Setting prairies ablaze in springtime is key to restoring damaged ecosystems, conservationists say

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On a recent weekday, short but mighty flames began consuming an expanse of tallgrass in Illinois' Nachusa Grasslands, their advance

marked with crackles and pops.

Satisfied with the blaze, a group of eight conservation workers split in two, walking the perimeter of a 124-acre square expanse of land. They used liquid fuel, drop by drop, to create a ring of fire and rubber tools to put out unruly sparks.

Everything was under control.

The neon orange fire charred most of what it encountered: native plants such as Canada wild rye, big bluestem and Indiangrass; and invasive species like bush honeysuckle and bush clover. It barely grazed a handful of scattered oaks and a willow grove at the center of the open meadow, all leafless but tall, alive and full of water—immune to the fire.

"If we're doing things right, we've tried to set ourselves up so that the fire is largely managing itself, and we're giving light touches to keep it where it needs to be," said Elizabeth Bach, a research scientist at The Nature Conservancy, which manages the nature preserve 100 miles west of Chicago.

"The idea is … that the fire won't get pushed outside of the boundaries. It's like, once you got your lines, you just color inside. Then everything kind of comes together at the end."

As spring gets underway, conservationists are purposely setting Illinois tallgrass prairies on fire to protect native species and revitalize one of the most endangered ecosystems in the world.

Prairies don't immediately come to mind when people think about threatened landscapes, and public attention is often focused on rainforests. But there are far fewer prairies.

"More tropical rainforest gets cut down every year than there is tallgrass prairie that still exists," Bach said. "We're all about setting up plants and animals to thrive today and into an uncertain future … with the ecological factors that support them, and prescribed fire is a pivotal one."

The National Park Service estimates that only 6.8 million acres of tallgrass prairies remain in North America, less than 4% of the 170 million acres that originally covered the region. In just 2021, 1.6 million acres of Great Plains grasslands were plowed primarily to expand row crops, according to a World Wildlife Fund report.

At Nachusa, more than 4,000 acres of grassland are protected. The Midewin National Tallgrass Prairie near Wilmington, which the U.S. Forest Service manages, covers another 20,000 acres. About 3,000 acres there are actively undergoing restoration or enhancement. Efforts to preserve these endangered Illinois ecosystems involve numerous organizations and institutions.

"As you may know, Illinois is the 'Prairie State,' but less than 0.01% of its original tallgrass prairie remains due to agriculture and land development," said Emily Reusswig, vice president of conservation and policy at Openlands, an environmental nonprofit contributing to conservation work at Midewin.

Dependent on disturbances

The roads leading up to The Nature Conservancy's headquarters at Nachusa are lined with black and gray plots of land in various stages of postfire recovery. Heavy in the air is the smell of burned grass. The nature preserve and its grasslands are home to 180 birds, over 700 native plants and a herd of 100 bison.

Meant to benefit these organisms and restore the health of their habitat, the carefully planned and controlled fires can only be executed by experts under specific wind, temperature and humidity conditions. These often occur from mid-March to May even though a layer of snow often coats the ground this time of year. But the unusually dry and warm winter had fire experts scrambling to start in February.

Four hours into the recent controlled burn at Nachusa, the small crew finally regrouped opposite where they started. They watched as the initial fire, pushing against the southeasterly winds, met the newer, taller flames quickly blowing in. In a moment, the blaze put itself out. All that was left was scorched earth.

These fires mainly target invasive species such as bush honeysuckle, yellow sweet clover, white sweet clover, Siberian elm, bird's-foot trefoil and bush clover.

In the 8,000 to 10,000 years since prairies took root in North America, their flora and fauna have become resilient and even dependent on disturbances such as fire. Indigenous people, for instance, have long relied on it as a tool to manage land. But nonnative plant and animal species introduced in the last several decades did not evolve to withstand fire.

"The suite of plants and animals that you see in tallgrass prairie are all there because they can tolerate fire every few years," Bach said. "In fact, some of them thrive with fire every few years. And that fire helps suppress things such as trees and shrubby brush that would move in if that wasn't coming through the system."

Fire also clears out dead stems and leaves without killing the roots of prairie plants, allowing them to grow back; it's like deciduous trees shedding their leaves in the fall. The ash also returns nutrients to the soil,

according to the Forest Service.

Teeming with life

Reaching over 5 feet, tallgrass thrives in the Midwest's rich soil. But that fertility also makes these kinds of prairies well-suited to row crops such as soybean and corn.

When settlers reached the Great Plains, they brought cattle to graze on the bison's vast pasture and plowed the grasslands.

"We removed fire as a factor, and we introduced things like buckthorn and honeysuckle, and we planted cornfields and cleared areas for homes," Bach said. "And that was very different from how our Indigenous neighbors have and continue to manage land and consider their relationship with land."

According to the Illinois Department of Natural Resources, in 1820 the state had 22 million acres of prairies, most of which were gone by the beginning of the 20th century. By 1978, less than 2,300 acres of high-quality original prairie remained.

