

High Country News



THE FUTURES OF
CONSERVATION

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The revival of
Fender's blue

The extremism
vaccine

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Shirley Romero Otero and Devon Peña attend an online meeting with community members of Alamosa, Colorado, during which they explain how they got a grant to purchase the R&R Market in neighboring San Luis.

Jimena Peck / High Country News

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EDITOR'S NOTE



Conservation is an ecosystem

IN JUNE 1934, AS GRITTY CLOUDS of dust boiled up from the Great Plains and darkened skies across the continent, University of Wisconsin professor Aldo Leopold addressed a crowd at the university's new arboretum. Leopold was deeply disturbed by what would come to be known as the Dust Bowl — a disaster he had foreseen as a young forester in the Southwest — and the usually restrained wildlife ecologist was in a bitter mood.

“There is a feeble minority called conservationists, who are indignant about something,” he wrote in an essay adapted from his address. “They are beginning to realize that their task involves the reorganization of society, rather than the passage of some fish and game laws.”

Leopold's caustic assessment is, in many ways, as true now as it was then. In the 1960s and 1970s, U.S. conservationists secured federal protections for land, air, water and endangered species, still some of the most powerful environmental laws in the world. But if conservationists are to protect ecosystems, the conservation movement itself must start acting more like an ecosystem, operating at many interconnected levels. Even as it advocates for laws and regulations capable of restraining corporate power and easing the effects of climate change, it must work to reorganize society — to support people and communities in living sustainably within ecosystems and alongside other species.

This special issue of *High Country News* is about the conservationists reorganizing our region on behalf of all species. Conservation's future will not be singular, so it's fitting that this issue brings together many voices. You'll read about rural community organizers working to revive economies and ecosystems, and activists helping to protect habitat corridors on the U.S.-Mexico border and in the Northern Rockies. You'll meet conservation scholars and practitioners who envision more effective, inclusive futures for federal environmental laws and land-management agencies. You'll hear from hunters, birdwatchers, artisans, lawyers and scientists, and from foresters- and firefighters-in-training. And you'll follow the journeys of butterflies, jaguars and a fictional character or two.

The people in this issue live in disparate places and face a variety of challenges, but all of them have found that Leopold was on to something. The great task of protecting and repairing ecosystems requires law and science, history and art, and brain and muscle — sometimes all at once. It also demands something even more fundamental: that we repair our ties with one another.

Michelle Nijhuis, acting co-editor and issue guest editor

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Editor-in-Chief Jennifer Sahn is on leave.



Totem poles sit beside a carving shed in the community of Klawock, Alaska. It can take centuries for a tree to reach the size required for totem pole and canoe carving. Many such trees in the Tongass National Forest have been lost to logging.

Bethany Sonsini Goodrich / High Country News



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By Jason Holley

Butterfly (top of page).
Lauren Crow / High Country News

Maps and illustrations throughout this special issue are by Lauren Crow, who has been creating portraits for HCN's Q&As for years. Crow, who is based in the UK, works predominantly in traditional mediums such as pencil and ink.

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The next chapter of environmental law

Experts recommend upgrades for foundational conservation policies.

BY KYLIE MOHR | ILLUSTRATIONS BY LAUREN CROW

IN THE 1960S AND EARLY 1970S, Congress passed a series of laws that profoundly affected Western ecosystems and human relationships to them. The Clean Air Act, designed to reduce air pollution, led the way in 1963, and in 1970, the National Environmental Policy Act, sometimes called the Magna Carta of environmental protection, created a review process for federal projects. In 1972, the Clean Water Act established requirements for the restoration and maintenance of waterways, and one year later, the Endangered Species Act created protections and required recovery plans for fish, wildlife and plants deemed threatened or endangered. Conservation finally seemed to have a solid legal foundation.

Six decades later, that foundation is in serious need of retrofitting. Though the West has the nation's highest concentration of areas permanently protected for biodiversity, it also has some of the highest concentrations of species at risk of extinction. Rising temperatures, precipitation extremes and larger, more destructive wildfires, all driven by climate change, are complicating pre-existing — and increasingly pressing — conservation problems such as habitat loss. “Too many of our environmental laws assumed a static system,” said Barbara Cosens, a professor emerita at the University of Idaho College of Law. “We’re no longer faced with a static system. We have a system that’s changing, and changing faster than anyone thought it would.”

The result, said Melinda Morgan, a University of New Mexico geography and environmental studies professor, is that federal conservation laws are “the equivalent of driving a Ford Pinto when we could and should be using a Tesla.”

High Country News asked five Western law and conservation experts to re-imagine these longstanding laws and their implementation. How might they better carry humans and Western landscapes into the future?

