High Country News

ALTERED LANDSCAPES



UNFENCING THE WEST

DRYOUT IN THE GRAND CANYON

WHAT NATIVE LAND IS WORTH

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A 12-foot-tall snow fence is installed along Interstate 80 near Arlington, Wyoming, in 1971. By slowing down the wind enough for it to drop the snow it's carrying, the Wyoming Snow Fence has likely prevented thousands of car crashes along the country's most dangerous stretch of interstate highway. (*See story on page 10.*)
Wyoming Transportation Department Collection / Wyoming State Archives

Know The West.

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Change comes to the Chiricahuas

The Chiricahua Mountains in southeastern Arizona are one of the nation's great gathering places. Human travelers from all over come to these scrubby mountains, particularly in spring and fall, to glimpse visitors from farther south: trogons, chunky tropical birds that are the spectacular quetzal's only slightly less spectacular relative, as well as ringtailed cats and jaguars, wild creatures seemingly dreamed up in a fever. The animals get here by crossing open desert, fields and the international border, hopscotching between similar "sky islands" throughout Northern Mexico and southern Arizona.

From the North, you reach the Chiricahuas by passing through a dramatic gap in the rocks, where the aptly named town of Portal is. You go from sprawling, dusty fields frequented by Border Patrol into a tight canyon covered with trees, dotted with log cabins and split by the south fork of Cave Creek. It's one of the West's gathering places, yes, but also one of its strange interfaces between vastly different ecosystems and ways of life.

Today, this area faces a massive change. The northwestern flanks of the mountains with their precariously stacked rock towers are already a national monument. A bill to redesignate the area instead as the newest national park has passed out of Congress with bipartisan support and, as of press time, awaits a presidential signature. If it's signed into law, the new park could attract more visitors than these quiet mountains have seen in a very long time.

A few weeks ago, a reporter called me from near Portal to talk about a story he wanted to pursue. He was on vacation in the canyon and mostly out of cell service but had still heard rumors that a significant piece of land, hundreds of miles away, was up for sale. When we spoke, I found myself briefly catapulted out of my late-afternoon life in southern Montana. Instead, I was with him by the cool waters of Cave Creek, thinking about the future of these dry lands, trying to recall the names and numbers of Southwestern sources who might know more.

Sometimes I imagine the work of *High Country News* as that of a spider, busily connecting far-flung land-bound communities with a web of fragile threads. It's a rare privilege to be able to tie together places as far apart as southwestern Montana and southeastern Arizona. Other times, though, I see our work as an absurd game of telephone, passing what we hear about the changes in one place to another, just so their inhabitants can learn and be ready in case those changes come for them. Sometimes, we forecast the change, and sometimes it catches us unawares.

Kate Schimel, editor-in-chief



Nick Mott / HCN and Mountain Journal

As bears 'spin out' in southern Montana, wildlife managers are at wit's end
Amid a record-breaking year of human-bear conflicts, the historically tolerant Red Lodge community is grappling with opposing views on how to live with the species — and whether a "fed bar" really should be a "dead bear."
By Nick Mott



Joe Sohm / Getty Images

The Forest Service is poised to hand off one of the West's most visited landscapes
Critics say this is a test case for privatizing public lands.
By Zoë Rom

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FEATURES

Hidden Waters 20
An artist chronicles the Southwest's disappearing waters.
BY BREMNER BENEDICT

After the Barb 30
The promises and pains of de-wiring the West.
BY KYLIE MOHR
PHOTOS BY REBECCA STUMPF AND LOUISE JOHNS

REPORTAGE

Funding a greener Eugene 7
A ballot measure in the Oregon city could provide millions of dollars for climate-resilience projects.
BY AMAL AHMED | PHOTOS BY TODD COOPER

The snow fence is a Wyoming icon 10
The hubris and ingenuity behind a life-saving structure.
BY CHRISTOPHER SOLOMON

Dryout in the Grand Canyon 12
The impacts will reverberate through recreation, river ecology and local tribes.
BY HEATHER HANSMAN

What California owes for Native land 14
In 1972, the state told Native families it would pay them 47 cents an acre.
BY ALLISON HERRERA

BOOKS, CULTURE & COMMENTARY

Sweat yourself clean 46
Getting immersed in the Yup'ik sauna tradition.
LIFEWAYS BY LAURELI IVANOFF
ILLUSTRATION BY APAY'UQ MOORE

Advice for a fractured world 48
Freaked out about everything? Aileen Keown Vaux has a poem for you.
BY COLEMAN STEVENSON
ILLUSTRATION BY LAUREN CROW

#iamthewest 52
Eric Romero, Santa Fe, New Mexico.
BY CHARLES MONTOYA

OTHER MATTER

EDITOR'S NOTE 3
LETTERS 6
COMMUNITY PAGES 18
HEARD AROUND THE WEST 50

ON THE COVER

Borehole Spring, Mojave Desert, California. A borehole exploration punctured a pressurized aquifer, creating an accidental oasis that attracts migratory birds and supports wildlife. Severe drought now threatens this wetland. *(See story on page 20.)* **Bremner Benedict**

Chyenne Smith rides the hillside above her cattle on a Bureau of Land Management grazing allotment near Salmon, Idaho, this May. Smith uses virtual fencing technology on the rugged public land, where steep terrain makes traditional fencing difficult. (*See story on page 30.*) **Louise Johns / HCN**



High Country News is dedicated to independent journalism, informed debate and discourse in the public interest. We welcome letters through digital media and the post. Send us a letter, find us on social media, or email us at editor@hcn.org

PERSPECTIVE AND PERSEVERANCE

I just finished reading the section of Origin Stories (October 2026) about Grand Staircase-Escalante National Monument by Paul Larmer ("Beauty and the Beast"). It offered some great perspective related to this issue and how it is playing out now. It was difficult to read because the visual quality was not great, but I persevered, and the information I took in was worth the (temporary) toll it took on my eyes. Thanks for the innovative issue and the insights it provided!

Faith Gregor
Denver, Colorado

ALL CRITTERS GREAT AND SMALL

Thank you for this thoughtful and engaging piece ("Room to roost," October 2026)! I agree that we owe urban animals more respect, compassion and empathy, and we should do whatever we can to coexist with them.

Jacqueline Emery
Via social

We owe urban animals so much. Plant more trees, more native plants for food and shelter, stop poisoning everything, reduce the noise, dim the lights, offer clean water, space and habitat!

Stacy Alaimo
Via social

THE PUBLIC-LANDS SHUFFLE

This is happening on many U.S. Forest Service-owned properties ("The Forest Service is poised to hand off one of the West's most visited landscapes," Sept. 29, 2026). The Mount Blue Sky Scenic Byway in Colorado is also being handed over to another local government entity. Funding for a lot of federal programs is being pulled, and other government entities are picking up the slack to keep public places running and open to public.

Coleman B. Loughery
Via social

It doesn't have me ringing the alarm bell. But it has made me wonder how other states would handle this — like Utah and Sen. Mike Lee, R, who loves to sell off public lands — and what it means for public lands.

Kat Zale
Via social

The current MAGA/Project 2025 movement against public lands is basically operating a policy-making laboratory to figure out how to undermine current public-lands protections with an end goal of either privatizing land or making it available for leased/licensed uses that would spoil it. It would be the first step in a laundering scheme, where this management arrangement is approved and then the county in question could take additional actions that wouldn't be as high-profile as if a federal agency did them. The drivers of these plans could also disavow any responsibility or knowledge, just like a business scheme with shell companies. The only saving grace here is that Pitkin County, Colorado, is likely to do things in a sane and productive manner, but if they export this to, say, Utah's Bears Ears National Monument or a not-so-popular public lands unit in Nevada, then the outcomes could become scary for conservation and normal recreation.

Kyle Alcorn
Via social

A DEPARTMENT'S DOWNFALL

Thank you for your stellar reporting ("How the Interior secretary has let down public lands and the nation," Sept. 24, 2026), which is often very sad news for us who care about our environment — sad but critically necessary!

Please keep up your wonderful dedication.

Peter Slattery
Salinas, California

I appreciate the exposé on Interior Secretary Doug Burgum highlighting the complete damage he's doing to the country's most precious resources, our national parks and open lands. Where is Burgum's integrity and conscience? Is this all feeding an ego?

Michael Inserra
Rancho Mirage, California

HOPE FOR THE FLOWERS

We loved that *HCN*'s August 2026 Conversations issue opened with Kylie Mohr's story "When wildflowers speak" on the secret dialogues happening underfoot between soil fungi and plants.

It is possible that desert-adapted plants like sagebrush will move upslope in a warming world and come to dominate Colorado's wildflower-rich montane meadows. But, as two of the three scientists who designed the study at the Rocky Mountain Biological Laboratory in the first place, we are not convinced that experimental heating caused sagebrush to take over the warmed plots.

The recent claim of "accelerated" sagebrush increase at the end of the 29-year experiment is based on a single final snapshot of a small area of each plot that shows approximately the same proportional difference among treatments as existed in 1990, before heaters were activated.

If change is happening, it is slow indeed. Do not yet despair for the wildflowers, fellow *HCN* readers!

Mary Price and Nick Waser
Gunnison, Colorado, and Tucson, Arizona

"The drivers of these plans could also disavow any responsibility or knowledge, just like a business scheme with shell companies."



Campaign volunteers and supporters participate in canvass training for Measure 20-388 at Washburne Park in Eugene, Oregon, this September.

REPORTAGE

Funding a greener Eugene

A ballot measure in the Oregon city could provide millions of dollars for climate-resilience projects.

BY AMAL AHMED | PHOTOS BY TODD COOPER

ON A MUGGY JULY DAY, volunteers marched the half mile from Eugene, Oregon's Sierra Club office to City Hall, chanting, "Climate change is here to stay, and billionaires have got to pay!"

The five bankers' boxes worth of signatures they carried — some 14,000 — aimed to put the Eugene Clean Energy Fund on the November ballot. If passed, the measure could provide millions of dollars in funding for climate-resilience projects.

Large corporate retailers would pay the city a 2% tax via a mandatory retail license. (Oregon lacks a statewide retail sales tax.) The tax would affect companies that reap more than $1 billion in gross profit nationally and $500,000 locally — big-box stores like Walmart and Target, e-commerce giants like Amazon and banks like Chase and Wells Fargo.

Most voters thought the idea was a no-brainer, said one volunteer signature-collector.

"In a country that has seen its first trillionaire, it is far past time to make ultra-wealthy corporations pay their fair share, so that our communities can become more livable and resilient," Aya Cockram, the campaign's co-leader and an organizer with Breach Collective, told the crowd outside City Hall.

THE EUGENE CLEAN Energy Fund is modeled after a similar measure in Portland that passed in 2018. Portland's 1% tax on large retailers has raised more than $1 billion to retrofit homes, plant trees and develop community solar, among other projects. The city estimates that the latest slate of projects, approved in 2025, will cut some 76,000 metric tons of greenhouse gas emissions, improve air quality, lower energy bills and enhance green spaces.



"Ballot measures like this are a love letter to the community — folks saying, 'If no one else will do this for us, we're going to do it for us.'"

Joel Iboa, executive director of the Oregon Just Transition Alliance, which co-led the campaign, speaks to supporters (*above*). A view of the city of Eugene from the top of Skinner Butte (*opposite*).

Advocates hope the funding will enable Eugene to meet its 2016 goal of cutting the community's emissions by 7.6% annually. The most recent data shows only a 10% total drop from 2014 to 2021, according to city spokesperson Marion Suitor.

The city's sustainability office planned to hire a third full-time staffer in 2026, but the position was eliminated in budget cuts. With rising inflation and the loss of state and federal funding, the city's financial analyst said Eugene needs to cut $5 million a year from its budget to avoid a financial crisis.

"Any of these (climate) programs that we're talking about, you can assume are not funded, or underfunded to the extreme right now," said Dylan Plummer, a campaign adviser with the Oregon Sierra Club.

AS PROPOSED, 10% of the measure's funds would go to green infrastructure and up to 30% to clean energy-related job training and apprenticeships. Several local labor unions have endorsed the measure.

Joel Iboa, executive director of the Oregon Just Transition Alliance, which co-led the campaign, cited an Amazon distribution center that just received city approval. The facility's delivery trucks will likely increase carbon emissions in the city, and while Amazon says it's committed to hiring locals, most of its revenue won't recirculate locally. "This is money that real people have helped make, and what we are doing is getting a small portion of that back and reinvesting it in the communities that have made that wealth possible," Iboa said.

The largest portion of the fund's revenue, up to 60%, would go to renewable energy and efficiency programs, and half of that must benefit under-resourced communities. Emily Matlock, communications director for the local environmental justice organization Beyond Toxics, said that the fund could expand the group's work on Eugene's west side, where industrial pollution and low-income housing are concentrated.

