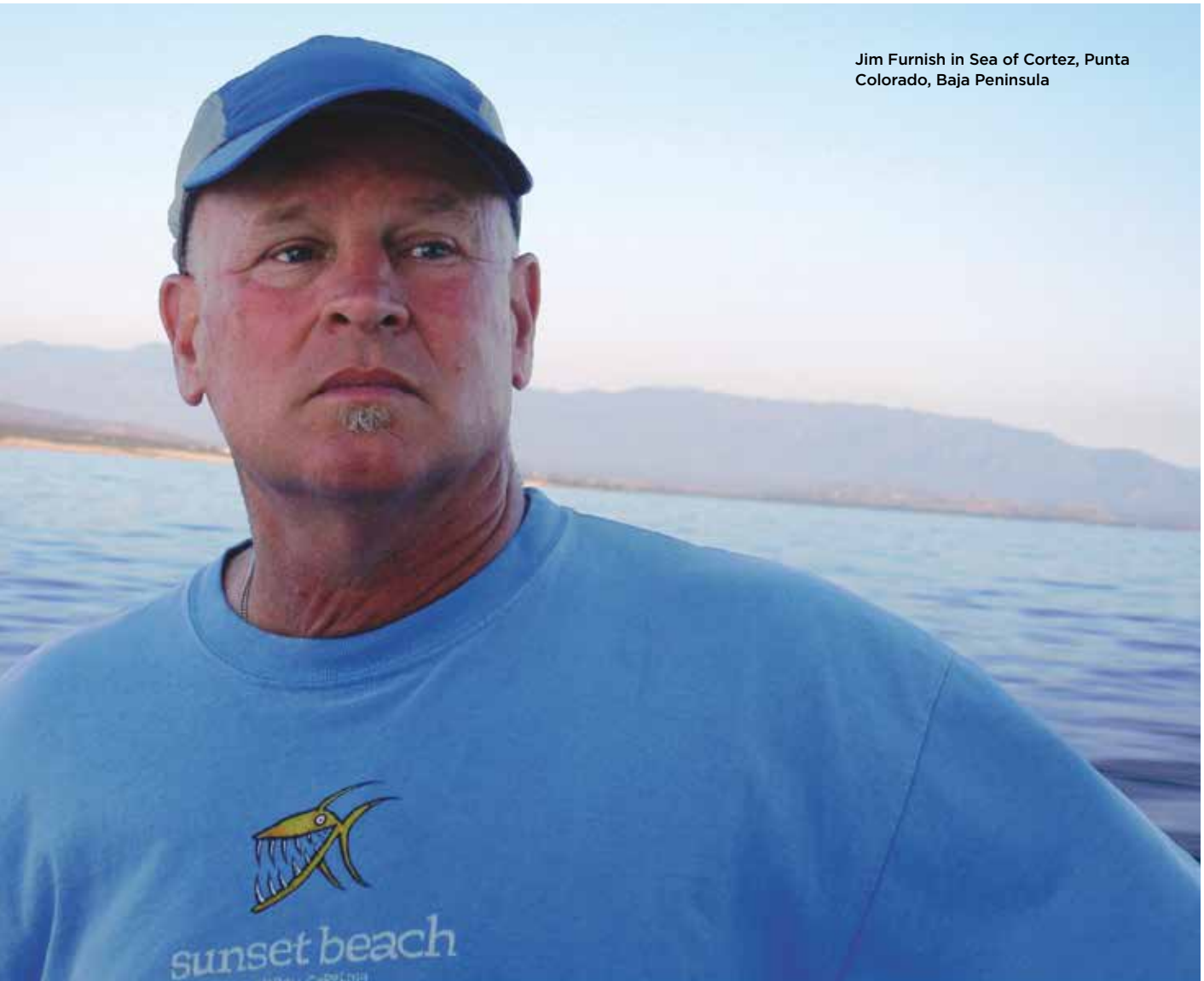
FOREST FRONTIERS

Jim Furnish, retired deputy chief, USDA Forest Service

JIM FURNISH is currently a consulting forester in the Washington D.C. area following a 34-year career with the USDA Forest Service. He retired after serving as deputy chief for national forests from 1999 – 2002. During the 1990s, Furnish was Siuslaw National Forest Supervisor in Corvallis, Ore. during the spotted owl crisis where they reformed management from timber production to restoration principles. Furnish was also a principle Forest Service leader in creating protections for 60 million acres of roadless areas in 2001. His recent memoir, "Toward a Natural Forest" (Oregon State University Press), speaks to forest management that works in concert with nature.

What led you to want to work for the Forest Service?

This was a dream of mine from the time I met a cousin, Dick Swartzlender, while he was working on the Olympic National Forest. I was about 10 years old at the time he took my Dad and me salmon fishing in Puget Sound and shared stories about his work. I was hooked.



Jim Furnish in Sea of Cortez, Punta Colorado, Baja Peninsula

What was the most difficult moment or encounter that you experienced in pursuit of your work?
I think it was the spotted owl crisis — which revealed that both the Forest Service and myself had erred badly in demanding timber production at the expense of other more important environmental resources, like wildlife, fish and water quality.

What do you think is the biggest issue facing national forests today?
The complexities of climate change — everything from worsening wildland fires, to forest carbon storage, reducing water supplies and habitat losses affecting myriad species. The Forest Service has also lost the strong social mandate underpinning their legitimacy.

Where is your favorite spot to experience nature and why?
That would be either on a promontory overlooking a vast landscape (and there are many great ones) or in a canoe enjoying the quiet energy of water and the abundant life it supports.

Do you have a favorite story from your years in the field?
That would be the indescribable satisfaction and mystery of meeting someone, somewhere many years after an encounter and hearing them speak to how what I did and/or said motivated them. I often have no recollection of the event, nor do I recall *intending* to do any such thing. The spotted owl crisis, and my years on the Siuslaw National Forest, offered many circumstances and opportunities to confront troubling realities and foster profound change.

For an extended interview with Jim Furnish, visit www.americanforests.org/magazine.

THIS PAGE: JACK JEFFERY, COURTESY OF AMERICAN BIRD CONSERVANCY

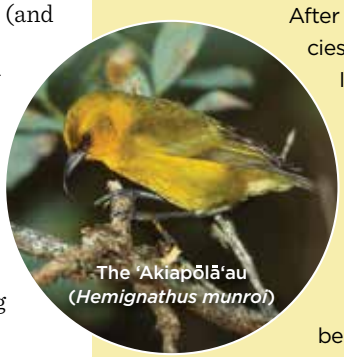

The ‘Akepa (*Loxops coccineus*)

GLOBAL RELEAF SHOWCASE

“For the Birds”: The Worthy Importance of Restoring Tropical Forests

The beaming sun warming your skin, the soft sand shifting between your toes and an island breeze blowing in with the waves... a tropical paradise is luxurious and exotic — its forests don’t need restoration, right? Not so fast! Tropical forests face the same threats as other forest ecosystems, such as deforestation due to continuing development and the threat of invasive species. Yet, their health is particularly crucial as tropical forests actually house 96 percent of the world’s tree species and store nearly 26 percent of global carbon emissions. And, the forests of Hawaii, the United States’ very own paradise, are no different.

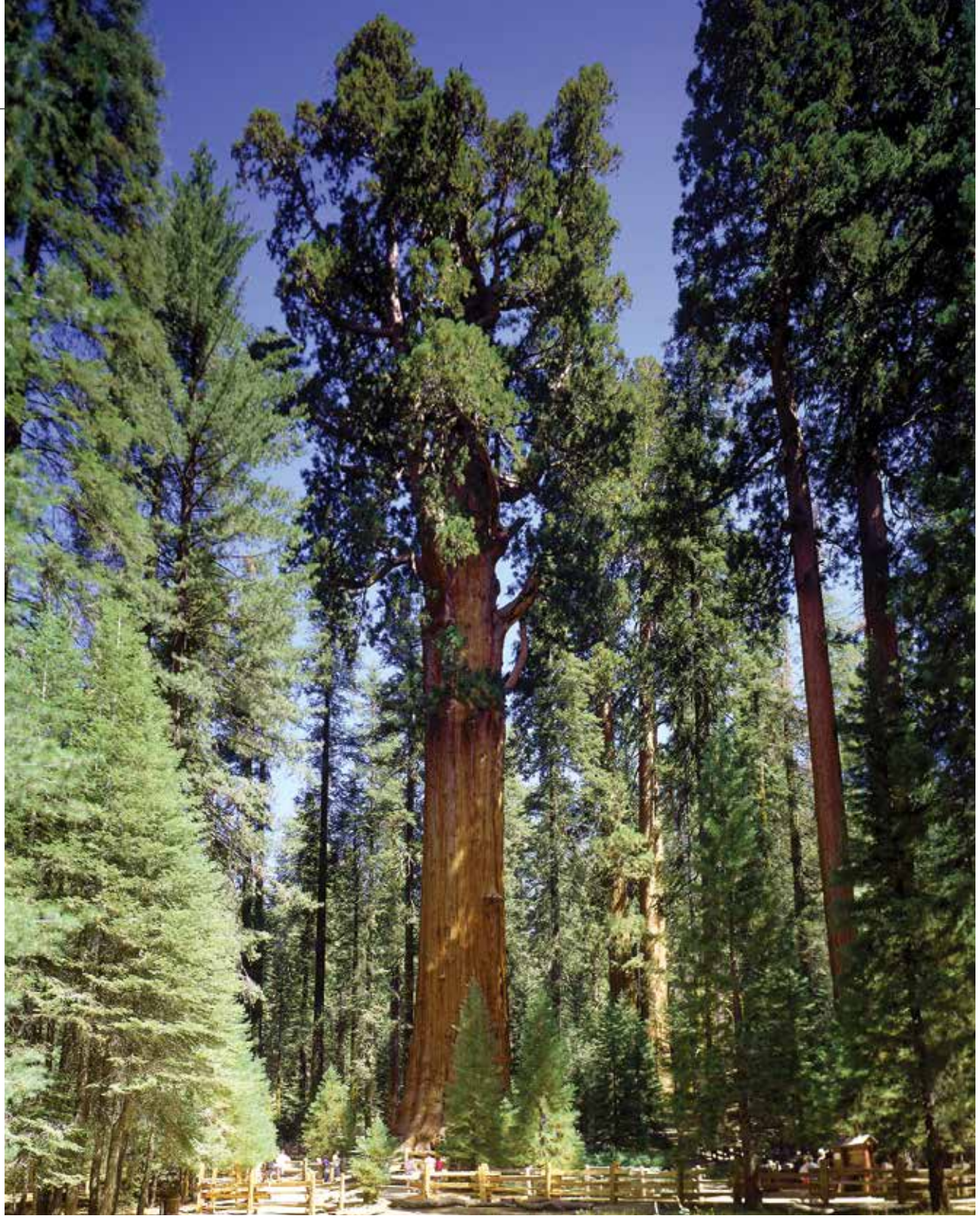
That’s why, in 2015, American Forests partnered with the Hawai’i Forest Institute (HFI) on a Global ReLeaf project to reforest four acres of the Keauhou Bird Conservation Center (KBCC) Discovery Forest by planting 2,400 trees, including 17 different native species.


The ‘Akiapōlā‘au (*Hemignathus munroi*)

After many decades of over-grazing that allowed invasive species to come in and consume a once-thriving forest on the Big Island, the KBCC Discovery Forest was established in an effort to begin restoring native species to the area and to improve wildlife habitat for endemic birds, many of which are critically endangered. American Forests and HFI particularly focused on restoring koa tree populations, as the tree provides habitat for many of these birds, including the ‘Akiapōlā‘au — which was put on the endangered species list in 1967 — and the ‘Akepa, which became endangered in 1970. These birds, whose range once spanned the Hawaiian Islands, can now only be found on the Big Island, with a small population of ‘Akepa also residing in Maui.

The ‘Akiapōlā‘au and ‘Akepa rely on the koa for scavenging for insect larvae and nesting, respectively. But, while the koa once dominated the forests of Hawaii, degradation and demand for its valuable timber rendered the species scarce. American Forests and HFI worked to change that.

However, there was even more to this project than just restoring forest and wildlife habitat. With a focus on long-term success, an outreach component was established to provide an educational experience for more than 800 students from Kamehameha Schools. By empowering and equipping these students through knowledge of the historical, cultural and environmental importance of the forests surrounding them, they can help ensure a lasting impact long after initial restoration work is done.



The champion Giant Sequoia

BIG TREE SHOWCASE

Giant Sequoia

SPECIES NAME: Giant Sequoia, Sequoiadendron giganteum

LOCATION: Sequoia National Park, Calif.

CIRCUMFERENCE: 1,020 inches

HEIGHT: 274 feet

CROWN SPREAD: 107 feet

TOTAL POINTS: 1,321

NOMINATED: 1940

NOMINATED BY: Isabelle F. Story

The first Sequoiadendron species can be traced back as far as 200 million years ago and stood among the dinosaurs during the Triassic period!

ISABELLE F. STORY

PARTNERS

A Partnership Celebrated with Ponderosa Pine

THE STARS ALIGNED, literally and figuratively, for the planting of our 50 millionth tree. Our corporate partner of 20 years, Eddie Bauer, was eager to join us for the momentous occasion and to put a spectacular flourish on the day by announcing Ryan Reynolds as their new philanthropic ambassador for our partnership. An avid outdoorsman and passionate environmentalist, Reynolds attributes his commitment to conservation to his boyhood experiences hiking and camping and to wanting to preserve a healthy planet for his baby daughter.