Monte Mills, director of the University of Washington's Native American Law Center

Big idea: Embed treaty responsibilities into land-management agency missions

Each of the federal agencies that manages Western public lands is governed by an act of Congress: The Organic Act created the National Park Service and charged it with conserving scenery, history and wildlife for future generations, while the Federal Land Policy and Management Act tasked the Bureau of Land Management with balancing multiple uses and managing resources for sustainable yields over time. But tribes were not involved in the discussions that led to these laws, and federal treaty responsibilities to tribal nations were not explicitly included in agencies' original missions. The result, Mills said, is that agencies tend to see treaty responsibilities as secondary. He believes that public-lands law and Indian law should be on the same footing. “Do it in a way that equally prioritizes your trust obligations and comes at it from the perspective that (tribal nations) are the original inhabitants of the land,” he said. Agencies should establish sustained, meaningful bilateral relationships with tribes, not simply invite them to “consult” on a proposed project or an existing land-management decision or plan. “The on-the-ground-relationships are



key here,” he said. This paradigm shift would also help land managers meet their founding missions, as Indigenous-led land management often enhances biodiversity. Mills noted that agency leaders could initiate change by, for instance, establishing incentives and evaluation metrics that reward employees' attention to trust responsibilities and encourage support for shared stewardship.

Robin Kundis Craig, environmental law professor at the University of Southern California Gould School of Law

Big idea: Focus on habitat, not species

For half a century, the Endangered Species Act has ensured that species are the basic units of conservation in the West. Craig wants to change that. “I would switch it away from thinking about conservation on a species-by-species basis and more comprehensively think about preserving good habitat, for whatever happens to end up there, on a broader basis,” she



said. Rather than waiting to act until species are in crisis, she said, an ecosystem-level approach could help prevent endangerment. To accomplish this, the existing law could give more weight to habitat loss when considering the listing of a species as threatened or endangered; when more than a certain number of species that share a habitat type are listed, restoration could be conducted at the ecosystem level. Habitat conservation plans, already mandatory for developers seeking “incidental take” permits under the Endangered Species Act, could also serve as a vehicle for strengthening the law. A new analysis published in the journal *PLOS ONE*, which found that most species don't receive protection under the law until their populations are dangerously small, lends urgency to these recommendations.

Big idea: Redefine Clean Water Act violations

Craig believes that the Clean Water Act needs

to be updated to address the challenges of climate change. Federal water regulation, strengthened by the 1972 amendments to the law, required states to set water-quality standards, while separate regulations created an “antidegradation policy,” meaning that if a water body was suitable for, say, public drinking water or recreation, it had to remain usable for that purpose. But the law makes no distinction between human-induced environmental changes that can be effectively regulated, such as industrial discharges of toxins, and those that are byproducts of climate change. So if climate change warms a stream to the point that trout or salmon cannot thrive, states could be considered in violation of water-quality standards and antidegradation policies. Ironically, this could prevent states from moving forward on renewable energy development and other projects intended to address the causes of climate change. “Protections that were put in were good and well-intentioned, but might trap states,” Craig said. She added that the EPA could create an analysis process that allows states to eliminate “existing use” requirements when climate impacts make a use impossible to maintain.

Barbara Cosens, professor emerita at the University of Idaho College of Law

Big idea: Bring adaptive management to the forefront of the National Environmental Policy Act process

Under the National Environmental Policy Act (NEPA), environmental impact analyses of federal projects are carried out before a proposed action is taken. “There’s no monitoring to see if what’s predicted actually happens,” Cosens



said. “There’s no ... flexibility to really handle situations where there’s high uncertainty. NEPA was a great idea for a period of time where things were not changing so rapidly, but it needs adjustment now.” Instead of a single

analysis, she’d like NEPA to require adaptive management, in which environmental impacts are monitored over the course of a project and adjustments are made in response to changing results and conditions.

Cosens works in the Columbia River Basin, where she sees the limitations of NEPA firsthand. “How exactly is temperature going to impact salmon in the Columbia River if we do this project or that project?” she said. “NEPA doesn’t handle it well.” The renegotiation of the Columbia River Treaty between the United States and Canada, which began in 2018, is still underway. While the discussions are not public, limited press releases and surrounding conversation make Cosens believe that participants are taking uncertainty seriously. “It looks like (the renegotiation) has the potential to address the kind of issues we don’t know the outcome of just yet,” she said. One day soon, she hopes NEPA will too.