In West Eugene, diesel fumes and industrial pollution waft over the neighborhood. Since houses here are generally older and poorly insulated, indoor air quality becomes unhealthy. These homes also require more energy to heat and cool, especially in climate extremes. The fund could help Beyond Toxics provide air purifiers and air conditioners to more residents who can't afford them.

In Trainsong, a neighborhood surrounded by railroad tracks and industry, the soil beneath the park contains toxic chemicals. Matlock said planned remediation efforts could inadvertently send toxins blowing into homes. The fund could help homeowners replace old insulation and windows and install energy-efficient heat pumps that filter air as they heat or cool it, thereby preventing a decades-long legacy of pollution from becoming further entrenched.

Advocates say the fund could also pay for pilot projects like a resilience hub offering residents respite and resources during extreme weather, or even small-scale solar power generation.

Five percent of the fund would be reserved for future innovation. "The sky is really the limit, and there is an opportunity for us to be on the cutting edge of the transition to green energy, and ensuring that it's done in a way that supports our front-line communities," Plummer said.

EUGENE'S CAMPAIGN IS modeled after Portland's, but organizers are wary of recent challenges there. Portland's tax was estimated to bring in from $30 million to $60 million a year. Instead, it brought in closer to $200 million a year — more than $1 billion cumulatively. Eventually, some began clamoring for what they saw as free money.

In August, a contentious ballot initiative designed to reroute 25% of Portland's Clean Energy Fund to the police department narrowly failed to gather enough signatures to qualify for November. The measure, backed by the Portland Police Association, would have given millions of dollars to the department, no strings attached. The campaign did not respond to a request for comment.

"This doesn't have anything to do with climate change, and they're not even pretending it does," said Cherice Bock, climate policy director at 350 PDX, which helped pass the Portland fund.

Meanwhile, Tom Dundon, the new, Dallas-based billionaire owner of the Portland Trailblazers, the city's NBA team, has suggested he'll keep the franchise in town if the city pays to renovate its arena. Mayor Keith Wilson appears willing to use clean energy fund dollars for the project. "We'll renovate green, cut carbon, and do it the Portland way," he said in a July press release. In mid-August, the City Council committed $120 million for the arena, from "sources yet to be confirmed."

Since the Moda Center is already LEED-certified, Bock sees no climate benefit from city-funded renovations.

She added that the perception that there is a surplus of clean energy funds to pass around simply isn't true. Yes, the fund is worth $1 billion, but a 2023 analysis by the city of Portland found that fully funding all the projects in the city's climate plan would cost $50 billion.

EUGENE'S CLEAN ENERGY Fund officially qualified for the ballot on Aug. 5. By then, heat waves had given way to the state's worst wildfire season on record. Smoke and smog filled the skies as residents experienced their second day of dangerous levels of particulate matter and ozone, with a local air quality index of 187.

More than 2 million acres of Oregon burned in fires exacerbated by extreme climate-driven drought and federal funding cuts to everything from Forest Service budgets to emergency firefighting assistance.

In light of this, the ballot initiative has provided a rare bright spot, Iboa said. "Ballot measures like this are a love letter to the community — folks saying, 'If no one else will do this for us, *we're* going to do it for us.'"

Amal Ahmed is a freelance journalist based in southwest Washington. She previously covered environmental and climate policy from Texas. LinkedIn: @amalahmed



REPORTAGE

The snow fence is a Wyoming icon

The hubris and ingenuity behind a life-saving structure.

BY CHRISTOPHER SOLOMON

THE MODERN SNOW FENCE STANDS like a piece of High Plains art on the lonesome, snow-swept landscapes of the West. Motorists zooming past rarely give the slatted contraption much thought. The story behind it, though, is a surprising tale of hubris and ingenuity along a stretch of Wyoming highway so dangerous that it became the world's foremost testing ground for wrangling blowing snow.

In 1944, the federal Public Roads Administration approved a national system of interstate highways. In southeast Wyoming, officials decided to build a 77-mile stretch of Interstate 80 closer to the Medicine Bow Mountains than the existing state road. Doing so would shave off 19 miles. Locals warned against it: The proposed highway would sit almost entirely above 7,000 feet of elevation — the highest stretch on the entire transcontinental highway — and was subjected to more wind and nearly twice as much snow as the alternative.

During the post-war years, "American engineers really thought that they were starting to be able to kind of control the environment, to a degree," said John R. Waggener, author of *Snow Chi Minh Trail: The History of Interstate 80 between Laramie and Walcott Junction*. For decades, a rumor festered among conservatives that Lady Bird Johnson, a highway beautification proponent and wife of Democratic President Lyndon B. Johnson, had insisted on the prettier but less-safe route. (She did not.)

On Oct. 3, 1970, the new stretch opened, with a ribbon-cutting, a high school band and the bold promise that "We'll Keep It Open All the Time!"

Just four days later, a snowstorm caused at least five crashes and closed a portion of the highway. More storms followed. That first winter saw 151 crashes and 208 hours of closures, writes Waggener, a University of Wyoming archivist and historian. Someone dubbed the highway the "Snow Chi Minh Trail" in a nod to Vietnam's deadly Ho Chi Minh Trail, which had become part of the American zeitgeist as the controversial war dragged on. The nickname took off, inspiring wry postcards. TV journalist Charles Kuralt, who roamed the country in a Clark Cortez Motorhome for his popular CBS Evening News segment, "On the Road," dedicated a 1972 story to the highway, calling it "the worst stretch of interstate in the nation." During filming, Kuralt's team had to rush an accident victim to the hospital.

When scientists from the University of Wyoming examined why the area was so treacherous, they concluded, according to Waggener: "Interstate 80 was paved smack-dab in the middle of a wind-tunnel."

In southern Wyoming, Interstate 80 passes through a high, wind-scooped basin, edged by tall peaks — the lowest spot on the Continental Divide. (There's a reason the Transcontinental Railroad and the Oregon Trail passed through here.) Air pours west to east through the Rockies, seeking lower pressure, and the path of I-80 is the easiest route, like the spout on a pitcher.

Winds here regularly blow 30 mph, sometimes reaching 100 mph and knocking over semi-trucks, Waggener writes. Early tests of energy-producing wind turbines were performed here. Today, hundreds of turbines dot the landscape.

That consistently strong wind moves a lot of snow. Winter storms here have filled entire highway underpasses. After one storm, the highway department had to use bulldozers to clear away dozens of 16-foot drifts.

Clearly, a solution was needed. But what?

Snow fences aren't new; they probably originated in Northern Europe centuries ago. But the advent of railroads and then automobiles brought new need for them — particularly in Wyoming, where the highway department used as many as seven varieties to keep the snow at bay, Waggener writes.

In 1970, the Wyoming Highway Commission brought in Ronald Tabler, a Forest Service research scientist, to build a better snow trap. Tabler loved bad weather. "The worse the better," recalled Kathy Ahlenius, whom Tabler trained and who today works as winter research coordinator for the Wyoming Department of Transportation. "He had a highway department radio in his personal vehicle so he could go out on closed roads." More than one snowplow driver told Waggener they would find a vehicle on the side of the road during a blizzard, pull over to help the stranded motorist, and instead find Tabler taking measurements.

A modern snow fence is really a wind fence, explained Ahlenius. "The function of the snow fence is to slow the wind down to allow the particles to drop out, and hopefully those particles will freeze together on contact" into a snowdrift behind the fence, she explained.

Tabler and colleagues brought groundbreaking scientific rigor and experimentation to studying how wind transports particles. The lessons they learned are still used by engineers today. Tabler calculated that doubling the wind's speed increases its ability to transport snow by *14 times*. So in theory, cutting wind speed by half reduces snow transport by *94%*. These calculations illuminated the complex aerodynamics involved. Bob Jairell, Tabler's longtime colleague, called him "an absolute genius," according to Waggener.

The signature design that Tabler developed — the Wyoming Snow Fence — stood 12 to 14 feet tall, tilted at a 15-degree angle downwind. It featured wooden slats, spaced evenly apart, giving the entire fence 50% porosity, which their testing showed was ideal. One small but key improvement: There was a gap between the ground and the first slat of 10%-15% of the fence's height. The gap discouraged snow from building up in front of the fence and reducing its efficacy.

Crews installed the new fences on the highway's most problematic areas. The fences were incredibly good at collecting snow and keeping it from blowing onto the roadway. Tabler measured the drift behind one of his fences at 35 feet deep.



A snowdrift meets a snow fence near Cheyenne, Wyoming. Tabler's testing found that this once-common fence design was not as effective as his later version, which has been widely adopted. **Leonard P. Tebbs / Wyoming State Archives**

In the decades that followed, Tabler refined his designs and learned how to place fences for optimal effectiveness. A highway department official dubbed Tabler "the Blizzard Wizard"; Jairell was "the Snowman."

In a 2006 report, Tabler and his co-author noted a 75% reduction in crashes on areas of I-80 protected by fences. Based on the 1.9 million vehicle trips taken during winter 2003-2004, he estimated that the fences prevented 275 crashes, 124 injuries and more than three deaths annually. Road closures had been reduced by about eight days per year, he said.

The highway wasn't perfect — the wind still howled, ice still formed, the road still occasionally closed. But it was much safer.

Tabler became the world's preeminent snow-fence engineer. His work appears on the approach to Denver International Airport, on the oil fields of Prudhoe Bay, Alaska, in Siberia and elsewhere. The company he founded also worked on projects to control blowing sand and dust. Tabler died in 2010.

Most snow fences in Wyoming now are built vertically, a tweak on Tabler's angled design. They're more expensive to build but cheaper to maintain because Wyoming's constant wind doesn't rock them from their moorings, Ahlenius said.

Today, Wyoming has more than 450 miles of snow fence, Ahlenius said, some of it the Wyoming Snow Fence and some "living fence," where shrubbery or trees are planted in an arrangement to knock down blowing snow. Some 50 miles of snow fencing, more than 10% of the state's total, is along the so-called Snow Chi Minh Trail. It's likely the greatest concentration of snow fences in the world.

"The snow fence *is* Wyoming," Waggener said — a humble device that has kept the state open to the world.

Chris Solomon is a freelance journalist based in north-central Washington. His work has appeared in The New York Times, Scientific American *and* National Geographic. *Threads: @chrisasolomon*

Dryout in the Grand Canyon

The impacts will reverberate through recreation, river ecology and local tribes.

BY HEATHER HANSMAN

FLOODWATERS IN THE GRAND CANYON during this summer's monsoon season wiped out bridges, buildings and three human lives, eroding beaches and building new rapids in the process. A warming climate means the canyon's majestic, highly managed river will likely see more intense seasonal floods. But even more often, it will have too little water.

The Grand Canyon is bookended by two dams that hold back the biggest reservoirs in the United States, providing water for up to 40 million people in the Southwestern U.S. These reservoirs — Lake Powell and Lake Mead — have been declining for decades thanks to shrinking snowpacks and the rising temperatures tied to climate change. Today, the combined water stored in the two reservoirs has shrunk to a level not seen since the 1950s, when Mead was the only reservoir and it was only half full, according to Jack Schmidt, senior research scientist at Utah State University's Center for Colorado River Studies.

Inflows into Lake Powell for 2026 are predicted to be 37% of the historical average. According to a Bureau of Reclamation study released in September, the reservoir could drop below 3,490 feet — the minimum elevation necessary to create hydropower — as early as September 2027, which would also threaten the structural integrity of Glen Canyon Dam.

The 11 tribes who call the canyon home are well aware of the changes: "Tribal relationship is a millennium longer than any scientist has been studying the Grand Canyon," said Kurt Dongoske, the Zuni tribal historic preservation officer, who is non-Native.

Dongoske, who has attended decades of Reclamation meetings, said that historically, tribal perspectives about the need for consistent ecosystem management have been ignored, and he expects that the agency will pay even less attention to them as the water levels drop.

ONE OF THE CLEAREST IMPACTS of low flows is sediment loss. Sediment provides the canyon's structural and ecological foundation, creating sandbars for fish habitat and beaches for rafters. But Glen Canyon Dam blocks more than 90% of the sediment that previously flowed through the canyon. Without sediment, vegetation can't grow, which destabilizes the banks and limits forage and habitat for wildlife and insects crucial to the food web.

Sediment also protects cultural resources, including Indigenous masonry dwellings, seasonal campsites and petroglyphs and pictographs. According to a 2023 report by the U.S. Geological Survey, windblown sand dunes prevent water-based erosion around the Grand Canyon's sensitive archaeological sites; nearly 400 of them are currently at risk as sediment levels drop.

To counter this, since the mid-1990s, Reclamation has intermittently released a big pulse of water, known as a "high flow experiment," to carry sediment from upstream into the canyon. But Reclamation neglected to do this in 2025 due to the government shutdown, and in 2026 it was deemed to be politically unpopular since water levels were so low.