American Forests' president and CEO, Scott Steen, Eddie Bauer's president and CEO, Mike Egeck and Reynolds welcomed the media at a hearty breakfast outdoors overlooking Lake Arrowhead, under heat lamps and with luxurious Eddie Bauer hats, gloves and blankets provided for all.

Then, we were off in a caravan of SUVs up steep winding roads to Mountain Communities, where American Forests has been planting trees with Eddie Bauer, and other partners, for a decade. Egeck had announced at breakfast that, on top of their 2016 tree-planting commitment to American Forests, Eddie Bauer would fund an additional 20,000 trees to be planted there as a special thank you to Mountain Communities' project manager, Cheryl Nagy, who had made all the arrangements for the planting day, from gloves and tools to trees, including the 50 millionth.

On hand to interview Reynolds and cover the event were media, including *People* magazine, *US Weekly*, *InStyle*, E! News and Getty Images. And sportingly, the media all participated in the authentic volunteer day by helping to plant 40 more saplings.

But, the very first tree in the ground that morning was our 50 millionth, a robust little baby ponderosa pine, no more than six inches tall, which Reynolds named, "Gordon," a nod to his Canadian heritage.

"It's a girl," announced the star, whose wife's name is Blake and daughter, James.

Gordon certainly ranks as one of the most photographed saplings of all time, in her prominent spot on that mountain top. We hope she grows tall and strong and serves as a thriving symbol of American Forest' ongoing partnership with Eddie Bauer.

Eddie Bauer and Philanthropic Ambassador Ryan Reynolds Plant 50 Millionth Tree in Celebration of 20-Year Partnership with American Forests on November 11, 2015 in Lake Arrowhead, Calif.

CHARLEY GALLAY/GETTY IMAGES

FROM THE FIELD

WASHINGTON, D.C.

Rebecca Turner, Senior Director of Programs and Policy

ON OCTOBER 26, 2015, American Forests hosted a ceremonial tree planting at the East Capitol Urban Farm in honor of its 140th anniversary and to recognize the signing of a new Memorandum of Understanding (MOU) with the U.S. Forest Service (USFS). Scott Steen, President and CEO of American Forests, and Chief Tom Tidwell reflected on the more than 110 years our organizations have partnered.

"It was one of our founders who convinced President Grant that managing forests was the responsibility of the federal government," said Steen. "And, it was at an American Forest Congress in 1905 that a consensus was forged to create a national agency to care for our forests. And, with that, our partnership with the U.S. Forest Service began."

Chief Tidwell added: "For more than 110 years, our two organizations have worked together replanting after fires, restoring wildlife habitat, and protecting threatened forest types such as whitebark pine and longleaf pine. In just the last 25 years, we have planted more than 20 million trees. We have restored more than 85,000 acres in our national forests."

Joining the speeches was Dr. Dwane Jones, professor of urban sustainability and Director of the Center for Sustainable Development at the University of the District of Columbia (UDC).

"While today we celebrate 140 years of American Forests and its long-standing relationship with the USFS, we do so standing on the site of a project that took a community of people and partners to make it happen," said Johnson.

The East Capitol Urban Farm was the perfect setting to honor our 140th anniversary and long-standing partner-

Top: The ceremonial tree planted in honor of the MOU signing; bottom: Chief Tidwell and American Forests CEO, Scott Steen, signing the MOU

THIS PAGE: AMERICAN FORESTS

Volunteers planting at the Festival Beach Food Forest tree planting in Austin

ship with USFS. As part of our Community ReLeaf program, American Forests has united with multiple partners to create the urban farm, complete with a tree nursery and children's nature playscape. The farm sits on a three-acre plot of land in Ward 7, an area with some of the highest poverty and unemployment rates in the city. The East Capitol Urban Farm will promote urban agriculture, improve food access and nutrition through a community-centered farmers market, offer nutrition education, provide a place for community gardening, create opportunities for entrepreneurship and include a research and demonstration site for UDC.

In addition to planting a scarlet oak, the official tree of Washington, D.C., we signed a service-wide MOU guiding the next stage of our partnership with USFS. The purpose of this MOU is to facilitate the continued cooperation across all aspects of USFS, from restoration projects on individual national forest units to urban forest projects with the state coordinators. The key areas of cooperation are: forest and landscape scale restoration efforts; protection and restoration of ecologically important, threatened forest ecosystems in the U.S.; expansion of high-impact urban forest greenspace and tree canopy cover in the nation's metropolitan areas; championing of innovation and collaboration within the urban and wildland forest conservation communities; education and inspiration of Americans to value and understand the importance of forests.

Here's to another 140 years!

AUSTIN, TEXAS

Ian Leahy, Director of Urban Forest Programs

I ARRIVED AT THE SITE of our Austin Community ReLeaf project to see a sizable group in a circle dancing, chanting, periodically waving their arms. The leader was dressed in traditional Native American ceremonial wear. In the middle were the 100 trees we were about to plant. They were blessing the trees through a modern variation of a Mesoamerican ceremony that dates back many generations, surviving the Spanish newcomers

Kids helping to mulch at the planting in Austin

THIS PAGE: MITCHELL WRIGHT

MITCHELL WRIGHT

Fruit trees were planted to provide the benefits of free nutrition and tree canopy in a lower-income community

in 1530 by agreeing to become Catholic in exchange for protecting such rituals. Welcome to Austin, Texas.

This project, the Festival Beach Food Forest, is nestled in a public park between Interstate 35, a high-rise retirement facility and a thriving community garden. The culmination of three years' effort by local residents to get permits, overcome skepticism, build a broad coalition and secure funding, American Forests was able to be that financial catalyst, selecting the site with local partner TreeFolks for our volunteer tree planting event with our corporate partner, Bank of America. It was the first phase of our broader project to plant fruit trees not only in this park but also on nearby residential properties and schools. The goal is to create a community asset combining the benefits of free nutrition and tree canopy in a lower-income community. This food forest is one of the first of its kind in the nation and has paved the way through local policy efforts for more in Austin.

NEW ONLINE

We've Arrived!

With a toast to the new year, we've finally joined Instagram! Stunning photos + forests — what's not to love?
Follow us on Instagram!
@AmericanForests

FROM LOOSE LEAF

CHAD PODOSKI VIA FLICKR

Rainbow *Eucalyptus* (*Eucalyptus* Deglupta)

Unique Tree Species around the World

Just like people, no two trees are exactly the same! Each species possesses a distinguishing characteristic, or perhaps a few, whether in its appearance, function, history or location. But, some species are considered to be particularly distinct. These trees aren't specific to one place, or even one continent. Each part of the world has a special species to boast! In "Unique Tree Species around the World," we take a look at some of the most interesting and one-of-a-kind tree species from each continent. Explore the trees of the world by visiting www.americanforests.org/UniqueTrees.

NEW ONLINE

Coming Soon!

New Year...New Website
We're excited to announce that, in 2016, we will be launching an entirely new website. Stay tuned!

WASHINGTON OUTLOOK

Land and Water Conservation Fund Update

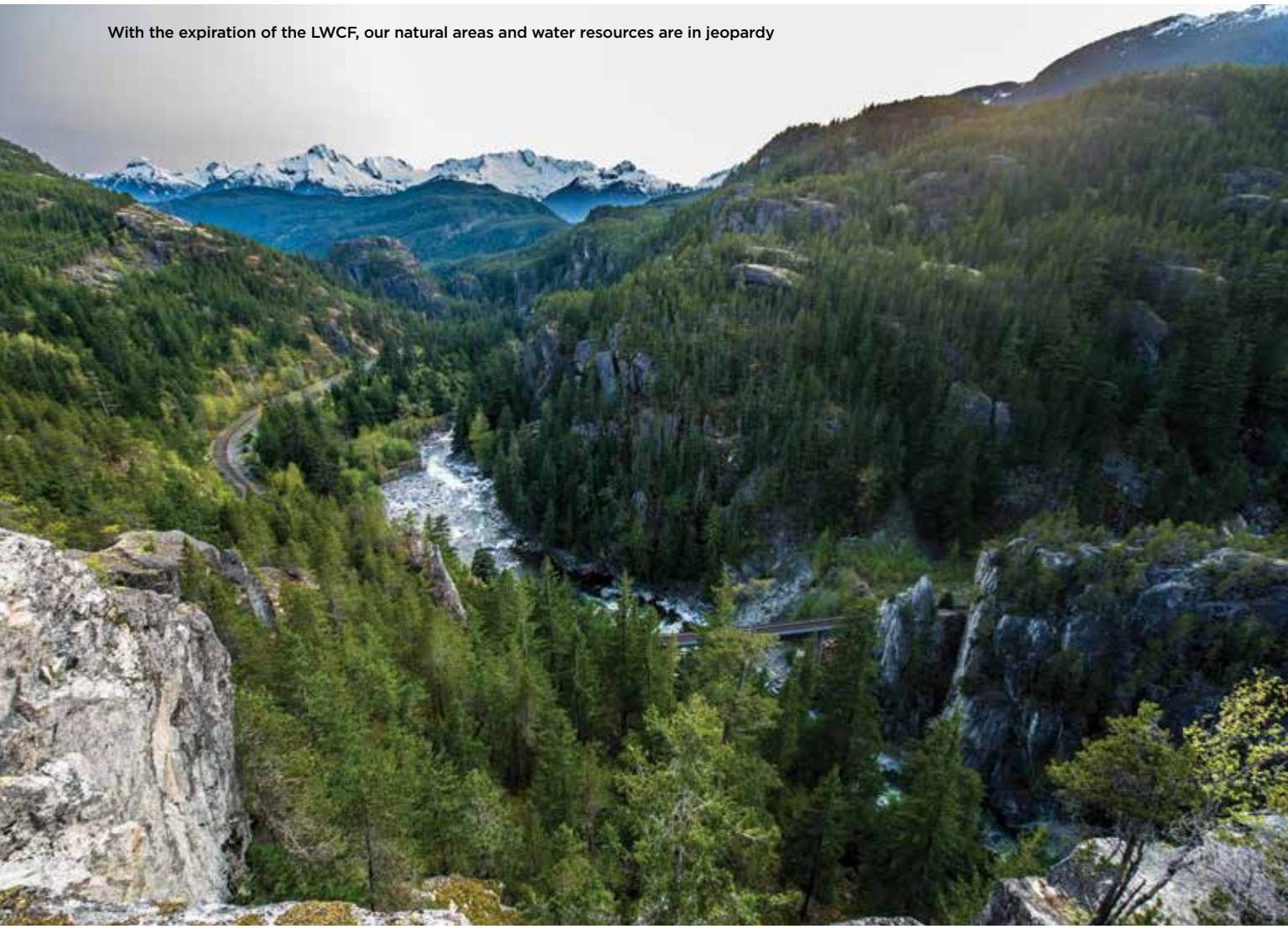
THE LAND AND WATER Conservation Fund's (LWCF) September 30th expiration date came and went without any measures to reauthorize it. This marks the first time in the program's 50-year history that it failed to be renewed by fiscal year's end. The backbone for conservation and recreation improvement — supported by broad bipartisan approval — is now in jeopardy as contentious talks of reform escalate.

The varying degrees of reform are represented through legislative vehicles in both the House and the Senate that seek the program's reauthorization. The House's solution (*Protecting America's Recreation and Conservation Act*) calls for extensive reform and a 7-year reauthorization, while the Senate's offering (S.556) emphasizes permanent funding for the program as part of a greater sportsman's package. The latter measure comes directly from the same bipartisan energy bill that was mentioned in our fall issue, which does not stand to move forward until 2016.

Wildfire Funding Policy Update

AMERICAN FORESTS has been hard at work gaining Congressional support for the Wildfire Disaster Funding Act of 2015, as the bill has 145 cosponsors on the House side (H.R.167) and 20 on the Senate side (S.235), as of November 20th. WDFA treats the 1 percent of fires that currently eat up 30 percent of suppression costs as natural disasters and calls for them to be funded through the Disaster Relief Fund. This would eliminate the practice of borrowing money to fight these catastrophes,

CHUCK FAZIO



With the expiration of the LWCF, our natural areas and water resources are in jeopardy

WDFA treats the 1 percent of fires that currently eat up 30 percent of suppression costs as natural disasters

(called *fire borrowing* or *transfers*) and the resulting lack of funding for programs that prevent and mitigate the costliness of these fires.

Its inherent ties to budgetary policy have thrust it into the center of the ongoing appropriations discussions, following the continuing resolution that delayed the deadline for a potential government shutdown until December 11th. Thanks to the swift passage of a budget deal that raised the debt ceiling and framed the appropriations process for the next two years, the stage has been set for WDFA's passage ahead of the next fire season.

Unfortunately, despite bipartisan proposals being put forward, a fix to wildfire suppression funding was not included in the Consolidated Appropriations Act of 2016. American Forests will continue to work on this issue, as each negotiation has brought us closer to a solution.