Sammy Matsaw (Shoshone-Bannock and Oglala Lakota), research biologist for the Shoshone-Bannock Tribes Fish and Wildlife Department

Big idea: Adequately fund co-management by tribes

The Shoshone-Bannock Tribes created Matsaw’s position — research scientist and principal investigator — not only to promote tribal participation in discussions about resource management, but to involve the tribes in the production of knowledge about those resources. Matsaw focuses on chinook salmon and steelhead research, but he is spread too thin, and, as a result, he said, “co-management” — tribal-federal management of select federal lands and resources within the framework of existing laws — is often an empty word. “We need to clone people like myself,” Matsaw said. Federal and state managers regularly ask for his time, and while he appreciates the ask, he is usually expected to work for free. He has a simple request: Fund tribal expertise.

Big idea: Integrate traditional ecological knowledge

Matsaw believes that traditional ecological knowledge holds valuable solutions to modern problems. “We see uncertainty as part of our management, (because) it always has been,” he said. Incorporating traditional ecological knowledge into scientific assessments and monitoring, Matsaw said, is one way of helping static laws and approaches deal with a changing environment. He’d like more funding for collaborations that center Indigenous teaching and systems of knowledge. “Individualism does not fare well as a scientist trying to apply knowledge in a changing climate,” he said. “We need to work in teams with different backgrounds, training and knowledge that is more natural for Indigenous peoples.”

Melinda Morgan, geography and environmental studies professor at the University of New Mexico

Big idea: Tackle an outdated approach to mining

The General Mining Law of 1872 lets citizens and companies explore minerals and establish rights on federal lands without authorization from any government agency. Unlike the coal, oil, and gas industries, which pay the government for the right to extract resources from public lands, hardrock miners pay no such royalties. “It operationalizes colonization, the idea that we need to give things away in order to get people out into the American West,” Morgan said. “We just don’t need to do that. We do not need to give minerals away. When it comes to energy, there’s just no free lunch.” Though decades of reform efforts have come up short, Morgan is optimistic about new bills that would impose royalties and stronger environmental protections. But she pointed out that reformers face a new challenge: The demand for electric vehicles, recently boosted by incentives in the Inflation Reduction Act, could increase mining of lithium, cobalt and other “battery metals” and create new resistance to regulation. ✨



The revival of Fender's blue

A rare butterfly's recovery illustrates the collaborative nature of survival.

By Jaclyn Moyer

FROM THE TOP of Pigeon Butte in western Oregon's William L. Finley National Wildlife Refuge, the full width of the Willamette Valley fits into a gaze. Slung between the Coast Range and the Cascades, the valley is checkered with farmland: grass-seed fields, hazelnut orchards, vineyards. In the foreground, however, grassy meadows scattered with wildflowers and occasional oaks trace the land's contours.

Upland prairie landscapes like these once covered 685,000 acres of the Willamette Valley. By 2000, only a 10th of 1% remained. Their disappearance has meant the decline of countless species that once thrived here; some are endangered, others have disappeared. Among the nearly lost is a nickel-sized butterfly called Fender's blue.

Endemic to this valley, Fender's blue was first collected in 1929. Shortly thereafter, it vanished, and, for 50 years, no one could find

the sapphire-winged insect; it was presumed extinct. But in 1988, a 12-year-old boy netted a few in a meadow outside Eugene, and a lepidopterist officially rediscovered the butterfly the following year. It was added to the endangered species list in 2000, when fewer than 3,400 remained.

Now, the butterfly's population has quadrupled and the species is slated to be downlisted from endangered to threatened. If this status change is finalized, as is expected to happen this year, Fender's blue will become only the second insect to have recovered in the history of the Endangered Species Act.

I'd come to the Pigeon Butte prairie one May morning in search of Fender's blue because I wanted to see firsthand the particular beauty of this rare butterfly. But also, at a time when an estimated half-million insect species worldwide face extinction and

butterfly populations are shrinking at unprecedented rates, I wanted to witness the thing this creature represented — proof that amid such overwhelming loss, recovery, too, remains possible.

It wasn't until I'd given up and started back down the hill that I saw them: two blue butterflies circling near my knees. When one landed, I peered at the underside of its wing and found the double arc of black spots that differentiate Fender's blue from its more common look-alike, silvery blue.

My first thought was one of wonderment: How had this delicate creature, with its tissue-thin wings and sunflower-seed sized body, come to be flitting about on this spring morning nearly 90 years after it was declared lost forever? My second thought was less romantic: So what? In the face of an ecological crisis of such grand scale, it was hard to imagine what difference the





A Fender's blue butterfly
at Baskett Slough National
Wildlife Refuge, Oregon.
Mark V. Leppin

survival of one small blue butterfly might make.