Losing those high flows means losing the ability to move sediment in the canyon, said Jen Pelz, water advocacy director at the Grand Canyon Trust. "I see that as one of the most significant impacts to the Grand Canyon."

WHEN THE RESERVOIR LEVEL DROPS, less water comes through the canyon and that water is warmer, because it comes from the sun-heated top layer of Lake Powell. River temperatures have historically hovered between 44 and 50 degrees Fahrenheit. In recent years, when temperatures in the river exceeded 60 degrees for three days in a row, Reclamation released what it calls "cool mix flows," pulling colder water from deeper in the lake. But now, with the lower water levels, the agency has less flexibility in how and when it does releases.

As of Oct. 4, a U.S. Geological Survey gauge at Mile 15 of the Colorado River measured 68 degrees Fahrenheit; it had exceeded the threshold to trigger a cool-mix flow for 111 consecutive days.

Warmer water causes algae blooms, which don't occur if the water is rich with sediment. And because trout can't handle the heat, the blue-ribbon fishery suffers, as does the $1 billion recreation industry. Smallmouth bass — non-native fish that are pulled down into the canyon through the dam's turbines as water levels drop — thrive in the warmer waters and feed on the young of threatened native fish like humpback chub.

Some 85% of the humpback chub in the U.S. live in the Grand Canyon, thanks to a decades-long recovery program that rescued them from endangered status in 2021. But the native fish recovery program relies on revenue from power generation at Glen Canyon Dam, and when power generation drops, so does funding available for the fish.

RECREATION, TOO, IS deeply entangled in the river flows and the ecosystem's health, said Ben Reeder, a longtime guide for Colorado River and Trail Expeditions. Each year, approximately 20,000 people take commercial river trips through the canyon, ranging from three-day motorboat trips to 18-day oar-powered raft trips.

Reeder, who runs 37-foot-long motorboats through the canyon, said that as river levels drop it becomes harder to get through rocky technical rapids like Hance and Horn Creek. Guides have had to adjust their routes, timing and scouting; Reeder even brings a slingshot to launch a rope to shore if his boat gets stuck.

"The Grand Canyon is a living, breathing thing," said Reeder, adding that he learned this perspective from the Indigenous elders he has been privileged to know. "When you spend a lot of time down there, you start to understand it." Reeder, who is also the Grand Canyon River Guides representative to the Bureau of Reclamation's Technical Work Group, said he's worried about what will happen as the river drops lower, possibly

preventing bigger motorized boats from getting through at all.

"The history of Grand Canyon boatmen has always been this resiliency. I'm confident we'll have solutions, but I'm not confident that I'm necessarily going to be able to guide and run boats there the way I am now," he said. "We will have to adapt."

To forestall the loss of hydroelectric power and damage to the dam from low lake levels, Reclamation is reducing how much water it releases from Lake Powell. The agency anticipates releasing 388,000 acre-feet in November, compared to the approximately 500,000 acre-feet it released during the three previous Novembers. Such low flows limit the options for steady-state releases called "bug flows," which Pelz said aim to keep fluctuations at a minimum, thereby giving insects like midges, mayflies and others the chance to hatch and support the food web, including bird populations farther downriver.

Dongoske said it's important to think about the ripple effects outside the river corridor, too. "Whatever happens in the Grand Canyon will have impacts on the community of Zuni," he said.

On a grand scale, Pelz said, low water levels create a feeling of scarcity that inhibits creativity and flexibility. This year's flash floods add to the uncertainty. "We really need to rethink how we're going to manage the river or how the infrastructure is going to work," she said.

Heather Hansman is a Colorado-based freelancer who covers water, recreation, land use and more. She's the bestselling author of Fierce Country, Powder Days *and* Downriver. *Instagram: @hhansman*

This story was produced by High Country News *in partnership with The Water Desk, an independent reporting initiative at the University of Colorado Boulder's Center for Environmental Journalism.*

"The Grand Canyon is a living, breathing thing. When you spend a lot of time down there you start to understand it."



A person stands at an overlook near the Wahweap Marina on Lake Powell at the Glen Canyon National Recreation Area on July 14, 2026, near Page, Arizona.
John Locher / AP Photo



REPORTAGE

What California owes for Native land

In 1972, the state told Native families it would pay them 47 cents an acre.

BY ALLISON HERRERA

THE DAY AFTER CALIFORNIA was admitted to the Union in September 1850, John C. Frémont, a U.S. senator who had settled in California from Savannah, Georgia, submitted 10 bills to the U.S. Senate seeking to transfer millions of acres of Indian Land to the newly admitted state.

One of the bills that passed sought to dispossess California Indians by "providing for the extinction of their territorial claims in the gold mining districts."

According to research done by historian Benjamin Madley, who wrote the award-winning book *An American Genocide: The United States and the California Indian Catastrophe*, the bill opened the door to an all-out assault on California Indians. California Indians held title to these lands under the laws of Spain, the first country to colonize California. Frémont told his fellow senators, "The Spanish law clearly and absolutely secured to Indians fixed rights of property in the lands they occupy, beyond what is admitted by this Government in its relations with its own domestic tribes." Nonetheless, the Senate agreed and passed the bill to divest California Indians of their land.

"Frémont was effectively acknowledging Native title, and that Native title had not been sundered under Spain or under Russia or under Mexico in their colonial regimes in California," Madley told *High Country News* in an interview. At the time, he added, "legislators under U.S. rule were aware of this, and they are profoundly concerned about its legal ramifications."

The solution was treaty-making.

Between 1851 and 1852, 119 representatives from tribes across California signed 18 treaties. They were promised 19 reservations, totaling about 7,488,000 acres, or 7.5% of California. But the U.S. Senate failed to ratify these treaties, so Congress provided only seven temporary military reservations totaling no more than 125,000 acres, with none of them larger than 25,000 acres. By the late 1860s, all but two of those reservations were abandoned.

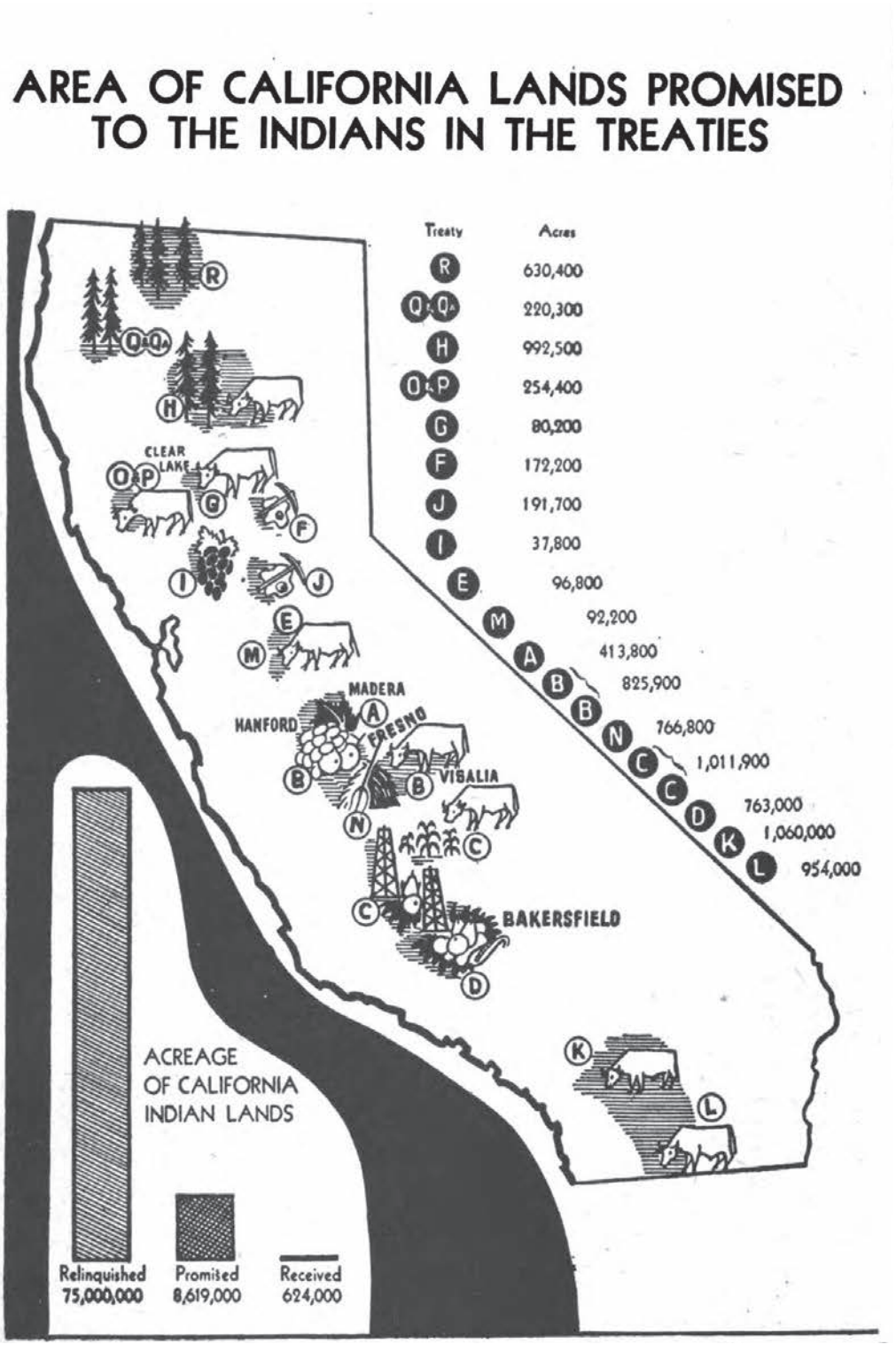
Nearly 80 years later, Congress passed the California Indians Jurisdictional Act, which authorized California's attorney general to sue the federal government in the U.S. Court of Claims on behalf of California Indian people to seek compensation for this land. Notably, it did not allow them to control the litigation or select their own attorneys.

Earl Warren, who later served as chief justice of the Supreme Court and delivered the majority opinion in *Brown v. The Board of Education*, argued on behalf of California Indian people in 1941 and 1942. The initial settlement in 1953 reportedly paid $150 each to roughly 33,000 individuals. The land was radically undervalued, and legal fees and offsets were deducted — expenses that the state of California said it had incurred to "care for the Indians." Related legislation called the Indian Claims Commission Act of 1946 allowed tribal nations in California and across the country to argue against the United States for land that was taken. However, the commission couldn't return land, merely award money based on the land's market value *when* it was taken.

IN A COURT CASE THAT DRAGGED on for nearly 30 years, California Indian families received payments between $600 and $700 dollars.

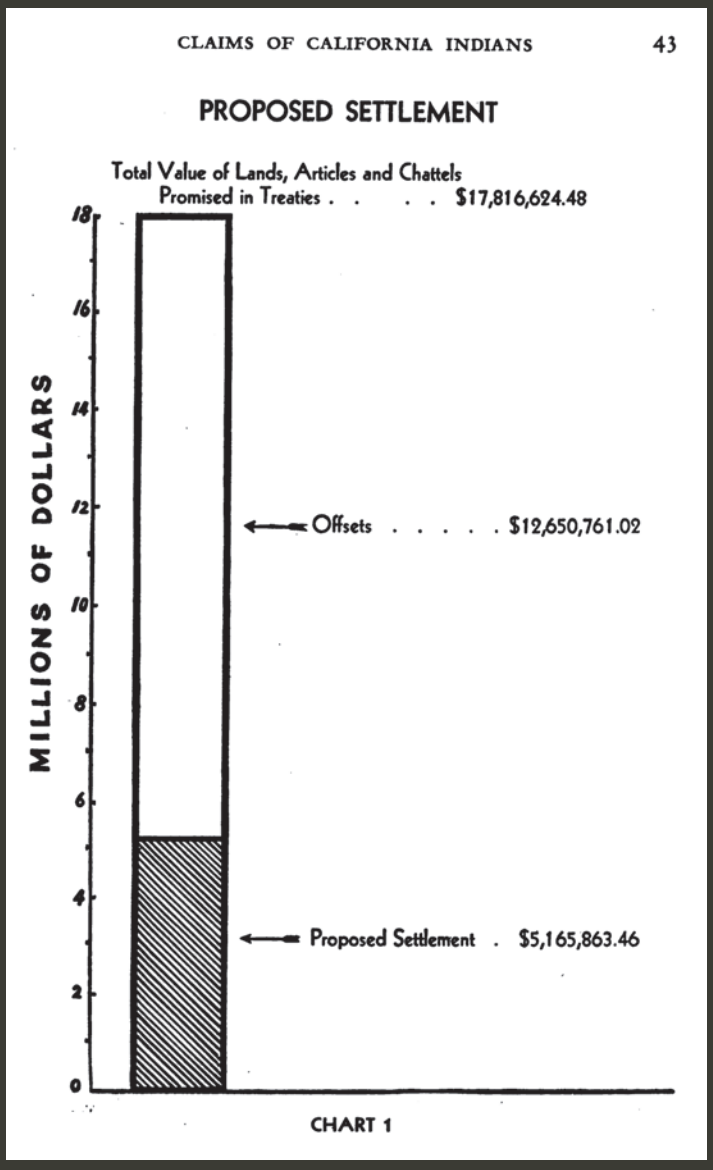
My family was one of them.