Appropriations FY2016 Update

IN SEPTEMBER, Congress passed a Continuing Resolution extending FY2015 levels through December 11th, giving them time to negotiate FY2016 appropriation levels and avert a "shutdown" of the federal government. In October, Congress passed The Bipartisan Budget Act of 2015 — a sweeping two-year budget deal which helps avoid a default on the nation's debt and extends the debt limit through the end of the Obama administration. The Budget Deal provides $112 billion in new funding to prevent a return to the spending caps known as sequestration with new funding split evenly between defense and nondefense programs. As of this writing, Congress has added a short-term Continuing Resolution so that negotiations can continue on the funding levels, as well as the fire fix and other issues.

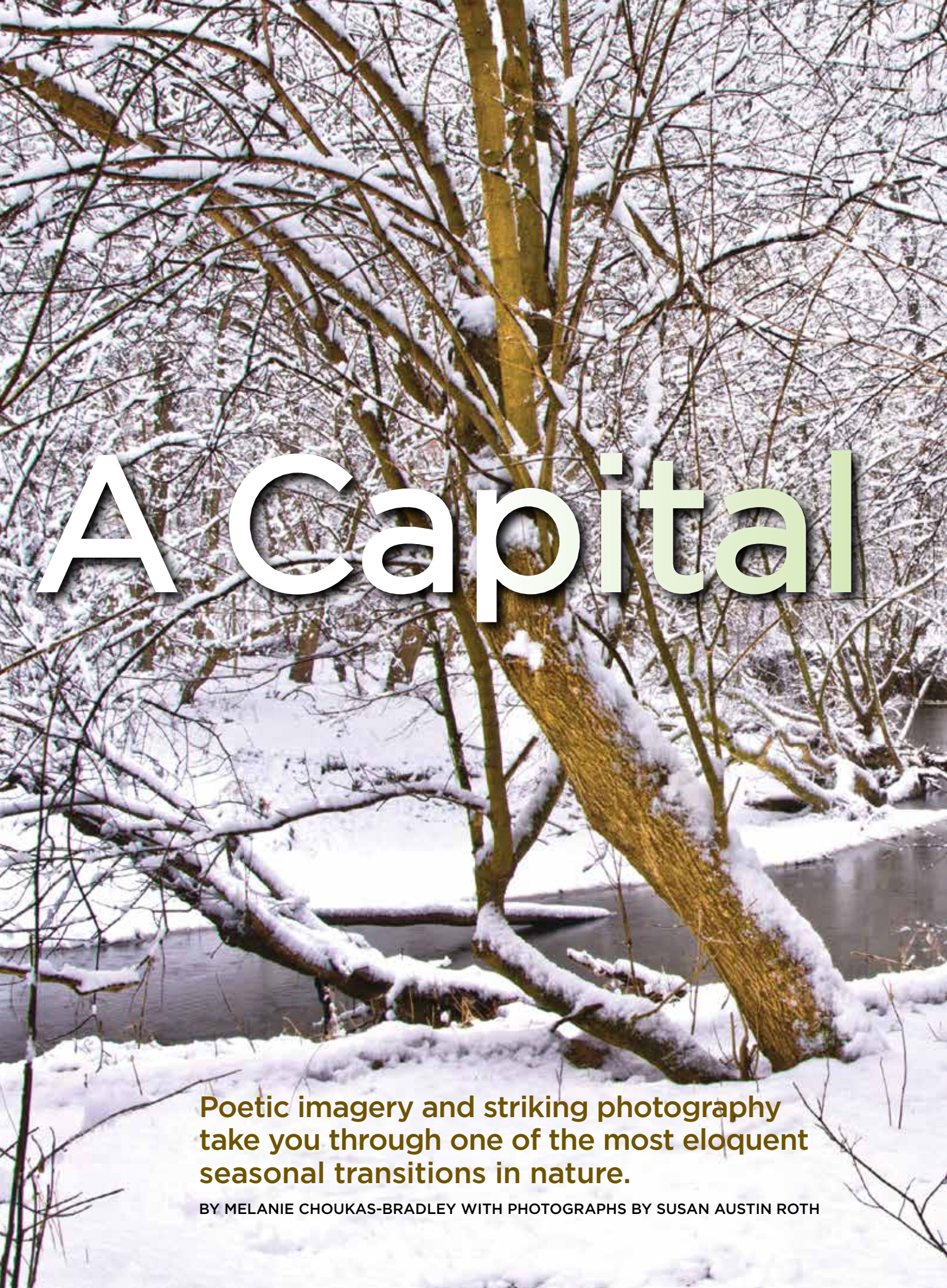
Thanks to funding increases provided through the Bipartisan Budget Act of 2015, the amount in the Department of the Interior, Environment and Related Agencies bill is nearly $2 billion more than the funding levels provided in either of the House or Senate Committee marks. It provides $5.664 billion to protect and conserve our nation's forests and fight wildland fires through the U.S. Forest Service, and provides $12.016 billion for the Department of the Interior. The bill provides $4.2 billion for wildland fire management activities at the Forest Service and Interior Department. Increases in the budget allocation provided by the Bipartisan Budget Act of 2015 allowed the Subcommittee to provide an additional $508 million above the 10-year average of fire suppression to account for a significant increase in firefighting needs in the past several years and the current forecasting models. The bill also provides an increase to hazardous fuels reduction programs, including $375 million for the Forest Service and $170 million for the Interior Department, which is a total of $19.2 million more than the fiscal year 2015 enacted level.

Rebecca Turner writes from Washington, D.C. and is American Forests' senior director of programs and policy.

Andrew Bell was American Forests' fall 2015 policy intern and is a junior at Arizona State University, studying public policy and nonprofit leadership.

PHIL ROEDER

United States Capitol building in Washington, D.C.



A Capital

Poetic imagery and striking photography take you through one of the most eloquent seasonal transitions in nature.

BY MELANIE CHOUKAS-BRADLEY WITH PHOTOGRAPHS BY SUSAN AUSTIN ROTH

Transition

IN A NATIONAL PARK AS OLD AS YOSEMITE and twice the size of New York City's Central Park, walkers, runners and cyclists witness an annual transformation as the stark topography of Rock Creek Park's winter landscape surrenders to the verdancy of early spring. When the days warm in the wild,

A winter's day in Rock Creek Park shows off the orange-tan bark of boxelders, which flourish in the park's floodplain

After a snowstorm, tuliptree samaras hold snow like vanilla ice cream in a cone

wooded heart of Washington, D.C., the boxelders overhanging Rock Creek put forth pendent clusters of greenish gold flowers and tender green leaves. Tiny spicebush blossoms form a yellow haze throughout the stream valley as a melodic chorus of spring peepers pipes up from every vernal pool. Wood ducks paddle past budding trout lilies, and phoebes call out as they explore their nesting sites under the West Beach Drive bridge. Work may be gridlocked across town on Capitol Hill, but there's no stopping the unfurling of the skunk cabbage leaves or the return of the alewives to Rock Creek.

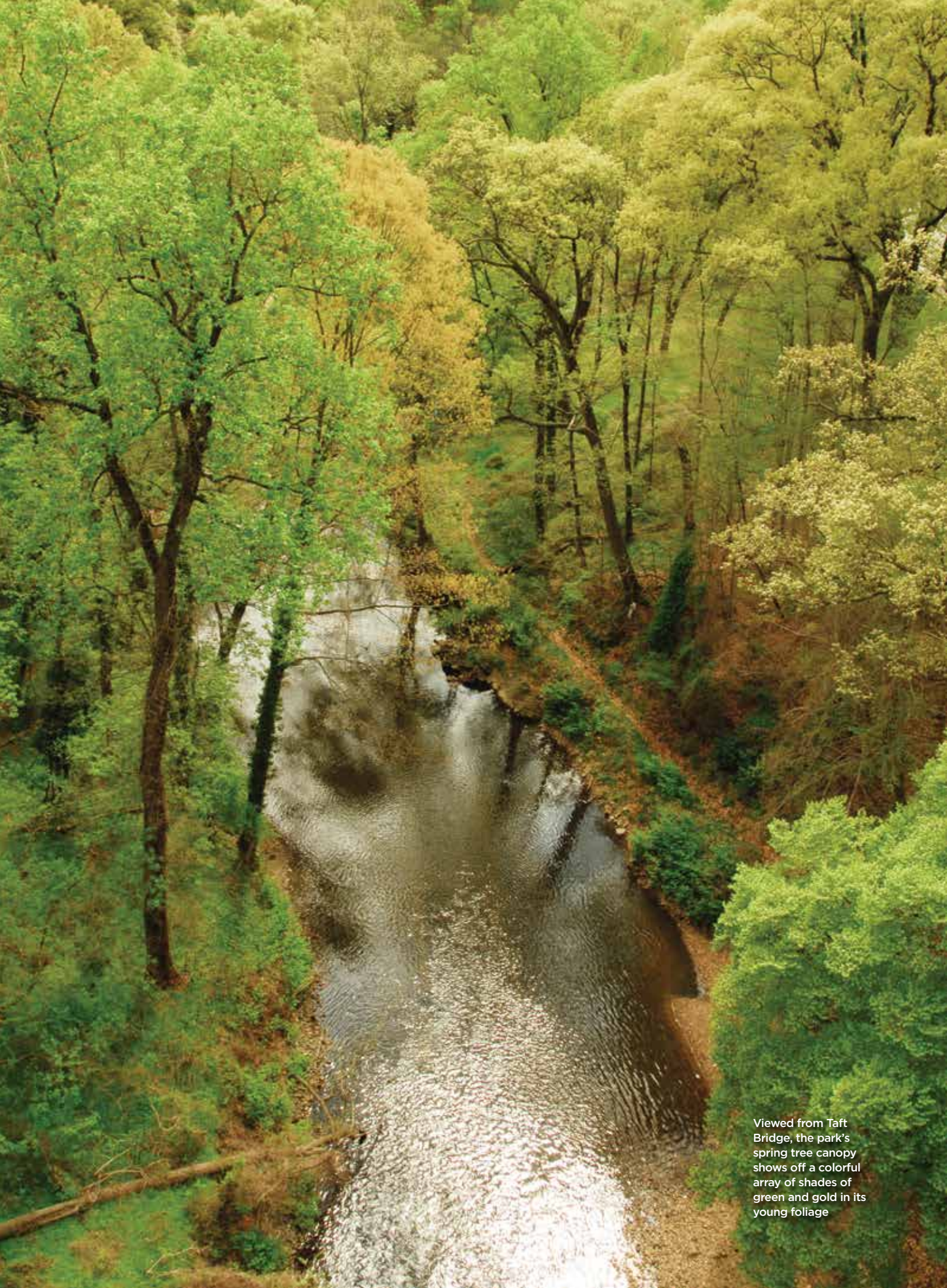
But, lest we prematurely jumpstart the spring season in Rock Creek Park before properly honoring its predecessor, for three months before the first peep from the peepers, the beauty of winter reigns in the nation's oldest urban national park, which, at 1,754 acres, is also one of the largest. The distinctive bark and architecture of trees that have escaped the axe since 1890 are on mesmerizing display in the leafless crowns of the creamy sycamores, red-barked river birches, dark black walnuts, sinewy ironwoods and tall tuliptrees of Rock Creek's floodplain forest. When snow falls it creates celestial ice cream cones in the clusters of samaras high up in the tuliptree crowns, and it turns the open beaks of the jimsonweed capsules along the creek's pebbled beaches into white rosebuds. In the park's rocky upland woods, the limbs of many species of oak and hickory display their impressive profiles free of leaves along with their distinctive twigs and buds. They are offset by an evergreen understory of mountain laurel and Christmas fern. The smooth pewter of American beech tree trunks is contrasted by the bleached wheat of their marcescent winter leaves all along the Rock Creek Parkway, where they are admired by D.C. commuters, who are collectively grateful for a glimpse of wild winter beauty on the way to their K Street offices.

Work may be gridlocked across town on Capitol Hill, but there's no stopping the unfurling of the skunk cabbage leaves or the return of the alewives to Rock Creek.

The unpredictability of Washington, D.C. winter weather brings constant anticipatory excitement and occasional dread to the human inhabitants of the nation's capital. Freezes and thaws in Rock Creek create scalloped shelves of gold-veined ice that collapse to flood waters on a 50-degree day. The thermometer plunges to the single digits and creek ice forms, snow comes as the slightest flurry or as a coastal blizzard dropping 30 inches of wet powder. Ice skaters practice figure eights on the vernal pools, and cross country skiers traverse the vast network of hiking trails enraptured by the snow-laced stream valley forest.

For Stephanie Mason, who turned her back on a Capitol Hill career many years ago and now serves as Senior Naturalist for the Audubon Naturalist Society (ANS), the stillness of winter among the leafless trees is punctuated by high drama in the Rock Creek Park winter bird flock.

