Democracy Dies in Darkness

Environment

Scientists discover an ancient landscape – in our own backyard

Newly recognized patches of undeveloped grassland are accidental time travelers from a distant past, and they offer answers for our 21st-century problems.

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Column by Dana Milbank

REMINGTON, Virginia — For more than a century, American conservation has been about trees, from the founding of the U.S. Forest Service to the Biden administration's plan to plant 1 billion trees to fight climate change. Opponents chided environmentalists as tree huggers — and the movement embraced the term.

But what if the whole premise was flawed?

We now know that European settlers were not met by a vast forest when they arrived, as popular imagination had it, but by a landscape with large swaths of open prairie and savanna. We also now know that, in our temperate climate, those grasslands hold a lot more plant and animal life than forests, and that planting such grasslands can be a far more efficient way to pull carbon out of the atmosphere than planting trees.

We know this in part because scientists have begun discovering tiny, still-intact remnants of these forgotten grasslands, plant communities that have been here for thousands of years and somehow managed to survive without being turned into a farm, a forest or a subdivision.

These are, in effect, accidental time travelers from a distant past — and they have come with answers for our 21st-century problems.

I went to meet them.

The scene along Lucky Hill Road shows just how unlucky nature has been under current human management.

Bud Light and Corona cans litter the roadside here, along with McDonald's wrappers and pieces of Styrofoam. High-voltage power lines stretch overhead and cars whiz by. The beeping of backup alarms fills the air — coming from the cranes, backhoes and dump trucks leveling a vast field where a data center will soon rise.

But immediately across the road from the construction site sits an ancient landscape that is somehow managing to hold on. A 300-year-old post oak stands sentinel over a patch of grassland containing an extraordinary 56 species of plants in just 100 square meters, including curiosities such as Parlin's pussytoes, grass-leaf blazing star and purple false foxglove. "This," says ecologist Bert Harris, whose Clifton Institute is trying to preserve such sites, "is a thing of beauty."

The humble patch of abundance is one of 1,700 "remnant" grasslands identified in Virginia over the past few years. Using carbon dating and other forensic techniques, scientists have found that plant communities in similar plots have existed continuously for at least 2,000 years — and possibly could

date back to the last ice age. Other efforts are uncovering remnants of early grasslands in other parts of the country and the world.

The discovery of these plots is remarkable, because pretty much nobody realized until recently that they existed. Virginia's Department of Conservation Resources still says online that there are "no remnants" of precolonial prairies "in the contemporary landscape."

For much of history, fires caused by lightning or set with intention by Native Americans swept through savannas, prairies and woodlands every few years, preventing open spaces from growing into forests. After Europeans arrived, most of those grasslands were lost to agriculture, and much of what survived grew into forests as a result of a fire-suppression effort over the past century. An estimated 95 to 99 percent of the original grasslands are gone in the eastern U.S., with similar losses in other regions.

The remnants have been spared by happenstance: They are small pieces of land, usually an acre or less, along roadsides or underneath power lines, where nobody wanted to farm but where occasional trimming prevented them from growing into forests.

This is turning out to be a most happy accident. As human activities drive countless plants and animals into decline and extinction, researchers are finding that, acre for acre, the remnants attract a rich community of insects and "are the most diverse plant systems on the continent," says Devin Floyd, whose Piedmont Discovery Center is working to identify and preserve the remnants.

Scientists are now finding that vibrant remnant grasslands can sequester about 40 percent more carbon overall than closed-canopy forests that are protected from fire, according to preliminary results shared with me from a study by Auburn University and the Southeastern Grasslands Institute. Certain remnants in Alabama have been found to store five to six times more carbon underground than these forests. And because that carbon is stored in roots rather than in the wood of trees, it isn't rereleased into the atmosphere as happens when trees topple from wildfire, storms or disease.

"The fact that these have the potential to store so much carbon in the soil kind of blew my mind," says Heather Alexander, a professor of forestry at Auburn who is leading the study, funded by the Tennessee Department of Environment and Conservation and now entering its third and final year.

Growing a forest can take generations. But the Auburn study is finding that it takes about eight years to convert degraded landscapes into grasslands that can absorb about as much carbon as the remnant prairies.

People such as Harris and Floyd are racing to collect seeds from the remnants, in hopes that they can produce an off-the-shelf seed mix that people can use to turn their fields and backyards into facsimiles of the ancient grasslands. But, as Harris notes, "the clock is ticking." When we arrived at the remnant on Lucky Hill Road, we found a legal notice posted. Data-center developers want to turn the 2,000-year-old grassland into "Gigaland."