My grandmother, Anna Herrera (née Forsting), was born in 1921, a Salinan Indian, three years before the United States recognized Indigenous people as citizens on their own land. As a girl, she remembered her mother, grandmother, great-grandmother, aunts and uncles living in a place called Toro Creek, a village tucked between what is now Atascadero and Morro Bay, on the central California coast — oak country, with a view of the mountains. She was still a teenager when



Above, a page from a 1944 report "seeking justice" for California tribes by California Attorney General Robert W. Kenny, "History and proposed settlement, claims of California Indians." **University of California**

Opposite image from left: Anna Forsting Herrera, the author's grandmother, Maria Severiana Bylon, the author's great-great-grandmother, and Felista Forsting, the author's great-grandmother, in 1934 at Toro Creek on the central California coast. **C. Hart Merriam Collection of Native American Photographs / The Bancroft Library / U.C. Berkeley Library**



A chart from the 1944 report by California Attorney General Robert W. Kenny shows the settlement's offsets. **University of California**

SOME OF WHAT WAS TAKEN OUT OF THE SETTLEMENT:

The federal government subtracted payment for lands and improvements thereon:

$294,448.94

Purchase, irrigation, etc., of lands:

$157,808.43

Removal and settlement of Indians:

$95,939.72

Subsistence:

$1,200,249.62

Surveying Indian reservations:

$6,202.75

Construction of a bridge over the San Luis Rey River, Pala Reservation:

$4,615.00

Selecting site for Mendocino Reservation:

$2,458.24

the Marre Land and Cattle Company waged a yearslong campaign to evict them.

After my grandmother died, I found a letter among her things. It was addressed to "ALL CALIFORNIA INDIANS" and dated September 1972.

A group called California Indians for a Fair Settlement had invited my grandmother to a meeting to discuss the check the federal government was about to send her. The U.S. had agreed to pay California Indians $29.1 million for the land taken in 1853. Divided across the acreage, that came to 47 cents an acre. The letter reminded her that some of that land had gold and was valued at $20 an acre, while the timber and minerals were worth more still. "What do you think California Indian land is worth?" it asked.

I don't know if my grandmother went to that meeting. She never talked about the letter, or the settlement, or the village her family was forced from.

To understand how California Indian land ends up worth less than the price of a stamp, you have to go back to treaties very few Californians grew up learning about.

Nearly a century ago, the Indigenous LandBack movement (recently gaining more attention as #LandBack) in California was born.

By allowing California Indian families the right to sue for land lost after the 18 unratified treaties, state leaders acknowledged the harm done. This was their chance to make things right.

IN MARCH 2026, A GLOWING press release from the California Natural Resources Agency celebrated a policy that aimed to bring 7.5 million acres back under the care of tribal nations.

The announcement declares that the "state's first-ever Tribal Stewardship Policy establishes statewide framework for tribal access, collaboration, and ancestral land return."

The California Natural Resources Agency says the acreage is representative of what the U.S. promised for reservations for California Indians under the 18 unratified treaties.

Over the last two years, more than 7.5 million acres have been part of California's LandBack pledge. The Yurok Tribe in Northern California, the Washoe Tribe and the Southern Sierra Miwuk reclaimed land bordering on

Yosemite National Park, one of the nation's biggest outdoor attractions. The land was previously held by the Pacific Forest Trust nonprofit and not part of the national park.

The Yurok, the Washoe and the Klamath have stories of land return that are part of the growing #LandBack movement in Indian Country. Nearly a century ago in California, however, Native people filed a lawsuit to either have the land returned or be compensated fairly.

Neither of those things happened.

The California Indians Jurisdictional Act, passed in 1928, allowed lawsuits on behalf of "the Indians of California" — defined as everyone who could trace descent from someone living in the state on June 1, 1852 — seeking land they would have received under the 18 treaties.

The case became known by its docket number, K-344, a lawsuit that happened after the congressional act became law.

In 1937, a Government Accounting Office report detailed every dollar the state had ever spent "for the benefit of" California Indians between 1852 and 1932, including money for schools, hospitals and surveying reservations that were never created. California wanted that amount subtracted from any monetary compensation the federal government paid for land claims.

These "offsets" included everything from prosecution of kidnappers to Indian Commissioners' pay to the cost of enrolling every California Indian on a 1928 list for compensation. California had a documented Indian child-kidnapping/indenture trade in the 1850s and '60s, and this line item is the federal government's own ledger entry for pursuing it. The proposed settlement was $17,816,624.48. The offsets to be deducted were $12,650,761.02, leaving the total settlement amount to be awarded $5,165,863.46.

Almost as an aside, the report notes that it did not count the money the U.S. reimbursed California for "suppressing and repelling Indian hostilities" — reimbursements, in other words, for the state militias that had been paid to hunt Native people. (That was a different ledger.)

By the time the case reached final hearings in San Francisco in 1955, it had become a fight over how to measure a people's relationship to land. The government's expert witnesses employed the so-called "ecological theory" — an argument that a tribe's true territory could be calculated mathematically by mapping which ground supplied most of its food and treating the rest as secondary, less deserving of compensation. Some government witnesses put the figure at 90% of subsistence, derived from just 5% to 20% of a tribe's claimed land. This argument reduced the amount of land California Indians owned, thereby shrinking the payout.

When asked how much land Indigenous people in California owned, Kroeber replied, "All of it."

Anthropologists Alfred Kroeber and Robert Heizer picked that argument apart. When asked how much land Indigenous people in California owned, Kroeber replied, "All of it." The three commissioners agreed, unanimously, rejecting the ecological theory in 1959. It would be another 13 years, in 1972, before letters like my grandmother's went out to households across the state, asking people to decide whether 47 cents an acre was an acceptable amount.

IN THE 1960s, THE WASHINGTON D.C.-based Wilkinson, Cragun and Barker Law Firm held meetings throughout California to convince tribal leaders and tribal citizens to accept the settlement money, or else risk of further litigation and a shrinking payout.

Most California Indians did end up accepting it, but not without numerous complaints over why it was so low.

In one meeting held in Eureka in 1964, Michael Rogers, from Witchback Hoopa Valley Reservation, an authorized representative of the Klamath River, contested the amount.

"The real issue today is that these attorneys are here to ask you to sell the rest of the state of California for 47 cents. Now they state that 47 cents comes from the price of 1853," he said. "Well, in 1853, if land was selling for 47 cents an acre, at that time gold was only worth $16 an ounce. Today, the price of gold is $35, and that 47 cents would be equal to $1 and a quarter, which Congress said that the Indians could sue for would be the limit."

Eventually, the settlement stood and the California Indians' lawyers convinced them to accept the offer. My grandmother, like tens of thousands of others, received her share — approximately $688. Her mother, Felista Forsting, her grandmother Maria Severiana Bailon, her uncles Jose Bailon and Ramon Roses, who were all part of the 1928 lawsuit and had their names on the judgement rolls, passed away and never received a penny.

Half a century later, the state has swapped the language of settlement for the language of stewardship. But the transaction still runs in one direction: California decides what to give back, when, and to whom — the same government that decided, in 1852, what to take. Some estimate Indigenous people lost more than 75 million acres in California.

But no initiatives, apologies or stewardship will fully compensate mine or other families for what was lost.

Allison Herrera is an award-winning freelance Indigenous Affairs reporter and a John S. Knight Journalism alumni. She is Xolon Salinan from California, a proud mother of Anna and lover of every rock, shoreline and mountain of her tribal homeland.

This article was supported with funding from Northwestern Medill Data-Driven Reporting Project.

A fall gathering in the Rockies

IN SEPTEMBER, members of the *HCN* staff and board gathered in Estes Park, Colorado, to reconnect and reset after another year of hard work. The aspen leaves were going gold on the hillsides, elk lumbered about the grounds, and there was even a dusting of snow up high one morning.

The gathering started with the board's fall business meeting, where we heard from the management team about our 2027 budget. We're projecting a spending increase from roughly $4.3 million this year to a little over $4.4 million next. The most significant bumps will come in payroll, taxes and benefits, which make up 58% of our expenses for the year, and the budget for freelance writers and photographers, which constitutes another 14% of our annual spending. We'll pay for all of this with a combination of donations, grants and "earned revenue," including subscriptions and ad sales.

Mia Axon, our acting director of philanthropy, noted that *HCN's* financial strength springs from the generosity of our readers. Thousands of you make tax-deductible donations each year in addition to paying for your subscriptions. We recently ran a report that found 750 people who have given to *HCN* regularly for 20 years now. One reader has donated every year for 36 years! This stalwart support is especially important when national foundations are overwhelmed with shoring up public media and the critical human services that have lost public funding in recent years.

Director of Product & Marketing **Gary Love** announced that our circulation grew 3% last year, and he expects it to continue to rise. That's in part because more of you are staying with us. A remarkable 45% of print subscribers have signed up for automatically renewing subscriptions, along with more than 80% of digital subscribers, which means that we don't have to chase you down and ask you to re-up every year. Thank you!

Our new editor-in-chief, **Kate Schimel**, shared that she and Executive Editor **Gretchen King** have been working with their team to refocus our reporting on the things that *HCN* does best. Kate talks about this in the Editor's Note, but the short version is that our journalism will continue to be rooted in the land and our relationship to it, and more tightly focused on serving rural and Indigenous communities, small towns and small cities.







The whole crew in Estes Park, Colorado. *(top) HCN* Acting Director of Philanthropy Mia Axon, Board Secretary Chris Winter and Executive Director & Publisher Greg Hanscom *(left)*; Board Fundraising Chair Jim Spencer and *HCN* Fundraising Communications Specialist Anna Demetriades *(right)*.

The rest of our time together was facilitated by **Daniel Student** with the Potrero Group. We started with an exercise that had everyone share one thing that has changed for the better during their time at *HCN*. It was a great reminder of how far we've come since the days when we put out a magazine every two weeks, wrestled with outdated software, and built our circulation strategy on "direct mail" hawking cheap subscriptions. (Our email newsletters are the primary driver for new subscriptions these days.)

Then we broke into small groups, tackling some of the issues that have been hanging us up, including the challenges of communicating and collaborating in a remote workplace and the curse of too many Zoom meetings. We finished with an exercise that teed up a strategic planning process that we'll embark on in the coming months.

We're grateful to *HCN* board members **Jim Spencer** and **Mike Tansey** for making the gathering possible.

— Greg Hanscom, executive director & publisher

SO LONG, AND THANKS FOR ALL THE BAGELS!

When **Mary Zachman** started as *HCN's* finance and payroll administrator in January 2019, she worked in a tiny cubbyhole in the back of our crowded Paonia, Colorado, office. In the years that followed, the staff dispersed across the West, and Mary's role ballooned. She would eventually set up and file taxes in 15 different states. Last year, she sent out 155 1099s to freelancers and contractors, almost double the number in 2019.

Through all of these changes, Mary has been a calm and steady hand, working quietly behind the scenes to make sure everyone got paid on time, entering literally thousands of accounting transactions and wheedling us to send in our credit card receipts. Now, she's stepping away from *HCN* to care for her family and do more of the things she loves: walking her dogs, tending her garden, and baking gorgeous sourdough bread and bagels. We wish her the very best.





Thank you, readers!