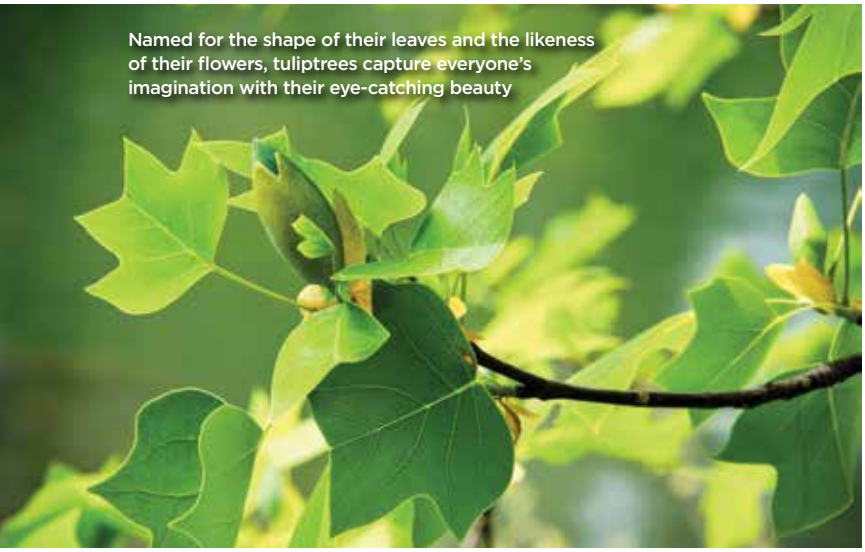
"Mixed winter flocks of our resident Carolina chickadees and tufted titmice, joined by overwintering kinglets and more, always amuse me with their noisy defiance of an otherwise quiet winter woods," Mason says with a smile. "Their many



Viewed from Taft Bridge, the park's spring tree canopy shows off a colorful array of shades of green and gold in its young foliage

Fallen trees span the creek like carefully placed bridges, however, their placement is actually due to being undermined and toppled from storm water surges

eyes find more food in fewer and more dispersed places. Foraging in the season's open, mostly leafless woodlands, their flocking behavior also helps the small birds stay alert to avoid predators. Imagine being a hungry sharp-shinned with its eye on one member of the group, only to have the entire flock scatter with explosive speed — and in all directions — as the hawk zooms in for the catch."



Named for the shape of their leaves and the likeness of their flowers, tuliptrees capture everyone's imagination with their eye-catching beauty

WEED WARRIORS

Rock Creek is 33 miles long. The National Park Service, which celebrates its centennial this year with its theme "Find Your Park," administers the creek and adjacent parkland within District lines. Montgomery County, Md. parkland dating to the 1930s shelters the creek's 22-mile journey upstream from D.C., from springs on and around a golf course in Laytonsville, to the humble but legendary landmark at the D.C. border known as Boundary Bridge — one of several footbridges traversing the creek within the national park that dates to Franklin Delano Roosevelt's New Deal. Together, D.C. and Maryland are fighting to enhance and restore the integrity of the stream valley and its waters under the Clean Water Act.

They have their work cut out for them.

By the time Rock Creek flows past the National Zoo and into the Potomac River near the Georgetown waterfront, it has drained a vast watershed covering thousands of urban and suburban acres. Stormwater runoff races across all those impervious surfaces and overwhelms Rock Creek and its many tributaries, carrying a heavy and polluting sediment load, eroding streambanks and toppling trees. Programs administered by the environmental

protection agencies of both Montgomery County and the District offer instruction and financial incentives to homeowners to help manage runoff in their yards. Several active nonprofit organizations serving as partners to the National Park Service monitor progress, educate citizens and oversee cleanup events, tree plantings and invasive plant removals, while the Potomac Appalachian Trail Club helps to maintain trails in the face of heavy use and many blowdowns.

Members of these organizations spring into action with annual cleanups and other events with the coming of spring. While laboring on behalf of the health and well-being of the Rock Creek stream valley, there is also time to do some "forest bathing," as the Japanese call it — kicking back, breathing deeply and contemplating the health-giving beauty of the forest. ANS, whose headquarters in the historic Woodend mansion are located next to Rock Creek in Chevy Chase, Md., has a dual conservation and education mission.

"The Audubon Naturalist Society and Rock Creek Park are old friends," says ANS Executive Director Lisa Alexander. "Our organization was founded just seven years after Congress set aside Rock Creek Park in 1890. ANS members, including Theodore Roosevelt and Rachel Carson, have been frequent visitors to Rock Creek Park and champions of it." Alexander adds, "We are lucky to enjoy the beauty of Rock Creek every day. With our headquarters at Woodend Nature Sanctuary nestled inside the Rock Creek Stream Valley, we welcome the hikers and bikers along the Rock Creek Trail who come to discover Woodend. Our environmental educators relish the opportunity to use Rock Creek as a living classroom for the school groups and summer campers they teach."

The many weed warrior programs focused on Rock Creek Park have made notable progress and, although it's a steep uphill battle, populations of native plants have gained some breathing space. Carole Bergmann, the Montgomery County Parks Field Botanist and Forest Ecologist who coined the term "Weed Warrior," has trained thousands of volunteers who are active in her county. The Rock Creek Conservancy has made considerable progress with their mission to eradicate English ivy in the park, and volunteers working with Casey Trees have also removed invasives. The National Park Service has had some success battling a pernicious invader called lesser celandine, or fig buttercup, in the floodplain forest. Consequently, in recent years the display of ephemeral wildflowers near Boundary Bridge has rebounded.

Budbreak among the trees is one of the great spring dramas in Rock Creek Park.

BUDBREAK

With the coming of spring, a creek-side carpet of yellow trout lily and pink and white spring beauty is soon enhanced by Virginia bluebells, Jack-in-the-pulpit and later Mayapples and wild blue phlox. In the upland woods, bloodroot flowers are followed by rue anemone, wild geranium and Indian cucumber root. In late April and early May, the wild pinxterbloom azalea puts forth its oversized two-toned pink flowers and, on its heels, fellow heath family member, mountain laurel, dazzles park visitors with its flower buds, which look like "mini-meringues," and its snowball-shaped flower clusters.

Budbreak among the trees is one of the great spring dramas in Rock Creek Park. One of the earliest buds to break is the duck-bill shaped bud of the tuliptree. Each bud puts forth tiny leaves shaped like a child's drawing of a tulip flower. These new leaves are an electric spring green, and they seem to reach for the sky like baby's hands. The silk-lined

Mountain laurel shrubs decorate the upland forest in the park with evergreen foliage and showy flower buds and blossoms. Rock Creek Park visitors note the resemblance of mountain laurel buds to "mini-meringues"

emerging leaves of the American beech unfurl in the opposite direction, earthward, spiraling out of their pointed mahogany buds like dancers' skirts. The leaves of both species will eventually lie horizontal, after their very different trajectories into the world.

One of the most improbable budbreak acts belongs to the mockernut hickory. Giant pinnately compound leaves and fistfuls of flowers simply explode from pale, egg-shaped buds. The oaks charm all comers with their miniature but very grown-up-looking leaves: chestnut, white, swamp white, red, black and scarlet oaks all bear tiny versions of their adult leaves at first, leaves awash in very autumnal-looking colors prior to the advent of chlorophyll.

Many of Rock Creek Park's trees, such as ashes, oaks, hickories, walnuts and butternuts, bear relatively non-showy wind-pollinated flowers. Standouts among the trees that put their efforts into showy insect-pollinated flowers include the early-blooming shadbush or serviceberry, the flowering dogwood, redbud, tuliptree and the umbrella magnolia.

THE SOUNDS OF SPRING

Spring is the most musical season in Rock Creek Park. Three major amphibious choruses regale park visitors. First to tune up are the wood frogs, who create a duck-like quacking racket during the first warm days of late February or early March. Their rather atonal sound is soon punctuated by the sweet music of the spring peepers, tiny chorus frogs whose collective calling has been compared to the sounds of sleigh bells. Simultaneously, the American toads sing out from every vernal pool and the creek itself, their calls a high and surprisingly musical sounding trill. Rock Creek Park's ever watchful Natural Resources Specialist Bill Yeaman, who has been looking out for the park's wildlife for more than 40 years as an employee of the National Park Service, anticipates the park's amphibian calls each year.

"As spring arrives in Rock Creek Park, the mating chorus of wood frogs, spring peepers, and American toads can be heard calling from the temporary pools along the park's northern floodplain (near Bound-

Pinxterbloom azaleas, one of the shrubby inhabitants of the park, offer their blossoms at eyelevel along several hiking trails

ary Bridge)," Yeaman says. "Spring also features the wondrous migration of blueback herring and alewives which make their annual journey from the Atlantic Ocean to Rock Creek to spawn before returning to the sea. A fish ladder was installed near historic Peirce Mill (a 19th century gristmill) in 2006 to enable these migratory fish to reach historic spawning habitat along Rock Creek."

As the season progresses, waves of spring migrating birds pour into the canopy, adding their songs to the songs and calls of the resident chickadees, cardinals, woodpeckers, white-breasted nuthatches and tufted titmice. Many species of warbler, scarlet tanager, eastern towhee, eastern wood-pewee and the wood thrush — Washington, D.C.'s official bird with the flute-like song — are among the most tuneful members of the avian spring chorus. Some pass through on their way north, but many stay to nest in the dense canopy. Thanks to Steve Dryden's Rock Creek Songbirds project, returning birds are greeted by a young welcoming committee, which includes many children whose families of origin still reside in the winter homes of Rock Creek Park's returning birds.

"One of the most fulfilling parts of the Rock Creek Songbirds project for me is connecting with schools in the Mt. Pleasant and Columbia Heights areas of Washington, which abut Rock Creek Park," Dryden says. "The younger students in these schools are often the sons and daughters of immigrants from Latin America, which is the winter home for so many migrant songbirds. It's fun — and educational — to tell the kids about the birds that their grandparents saw during winter coming back to Rock Creek Park each spring. At one school, we made a 10-foot banner which proclaimed 'Welcome Back Songbirds' in Spanish as well as English. We hung that in the foyer. Later, the class walked to the park and helped plant oaks to improve the habitat for the birds and other wildlife."

With a little luck, those oaks will grow strong and tall, sheltering and nurturing future generations of returning migrants for decades and centuries to come.

Melanie Choukas-Bradley and Susan Austin Roth are the author and photographer of *A Year in Rock Creek Park—the Wild, Wooded Heart of Washington, DC.* (GFT Publishing, 2014; paperback edition distributed by the University of Virginia Press). They lead nature walks in Rock Creek Park for many Washington, DC,-area organizations and lecture widely on the natural history of the park.

BILLTACULAR VIA FLICKR

The wood thrush is Washington, D.C.'s official bird and frequently graces Rock Creek Park with its flute-like song

An American toad enjoys a vernal pool after a spring rain in the Rock Creek Park floodplain

A CITY AT A CROSSROADS

Finding trees at the intersection of environmental action and social justice in Oakland, Calif.

BY CHRISTOPHER HORN

BEFORE THE GREAT RECESSION HIT IN 2008, the City of Oakland budgeted nearly $4.5 million dollars to its Tree Services Division, housed under the city's Department of Public Works. Only one year later, that number plummeted to under $2.5 million.

"The City had to face extremely hard choices back in the recession in order to keep operating," said Kristine Shaff with the Department of Public Works. "We are always hopeful that funding for Tree Services will be restored."

Hard choices were weighed and, ultimately, decided on by governments in large cities across the United States. Budgets for trees, parks, green space and landscaping typically get the short end of the stick when funding is on the chopping block. (It happens so frequently that the U.S. Forest Service has resources to help municipal government employees prepare for budget cuts.)

Unfortunately, in these circumstances trees aren't the only inhabitants of a city that can feel the effects.

ALL PHOTOS BY CHRISTOPHER HORN, UNLESS OTHERWISE NOTED.

Volunteers and tree advocates are transforming concrete into green space in many underserved and low-canopy neighborhoods across Oakland, Calif.

The hills of the East Bay are heavily forested, while the flat lowlands are where much of Oakland's less green neighborhoods, primarily in Districts 5 through 7, are located

A CHANGING CLIMATE

In 2014, the Intergovernmental Panel on Climate Change (IPCC) released its fifth comprehensive assessment report on climate change and its impacts. Among a myriad of alarming findings, a group of more than 700 experts from multiple disciplines noted two points that could have a major effect on urban forests and the people who live in them:

- "Many global risks of climate change are concentrated in urban areas."
- "Climate-related hazards exacerbate other stressors, often with negative outcomes for livelihoods, especially for people living in poverty."

The first point may not be all that surprising: Urban population in the U.S. totals more than 80 percent, a number that UNICEF projects to hit 90 percent — or 365 million people — by 2050. The second point is not as apparent, nor as simple as the first. While current and future population growth in American cities can be representative of economic opportunity and an overall good standard of living, these changes can also have negative repercussions, most notably for low-income and minority communities.

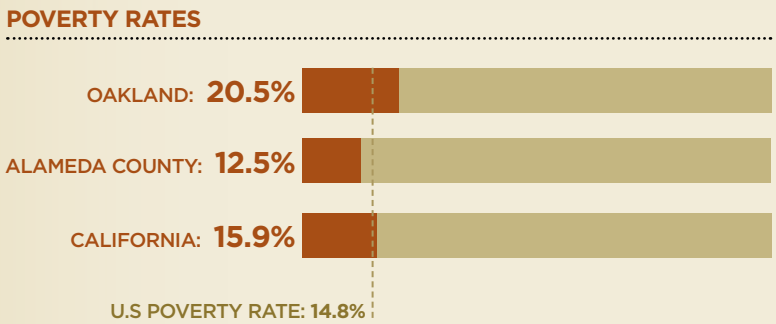
With startups and tech companies flocking to the Bay Area, the region has witnessed a steady growth in population ever since the initial tech booms of the late 20th century. And, with a major housing crisis in San Francisco that is currently displacing longtime residents and pricing out newcomers, a socioeconomically and racially diverse group of people is moving elsewhere, particularly to conveniently located Oakland. Reversing a trend of population decline that the city faced from 2000 to 2010, Oakland had an estimated population increase of 5.9 percent between 2010 and 2014.