A FEW YEARS AFTER the rediscovery of Fender's blue, a graduate student named Cheryl Schultz found herself just outside Eugene, slogging through blackberry brambles taller than her head. Here, at what is now a Bureau of Land Management area called Fir Butte, pockets of remnant prairie persisted among a snarl of woody invasives. In these openings a few dozen Fender's blues resided. Today, much has changed, and the site hosts more than 2,000.

Schultz, now a Washington State University professor, has helped lead Fender's conservation for nearly three decades. But as a kid, she didn't carry around a butterfly net. Instead, she came to butterflies by way of her interest in something else. She started her career in the years following the fiercely divisive debate over the addition of the northern spotted owl to the endangered species list. The fight pitted environmentalists against the timber industry and framed the issue as an either/or battle of good versus evil, jobs versus owls. Schultz grew wary of such dichotomies. She wanted to explore how science could help wildlife and people better share a landscape.

Trying to save Fender's blue offered a challenge well-suited to this line of inquiry. Biologists knew the butterfly's limited habitat would need to be expanded to prevent its extinction, but its range overlaid a landscape dominated by the human endeavors of agriculture, urban development and private land ownership.

Schultz began by observing Fender's blues to better understand their particular ecology: How far will a Fender's travel? How much nectar is needed to support a population? How do fires and herbicides affect the species? Then, she and her colleagues used their findings to help develop the U.S. Fish and Wildlife Service Fender's blue recovery plan. But science alone, Schultz told me, cannot enact

conservation. "Recovery takes three things," she said. "Science, time and partnerships."

PERHAPS THIS STORY of recovery begins not with an insect but with a plant: Kincaid's lupine, a perennial wildflower with palm-shaped leaves and spikes of muted purple blossoms. Like many butterflies, Fender's blue exists in tight relationship with a particular host plant. From the moment a Fender's caterpillar hatches in early summer until it unfurls from its chrysalis as an adult butterfly the following spring, the host plant — almost always Kincaid's lupine — provides its sole source of food and shelter. "They're a species pair," Tom Kaye, the executive director of the Corvallis-based nonprofit Institute for Applied Ecology, told me. "To conserve the butterfly, you have to conserve the lupine."

After the butterfly's rediscovery in 1989, researchers began searching for Kincaid's lupine. Like the insect, the plant was exceedingly rare. It grows in upland prairies, ecosystems comprised of grasses and forbs that build soil and, unless something interrupts the process, eventually give way to shrubs and trees. To remain prairie-like, a prairie requires disturbance.

In the Willamette Valley, that disturbance historically came in the form of fires managed by the Kalapuya people, who burned the prairies regularly to facilitate hunting and sustain plant communities that provided crucial foods, including camas and acorns. When settlers displaced the Kalapuya via disease, genocide and forced removal, burning ceased. The long-tended prairies, invitingly flat and graced with a mild climate and plentiful water, were swiftly plowed under for agricultural fields and

turned into settlements.

Without fire, what little prairie habitat remained began to transform: Hawthorn and poison oak encroached, fir and ash trees took root, and the diversity of grasses and flowering plants that had once flourished — including Kincaid's lupine — withered.

Researchers at the Institute for Applied Ecology have been studying Kincaid's lupine in an effort to reverse that trend since the organization's founding in 1999. Many of the conservation strategies they've developed have to do with the ways the lupine interacts with its environment, such as the symbiotic relationships it forms with mycorrhizal fungi and rhizobium bacteria. Rhizobium live in nodules attached to the lupine's roots, where, in exchange for nutrients, they provide the plant with a steady supply of fixed nitrogen. In

new restoration sites where these fungal and bacterial partners are scarce, inoculation with soil from areas currently supporting robust lupine populations can bolster the new plants' chances of success.

On a June afternoon, Kaye and I stood amid rows of flowering plants at the organization's seed production farm. The lupine was nearly ready to harvest, and Kaye lifted a pod and held it skyward. Sunlight flooded the husk to reveal the dark orbs of just two seeds cupped inside. Kincaid's lupine, he said, produces scant seeds, especially in the

wild, where predators such as weevils abound. That made it nearly impossible to collect enough for restoration. "I could hold in my hand the entire seed output of a population," Kaye told me. "Meanwhile, from a production field I could fill bags."

So he and his colleagues sought ways to boost the cultivated supply. In collaboration with the

"The worst thing that could happen to these meadows is for people to just turn around and ignore them."

Sustainability in Prisons Project, the organization established a seed production field inside the Oregon State Correctional Institution. Through this program, incarcerated people have produced tens of thousands of Kincaid's lupine seeds, and, by extension, adult plants that now host Fender's caterpillars in restored prairies across the Willamette Valley.