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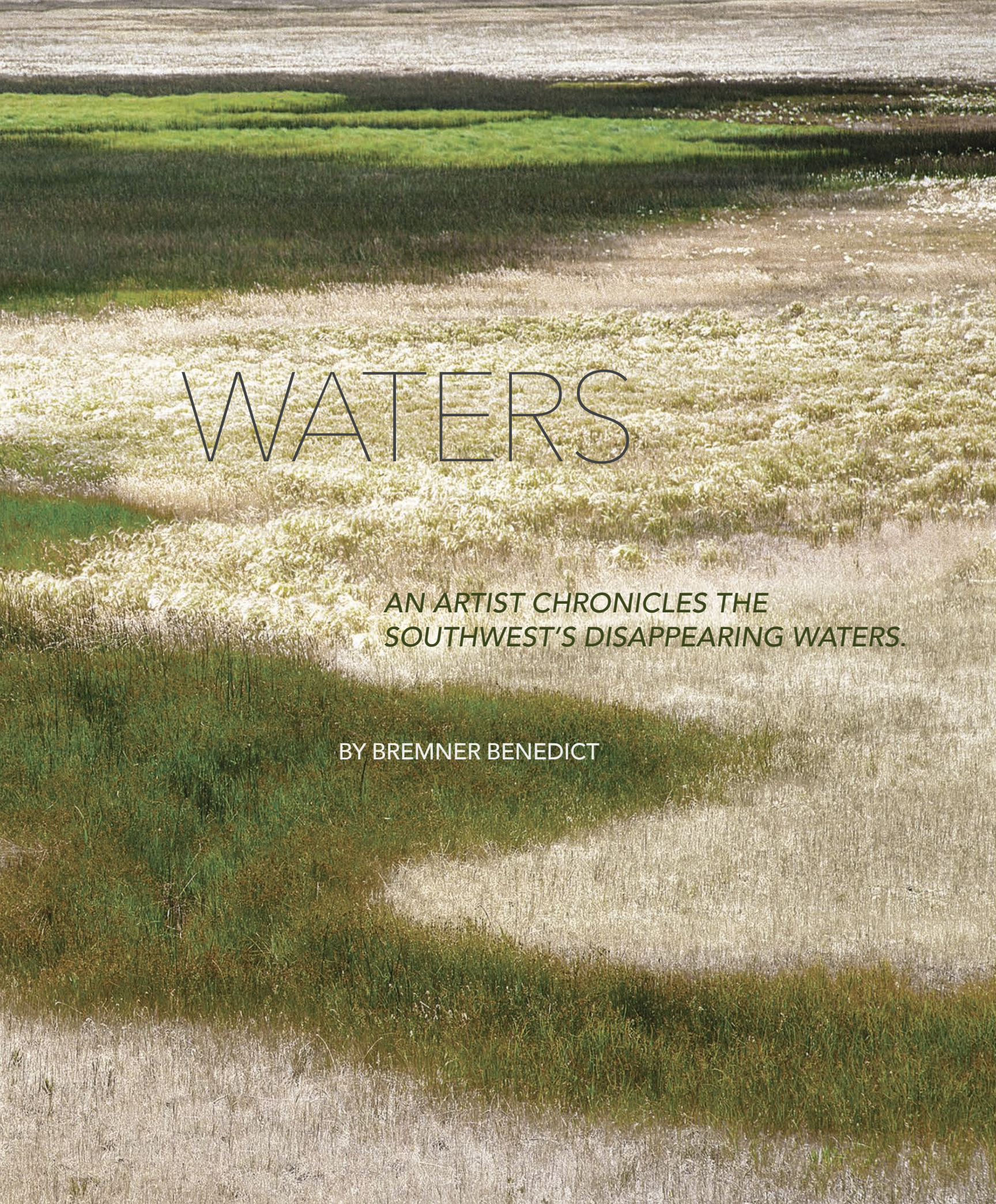
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DAIRY SPRING, COLORADO PLATEAU, ARIZONA.
Mormon pioneers in the late 1870s and 1880s used water from this spring to support a cooperative dairy that produced butter and cheese.

HIDDEN



WATERS

AN ARTIST CHRONICLES THE SOUTHWEST'S DISAPPEARING WATERS.

BY BREMNER BENEDICT







DESERT SPRINGS ARE REMOTE POOLS OF WATER, AN UNEXPECTED AND UNLIKELY SIGHT IN A LANDSCAPE DEFINED BY DRYNESS. FOR MILLENNIA, THEY SUSTAINED LIFE ACROSS THE WESTERN UNITED STATES, GUIDING MIGRATION AND SHAPING WHERE PEOPLE SETTLED.

They are living archives, holding both human and natural history in the same small patch of ground, rare lifelines that sustain biodiversity, cultural history and hydrological systems far out of proportion to their size. Their depletion is often gradual, easy to miss without some memory of what these places once were.

At a Hopi festival in Flagstaff, I spoke with members of the Black Mesa Water Coalition, who described losing the springs their community depends on, and how that loss affects them both physically and culturally.

◄ DYKE HOT SPRINGS, BLACK ROCK DESERT, NEVADA.
Archaeological evidence of Indigenous peoples' use of hot springs goes back 10,000 years. These modern tubs are for cooling the extremely hot water enough for a pleasant soak.

◄◄ ALAMO SPRING, SONORAN DESERT, MEXICO.
A rare freshwater spring emerges from the desert, creating small islands at the edge of the saltwater ocean.

▼ TAPPEN SPRINGS, COLORADO PLATEAU, ARIZONA.
A permanent water source in the arid desert environment, this area has historically served as a critical oasis for Indigenous tribes, local people and historic cattle drives.





▶ LISTON SEEP, COLORADO PLATEAU, UTAH.
Once used to water cattle, this spring was diverted and later abandoned after the animals were moved elsewhere.



▶ MIRROR LAKES, BOTTOMLESS LAKES STATE PARK, CHIHUAHUAN DESERT, NEW MEXICO.
These deep, spring-fed sinkholes shrink slowly. Agricultural overpumping is depleting the region's hidden water table, drying up this ancient desert oasis.



▲ CORN CREEK SPRINGS, MOJAVE DESERT, NEVADA.
Historically and culturally important to Native Americans and later Europeans, the area now lies within the Nevada Test and Training Range.

Their words stayed with me. A few weeks later, a spring ecologist invited me on a survey trip into the arid mountains of northeast Arizona. Standing at a single roadside spring, he ran through the list of species it supported, then added, almost in passing, that since 1880 more than 80% of the region's springs have been ecologically impaired. He estimates that springs support more than 15% of the nation's endangered species. I was awestruck that so much could depend on so small a place.

This project grew through a chain of introductions. A friend of a museum curator in northern Nevada knew someone with a spring on his property, though it took a lot of texting before I found it. A year later, when I was back in the Black Rock Desert, that same landowner, whom I have yet to meet in person, texted me directions to a different spring each day. In return, I sent him images. Finding springs depends as much on strangers, ranchers and landowners as it does on database research.

People often ask if my photographs show the true color of what is there. Not quite: I desaturate the surrounding land slightly while leaving the spring itself a touch brighter, so the eye catches the pull between the parched ground and the water that transforms it. Translating the science of springs into something that can be felt, not just read, matters to me as much as their visual character, in the spirit of the naturalist Alexander von Humboldt's belief that art builds the emotional connection to nature that data alone can't.

At a desert spring, silence can seem ordinary in a place where frogs once called. That's the trouble with a shrinking landscape: Each generation is born into scarcity relative to the last and accepts it as normal, unaware of the loss of past abundance.

"Hidden Waters" acts as a witness to what remains, a memory to hold on to. Some springs will not return to what they were. But the act of making their decline visible refuses to let them slip quietly into absence.

Bremner Benedict, a former Flagstaff, Arizona, resident, has spent nine years photographing desert springs across the West. She is completing Hidden Waters, *a book about disappearing desert springs. Learn more at* **www.bremner-benedict.com**



HANGING GARDEN, COLORADO PLATEAU, ARIZONA.
Groundwater moving laterally through porous rock emerges from the cliffside as a desert seep, sustaining a vibrant colony of mosses, ferns and flowering plants.





▲ WILLOW CREEK, MOJAVE DESERT, CALIFORNIA.
Ancient groundwater takes millennia to travel and refill deep basins. Modern agricultural pumping extracts this water faster than nature can replace it, drying up the springs.



► DEVIL'S INKWELL, BOTTOMLESS LAKES STATE PARK, CHIHUAHUAN DESERT, NEW MEXICO.
An ancient deep-water cenote, or sinkhole, fed by underground springs, attracts scuba divers to the desert.

►► EAST PINTO HOT SPRINGS, BLACK ROCK DESERT, NEVADA.
Indigenous Shoshone and Paiute ancestors used springs in the area for over 6,000 years. Contemporary scientists search these hypersaline, extremely hot waters for new medicinal compounds.



AFTER



Harrison White puts virtual fence collars on cows at his family ranch near Two Dot, Montana. **Rebecca Stumpf / HCN**

THE BARB

The promises and pains of de-wiring the West.

"It watches with argus eyes the inside and outside, up, down, and lengthwise; it prevents the 'ins' from being 'outs'; and the 'outs' from being 'ins'; watches at day-break, at noontide, at sunset and all night long."

— Glidden Barb-Fence Journal, 1885

By **KYLIE MOHR**

Photography by **REBECCA STUMPF** and **LOUISE JOHNS**

DROOL GLINTED IN THE SUN as the cattle in a small enclosure on the McFarland White Ranch tossed their heads and, one by one, funneled into a steel chute designed to hold them still. Metal screeched as the gates opened and closed behind them. Some mooed as Harrison White approached, carrying a thick black polymer collar.

White's multigenerational family ranch lies a dozen miles away from tiny Two Dot, Montana, in the forested foothills where the Crazy Mountains slump into the Musselshell River Valley's rolling plains. On this July morning, its cows were visiting an unusual kind of jewelry studio to be fitted with new, high-tech necklaces — GPS tracking collars that communicate with nearby base station towers. Via satellite, these stations connect to an app where ranchers like White and his sister, Lanie, can see the location of each collared animal. With a few clicks of a mouse, they can draw invisible fences. If a cow gets too close to one, her collar delivers a warning noise, then a shock.

After White buckled on her collar, the cow jumped out of the chute, bucking and swinging her head as she adjusted to its weight. In a few moments, she was nibbling nearby grass.

About 620,000 miles of barbed wire and other fencing crisscrosses the West like lattices on a pie crust of an imprecise baker, dividing land and life. These fences enable people to dictate how public and private lands are grazed and how, or even if, migrating wildlife reaches its final destination. They are sometimes more trouble than they are worth, though. Just ask the ranchers who build and repair them.

"Real fence is bullshit," Lanie White said as she programmed the collars stacked in the bed of a nearby ATV. "It's expensive, it's damaging, and it fragments ecosystems."



"REAL FENCE IS BULLSHIT."

The use of virtual fencing has expanded dramatically on Western land since 2021, when the technology became commercially available. More and more ranchers are using it to replace physical fences destroyed by wildfires, keep cows away from spawning fish or nesting birds and direct cows to graze fire breaks.

The McFarland White Ranch was one of the first in Montana to try virtual fencing, starting in 2022 with one brand, Vence, before switching to another, named Halter. Vence was co-founded by a New Zealand livestock manager and partially bankrolled by a division of Shell, which wanted to use the technology to reduce overgrazing and increase carbon stored in the soil as part of the carbon offset programs it participates in. The pharmaceutical giant Merck's Animal Health division acquired it in 2022. Halter also has roots in New Zealand, where the dairy industry's practice of frequently rotating cows through small paddocks requires heavy investments in fencing.

Virtual fencing won't replace barbed wire anytime soon; it doesn't always work, and it's hard to bet one's livelihood on new technology. Yet the White family believes it can transform their ranch for the better, and they're committed to realizing its potential. Virtual fencing, said Lanie White, is "the biggest ranching revolution that will occur in my lifetime."

PHYSICAL FENCING HAS A LONG, tangled history in the U.S. In the early 1800s, colonists were drawn West by the promise of "free" land stolen from Native Americans and a belief in the new nation's "manifest destiny" to control the continent. But the Great Plains lacked the wood and stone used for fencing

back East, and when settlers tried stringing smooth wire between fenceposts, livestock pushed right through it.

By the late 1860s and early 1870s, the race to develop "spiked" wire fencing was underway. After Illinois farmer Joseph Glidden invented a new design in 1873, he patented his technique for attaching barbs to double-stranded wire as well as the machinery required to mass-produce the fencing. Glidden's metallic imitation of a thorny hedge was cheaper and easier to string than anything else available, and sales exploded. Soon, settlers were slicing up the landscape. "So much of our fencing system in the United States is following section lines — the township and range system," said David Augustine, a landscape ecologist with the Department of Agriculture's Agricultural Research Service. "Almost every section has a fence on it, which rarely follows an ecological boundary."

Fencing has always been used to control both animals and humans; during the 20th century, armies defended trenches with barbed wire, while states use it to imprison people. "Control through violence and force, I think that's the underlying basic meaning," said Scott Abbott, a Utah Valley University professor and co-author, with Lyn Ellen Bennett, of *The Perfect Fence: Untangling the Meanings of Barbed Wire*.

Historians and scholars argue that barbed wire — along with railroads, plows and the telegraph — enabled the colonization of the West. "They were mechanisms of containment in a paradigm of domination," said Dina Gilio-Whitaker (Confederated Tribes of the Colville Reservation), assistant director of the California Indian Culture and Sovereignty Center and a special adviser to the *HCN* board of directors. Fencing and the private-property ethos it upheld encouraged individualism. Together with the Dawes Act of 1887, which divided communal reservation land into individual plots, fencing facilitated tribes' assimilation into a capitalist economy.