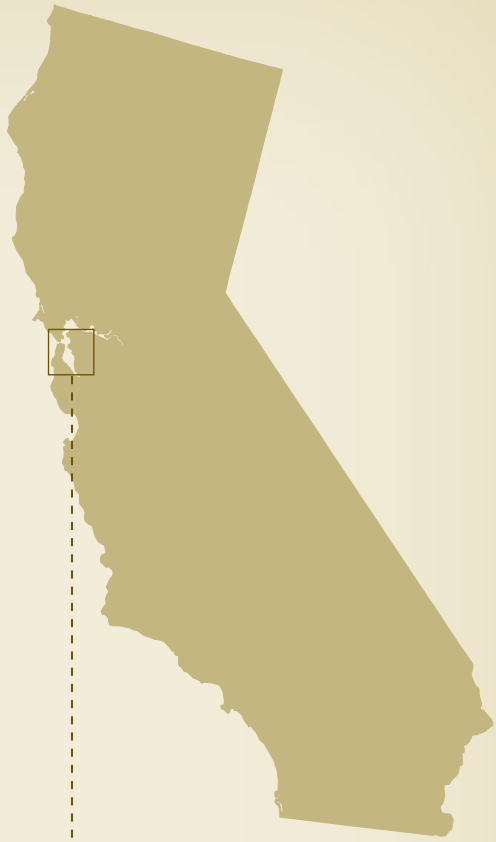
And, when gentrification and urban development remove aspects that provide opportunities to everyone — jobs, affordable housing, etc. — it creates a community that lacks economic diversity. While it's obvious that predominately high-income areas are better able to support greater tree canopy, it's also typically true that neighbor-

"Climate-related hazards exacerbate other stressors, often with negative outcomes for livelihoods, especially for people living in poverty."

The Socioeconomics of Trees

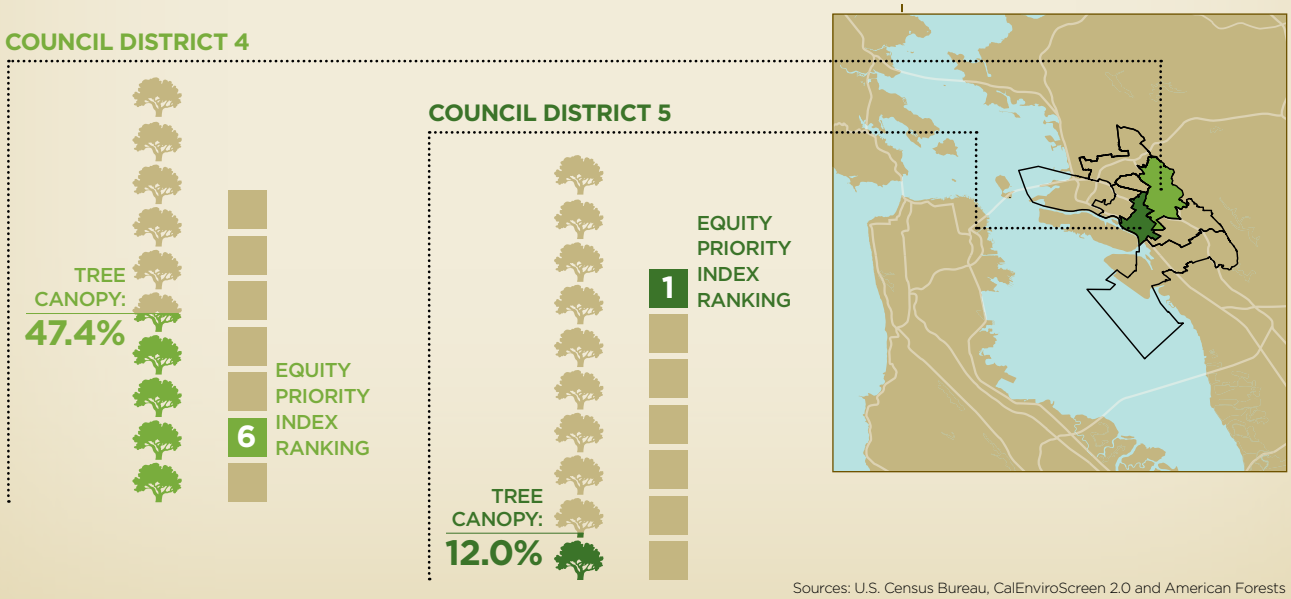
Research has shown a strong correlation between socioeconomic conditions and urban tree canopy, and in Oakland, this phenomenon is very noticeable.





Tree Canopy and Planting Priority

A canopy assessment measured Oakland's tree canopy at 24.8 percent. The same study ranked each of Oakland's seven council districts by an equity priority index that included five socioeconomic indicators: income, poverty rate, unemployment rate, population and age. Data was tabulated to determine an average score and rank for each of the factors, which were cumulated to produce a final aggregate score and priority index, with 1 being the highest priority and 7 being the lowest. When paired with district tree canopy data, the differences between Oakland's low-income and high-income neighborhoods are drastic.



Sources: U.S. Census Bureau, CalEnviroScreen 2.0 and American Forests

hoods with more economic diversity also have resources available to support tree planting and care, resulting in more canopy cover development over time.

However, the real issue lies in predominantly lower-income neighborhoods, which have substantially less canopy on average as well as fewer resources to do anything about it. This is precisely the case with Oakland.

A ROCKY RELATIONSHIP

Upon conquering Native American lands in the region, conquistadors from Spain called the settlement around present-day Oakland "encinal," Spanish for "oak grove" — a reference to the impressive stands of live oaks that lay between the flat, coastal plain and the higher elevation on the east side of San Francisco Bay. In 1852, two years after California officially became a state,

As climate change worsens and weather patterns shift to more extreme temperature and precipitation conditions, underserved communities bear a lot of the associated burdens.

the name stuck and the town of Oakland was incorporated.

In the more than a century and half since then, the city's forest declined steeply, as many do, at the hands of expansion and development. Today, Oakland's estimated 200,000 trees total 24.8 percent urban tree canopy, a moderate figure that ranks in the middle of other Bay Area cities, but below the national average of 27.1 percent. And, while the city's trees provide benefits valued at more than $15 million annually, those benefits are not always proportionately allocated among Oakland's seven council districts.

However, the relationship between socio-economics and urban tree canopy is not unique to Oakland. Urban areas with little tree canopy encounter far more problems associated with the lack of green infrastructure — defined by the U.S. Environmental Protection Agency as "the patchwork of natural areas that provides habitat, flood protection, cleaner air, and cleaner water." In most circumstances, these areas are com-

Treeless planters in Council District 6, which has the second-highest poverty rank among Oakland's districts

prised of low-income communities with limited access to critical resources that can improve environmental conditions. And, as climate change worsens and weather patterns shift to more extreme temperature and precipitation conditions, underserved communities bear a lot of the associated burdens.

Several studies have found correlations between city trees and public health in neighborhoods with low tree canopy — increased respiratory illness, particularly among children and senior citizens, and more incidents of diabetes and heart disease. In terms of psychosocial benefits, a lack of access to green space can negatively impact mental well-being and stress levels, the latter a foreboding allusion to the potential climate change risks highlighted in the recent IPCC report.

Recognizing that tree canopy can be an important factor in understanding and addressing income disparity and supporting sustainable development — both environmentally and economically — a recent study by American Forests examined tree canopy by Oakland council district in correlation with several demographic and socioeconomic factors, including income, poverty rate, unemployment rate, population and age. The information that was derived can help identify the districts where additional trees can provide the greatest positive impacts for communities.

The American Forests analysis found that Council Districts 3 and 4 have tree canopy percentages higher than the city's overall total. Council District 4 has the highest canopy coverage and median household income, and trees there intercept the most stormwater and absorb the most carbon annually, while Council District 1 has the lowest risk for poor air quality. In contrast, Council District 5 has the second-lowest canopy cover and ranks the highest in poverty rate, while Council District 7 has 18 percent canopy cover and is at the highest risk for poor air quality and unemployment.

When government and nonprofit resources are stretched thin, poorer communities have a much more challenging time improving socioenvironmental conditions than their affluent neighbors.

FROM GRAY TO GREEN

Since the 2008 financial crisis, the budget for Oakland's Tree Services Division has been up and down, with the most recent fiscal year having the highest allotted amount since 2010-2011. With funding still at relatively low levels, local nonprofit groups, in partnership with the city, are leading efforts to plant trees and engage communities.

In response to the city's budget cuts, an employee for the city described the problem to Arthur Boone, a local environmentalist, and suggested the idea of assembling a group of dedicated tree-planting volunteers.

"The area group [Sierra Club Bay Chapter] concurred and agreed to be the sponsor," Boone said. "A few people I know volunteered to help and off we went!"

Known as the Sierra Club Tree Team (SCTT), the group has planted nearly 1,400 trees since planting its first ones in January 2010 — a welcome amount as the city no longer plants trees as

The Sierra Club Tree Team, a group of local tree-planting volunteers, is working to remove concrete and install planter boxes, altering the landscape in a city where over half the land is covered in hard surfaces

part of its operations. The team plants between 200 and 300 trees each planting season, which runs from roughly November to June. Other local nonprofit organizations, including Urban Releaf, also plant trees across Oakland. Urban Releaf declined to comment when approached to be a part of this story.

Additional funding from the group has gone to its efforts with the city to remove concrete from sidewalks, creating planting space that volunteers and neighborhood residents can add trees to. This initiative is extremely helpful as more than half of Oakland is covered in concrete, asphalt and other gray infrastructure, putting pressure on stormwater and sewer systems, thus negatively affecting water quality. Another area of interest for the SCTT is advocacy. Volunteers have lobbied to other branches of local government, namely Oakland's city council, to increase the Tree Service Division's budget. One of the group's goals is to reinstate tree planting as a division task, a service that the SCTT says would cost approximately $350,000 each year.

In many cases the trees that the team plants are located along streets, mainly in residential areas. Although the group prioritizes plantings on a first-come, first-served basis, in the higher income areas of the north and in the Oakland Hills, the SCTT requests residents to cover the costs. For tree plantings in the denser, more impoverished areas south of Interstate 580, grants and other donations cover the costs.

The hyper-engaged group is now led by Derek Schubert, a landscape architect who carries on Boone's pursuit of adding trees to communities that greatly need them. At a planting in Council District 6, which has the second-highest poverty rank among all districts, Schubert addressed this idea to a group of neighborhood residents and volunteers.

"Though the city's tree canopy is nearly 25 percent," he said, "we must remind ourselves that this number is not distributed equitably."

TREES + PEOPLE = COMMUNITY

Community forestry groups and professionals constantly talk about and tout the quantitative benefits of incorporating trees in city-scale green infrastructure, which, as previously outlined, can be evaluated and given a monetary value, a process that, among other outcomes, can ultimately lead to increased investment in growing and maintaining a city's tree canopy.

Oakland's street signs pay homage to the city's arboreal history

While urban forestry as a specific field has been around for decades, it has only been within the last few decades that we have taken a closer look at trees and nature in cities and their relationship with the social sciences. Though the results can still be quantified, looking at community trees through this type of lens leads to a more humanitarian approach to urban greening initiatives.

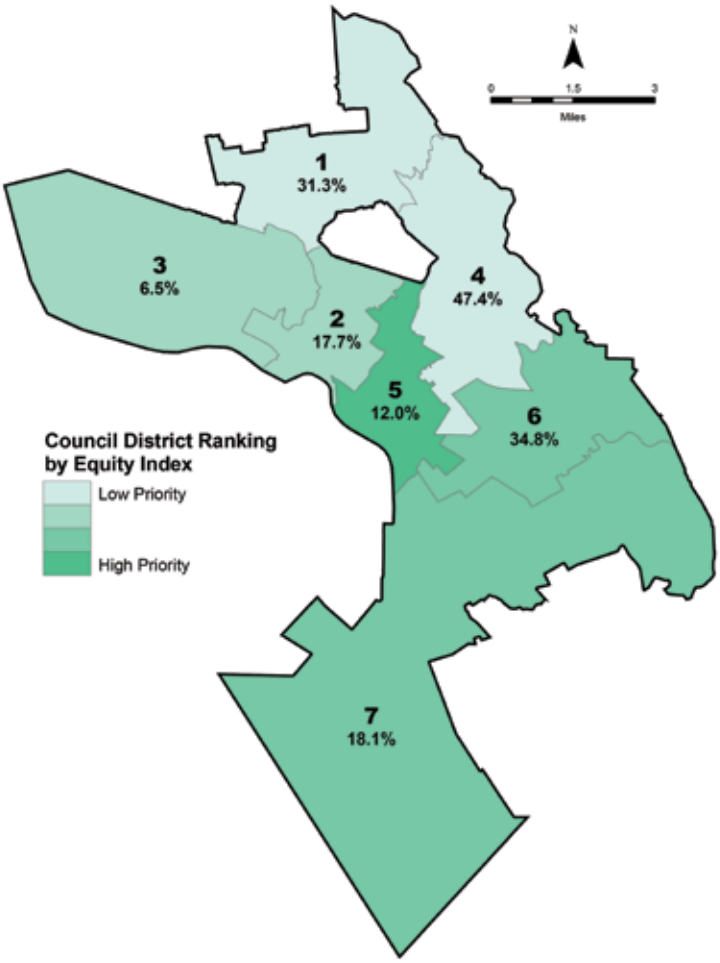
Among the qualitative benefits of trees in cities is the correlation between the presence, number and location of trees and the amount of time inner-city residents spend in public green space. Additionally, the more time people spend outdoors, the stronger the ties they have with their neighbors, which, in turn, establishes a greater sense of community.