ONE LATE MAY MORNING, I met Soledad Diaz, an ecologist with the Institute for Applied Ecology, at Baskett Butte in the Baskett Slough National Wildlife Refuge. Here, in one of the Willamette Valley's largest restored Fender's prairies, I found her crouched with a crew of sun-hatted researchers, counting flowers to estimate available nectar resources.

Diaz gestured to my shoulder. I spun around to watch the flicker of a Fender's blue as it flitted off and landed upon a nearby lupine. "Looks like an old one," Diaz said, pointing out the tattered edges lacing the butterfly's wings. In the life of a Fender's blue, "old" means just nine or 10 days. On the slopes around us, knee-high grasses rippled and flowers bloomed: checkermallows, mariposa lily, Oregon iris, plenty of host lupine. Blue butterflies flew from plant to plant with such carefree buoyancy it was hard to remember they were urgently attending to the task of finding nectar and a mate under the ticking clock of their brief lifespan.

Most remnant populations of Kincaid's lupine are found on hills like Baskett Butte, explained Graham Evans-Peters, the Baskett Slough Refuge manager. Because steeper terrain makes farming difficult, landowners historically used these uplands for livestock rather than crops. Grazing cattle, like fires, keep woody encroachment at bay and mow down tall grasses. And, Evans-Peters told me, "They don't like lupine."

The Fish and Wildlife Service began restoring Fender's habitat at Baskett Slough in the mid-1990s. The agency removed

encroaching weeds from the existing lupine patches on the butte, then controlled invasive species on the adjacent slopes and replanted them with native vegetation. As the populations of these plants grew, so did that of Fender's blue.

Today, high-quality Fender's habitat covers over a hundred acres at Baskett Slough. But the work isn't done; the prairie must be actively managed. "One of the most important tools for holistic prairie management," Evans-Peters said, "is fire." While burning kills some Fender's larvae, it keeps meadows open and leads to such significant leaps in vigor of both nectar and host plants that the butterfly's numbers, too, rise in ensuing years.

Burning also benefits another species interaction, this one between Fender's caterpillars and their caretakers: ants. Fender's caterpillars produce nectar several ant species eat. In exchange, the ants stand guard against predators and parasites. These ant-tenders, however, don't always show up. When dense grass surrounds the caterpillars' host plants, it cools the soil, reducing ant activity, and creates a maze that prevents ants from finding the caterpillars in the lupine above. Burning cleans up this accumulated thatch, which researchers suspect is one of the reasons fire increases ant-tending. Studies show that the caterpillars' survival rates can be three times higher when the caretakers are present than when they're not.

At Baskett Slough, the Fish and Wildlife Service burns sections of the prairie annually in partnership with the Confederated Tribes of Grand Ronde, which include bands of the Kalapuya. Over the past two decades, the tribes' fire program has increasingly focused on reintroducing cultural burning practices to manage land and enhance traditional food sources. Now, due to growing interest in using fire as a tool for restoration, many agencies are seeking the tribes' expertise. "We want to get to the point where we're conducting cultural burns that have the restoration effort behind

them," Colby Drake, burn boss and natural resources manager for the Confederated Tribes, explained at a forestry summit in 2021. "The momentum is ripe right now to get that good fire on the ground."

NINETY-SIX PERCENT of the Willamette Valley is privately owned. Partnerships with private landowners such as Jim and Ed Merzenich of Oak Basin Tree Farm are crucial to conservation efforts.

At the Merzenichs' farm outside of Brownsville, a population of Fender's blues resides in a series of open meadows that spill down the southwest slope of an otherwise forested hillside. These meadows were once overrun with blackberry and isolated by surrounding stands of firs. But Jim Merzenich, working with the Fish and Wildlife Service and the Institute for Applied Ecology, has removed blackberries and cleared connecting corridors through the forest. He's now working with the Greenbelt Land Trust to establish a conservation easement to permanently protect the area.

"A lot of landowners have a fear of government interference," Merzenich told me. "But we've had no conflicts." On the contrary, partnerships with federal agencies have provided the funding and expertise to restore oak and prairie habitats on Merzenich's farm even as timber harvests continue.

When I visited Merzenich's prairie in early July, it was too late in the year to see Fender's blues flying, but Kincaid's lupine bloomed purple amid grassy meadows splashed pink with clarkia and ribboned with bands of yellow tarweed. New blackberry canes, too, were abundant, already resprouting and reaching into the open space of the recently cleared corridors. "The population here is precarious," Merzenich said. "The worst thing that could happen to these meadows is for people to just turn around and ignore them. You'd lose your lupine, lose your butterflies."

Even the most robust Fender's populations remain dependent upon humans. To keep at bay the

myriad plants ready to rush into the open space, people — restoration technicians, landowners, fire crews — must regularly mow or spray or burn the butterfly's habitat. At first glance, this can appear to undermine the significance of the species' recovery. Despite decades of conservation, the butterflies are far from self-sufficient.