Wildlife was also impacted, though managers weren't always aware of it. Officials installed fencing along the northern boundary of Yellowstone National Park in the early 1900s to keep livestock out of the park and pronghorn inside it to protect them from poachers. (The population declined, and the fencing was removed.) But by the 1960s, concerns about pronghorn getting entangled

Lanie White gathers virtual fence collars to prepare collaring the cows at her family ranch near Two Dot, Montana (*left*). Pronghorn stand behind traditional wire fencing on property near the McFarland White Ranch. They regularly get ensnared in fences when they try to crawl under them rather than jump over (*below*).
Rebecca Stumpf / HCN





As Jay Ward closes a gate, newly collared cattle head out to graze in a field on the McFarland White Ranch. Cattle are rotated among the fields to prevent overgrazing. **Rebecca Stumpf / HCN**

and dying in fences began to appear in the scientific literature. In 1965, photos of pronghorn dying after allegedly being caught in Wyoming sheep fencing prompted Rep. Henry Reuss of Wisconsin to introduce legislation prohibiting the construction of fencing that impeded wildlife movement on public lands. (A Bureau of Land Management report at the time found that 4,804 miles of barbed wire and 1,340 miles of woven wire fencing had been constructed on public lands in the state.) Fiction reflected the shifting attitudes: In Edward Abbey's 1975 novel *The Monkey Wrench Gang,* a river guide named "Seldom Seen" Smith says, "Always cut fence. That's the law west of the 100th meridian. East of that don't matter none. Back there it's all lost anyhow. But west, we cut fence."

Despite environmentalists' growing anger over the mistreatment of Western landscapes, Seldom Seen's instructions were merely a wish list. There was no practical alternative to barbed wire fencing in the West — not until virtual fencing's arrival in the West just four years ago. After more than a century and a half, could the dream of a fenceless West finally become a reality?

The idea of virtually controlling animals isn't new. In 1973, "invisible fences" of buried wire, reinforced by shock collars, were patented for dogs. Researchers began experimenting with radio-wave activation in 1987. Scientists within the Department of Agriculture started designing virtual fencing for cows in the early 2000s, but it took more than two decades — and the efforts of overseas companies working with dairy producers — for virtual fencing to become commercially viable for the West's beef cattle, which roam over large areas.

The possibility that this new technology might serve both ranchers and wildlife has conservationists excited. The Nature Conservancy (TNC) is among the organizations offering financial support to Montana ranchers who implement virtual fencing. In partnership with the Southwest Montana Sagebrush Partnership, TNC is working with eight Montana ranchers who are using three different companies — Vence, Halter and Gallagher eShepherd. Jim Berkey, TNC's High Divide Headwaters program director, sees the potential for a paradigm shift. If virtual fencing can ease the burden of physical fencing on wildlife, he envisions "vast potential changes across the landscape."

FOR RANCHERS, VIRTUAL FENCING'S appeal increases with every wildfire. Fast-moving rangeland fires obliterate wooden fenceposts, destroying thousands of miles of astronomically expensive fencing that costs $15,000 per mile or more to replace. Virtual fencing costs vary, but collars (which are rented from the companies) and their batteries usually run about $50 per year, while brands that rely on base stations typically charge $10,000 per tower. Most base stations are easily relocated when pastures are changed; transmitting signals between a collar and a virtual fence requires about the same amount of cell coverage needed to send a text.

The economics of virtual fencing tend to favor large ranches, which rely on a lot of people to manage their herds and require many miles of fencing. Smaller operations that have less to gain may find it harder to invest in the necessary equipment. Ranchers may be able to share the upfront costs with nonprofits like TNC, the National Wildlife Federation or Rocky Mountain Elk Foundation; state departments of wildlife; private donors or family foundations; and, sometimes, federal agencies. Often, though, ranchers aren't inclined to try it out until they're faced with the even higher costs of wildfire recovery.

The 2020 East Troublesome Fire near Granby, Colorado, spurred some of the first virtual fencing in the West and its first known use on a Forest Service allotment. A Natural Resources Conservation Service grant funded a Vence trial with six ranchers and close to 3,000 cattle starting in 2022. "At that time, nobody knew what virtual fencing was," said Allegra Waterman-Snow, a district manager at the Eagle County Conservation District. "It was completely new."

More wildfires in 2022 prompted more ranchers to try virtual fencing. Dan Probert, an eastern Oregon rancher, saw 20 miles of fencing burn on the 20,000-acre Saddle Creek Forest Service allotment during the 2022 Double Creek Fire. Some of the allotment, which he's permitted to graze, overlaps with the remote Hells Canyon National Recreation Area, and Probert estimated that the cost of flying or packing in the materials would have cost $20,000 to $25,000 per mile. "No one, including us and the Forest Service and a bunch of different wildlife groups, wanted to put the hard fences back in," he said.

Mike and Joy Wilson, who raise cattle in north-central Washington, have also lost physical fencing to wildfire, but they switched to virtual fencing when they leased 9,000 acres from the Confederated Tribes of the Colville Reservation, which had recently reacquired the parcel and hoped to help create a wildlife corridor between the Rocky Mountains and the Cascade Range. It had minimal fencing, and any new physical fencing risked disrupting the corridor. "With the ability to put virtual fences in, the wildlife never knows the fence is there, so it just made good sense," Mike Wilson said. It also made sense financially: Neither landlord nor lessee wanted to pay for new fencing, and the nonprofit group Conservation Northwest was willing to fund two base stations.

Near Salmon, Idaho, the nearly 70,000-acre Diamond Moose allotment on the Salmon-Challis National Forest had minimal fencing before it burned in the 2022 Moose Fire. The Forest Service would have likely closed the entire allotment to grazing, perhaps for several years, while the vegetation recovered.

But when permittees Chyenne and Jay Smith rounded up their cattle after the fire, they noticed that the fire had scorched some forage but left large areas unscathed. They wondered if virtual fencing could be temporarily positioned around the unburned areas so they could continue to graze their cattle while the burned acreage recovered.

Melinda Ellison, an associate professor of range livestock research at the University of Idaho's Nancy M. Cummings Research, Extension and Education Center, was already familiar with virtual fencing. She was actively seeking an opportunity to test it in the steep, rugged grazing allotments near Salmon when the Smiths approached her as the Moose Fire was being contained. Ellison teamed up with the couple on a last-minute hunt for funding and agency partnerships, eventually enlisting the Bureau of Land Management, Forest Service and Idaho Department of Agriculture. Ellison's team has been working with area ranchers ever since, helped by grants from the Foundation for America's Public Lands and the USDA.

It took time to teach the Smiths' cows new routes — cows that stubbornly ignored the shocks were removed from the range — and the ranchers struggled to apply the technology to the landscape. In the beginning, Ellison and her students repositioned virtual fences

A base station used with virtual fence collars at University of Idaho's Nancy M. Cummings Research, Extension and Education Center near Salmon, Idaho.

Jay and Chyenne Smith at their ranch near Salmon. **Rebecca Stumpf / HCN**







Garrett Godfrey, ranch hand at J Lazy S Angus Ranch, moves cattle with Chyenne Smith on a Bureau of Land Management grazing allotment near Salmon, Idaho, in May.
Louise Johns / HCN



on the Smiths' behalf. "The software side of it is still moderately clunky, so you kind of have to be a little bit techie to be very proficient with it," Ellison said.

Hardware snafus included cows stepping on and damaging loose collars as they lowered their heads to graze; once, two bulls got stuck together when the carabiners on their collars interlocked. Other early adopters of virtual fencing faced similar problems, said USDA researcher Augustine. "The product was just not quite right," he said. "It hadn't been thoroughly validated on working ranches."

The satellite research station's cow-calf operation is now focused on virtual fencing's practical applications. Three graduate students and one or two undergraduates from the University of Idaho work on the project, which spans nine ranches, 2,000 or more collars and 20 base stations.

Grant money pays for collar rental and batteries, and the Forest Service has purchased three base stations so far. Dwayne Rice, the agency's Region 2 rangeland program manager, said that it prefers not to invest in collars. "We're not in the livestock business, and we don't want to be in the livestock management business," he said. "That is the business of the rancher."

As of spring 2026, cattle on 270,000 acres of allotments within the Salmon-Challis were being managed with virtual fencing, said Kyle Nelson, rangeland management specialist for the Salmon-Challis National Forest. The Forest Service permits it as a temporary range improvement similar to a fence gate. "I think it's been a great technology to implement," Nelson said. "I see us continuing to use it."

Chyenne Smith's computer is now integral to her morning routine. She starts the day at her kitchen table with coffee or tea and a map on her laptop showing her herd's location. The arrangement of the cow-shaped icons on the screen can tell her whether they're gathered around a water trough — a sign that the water is still flowing — or avoiding a salt lick, indicating that a replacement lick is needed. Rapid or unnatural movements may indicate an injured cow or the presence of a predator. Jay said that his and Chyenne's time on the allotments is more targeted and purposeful, since they can see exactly where problems are occurring. "We wouldn't like this if it wasn't hands-on," he told me.

Virtual fencing has made their jobs easier in other ways, the Smiths said. In the past, some cows would head to higher ground before the spring forage matured, while others lollygagged at lower elevations and missed out on peak forage, potentially violating the terms of their grazing permit. "We were able to fix both of those problems," Chyenne said. Now, they use the technology to graze evenly or pick strategic areas that need resting. "It makes us better range managers," Jay said.

On a sunny spring day, I met a group of







“COWS ARE KIND OF LIKE PEOPLE IN THAT WAY; SOME ARE TROUBLE-MAKERS NO MATTER HOW MUCH YOU DO.”

Chyenne Smith checks the boundaries of her virtual fencing on the J Lazy S Angus Ranch at dawn. Her daughter and friends join her in the kitchen (*left*). One of the J Lazy S Angus Ranch cows sports a virtual fence collar (*top*). **Louise Johns / HCN**

Chyenne Smith checks on her herd of cattle grazing along the Salmon River (*above*). **Rebecca Stumpf / HCN**

recently collared cows in one of the Smiths' fields. Reddish clay painted the hills below the Beaverhead Mountains, where snow still clung to the peaks. The Smiths had placed a virtual fence near a physical fence so that the cows would learn to respond to their collars' beeps and shocks as they would to a physical barrier. "Cows are kind of like people in that way; some are troublemakers no matter how much you do," Chyenne said. The animals were hunkered down in bushes, but as we approached, they began to scatter. When they got too close to the physical fencing behind us, their collars began to beep. Slowly, they ambled off, returning to their pasture. They were quickly getting the hang of it.

NOT EVERY TRIAL HAS GONE SO smoothly, though. The McFarland White Ranch near Two Dot, Montana, became one of the first and largest proving grounds for virtual fencing in 2022, when the Whites collared 1,800 cows with Vence technology. The Whites hoped that virtual fencing would help them contain their animals more efficiently, allowing them to more quickly reforest their property after the 2021 American Fork Fire. But shortly after they started, hundreds of collars started breaking and falling off — and with them, quarter-pound lithium batteries. Once the batteries died, the collars couldn't be found.

"I didn't know it until it was a disaster," said Lanie White, who worried that the batteries would rust, break open and leach heavy metals into the headwaters of the American Fork River and Big Elk Creek, both of which run through ranch property. The remaining collars needed new batteries every six months — more frequently than the Whites had been led to believe, they said. (Chyenne Smith, who is still using Vence collars, said they also lost collars initially but were able to find most of them. Now they lose only a few, she said.) According to Merck Animal Health spokesperson Jennifer Luddy, "System performance may vary by terrain, weather, infrastructure, grazing practices and frequency of use."

In February 2023, the Whites removed the remaining collars. Lanie White has since told neighbors and other ranchers about her negative experience; Vence declined to discuss details. "We take product performance concerns seriously and carefully review each case," Luddy wrote in an email to *HCN*. Today, a heap of collars with dead batteries lies beside one of the Whites' outbuildings. Another dozen are hung up on racks outside a barn — relics of a failed experiment.

In the fall of 2024, the Whites re-collared 350 cows. They used collars from Halter, and



Lanie White said she noticed immediate differences. The cows calm down faster after being fitted with the new collars, she said, perhaps because they fit more snugly and don't swing as much when the animals move.

The batteries in the Halter collars are charged by small solar panels, and the company claims each collar will last five to seven years — something the Whites and other ranchers appreciate. "Changing those batteries out is a pain in the ass. Solar is a huge improvement," said Oregon rancher Probert, a Vence customer. Previous batteries, he said, drained quickly if cows interacted with fencing frequently, complicating rotational grazing in small paddocks. The newest Halter collars can transmit data directly to the Starlink satellite network, eliminating the need for expensive local base stations.

The Whites have less institutional support than the Smiths, but they're not on their own: Most of the current costs of their system are covered by the National Fish and Wildlife Foundation, and they've also received help from the Property and Environment Research Center (PERC), the Forest Service and the Rocky Mountain Elk Foundation.