As is the case for all the stakeholders that are invested in making Oakland a greener place, resources are precious and partnerships are vital to achieving goals. Chief among the concerns of those working in neighborhoods across the city, primarily those in underserved and minority communities, is to provide the resources necessary to develop future tree stewards.

Robert Zahn, a certified arborist and supervisor with Oakland Tree Services Division who has worked for the city for 27 years, has witnessed firsthand the sense of pride people, particularly children, have when they plant a tree. During his time working for the city, Zahn and the Tree Services Division have coordinated Arbor Day tree plantings on school grounds throughout Oakland's neighborhoods.

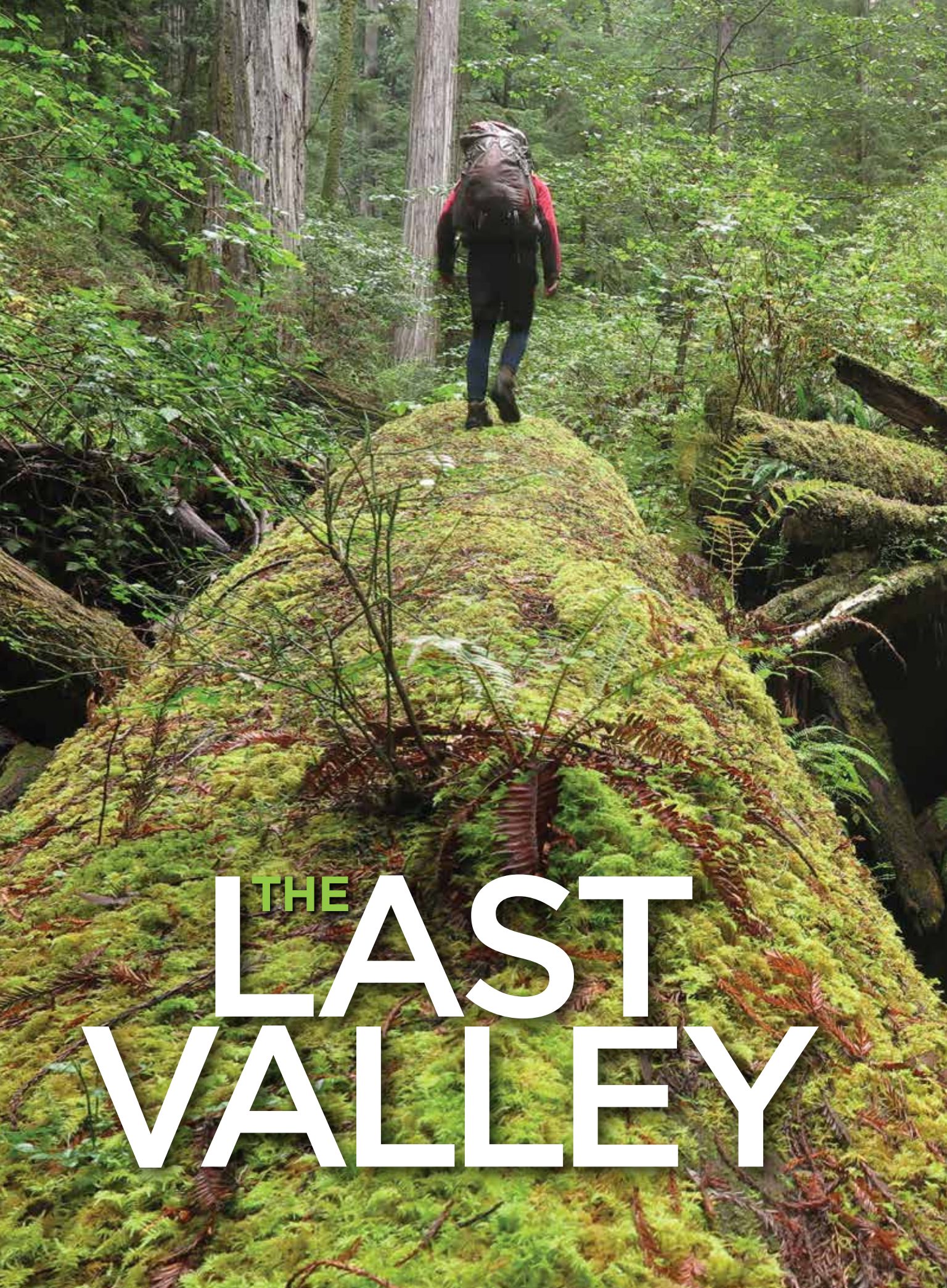
"The students are positive and happy to help us," Zahn said. "And, there is always the kid who wants to dig every hole! I love that they show a real sense of ownership — *this is the tree I planted.*"

Christopher Horn writes from Washington, D.C. and is American Forests' director of communications.



Tree canopy isn't always the best indicator for prioritizing tree plantings. When socioeconomic factors are examined, areas with the greatest need may not seem as apparent.

BOTTOM RIGHT: AMERICAN FORESTS



THE LAST VALLEY

An adventurous journey through Little Lost Man Creek points to the importance of watershed protection.

BY TYLER WILLIAMS

THE DIM LIGHT OF A REDWOOD FOREST makes it difficult to discern the onset of dusk. Shadows of the woods creep up on you, growing almost imperceptibly until suddenly, it's night. This flip of the forest light switch felt imminent as I stood scratching my head, trying to find myself among the wavy lines of a damp and tattered paper map.

Tyler Williams hiking Little Lost Man Creek

Little Lost Man basin

Williams hiking through Bull Creek Flats

The distant rumble of a logging truck unexpectedly drifted through a cathedral of tree trunks to my left. This presented me with a dilemma. Although I'd been struggling along game trails for two hours, the security of my vehicle was evidently not far away. My intended destination, on the contrary, lay far below in a steep, dark, densely forested canyon known quite cryptically as Little Lost Man Creek. I stood there indecisively in the fading light, giving myself a pep talk to try and ratchet up my courage. Just then, it was easy to understand how these forests were once seen as an oppressive and menacing force, and how appealing it must've been to overcome that force and bring light to the wilderness, to chop it all down.

This was exactly the course of things in the late 1800s, after California's gold rush brought a flood of immigration. The great cloak of redwood forest, once filling every fog-shrouded river valley from San Francisco to Oregon, began to get chipped away. Progress was slow during the first 50 years of this systematic logging, even after the invention of the steam donkey and the unscrupulous cunning of timber speculators who used a government loophole to acquire the vast majority of redwood country.

By the turn of the century, San Francisco's progressive Sempervirens Club was gaining a small foothold in opposition to the juggernaut of redwood carnage, and a handful of societal elites were funding land grabs of their own, in the name of preservation. Congressman-philanthropist William Kent established and named Muir Woods in 1906, and a decade later a seminal redwood-saving road trip was undertaken by paleontologists John C. Merriam and Henry Osborn and controversial ethnographer Madison Grant. Their drive up the developing Redwood Highway — today's Highway 101 — brought them past the giant trees of Bull Creek Flats, and this forest glen became a top priority for the newly formed Save the Redwoods League. The grove finally gained protection in 1931 when John D. Rockefeller donated $2 million for its acquisition. It was the single biggest victory of the preservationist movement at the time, but it would only be 15 years before it also became their biggest lesson.

Winter rains come in waves along California's North Coast, tapping tropical moisture sources to spew inches of water in a matter of hours. During these episodes, the coast mountains become

Fog over the "redwood country"

ALL PHOTOS BY TYLER WILLIAMS

Above: Old-growth forest surrounding Little Lost Man; below: Fog over the basin of Redwood Creek

exceptionally dynamic. Landslides of mud slew downhill, big trees topple from gusts of wind upon loose saturated soil, rivers rage and claw at their banks. This has been going on for centuries. But, by 1955, the mountains surrounding Bull Creek were denuded, and, although the eye-popping trees of the valley were protected by law, an apocalypse began to unfold during a particularly drenching storm.

Scientists Douglas Jager and Richard LaVen's assessment of the resulting flood paints a clear picture:

"The 1955 flood entrained a sawmill cold deck, cull logs, charred stumps, slash, houses, car bodies, propane tanks, mattresses, tires, and a few coffins, mixed them liberally with the products of erosion, and deposited them in the lower six miles of the Bull Creek channel."

Dozens of big redwoods were lost due to bank failure, and the once quaint little creek was altered into a wide plain of sediment. The golden trophy of redwood preservation was ingloriously tarnished in a cake of mud.

Hastily constructed roads and clear-cut hillsides were the primary culprits for the destructive flood. With the heavy rain, erosion ran unchecked from a freshly exposed landscape that was once held together by a web of root and bush and raindrop-shielding canopy. In preservation terms, it was apparent that simply safe guarding the biggest trees was not enough. The Bull Creek flood prompted a more holistic view of old-growth stewardship. Save The Redwoods and California State Parks sprang to action, and, by the late 1960s, most of the Bull Creek basin was in some form of park management.

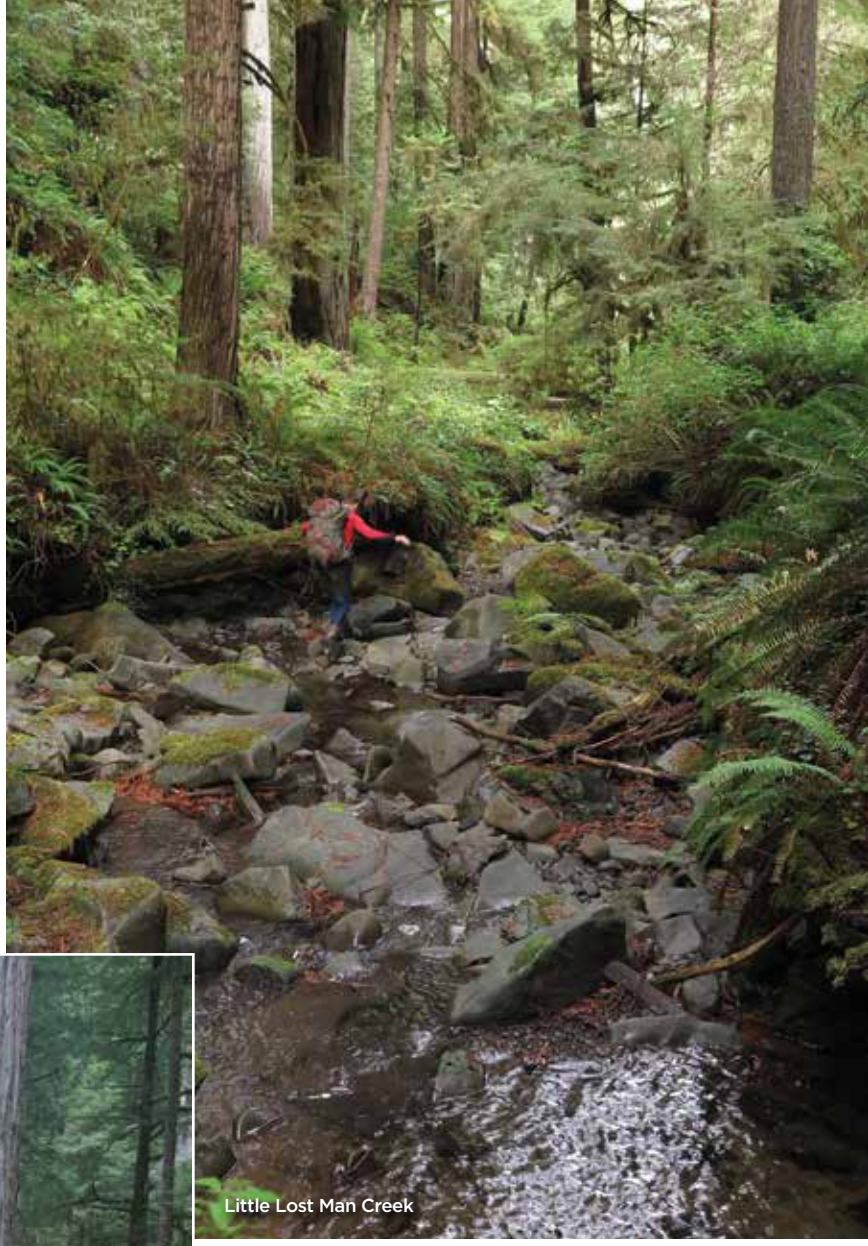
The new Bull Creek acquisitions were still underway as a second major flood came in 1964. This one had a far greater reach than the '55 flood, destroying not just the rehabilitation work that was underway on Bull Creek, but also damaging bridges and other infrastructure throughout the region. Questions about indiscriminate logging were now recognized not just by the conservationists but even among the general public.