But this relationship is nothing new. Without the fires tended by the Kalapuya, the prairies of the Willamette Valley, along with Fender's blue, would have vanished long ago. Nor is the entanglement unique when examined in light of the other partnerships surrounding the species — those entwining butterfly and host-plant, rhizobium bacteria and Kincaid's lupine, caterpillars and ant-tenders. Self-sufficiency, it seems, is irrelevant: Survival is a collaborative process.

Butterflies, despite their poster-child fame, are not great pollinators. Their long, slender tongues often reach nectar without touching pollen or stigma. If not pollination, what ecological purpose do they serve? Their niche is to turn plant material into food for animals like the western meadowlark, also a species of conservation concern. But Fender's most significant function might be its ability to evoke the attention, and care, of humans. "People respond to butterflies in a way that doesn't always happen with insects," Schultz said.

It's hard to imagine a coalition of scientists, farmers, incarcerated adults, government agencies, nonprofits and tribal nations coming together with such resolve on behalf of, say, a modest ant or lupine. But in the course of Fender's conservation, these organisms too — and the suite of other prairie species whose survival is bound up with the butterfly's — have benefited. So while Fender's owes its recovery to the prairie community, one could also argue that the butterfly, by recruiting the assistance of humans, has saved the prairie. The truth, I suspect, contains no such dichotomies, only a tangle of relations binding each to the rest. ☀

On Hearing the Sonic Boom of a Meteor Over Salt Lake City While Drinking Coffee with Lao-Tzu

By Christopher Cokinos

Above the mountains and the city, crashing
into stratosphere to flare unseen and crackle
-rumble like less sonorous thunder, the mystery
sound lifted our gaze from morning
coffee and an online heat map of the future sky.
We'd learn, hours later, that a venerable rock had skipped
Earth's air, skipped terrestrial catastrophe, meteoroid returning
like a ship to the vacuum-dark sea. Door-cam videos,
texts, the chatter of averted disaster : instead of mass extinction,
a Tweet. It's always like that, the moment as epoch, manifesto
of a second or maybe two : enchantments
at the edges of mortality. There was ridge
-top lightning I ran from once, then, in a way, I blessed :
that should be involuntary, like breathing, but
we grim ourselves with worry. Of course.
When has fear ever fixed trajectories
or filled your lungs?—and
it's not that your slogan's pithy fever
is mistaken, but its t-shirt doesn't help.
What if, before moisture flux convergence and polar
amplification, before Charney sensitivity, Lao-Tzu
had been right? That the only path to serenity
is to do the work then step back. Like a fossil
made of smoke, he looked up with me. We stared
at air whose crash we couldn't then name. So
I sipped. He scratched on scroll.
Made of scrub-jay digits, what was blue
-feathered bone lands in our scrawny hands
like a choice. The wake is silent. Then resumes
the granite, an outcast monarch, the locust-leaf wind.
Like me, you can use that quill
to message an empire. You can change
yourself even if the world refuses.
Take it.

WEB EXTRA Listen to
Christopher Cokinos recite his
poem at hcne.ws/sonic-boom

Forging a new generation of firefighters

A wealthy California county's fire department breaks down barriers to recruitment, training and retention.

BY DANIELLE VENTON
ILLUSTRATION BY LAUREN CROW

IT WAS NOON — AND LUNCHTIME.

Armando Jimenez and Jesús Chavez took off their hard hats and sat down at a picnic table in Memorial Park in Marin County, California. The park is bordered on three sides by a playground, a parking lot and a baseball field. If a fire threatened it, it would likely approach from the fourth side, a steep hill that was, until recently, covered with flammable brush.

Thanks to Jimenez, Chavez and their crewmates, that hillside has since been cleared of small trees, branches and twigs. Now, if a spark ignited a fire, the flames would be much less likely to climb into the treetops and start a dangerous conflagration.

Jimenez and Chavez are part of the first cohort of FIRE Foundry, a job-training program that aims to diversify the Marin County Fire Department and possibly serve as a model, not only for the firefighting profession but for the broader conservation workforce. With funding from the state of California and earnings from its own fuel-reduction services, FIRE Foundry offers its recruits full-time employment, temporary housing at the fire station, assistance with basic expenses, mental health support, tutoring, free uniforms and boots, a full scholarship at the local community college and training in emerging fire technology, including remote sensing programs and predictive services.

"I really want to see more minorities in the fire service," said 21-year-old Jimenez, who was born and raised in Mexico and sought asylum in the United States in 2010. "That's the major thing (that) made me want to join."