Representatives from Halter have helped the Whites troubleshoot their equipment by phone and in person, and in July, Morrison visited the ranch to help the Whites fit their herd with some 300 new collars. By the end of the month, he was scheduled to help ranchers across Montana and the Dakotas put on more than 8,000 collars.

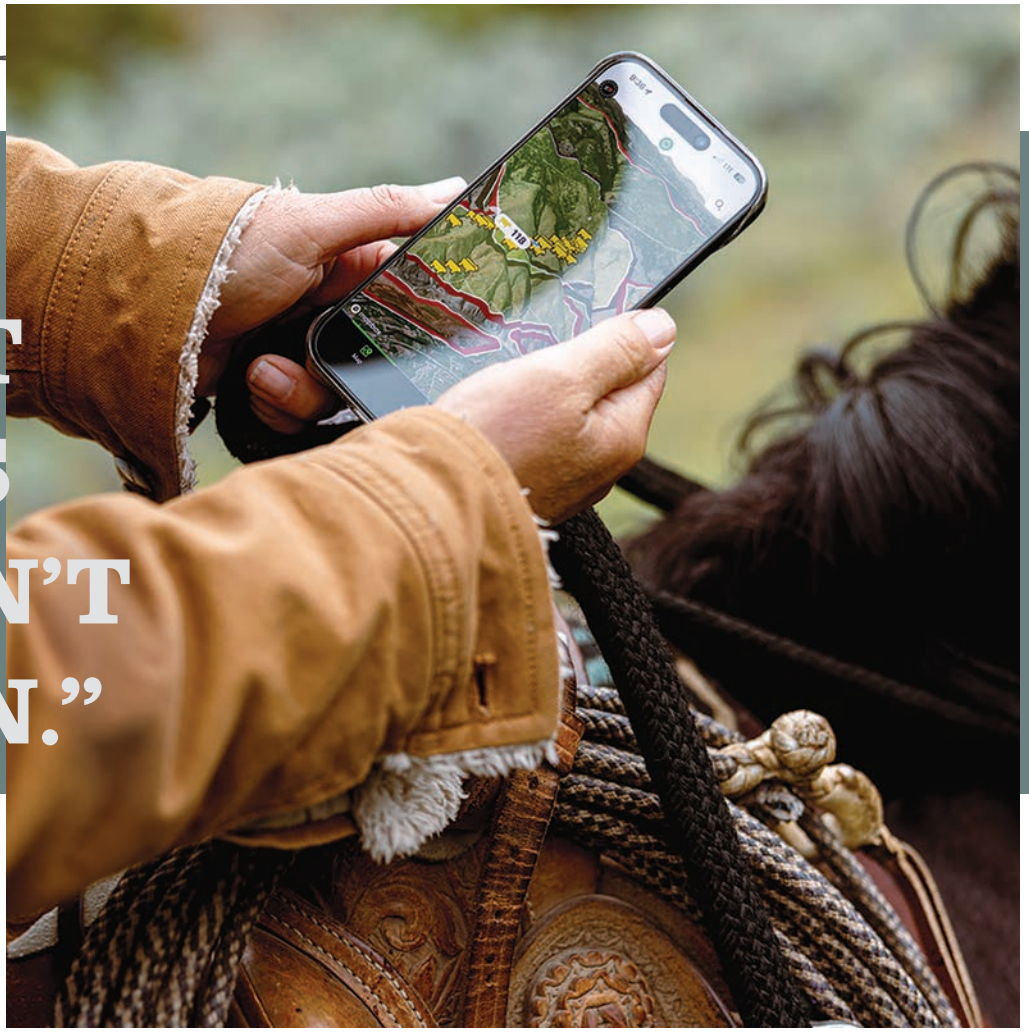
After all the problems, I asked Lanie White why she continued to test virtual fencing. "We're nothing if not tenacious," she replied. If there's a ranching revolution to be had — and she thinks there is — she wants to be part of it.

"I WOULD SAY VIRTUAL FENCING is here to stay, for sure," said Paul Evangelista, a researcher who studies it at Colorado State University. Roughly 200 of the more than 900 Forest Service permittees in Region 2, which includes Wyoming and Colorado as well as the Great Plains, now use virtual fencing.

The technology is spreading especially quickly in eastern Oregon, where the 2024 Lone Rock Fire destroyed 1,100 miles of fencing that would cost an estimated $25 million to replace. "It burned so much that ranchers truly did not have a place to put their cows," said Dallas Hall Defrees, regenerative ranching program director for Sustainable Northwest, a Portland-based nonprofit that runs a regional regenerative ranching program.

Private land made available for short-term grazing lacked fencing, rendering it

"WE WOULDN'T LIKE THIS IF IT WASN'T HANDS-ON."



Cattle wearing virtual fence collars on the McFarland White Ranch near Two Dot, Montana, are herded to a new pasture. **Rebecca Stumpf / HCN**

While out riding, Chyenne Smith checks the virtual fencing app Vence on her phone to see where her cattle are located. **Louise Johns / HCN**

basically useless to ranchers who needed to safely contain their cattle. But a project to install virtual fencing on 177,000 acres of private land across three counties in the Upper Rock Creek watershed is currently underway, led by Sustainable Northwest and its partners. Once complete, it will be the largest virtual fencing system in the state and likely the Pacific Northwest. "What we're trying to do with virtual fencing is to have working lands and to do them better, to have rural economies, rural communities and ecosystems all function alongside each other," Defrees said.

More companies are entering the market. The initial players, Vence and Halter, have been joined by Gallagher eShepherd and a Norwegian company called Nofence, and the competition seems to be driving improvements. "The pace at which these companies are innovating and changing the technology to meet producer needs is happening pretty quick," Waterman-Snow said. "I think virtual fencing is going to look pretty different in another five years."

Business for established brands is booming. At the Whites' ranch in July, Halter territory manager Joshua Morrison rattled off numbers over a lunch of ground beef, potatoes and peas. He said that ranchers on 75 properties in his coverage territory, which stretches from eastern Montana to western North Dakota, had purchased 65,000 collars from Halter as of July 2026, and 40 more ranches in western Montana and Idaho were trying the technology. "It's just blowing up," Morrison said.

While virtual fencing's hardware and software improve every year, the technology still has its limitations, technical and otherwise. "It's not a scalpel yet," Defrees said. "It's a steak knife." Virtual fencing can't prevent drought, invasive species or wildfires. And it's not a shortcut to good land management. "We did not see that the simple fact of virtual fencing meant that your ground improved," Waterman-Snow said.

In the arid West, where thirsty cows will ignore beeps or shocks to get to water, ranchers who use virtual fencing must make sure their enclosed areas contain enough water and are a decent distance from streams and other appealing areas. "You can draw all the fences in the world with virtual fencing, but if you don't have water, it ain't no good," said Koy Holland, a third-generation rancher in the Grasshopper Valley west of Dillon, Montana.





The collars used by Lanie White and her brother Harrison rely on satellites from Starlink (*top*). Harrison White and his dog McClane take a break on his family ranch (*above*).
Rebecca Stumpf / HCN

Then again, not all ranchers, at an average age of 58, are comfortable with smartphones, much less an emerging technology with a still-clunky interface. "The learning curve is steeper for the humans than it is for the livestock," said Tony Vorster, a researcher at Colorado State University.

EVERYONE WANTS SOMETHING different from virtual fencing. Ranchers want to save money, graze more efficiently. Wildlife groups imagine a fence-free future where deer, pronghorn and even birds like grouse and owls can move unfettered. Virtual fencing companies see a largely untapped market.

Ranchers are also intrigued by a new source of data on their cows. Some hope the GPS data from virtual fencing systems will help convince permitting agencies that they're grazing their allotments responsibly and enable them to make more informed decisions about livestock numbers and grazing duration. Several ranchers said they hoped the data could protect them from the effects of lawsuits brought by conservation groups critical of public-lands grazing. "Each cow collects an astronomical amount of unbiased data about how they graze, how long they graze," said Chyenne Smith. "It's a really good tool if you're not breaking laws and messing stuff up."

Despite the dream of a wire-free West, virtual fencing has yet to bring about a meaningful reduction of physical fencing; the technology is just too young for ranchers or land managers to feel comfortable tearing down barriers. After less than two years of experience with virtual fencing, Holland chuckled at the suggestion that he take down his physical fencing. In his area, it costs between $17,000 and $20,000 per mile in labor and materials, and "it's pretty hard to rip a fence down when it costs that much," he said. "What we're doing is throwing gates open."

The Salmon-Challis National Forest, while further along in its virtual fencing experiment, also hasn't removed physical fencing from its allotments. "It is definitely a discussion that we're all kind of curious about, but I don't think we're quite there yet," Nelson said. "I don't necessarily think we'll get to a point where we have no physical fences out there."

Even ranchers in Eagle County, home to one of the nation's first trials, aren't confident enough in the technology, which only works 70% to 80% of the time in the area's mountainous terrain. "That's honestly just not quite enough assurance for them to be able to consider taking down fences," Waterman-Snow said. Perimeter fencing, which keeps cows off roads and out of neighboring properties, will almost certainly remain in place for the foreseeable future.

Virtual fencing may well eliminate the need for some new fence construction. But the West's fencing legacy is proving harder to shake. As I left the McFarland White ranch, driving slowly on the bumpy dirt road, rain splattered my windshield. A few minutes later, I stopped abruptly at the sight of a woven-wire fence topped with barbed wire, a design that dates back more than a century and presents an impassable barrier to many species.

Posted on the fence was a "Private Property, No Trespassing" sign. Directly beyond it stood a pronghorn with two fawns. While some Westerners were trying to do things differently, change was slow to catch on. I was looking at the past, the present, and the future, all within a few short miles.

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J Lazy S Angus Ranch cattle learn how to respond to their virtual fence collars in a pasture next to the Salmon River. **Rebecca Stumpf / HCN**

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Sweat yourself clean

Getting immersed in the Yup’ik sauna tradition.

BY LAURELI IVANOFF | ILLUSTRATION BY APAY’UQ MOORE

"IT'S DARK IN THERE. And really hot. And kind of dirty."

That is what our then-4-year-old son said at the dinner table when our visiting friend, Luc, asked what a maqivik was. Dad, between bites of moose soup, had said he'd light ours after supper.

"Well, Herb, it sounds like we need to clean the sauna," his wife, Heidi, said in a jovial tone.

We laughed. The woodstove where we maqi, or bathe, is in a tiny 6-by-10-foot wooden building constructed from a greenhouse framing kit. Pallet wood and spruce driftwood that Dad and Heidi harvested from the Unalakleet beaches are stacked under benches against insulated plywood walls. Bits of dark brown spruce bark lie on the floor. I wouldn't say Dad's maqivik is dirty, but the place where we get clean from the inside out isn't the tidiest place you'll ever visit. It gives an air of function over form.

In the maqivik, the temperature set to a slow roast, all of us are sweating in the dark, the fire crackling. I hear Dad, bent over, his hands holding his head between his knees, tell Luc, "You don't have to prove anything. Go out to cool off any time you want."

I thought that was nice of Dad to say. In some places, entering a maqivik is entering an unspoken competition. Ego comes into play as the entrants try to out-stay their fellow maqiers. That's never been the situation in Dad's — though I always note when I stay in the heat longer than everyone else. (It's not often.)

Someone shone the only light source, a flashlight, on the Finnish thermometer on the wall. It read 215 degrees Fahrenheit.

"Alright, yeah," Luc said in his soft voice. "It is pretty hot."

He opened the door to the structure's other half, which serves as a cooling room and greenhouse. In the summer, Heidi grows tomatoes and squash in here with varying success. In the fall, with three adult bodies sitting on the benches, condensation rains down from the corrugated polycarbonate roof panels.

The Finns are famous for their saunas. But Alaskan cultures also utilize variations for bathing and overall health.

My Yup'ik friend Nikki Corbett is a maqivik evangelist. She grew up in Bethel, where the family's water was hauled to a 1,000-gallon storage tank. "Who wants to take a timed shower twice a week when you can go enjoy an hour and a half to two hours in the maqivik?" she said.

Nikki now lives in Soldotna, has an avid TikTok following and is studying to be a psychiatric mental health nurse practitioner. She built a maqivik on her property, and even though she now has running water, she enjoys the sauna a few times each week.

"Taking a maqi has always been my space to cleanse my body but also to cleanse my energy. It's been a space to spend time with friends and family … a space to leave all the negatives from the day, week, month and imagine it flow down the drain away from my mind and body."

"Taking a maqi has always been my space to cleanse my body but also to cleanse my energy… a space to leave all the negatives…"

The first time I took a sauna, I was around 5. Maybe younger, maybe older. Dad said my uncle Jerry was lighting the woodstove in his maqivik.

"Want to come, babe?" I imagine Dad asked. "It's good for you. You'll get real clean."

Always up for new experiences, I wholeheartedly agreed.