"You do, sometimes, kind of run into the mentality that land is a resource that should be productive with this kind of direct human output," Bach said. "It is true that the soils of Illinois can grow a lot of grains, a lot of calories. And that's an important thing. We need that, our world needs food. We all need to eat."

She said productive agricultural land and human development can—and should —coexist with nature.

"I think it's an 'and,' it's not an 'either-or,'" she said. "How do we think about our ecosystems a little more holistically? Not just what they can

produce for us, but also, what we can do for them?"

Grasslands are teeming with life that conservationists are trying to protect and restore.

The monarch butterfly is perhaps one of the best-known prairie insects. Other prairie pollinators, essential in sustaining plant life, include the endangered rusty patched bumblebee.

Grassland birds, such as the bobolink, greater prairie-chicken, and Henslow's sparrow, are some of the most imperiled species in the country, with populations declining by over 40% since 1966, according to the National Audubon Society.

Yet the organization's Great Lakes regional office says populations of bobolinks and Henslow's sparrows have remained steady or increased in the Chicago Wilderness region, which includes Midewin, due to land management practices such as prescribed burning.

In late 2023, Openlands received a $1.5 million grant from the National Fish and Wildlife Foundation to bring back a dozen bird species through the restoration of over 1,300 acres of prairie, savanna and floodplain wetland habitats at Midewin's Grant Creek watershed.

After the recent prescribed fire at Nachusa, Bach pointed to a group of 50 bison quietly munching on grass that was burned in early March. The imposing animals are equipped to survive winter from fat reserves in their bodies, but they'll still eat what they can find, especially in scattered patches of grass where there wasn't enough dry material to burn.

"If it's green and they can eat it, they'll eat it," Bach said. "In restoring this big area, that grazing factor was missing. We had the fire, we had the landscape, we had the native plants and animals … So, after a lot of

careful thought and planning, the bison came back."

The last recorded sighting of a wild bison or American buffalo in Illinois happened in 1870. The animal was ultimately forced out of the state by hunting, agriculture and development. Just as grasslands co-evolved with fire, they grew to be dependent on the grazing patterns of bison, which diversified native vegetation, maintained habitats for birds and cleared out invasive species.

In 2015, Nachusa Grasslands welcomed the first baby bison born in Illinois in nearly two centuries. It became the newest member of the first herd to have been officially reintroduced east of the Mississippi River for conservation purposes in 2014. Midewin's herd of bison was introduced in 2015.

Bach said she didn't anticipate how visitors would connect with the bison, which has become a conduit for more Illinoisans to understand the uniqueness of tallgrass prairies "that are literally in our backyards."

Lessons in climate resilience

Grassland animals have evolved to respond to fires and predators by burrowing, running, flying or camouflaging at a moment's notice.

Still, about 75% of prairie life occurs almost entirely underground.

Most of the biomass—the bulk of organisms—in a prairie is found in its roots. They are great at absorbing water and storing nutrients, which allows the grass and the whole ecosystem to bounce back from disruptions.

These deep, dense roots also allow the soil to serve as a safe, long-term repository for the carbon dioxide the plants capture from the

atmosphere. Remnant prairies, which have remained for millennia, have roots that go as far down as 15 to 20 feet.

"Restoring our ecosystems is really a powerful way to not only store carbon but also help us adapt to our changing climate," Reusswig said. "Because these prairie plants, they clean our water, they soak up carbon, they help reestablish our aquifers … They just have a ton of ecosystem services or natural capital when it comes to helping us thrive both today and in the future."

While forests can store more carbon than grasslands due to their larger biomass, they are also more vulnerable to changing weather patterns and unexpected disasters such as drought and wildfires. And when trees die and decompose, they rerelease the carbon stored in their trunks, branches, leaves and roots.

"It's not about one system (being) better than another system," Bach said. "Because the systems have evolved where they thrive. The grasslands are going to be a really good system in Illinois for locking up carbon. A rainforest is going to be a really good system in Brazil for locking up carbon. That doesn't mean we need rainforests in Illinois."

Into the future

Prairie restoration work can be tedious, like collecting more than a thousand pounds of seeds by hand every year to regrow hundreds of native plant species.

Reseeding is essential to restoration. Prescribed burns are done on land that has often already been repopulated with native plants, in hopes that native species come back and eventually reestablish their co-dependence with fire. For instance, the 124-acre parcel that was recently torched had been planted in 2017.

"Once we got that all planted," Bach said, "we kind of let it do its thing. We've come in, we've now burned it a couple of times since then. And it's now in a situation where we burn it every few years. We check it for invasive species that might be a concern, but there's not a lot of other intervention we have to do. It's pretty set to go."

Restoration does not entail re-creating prairies exactly as they were hundreds of years, even decades, ago.

"Ecosystems aren't static. They're evolving, changing and responding to weather and climate and all kinds of impacts," Bach said.

"Our goal here is to set up communities of native plants and animals for success (in) the future. And that includes these regular disturbance regimes and ecological factors. It's not a static thing that you'll walk away from."

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