Despite studies suggesting that communities are best served by first responders who reflect local diversity, professional firefighters are overwhelmingly white and male — both in Marin County and nationwide. Marin is one of California's richest counties. It's also the most segregated county in the Bay Area, and so, several years ago, Fire Chief Jason Weber decided to tackle his department's diversity problem by addressing its deeper causes.

One of those causes, said Weber, is that the "feeder programs" that funnel people into the profession — volunteer and seasonal firefighting programs, junior college classes that lead to further training — offer low or no wages. "We're trying to break that mold," he said. "We're trying to break systemic cycles of poverty, generational poverty, and that has to do with the importance of a sustainable-wage career."

While the program is still in its infancy, observers say its approach could help diversify related professions in land management and restoration. "I know the (conservation) world really well, and it is and always has been dominated by white men," said Rhea Suh, current president of the Marin Community Foundation and a former leader of diversity programs for the Department of the Interior. "I am fascinated that there are people on the ground like the Marin fire chief, who's saying to himself, without any kind of outside pressure, 'We have to figure out a sustainable way to maintain our pipeline and ... if we are going to attract more people of color, more women, we need to have a different attitude and posture.'"

As the impacts of climate change deepen,

Nearly 83% of the Marin County Fire Department's 80 full-time firefighters are white men. Approximately 7.5% are white women, and an equal percentage are Latino; Asians account for just 2% of the firefighters. **None of the department's full-time firefighters are Black.** In comparison, 3% of the county's population is Black, 16% is Latino and 6% is Asian. Slightly more than half of the population is female.

In 2019, according to the Bureau of Labor Statistics, **96% of U.S. career firefighters were men** and 82% were white.

Suh pointed out, demand for workers trained in restoration and adaptation will only grow. "We know the fires are coming. We know sea-level rise is happening. Why can't we really think about the pipeline for these positions?" she asked. "These can be the great jobs of the next century."

At the lunch table, Chavez said that, at 23, he was surprised to find himself back in school, taking EMT classes. But, he said, "I have to face it. It's to become a better person for myself."

As a kid, he said, he wanted to join the fire service but didn't know how to get in. He applied for FIRE Foundry after seeing it advertised on Instagram. He soon took to the hard work, the time outdoors, and the camaraderie among his fellow firefighters.

"They get down and dirty," he said. "I like that. Everyone's close, like a whole family." ☀



Sizes are approximate

8

0.29

0.09

0.25

non-dect -0.8

Nesting Controls

8

0.29

0.09

0.25

non-dect -0.8

Nesting Controls

8

0.29

0.09

0.25

non-dect -0.8

Nesting Controls

8

0.29

82
Pb



130 micrograms

Range
vvnon-dect -0.8
2.0-717.9
2.0-53.7
4.3-717.9

Median
0.29
40.0

SE
0.09
13.94

n	mean
8	0.29
73	77.73

SE
3.76
17.84

Median
21.4
55.9

Mean
23.03
95.63

n
18
56

SE
13.94
17.84

Median
40.0

Figure - 01

Lead fragments

Pb

Cu



Freeing eagles from a deadly threat

Spurred by the toxic effects of lead ammunition on wildlife, hunters and environmentalists begin to rebuild old alliances.

BY CHRISTINE PETERSON | ILLUSTRATION BY ISRAEL VARGAS

THE GOLDEN EAGLE did not fly, even when Hannah Nikonow pulled over, climbed out of her car and approached the bird on a cold January day. As she closed the 10-foot gap between them, it drooped its head and clenched its talons, clearly distressed but incapable of moving. Nikonow threw a blanket over its head, placed it in her car and called Montana Fish, Wildlife and Parks. Then she drove to the Wild Skies Raptor Center in Potomac, Montana.

There, tests revealed the bird had 130 micrograms per deciliter of lead in its blood. Even tiny amounts of lead can be harmful to eagles, but levels above 60 micrograms per deciliter are considered clinical poisoning. Biologists administered chemical flushes to wash the lead away, but the bird died nine days later.

Nikonow encountered the eagle in the Garnet Mountains of western Montana, a place teeming with wildlife year-round and, in the fall, hunters like herself. She grew up hunting in Worland, Wyoming, and switched from lead to copper ammunition in college after she learned about the dangers lead poses to wildlife. The eagle was likely poisoned while eating a carcass killed with lead. “I can change myself, but if everyone else is still using lead ... these animals are going to die,” she said.

The debate over the use of

lead bullets by hunters has been brewing for years in hunting and conservation communities. Some environmental groups have called for a ban on the use of lead bullets in hunting, and, in 2019, the California Legislature approved one statewide. Still, many hunting groups say lead-bullet bans are just one more attack on Second Amendment rights and yet another obstacle to hunting, a pastime whose decline threatens state wildlife agencies that are funded in large part by hunting-license fees. Unlike many of today’s political battles, however, the lead-bullet debate has a growing middle ground.