This was the last chance to preserve an entire intact watershed of old-growth redwood. There were still a few out there. But, the wheels of change are

grinding, and, by the time Redwood National Park was being pieced together between 1968 and 1978, the last of the old-growth valleys fell to the saw.

Ninety minutes north of Bull Creek, the basin of Redwood Creek became the most contentious part of park expansion, not just because there were big trees there but because the threats of upstream erosion were very real. Abandoned logging roads collapsed during floods in 1972 and in 1975, damaging some of the coveted big redwoods downstream. After a protracted battle, the Carter administration finally obtained the lower third of the watershed for park land in 1978. Like so many valleys behind the redwood curtain, much of Redwood Creek was logged before the legal deal was signed.

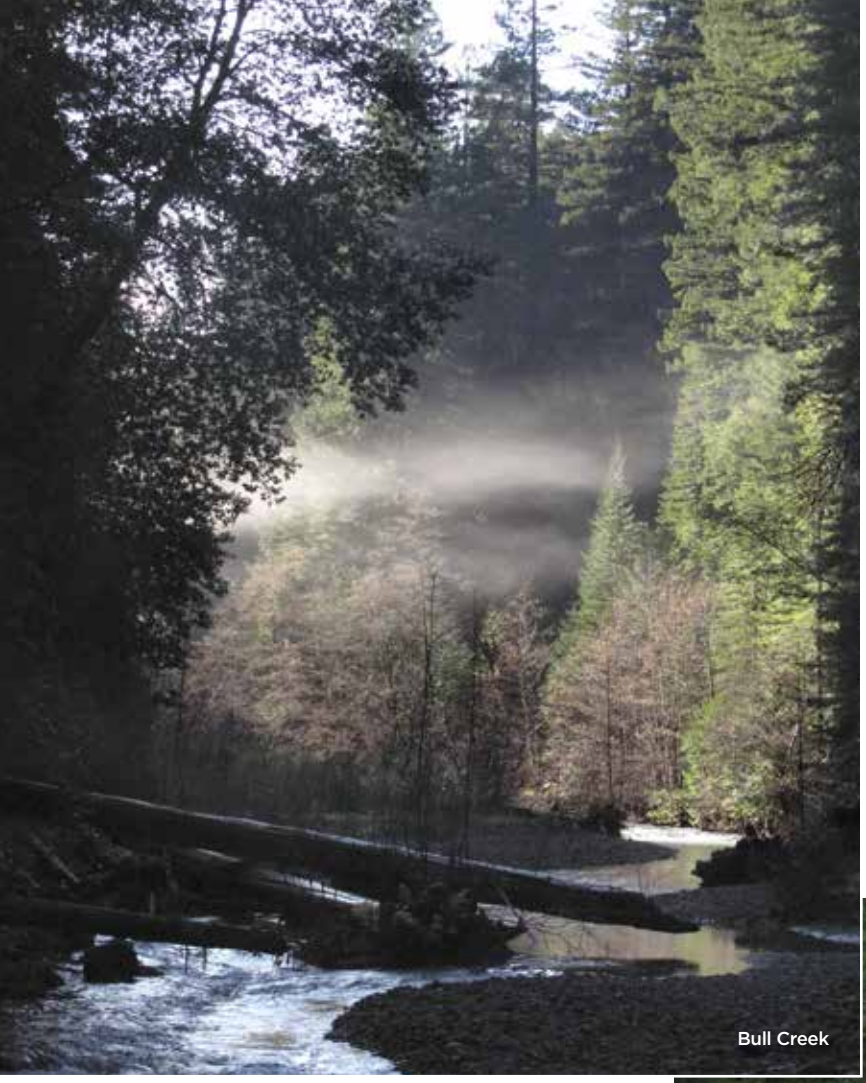
Little Lost Man Creek lies just over the ridge from Redwood Creek. It is a much smaller watershed. You could fit more than 20 Little Lost Mans within the valley of Redwood Creek. It lacks, too, the groves of giant trees found both in Redwood Creek and nearby Prairie Creek, a park centerpiece with a paved road and a web of trails. Little Lost Man quietly squeezes between the two, hidden within a cloak of green, unceremoniously holding the title of last undeveloped redwood valley. It is hardly a vast wilderness of redwood primeval, but it doesn't take much for old-growth redwood to be a clandestine environment. Despite its diminutive proportions, Little Lost Man, I would learn, is pretty damn dank and wild.



Little Lost Man Creek

Williams' camp site

When the forest's eternal dusk finally fell into dark, I pitched my camp on a one-man gravel bar in the middle of the almost dry stream. From my sleeping bag, I could lean over and ladle out a cup of translucent creek water. Out the front door, a silver-barked redwood soared to a very average 250 feet, pointing to a narrow gap of stars. In the night I awoke to the hoots of an owl. In the morning, I followed the wet splotches of a bear's pads for a time, hopping among the rocks of the creekbed.

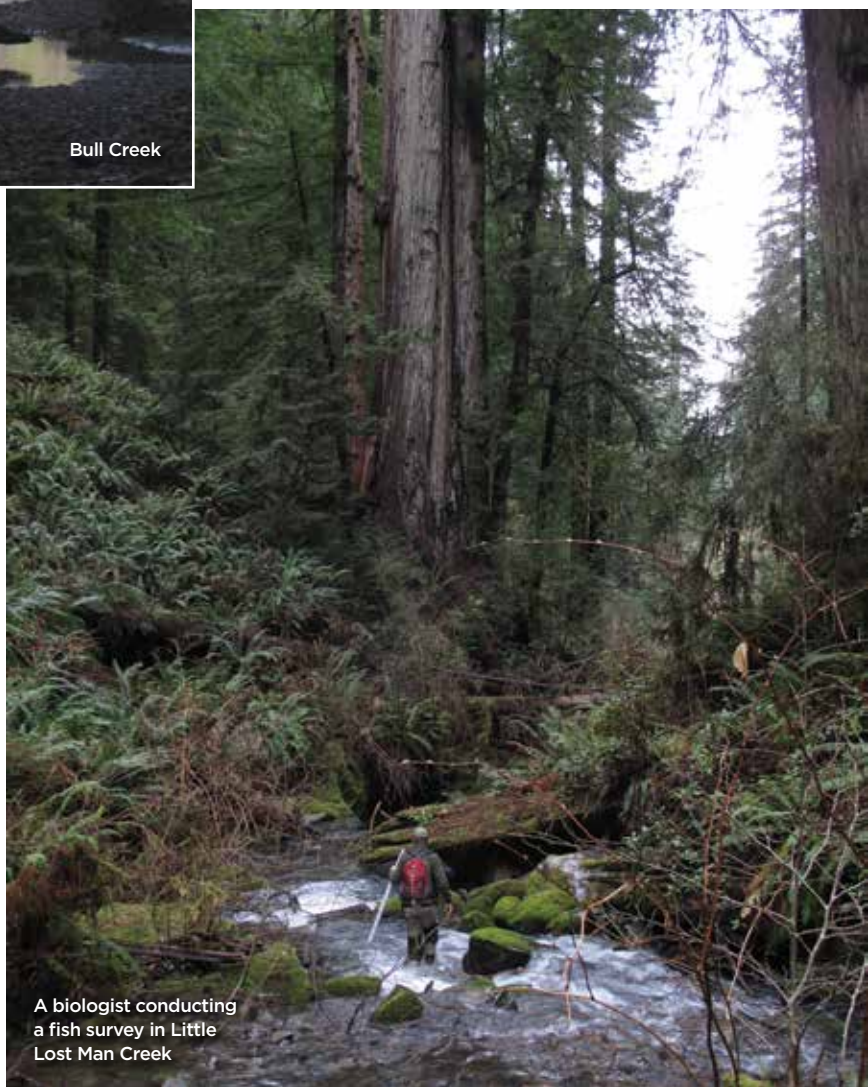


Bull Creek

The bruin's soft, grippy paws would have been nice to have instead of my rubber-soled boots. Although the creek offered the best route of travel, it was hardly a boulevard. At a 6-inch-deep pool, snot-slick cobbles caused me to slip, then stumble, finishing with a full-on belly flop. I stood up dripping and looked around, as if someone was nearby to have witnessed the hilarious crash landing. My reaction was ingrained from similar episodes I'd experienced as a field technician, conducting salmon spawning surveys on this and other coastal streams. Such antics are a part of that job description, and always good for a laugh between survey partners.

On this October day, there was hardly enough water to qualify Little Lost Man as a salmon stream, but things change completely when the seasonal rains arrive. This is home to all four anadromous fish of the region: coho salmon, chinook salmon, steelhead and coastal cutthroat trout. They arrive once the creek gains a reliable surface flow, usually in November, to hollow out their nests — called redds — in the submerged gravels. After spawning, strategies vary for hatchlings of the various species. Some make an almost immediate migration to the sea while others take a full year's residence in a deep pool of the creek before going to the big blue. One thing all anadromous fish need, however, is clean gravel and cold water, which brings us back to the importance of watershed protection.

Even a single disturbed roadcut can sully a stream during a large rain event, smothering a redd in mud and literally suffocating salmon eggs before they've had a chance to hatch. In undisturbed Little Lost Man, salmon thrive, along with other aquatic species like the tailed frog. Surveys have found roughly 1.0 tadpoles per square meter here. In actively logged drainages, that number drops ten-fold, to 0.1 tadpoles per square meter. This science might provide hard data, but to anyone who has walked both pristine and heavily logged drainages, it's really just illustrating the obvious. Privately held timberland creeks are brown water mud pits for days after a heavy rain, while intact streams, like Little Lost



A biologist conducting a fish survey in Little Lost Man Creek

Man, regain their clarity quickly, sometimes within 24 hours after the deluge.

This kind of natural buffer against big storms is just what we hope to regain with places like Bull Creek and the more recent acquisition of Mill Creek. This is the watershed of Jedediah Smith Park, where some of the biggest known redwoods lurk. From the 1950s until 2000, upper Mill Creek was managed for commercial timber. Today, nearly the entire watershed, about 25,000 acres, is in park hands. Even though few ancient trees were left to save, this was one of the biggest triumphs of redwood protection. The landscape and the creek, for more than a dozen years now, are on the mend.

Waterways like this support a web of life integral to the ecosystem, and it starts right at the headwaters. This is where the cold water that fish require emanates. And, because headwaters are generally steeper than lower reaches, disturbed sediments flush rapidly downstrem from headwater slopes to settle in low-gradient areas, where fish spawn. For the iconic salmon, the giant trees that shade their redds and keep the water cool, and everything else down to microorganisms in the bottom of the creek, headwaters are of critical importance. Clearly, redwood preservation is about more than just the big trees.

I tried to keep the importance of this ragged natural world in mind when I approached logjams that created 20-foot waterfalls in the creek. These barriers help slow down the floods and the sediment, as well as random hikers trying to bushwhack downstream. My low point came at a freshly fallen hemlock that was the latest layer in a logjam that completely obscured the creek. With no good option of weaseling my way under or around, I plunged ahead into the tangle, swinging my feet over a menagerie of horizontal limbs to probe for something solid underfoot. This worked, slow as it was, until my purchase gave way and the false floor exposed a 10-foot drop below that I might have plunged right through. But, there was no plunging. Arms, pack, crotch, all were hung up in the miasma of branches, thoroughly preventing any further descent. I rolled to a mossy log and crept by hand and foot down to the next level.

It was late afternoon by the time I rounded a corner to see a footbridge. From here a trail led less than a mile to the relative bustle of Highway 101. I can't say it wasn't a welcome sight. A comfy car, a smooth road, the redwood hot tub it might deliver me to; it was all quite luxurious and appealing upon emerging from an overwhelming copse of ancient forest.

Williams navigating the creek

With my spirit renewed, but my body craving civilized comfort, I couldn't deny the societal benefits we've gained from the harvesting of those once infinite redwood groves. Fast growing, straight, massive, rot resistant, this was the greatest timber tree humanity has ever known. Plenty of *Sequoiadendron sempervirens* were used for important infrastructure of this continent. Looking back, it's just unfortunate that we were so darn voracious about it, unable to spare just one significant watershed of old-growth redwood. A quick scan of the map reveals a number of potential basins that, in a perfect world, we might have preserved: Larabee Creek, Yager Creek, Lawrence Creek, Maple Creek, Blue Creek, Turwa Creek, even 65-mile long Redwood Creek, in the context of the entire redwood belt, would not have been over generous. But, just a century-plus after redwood logging commenced, the largest remaining watershed that is unlogged and undeveloped is 6-mile-long Little Lost Man. It's not the redwood redoubt some of us might want, but it's what we've got.

Tyler Williams is a big-tree hunter, adventure seeker and author of *Big Tree Hikes of the Redwood Coast: A Guide to the Giants.* To learn more, visit his website www.funhogpress.com.

Harnessing the Knowledge of Plants, Online

Botanical gardens are building the first online catalog of every known plant species in the world. It could be a game-changing tool for conservation.

BY TATE WILLIAMS

TOP: ©ROBERT BENSON PHOTOGRAPHY

FOR MORE THAN 400 YEARS, humans have been collecting bits of leaf and twig, pressing them flat and dry for safe-keeping and writing about them in journals and books, all to better understand the world's plants and, more recently, to protect them.