An old saying had it that when Europeans arrived along the East Coast, the tree canopy was so dense that a squirrel could travel from the Atlantic to the Mississippi without ever touching the ground. The virgin forest supposedly found by the early explorers became a standard trope in art and literature.

But it was never so. About 40 percent of the southeastern U.S. and Mid-Atlantic were likely prairies, savannas or open woodlands. An account of the DeSoto Expedition written in 1540 mentions “the savanna” they traversed in what is now Tennessee. A 1669 map labeled large parts of Virginia “savannae.” A map of what is now North Carolina included a section called the “Grande Savane.”

“Our grasslands were gone before the camera was invented, before they could be painted and largely before scientists were a thing,” observes Dwayne Estes, director of the Southeastern Grasslands Institute, which has been compiling the early writings.

A “collective amnesia” set in after the Civil War, Estes says. “As the modern day science of ecology was developing around the turn of the century, it became this notion that everything was historically forested … and that set the tone for the environmental movement, and it set us off really on a misguided foot.” The forest canopy rebounded over the past century, but in the process claiming more chunks of the remaining grassland.

“Everybody thinks about planting trees,” the Clifton Institute’s Harris said. “But really what we need to do in a lot of cases is *not* plant trees and even cut trees down.”

That would be a radical shift. But the remnant grasslands hint at an extraordinary volume of life once nurtured by these landscapes.

The remnants found in the southeast and Mid-Atlantic typically have 50 to 80 plant species (and as many as 130) per 100 square meters, compared to between 10 and 40 species commonly found in hayfields and areas that became closed-canopy forests. Virginia surveys by Virginia Tech, the Clifton Institute and Piedmont Discovery Center have identified 952 plant species in the tiny remnants — nearly a third of all the plant species found in the entire state. It’s no wonder that the butterflies, bumblebees, grassland birds and others that depend on these shriveling landscapes are also vanishing.

My first stop with Harris and Floyd was a remnant on Ritchie Road right next to the “Flying Circus Aerodrome” in Bealeton, Virginia, just over an hour from D.C. There were cups, bottles and cans, discarded Lays and Cheetos bags, deep tire ruts in the ground and a power line overhead.

Yet this postage-stamp plot contains 77 different plant species — only four of which are non-native. Among the unusual specimens were blackjack oaks and narrowleaf mountain mint, whorled milkweed and reindeer lichen, Elliott's bluestem and fuzzy wuzzy sedge. They've been here for hundreds, or thousands, of years, as the parcel went from fire-maintained savanna to colonial path to telegraph corridor to power line route.

Power companies and transportation departments now routinely use herbicides rather than just mowing to control growth under power lines. If a too-heavy Roundup bath comes to Ritchie Road, the remnant's 2,000-year history will come to an end.

The end will probably come sooner for the remnant at our second stop, on Lucky Hill Road in Remington. The owner of the land hopes Gigaland will be the next phase of the planned 600-acre data-center complex.

Harris and Floyd know this remnant is a goner. They fill baggies with seeds and make plans to dig up some Carolina rose roots for transplanting. They discuss the legality of bringing in a backhoe to rescue some of the smaller oaks.

In the growing season, the remnants are ablaze with purples, yellows and pinks. Even when we visited in the fall, the goldenrod was flowering, the grass-leaf blazing star still showed some purple and the grass stalks formed a tapestry of browns and blues.

What Gigaland would destroy is exactly what many of us are trying to build. “Everybody’s doing these things called pollinator gardens and native meadows,” Floyd said above the trucks’ beeping. “What we’re all doing is attempting to reproduce this thing.”

In the meadow on my farm, I’ve planted 18 species of wildflowers and two grasses — a pale imitation of the remnant savannas. But people will soon be able to plant meadows that much more closely resemble the remnants.

Estes, from Tennessee, has developed a 90-species seed mix for his area that closely mimics the ancient grasslands. By the end of next year, his Southeastern Grasslands Institute will launch “Grasslandia,” an interactive map that will suggest tailored seed mixes for locations in 24 states. In backyards, in community plots and in abandoned fields, we will then be able to plant our own carbon sinks.

The climate benefits of these reconstructed grasslands will vary widely based on soil quality. But the very notion that some grasslands can store more carbon than some forests is counterintuitive; it turns out their fine roots go deeper and occupy more layers of the soil than those of mighty trees.

This is why grasslands "absolutely must be looked at as a major solution to carbon drawdown," Estes says. "We're able to heal landscapes very quickly that have gotten off kilter, and I think that's a very scalable model that we can apply to hundreds of thousands if not millions of acres."

One of the newest solutions for a warming planet, it seems, has been with us all along.

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