We drove across town to Uncle Jerry's. Behind his house was a tiny, unfinished plywood-clad building. Wearing towels, we stepped inside. It was dark in there — and really hot; I felt like I could hardly breathe.

"Put that rag on your head, babe," Dad said. Inside a white 5-gallon bucket on the floor was a white washcloth. I dunked it in the cold water and placed it on my head and felt immediate relief.

The men inside the sauna talked. About what, I don't remember. I do remember it felt nice to be with Uncle Jerry, like it always does. I remember the red glow from the woodstove.

"Sit on the floor, babe, if it gets too hot," Dad said. "By the door." So I did. It was nice. Bearable. I felt a tiny stream of cool air being sucked in through the crack in the door. The men kept talking. I could tell Uncle Jerry was happy I was there, and that felt good.

I could tell Dad was proud of me. Saunas aren't easy. They stress the body, but in a good way that strengthens your heart. The heat and sweating gets the lymphatic fluid flowing. Lots of studies show the health benefits. We just know it's plain good.

I've heard Dad say, "I don't understand people who don't like to steam," after pouring three ladles full of water onto the best sauna woodstove he's ever owned (and he's owned a lot). Our friend had welded two steel baskets onto either side of the belly of the stove to hold volcanic rocks that Dad picked up during our annual trip to Shorty Cove, Mom's favorite place, to harvest herring eggs. The porous rocks absorb and disperse the heat. When we ladle water onto them, it instantly turns to steam. Steam fills the air in the tiny box cooker, making it even harder to breathe.

Does it slightly burn my eyelids' paper-thin skin? Does the heat seep through my skin and down to my marrow? Does it feel deep and satisfying? Yes, yes and yes. Eyes closed, I can feel aches I didn't know I had dissipating as sweat pours from my nose and chin.

Sitting on the slatted pine bench, the sauna feels really good, until it doesn't. After a few moments of real discomfort, I push open the plywood door to slip outside and gulp some ice water. Sometimes, especially in the fall, we'll hear an owl hooting. Sometimes it rains, and I sit and feel the raindrops cold on my steaming skin. Sometimes, if there's snow on the ground, I'll talk someone into rolling in it with me. After a few minutes of cooling, we head back in for another round. And, at the end, I feel cleaner than ever.

"I'll always choose a maqi over a shower," Nikki said. "You will never get clean by a shower. Trust me."

It feels like she's right, even in Dad's very functional sauna.

Laureli Ivanoff is an Inuit writer and journalist from Unalakleet, Alaska, now based in Anchorage. Instagram: @laureliivanoff



Q&A

Advice for a fractured world

Freaked out about everything? Aileen Keown Vaux has a poem for you.

BY COLEMAN STEVENSON
ILLUSTRATION BY LAUREN CROW

IN *SAD MAN HAPPY HOUR*, Portland poet Aileen Keown Vaux places the lighthearted and pedestrian alongside the bleak and profound: a plate of sizzling hashbrowns paired with nuclear proliferation; holding hands with someone while watching the Earth burn. In an unapologetic collection set largely against the roiling ocean, dusty high desert and dense Northwestern forests, little deaths lurk everywhere, from parents flushing goldfish down the drain to children showing off wild animal carcasses. Despite wildfires, tsunamis, pandemics and failed relationships, Keown Vaux offers us hope, a quest for redemption and a life truly lived. We trust their poetic voice, which urges us to keep trying.

High Country News spoke with Keown Vaux about the state fairs, precocious children and looming volcanos that influenced *Sad Man Happy Hour*.

This conversation has been edited for length and clarity.

In the book's acknowledgements, you state, "I am indebted to the Pacific Northwest, a place that inspires me to write as expansively as the land." Tell us about this and what it means to write "expansively."

I am from Washington but moved around the Pacific Northwest with my family before we made Yakima our home. Yakima is a particular preoccupation for me. It's the reason this book exists — the first section, inspired by Central Washington State Fair themes, helped me find my writing voice, a tone that balances the sincere with the absurd. A lot of my writing is based around honoring and interrogating the place I come from.

I try not to be only one thing. When we talk about expansiveness, this region teaches me how to appreciate diversity. I translate this almost as a one-to-one to my personal identity. The scale and variety of the Pacific Northwest landscape astound me. We're near bays, we're near oceans, we're influenced by pine trees. In Yakima, there's the desert landscape, there's the wheat fields of Walla Walla and the Palouse from Pullman up through Spokane. Then you drive through the Columbia Gorge, astounded by the sense of time and the cataclysmic experience that carved that feature. I was really disoriented when I lived in the Midwest; it wasn't until I came back here that I was like, oh, I need volcanoes to look at to understand where I'm at.

Do you consider these to be persona poems, where you as the poet speak as other characters? How much is direct lived experience versus imagination?
I don't think I would classify them as persona in the sense of representing a type of human. It's more accessing flashpoints of interest and then allowing my mind to follow its own through-thread. One of the sneaky pleasures of poetry is that you can start with a kernel of truth, but you don't have to stay faithful to it. I think I gravitate to poetry because there's so much structure, yet so many opportunities to break it.

If you have a grounding structure — a container, a logic — the poems can amoeba inside that.
Yeah, it's 700 raccoons in a trenchcoat.

Clown car!
Exactly.

Let's talk about the dark humor you use.
It's harder for people to accept challenging topics if they're not sort of Trojan-horsed into something a little funny, so that's how I like to approach my work. When I read (in public), I'm jocular, kind of like, "Whoop, whoop! We're just having a good time." It gets delivered in a way that feels much lighter than when you're reading them (yourself). Up in Shelton, Washington, I just read the poem "Trust Fall" about the co-worker flushing her kid's goldfish down the toilet. People were chuckling, and because I'd never read that poem out loud. I was like, "Oh, man, you guys are sick! This is not funny." So it worked.

If death is showing up a lot [here], it's because I'm observing it, and it feels as vital and vibrant to me as life-living. I think there's something categorically different about living within eyesight of Mount St. Helens, having these giant peaks where you're like, "I'm not in charge here. I could go at any second." I don't think it's good to hold that inside, so this is probably one of my artistic tics, getting it out of my body and asking, "Are you guys thinking about this, too?"

What I started to do unconsciously turned into a conscious practice of thinking about what laughter does to us physiologically in the face of needing to survive things that feel impossible. I read a book about people who work in morgues or who do things like alpine rescue, and the use of gallows humor — there's a physiological response that's happening with your vasovagal nervous system. If I'm going to talk about death, it better be funny.

Tell us about the kids the speaker interacts with in "Boa Constrictors are Addicted to Hugs." They say some incredible things. Did they really show you a bunch of animal carcasses?
I think kids approach me because they're like, "I don't totally know, but I think you're willing to hear me out on this." And I'm like, "You got it right, Daniel! I will listen to you say, 'Hey, guess what! Boa constrictors are addicted to hugs.'" Then they asked, "Do you wanna tour everything dead in the yard?"

I do! And we did! My friends have this backyard that's sort of wild, and we looked at everything that had died there. It wasn't scary or upsetting; it was fascinating. Kids need to process that, and so do adults. I'm not afraid of being at that precipice with people.

This book provides advice on how to deal with, essentially, the end of the world. We're presented with tragedies, large and small. The attitude is, yes, this is brutal, but, as you write in "Zero Gravity": "still, I plan; / a garden plot rented for the summer / where my seeds will grow." There are wonderful examples of continuing to live in the face of it all; despite global warming, the folks in "Fair Fever, Catch It!" carve butter sculptures and watch calves be born.
I'm aware of the ways in which we're not doing great right now. but I hold out hope for the next phases. We need a reminder that we should not lose our humanity when we think we are losing our world.

Coleman Stevenson is a poet, artist and educator known for her text and image illustrations and her classes that help others explore their creative potential.



Sad Man Happy Hour
Aileen Keown Vaux
110 pages, softcover: $18.95
Unsolicited Press, 2026.

"We need a reminder that we should not lose our humanity when we think we are losing our world."



Heard Around the West

Tips about Western oddities are appreciated and often shared in this column. Write heard@hcn.org.

BY TIFFANY MIDGE | ILLUSTRATION BY DANIEL GONZÁLEZ

COLORADO

In September, a rogue squirrel broke into an electrical substation and caused an explosion that cut power for thousands of customers in Castle Rock, Colorado, KUSA reported. Clair Whitehead, a Castle Rock resident, said she rushed home to check on her fish, Bubbles, whose tank depends on power. "He was not happy about it," Whitehead said, referring to her fish, though the squirrel may have been equally dismayed, since his mission of sabotage ended up killing him. Then again, according to kygo.com, "squirrels aren't exactly known for their risk-assessment skills." The rascally rodent had apparently called for reinforcements, though, because a different squirrel infiltrated the same substation the very next day and caused another blackout. CORE Electric Cooperative said that birds, rodents and other wildlife are "responsible for between 5% and 10% of all outages on its system each year." Fortunately, the local squirrel population seems to have settled on a truce, at least for now. But we must be wary.

CALIFORNIA

"Gutteral Scream at the Sea" is the brainchild of San Francisco "mischief maker" Danielle Egan, the organizer of ingenious think-outside-the-box enterprises like Outernet, a startup that urges people to get off their devices. If you want to spend less time on your screens and more time on your screams, you're not alone: About 100 like-minded folks gathered at a scenic overlook to shriek at the top of their lungs. "I felt like I needed a really good scream," Egan told *SFGATE*. "And I think it'd be more fun with other people. There's a lot of things to scream about in this day and age." In addition to the group scream, there was a competition judged on length of scream, volume and style. First place went to Olivia Gugliemotto, whose scream hit 121.9 decibels. "I have screamed at the ocean before. And I grew up screaming at Lake Erie, so I have a lot of practice," Gugliemotto said proudly. And, we suspect, a bit hoarsely.

COLORADO

The 46-year-old Telluride Mushroom Festival was an ideal cosplay opportunity, if instead of your favorite Marvel or Anime character, you like dressing up as your favorite fungus. Which is what hundreds of fungi fans did at the four-day celebration's Mushroom Parade. *The Telluride Times* raved: "The verisimilitude of their costumes to real-life fungi is astounding." In addition to the parade, there was a smorgasborg, or rather sporegasborg, of other activities and events, including presentations by "myco-luminaries," mushroom-hunting forays and fine dining, as well as classes and lectures. Interested in going next year? Check out telluride institute.org.

OREGON

If mushrooms aren't your cup of reishi tea, and we suppose anything's possible, check out Portland, Oregon's "Geek Week PDX." This event, held Sept. 11-20, celebrated "geek" culture (hence "Geek Week") with activities featured around gaming, comics, art and science. Perhaps the highlight was the "Sneaky Squatch," a treasure hunt that featured dozens of sasquatch exhibits hidden throughout Portland in places like City Hall, the Portland Visitor Center, coffee and comic book shops and a place called "The Freakybuttrue Peculiarium," i.e., "the world's weirdest art gallery." Seekers on the search for the elusive sasquatches pulled the clues for their whereabouts off the Geek Week website, OPB reported. More than 25 local artists participated, creating a variety of sasquatches, ranging from a 2-inch-tall cryptid, all the way to a 200-pound Bigfoot ballerina. But no living specimens showed, at least none that we know about.

CALIFORNIA

We're not surprised that it takes a trained eye to notice the very small differences between, say, ordinary rocks and old tree roots nestled in a creek and a 10,000-year-old mastodon tooth. At first glance, your average person probably wouldn't spot anything out of the ordinary. Luckily, Brigid Lynch, an experienced scientist who works for Balance Hydrologics, was on a Midpeninsula Regional Open Space District (Midpen) preserve in San Mateo County, surveying for a habitat enhancement project for the threatened California red-legged frog. She initially thought the fossil was "an oddly shaped rock," KTVU reported, but paleontologists from Pacific Paleontology confirmed that the "rock-like" find was "the most spectacularly well-preserved mastodon molar we've ever seen found locally here in the Bay Area to date." Pacific mastodons, massive herbivores that are distantly related to modern-day elephants, lived from the Pleistocene epoch around 2.5 million years ago until becoming extinct about 11,700 years ago. That's a long time. Which may be why Midpen donated the tooth to Stanford University's Doerr School of Sustainability. If only our own teeth were that sustainable. ...



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#IAM THE WEST

ERIC ROMERO
Artist
Santa Fe, New Mexico

I thought the fence was only a fence. Wood buried in the earth, wire holding the horizon together, the old world leaning against the new. I passed it as a boy without knowing I was passing through someone else's hands. My grandfather is gone. I don't remember his voice, but the farm remembers. His hands are still here, buried beneath the posts. I became a father and learned the old language — work, patience, repair. Now I look at that fence and understand. A father does not always leave his name. Sometimes he leaves a place strong enough for his children to lean against.



Charles Montoya / HCN

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