Our knowledge has become exponentially more sophisticated over those years, but the information we've accumulated remains scattered all over the world and is often difficult to access. As biologists race to protect biodiversity, there's an effort underway to change that, a global partnership to build World Flora Online — the first online catalog of the estimated 400,000 vascular plant species of the world.

Once established, World Flora Online would act like a central nervous system — linking up a broader drive to digitize the world's knowledge of plants — to convert archives of print

Facing page: The iconic Enid A. Haupt Conservatory at The New York Botanical Garden; above center: Staff meticulously glue specimens to acid-free paper along with descriptive information, for experts to identify and catalog for study; above right: Catalogs in the herbarium at The New York Botantical Garden; bottom right: Each cataloged specimen represents a snapshot, one plant found in one place and time

THREE PHOTOS, RIGHT: TATE WILLIAMS

Below: Digitized catalog specimen of the *Acer glabrum Torr. var. glabrum*, the Rocky Mountain maple; Right: Live foliage of a Rocky Mountain maple

FAR LEFT: WWW.NYBG.ORG; NEAR LEFT: KEVIN BEDELL VIA FLICKR

"If we don't know what we have, how on earth can we actually plan to conserve the species or the habitats, or move forward in any way, shape or form?"

volumes and millions of dried plant bits into a collection of navigable data. The vision, especially if it's built out and linked with rich information, is one intuitive, clickable hub that can serve biologists studying the Amazon, land managers defending against invasive species and even native plant gardeners. Such a tool could be a breakthrough for conservation.

"Everything else depends on knowing what we have," says Andrew Wyatt, vice president of horticulture at Missouri Botanical Garden. "If we don't know what we have, how on earth can we actually plan to conserve the species or the habitats, or move forward in any way, shape or form?"

In 2012, the Missouri Botanical Garden, the New York Botanical Garden (NYBG), the Royal Botanic Gardens, Kew and the Royal Botanic Garden Edinburgh launched the effort to create an online flora of all known plants by 2020, one step in a global partnership to halt the loss of plant biodiversity. There are now more than 30 partners around the world on board, each sifting through their collective resources and figuring out how to link them all up.

"Information about plant species is hard to get at," says Wayt Thomas, curator of botany at NYBG, and their lead scientist working on the partnership. "A lot of it is not available online; it's only available hard copy. And, even if it is available online, it may be distributed, scattered all over the Internet, and some of it is reliable while others less so."

Thomas, and the team at NYBG, have been among the leaders turning stores of plant information into a more accessible digital form. It's a daunting task, and to get a sense of the scope of information they're dealing with, it helps to look at the raw data that forms the foundation of these efforts — preserved plant specimens. The millions of specimens, tiny dried bits of shrub, tree, cactus, etc., collected over the years are the bits of data that form the basis of plant biodiversity research.

At NYBG, for example, tucked away in manila folders, stacked in four floors of climate-controlled cabinets, are 7.8 million dried specimens, forming the second-largest such collection, or

THE NEW YORK BOTANICAL GARDEN

Springtime in the Native Plant Garden at The New York Botanical Garden

TATE WILLIAMS

Robert Naczi, curator of North American botany at The New York Botanical Garden

herbarium, in the world. Each specimen represents a snapshot, one plant found in one place and time. NYBG's herbarium has dried plants collected during the explorations of Charles Darwin and Captain James Cook.

NYBG's herbarium adds up to 40,000 new specimens from around the world each year. Staff meticulously glue them to acid-free paper along with descriptive information, for experts to identify and catalog for study.

The preservation process has been pretty much the same since it was developed in the 16th century, but starting in the 1990s, NYBG began turning its flattened plants into searchable files, logging descriptive information indexed with digital photographs. They're taking up to 30,000 images a month, both to keep on top of incoming specimens and to digitize their historic collection. So far, they have 2.5 million specimens in their digital database.

"We'll keep going until as much information as we have locked away can be made available, open access to the world," says Melissa Tulig, associate director of the herbarium, the technology lead on the digitization effort.

Then, there are the hundreds of volumes of books that are informed by the specimens, the authoritative publications on plant species. Garden staff are simultaneously digitizing their own hard copy publications for use by World Flora Online. One current project that is serving as a test case is converting the 114-volume Flora Neotropica, one of their most revered works — taking scans of the pages and then using character recognition software to turn it into searchable information.

COLLECTIVE EFFORT, SUBSTANTIAL RESULTS

With these digitization efforts combined, NYBG is building a cross-referenced database of its collective knowledge. Meanwhile, dozens of partner groups large and small are pursuing similar efforts, whether with their own specimens, books or databases they've already built. The goal of World Flora Online is to get these efforts connected, make core elements of their data compatible and then go knocking on doors to fill in the gaps.

World Flora Online is initially aiming to house just the names and descriptions of every known species, not digitized specimens, for example. But, what really excites conservationists and researchers is the opportunity to add in or hyperlink such powerful data to that central hub. You could one day pull up a species of Ash, for example, read a vetted description, then follow links to the publications about it, high-resolution images of individual

Left: Digitized catalog specimen of the *Fraxinus pennsylvanica Marshall*, the green ash; Above: Live green ash tree

FAR RIGHT: WWW.NYBG.ORG; NEAR RIGHT: STEVEN KATOVICH, USDA FOREST SERVICE, BUGWOOD.ORG

Below: Digitized catalog specimen of the *Pinus rigida Mill.*, the pitch pine; left: Two live pitch pines

FAR LEFT: SANDY RICHARD VIA FLICKR; NEAR LEFT: WWW.NYBG.ORG

The goal of World Flora Online is to get these efforts connected, make core elements of their data compatible and then go knocking on doors to fill in the gaps.

specimens taken throughout history, conservation status and information about efforts to protect it. It will be a road map to finding digitized plant information, as it becomes available.

That's when things get interesting for researchers like Robert Naczi, curator of North American botany at NYBG, who works down the hall from the garden's imaging lab.

Naczi wears multiple hats related to the garden's work on plants in north America, including an update of a staple text — the Gleason and Cronquist Manual of plants in the Northeastern U.S. and neighboring Canada.

The latest edition is from 1991, and with huge breakthroughs in plant science since then, users are eager for the update. Working closely with the digitization team, he's releasing batches of chapters annually, in an online version and for use by the World Flora Online.

Also an active researcher in plant identification and conservation, Naczi is well acquainted with the importance of more accessible data.

He notes a current research project identifying declines in common species in North America, with one example being the American plum in southern New England and the Mid-Atlantic states. Naczi explored plant specimen records at multiple herbaria, finding evidence of declines in several species.

It took weeks of traveling to other collections and perusing hundreds of physical specimens with his specialist's eye.

"It took a lot of time," says Naczi. "This is very, very time-intensive work, and this is why no one's done it before."

Nothing will replace the value of physical specimens, but when more records are digitized, it can mean the difference between days of work and weeks of work. World Flora Online will provide a one-stop location to search and find links to such digitized data, as it's available.

"Once it's digitized, oh, it's golden," says Naczi.

With limited resources and expertise available in conservation efforts, such time is precious. With an emerging invasive threat, for example, acting fast is the difference between containment and losing control.

Naczi also points out the inherent power in the mere act of "putting it all in one place."

"By having a comprehensive treatment like we envision for the World Flora Online, then we see where the gaps are," says Naczi.

A LONG ROAD AHEAD

There are still significant scientific and technical hurdles before reaching that vision, and the partnership meets every six months to advance plans. Aligning such a large set of partners is not easy. Funding is always a limiting factor. NYBG's digitization work relies on grant funding, having recently landed chunks of support from the Sloan Foundation and Google for its World Flora Online contributions.

And, in a way, such a project will never be truly finished. There's still an estimated 10 percent more species out there to be discovered, not to mention thousands of duplicate names, conflicts and corrections that will need to be made. Then, there are the never-ending tech advances to keep up with.

But, for Melissa Tulig of NYBG's digitization lab, the uncertainty is part of the excitement, especially once researchers, programmers or anyone, can get their hands on these entire data sets:

"I mean, analyses we haven't even thought of yet, about distribution patterns, weather changes and how climate change is going to affect species distributions — there are so many things that creative scientific researchers can do with these data once they are digitized."

Tate Williams writes from the Boston area about science, the environment and culture. Read more of his work at www.tatewilliams.org and follow on Twitter @tatejw.

Bull Creek Flat, near Joan's favorite old-growth forest, Rockefeller Forest, in Humboldt Redwoods State Park

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Speaking for the Trees

BY AUSTA SOMVICHIAN-CLAUSEN

WHAT COMES TO MIND when you think of an old-growth forest? Muir Woods in California, if you've been there? Or, if you haven't, maybe spooky, gnarled woods — the kind you saw in the movie *Snow White and the Seven Dwarfs* as a child. But, those more familiar with the term may think of Joan Maloof and her work dedicated to protecting them.

Maloof, a proud and self-declared tree hugger, and founder and director of the Old-Growth Forest Network (OGFN), knows more about these ancient forests than most people. Yet, even she knows they can be difficult to define, saying "it's not that simple, really." Old-growth forests can be hard to define not only because of the continually changing standards for what can now be considered "ancient" or "old-growth," but also because of how much the term itself has changed over time.

"Some people call them Original Forests," Maloof says. "In other nations they're often called Primary Forests. A hundred years ago, we were calling them Virgin Forests. There isn't just one formula to follow — it's not black and white."

But, at any rate, most all of our original forests have been logged or otherwise disturbed. Less than 1 percent are left in the eastern United States, and only 5 percent remain in the West. Even if a long time has passed since being logged, the forest may never fully return to the same state it was in originally.

The ambitious goal of the organization is to ensure that there is at least one forest protected in every county in the U.S. that can sustain a forest — there are more than 2,300 of them out of a total of 3,140. While OGFN focuses on old-growth forests, in many of these counties where old-growth forests do not exist, they find the oldest *possible* forest to protect. They may not be old-growth right now, but they could be in time. Maloof likes to think of these as "future old-growth forests." OGFN has more than 50 preserved so far, only three years after its founding.

Maloof explains that one of the obstacles to preservation is that developers who buy a piece of land see the green spot on a map and think only "open ground to develop" and not about the repercussions of ignoring what may be in those areas, including older forests. Also, loggers and developers may take advantage of the strictest definitions of an old-growth forest being an untouched one, to show a particular forest doesn't count, so they can move forward with their plans to clear the area.

> "Maybe we can't protect old-growth forests in our community, but we can protect the oldest forests in our community."

In addition to educating developers, Maloof speaks about the challenge of rallying enough people in a particular area who want to be involved in the preservation process. It may not be easy for most people to understand the importance or significance of an ancient forest until they step into one for themselves — until they smell the fresh air, hear the sounds of the forest and understand the nuances within it. This is why Maloof stresses the importance of the OGFN, hoping eventually there will be a forest within a short distance from every town or city.

"Maybe the days are past to be able to protect the old-growth forests in our community, but we can still protect the *oldest* forests in our community," Maloof says.

When a forest is officially added to the OGFN, a hike is usually led through it, and Maloof says that what surprises her visitors the most about old-growth forests, particularly on the East Coast, is how subtle they are. She says they expect a much different experience, similar to the striking redwoods of California (which is also one of her favorite old-growth forests), but that when they begin to understand the subtlety of the forests, many of them become "old-growth forest addicts" who love and understand them.

Maloof says she has a theory that the more time you spend in the forest, the more you find yourself working to save the forest.

Besides being the author of two books, and Professor Emeritus at Salisbury University, Maloof lectues at many universities and conferences. Maloof speaks passionately about a couple of her favorite experiences lecturing, including at Cornell University. As a result of her first book, "Teaching the Trees: Lessons from the Forest," not only was she invited to the university as their annual Cornell Plantations Guest Lecturer, she also was able to add Cornell's own old-growth forest, Fischer, to the OGFN and, ultimately, ensure that it is protected from being logged.

Currently, Maloof has a third book in the works. She says an official title has not been decided on, but that it will be a collection of data from numerous journal articles that all lead to a key conclusion: old-growth forests have superior and important biodiversity compared to other types of forests. She is hoping that, once published, her latest book will reach those in forestry schools as a supplementary text and will help educate future guardians of the forest.

Although it may be difficult to pin down a clear definition of an old-growth forest, what is clear is that, as long as Joan Maloof is around, they will have a strong advocate for their survival.

Austa Somvichian-Clausen is American Forests' spring 2016 marketing and communications intern and is a senior at American University, studying public communications and environmental studies.

JAMIE PHILLIPS

Above: Joan Maloof; below: Joan Maloof exploring an old-growth forest

RICK MALOOF

last look

CHUCK FAZIO

This past fall, photographer Chuck Fazio was appointed Artist-in-Residence for American Forests. Chuck is a master photographer who has been shooting pictures for more than 40 years. He has photographed every U.S. president and vice president since Ronald Reagan, as well as countless celebrities. Chuck's nature photography inspires viewers to appreciate the profound beauty of the natural world and to embrace a deeper understanding of the fragile connection between human life, wildlife and nature. Last February, Chuck accompanied American Forests on our "Winter in Yellowstone" expedition, capturing stunning photos of both the landscape and wildlife. We can't wait to share more of his work with you!

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