“LEAD IS A TOXICANT that affects almost every system in an eagle’s body. It takes the place of essential nutrients,” said Todd Katzner, a research wildlife biologist with the U.S. Geological Survey. “It takes the place of calcium, so the lead is shunted to the bones, and then bones aren’t as strong and don’t do what they should do.” It also affects nerve function and interrupts neurotransmission, causing eagles to lose coordination and become paralyzed and convulsive as their muscles waste away.

When a lead bullet hits an animal, it doesn’t just lodge in place or pass through; it often fragments into as many as 450 pieces. And some of those pieces can travel as far as 15 inches from the bullet’s

original path, said Chris Parish, CEO of the global nonprofit The Peregrine Fund and co-founder of the North American Non-Lead Partnership. The lead not only stays in carcasses, where birds might consume it, but ends up in the carefully packaged meat in hunters’ freezers.

While ingesting lead isn’t good for anybody, eagles, vultures and condors have exceptionally acidic stomachs that break the metal down, making it easier for the poison to enter their bloodstreams. And unlike some raptors, eagles switch to a steady diet of dead animals at the start of each winter, exactly when hunting seasons end.

Parish has studied the effects of lead on raptors for decades. In the early 2000s, when he was the coordinator of Arizona’s condor reintroduction program, he and his colleagues noticed that a disproportionate number of condors were dying in the late fall and early winter. In the mid-2000s, they published research establishing a connection between the deaths and lead ammunition, and further studies have confirmed the broader effects of lead poisoning on eagles and condors. In 2016, the U.S. Fish and Wildlife Service reported that poisoning was the leading cause of bald and golden eagle mortality and that lead was the primary cause of it. Last February, Katzner and almost a dozen other researchers co-authored a paper showing that lead is also limiting golden eagle population growth.

Parish is a scientist, but he knows science doesn’t automatically lead to change: He grew up as a ranch kid in rural Southern California, where he hunted, fished and lived with people who distrusted government mandates, even those backed by science. “We commonly say that our scientific and conservation endeavors are based on a firm foundation of science,” Parish said. “Well, that’s fine. But all of that is for naught, unless you are working with the community members within the communities.”

Some hunters have criticized the push for non-lead ammunition. They wonder if lead really

does cause the problems scientists describe, and worry that other ammunition, such as copper, is less lethal than lead and not really worth the higher cost. (The cost is dropping, but at one point it was double that of lead.) And non-lead ammo is often harder to find, especially given the current ammunition shortage, which has been caused largely by pandemic hoarding and fears of restrictions under a Democratic president.

Even if hunters and state legislators could be persuaded to support new restrictions, Parish said, bans alone are unlikely to change hunting practices. A copper round looks almost identical to a lead one, rendering enforcement difficult at best. But more importantly, Parish said, “folks have to first believe there is a problem worth solving, then believe their action can help, and then, finally, be willing to make the change. Like, a diet or exercise regime sounds good to most folks, (but) turning an idea into action takes a bit more than an infomercial or reprimand.”

So he and others are working to change the narrative about non-lead ammunition by talking to hunters, offering educational programs and otherwise building relationships. Incentives have been helpful, such as giveaways of non-lead ammunition and cash drawings for hunters who make the switch or remove gut piles from the field. Sporting Lead Free, part of the Teton Raptor Center in Wyoming, leads educational ballistics workshops designed to demonstrate the efficacy of non-lead ammunition. Many states, including Wyoming, are incorporating information about non-lead ammunition in their hunter education classes.

These efforts add up, said Parish, who attends formal functions wearing a belt-buckle-sized bolo tie that’s embedded with a half-dozen ivory teeth surrounding a spent copper round. The teeth come from elk he’s killed with non-lead bullets.

“This is my life, it isn’t just a job,” he said. “And it depends on trust.”

HUNTERS, LIKE MOST PEOPLE, seldom like being told what to do. But many pride themselves on their predecessors' role in conservation history. More than a century ago, sportsmen concerned about game populations lobbied for restrictions on their own pastime.

As European settlers spread across North America, they devastated the continent's wildlife. During the first half of the 1800s, the bison population plunged from more than 30 million animals to about 1,000; elk dropped from 10 million to 41,000, pronghorn from 40 million to 12,000, and bighorn sheep fell from 1.5 million to about 85,000. The passenger pigeon went extinct, and duck populations in some places dropped by 99%. The causes included market hunting, overharvesting, habitat devastation and, especially in the case of bison, deliberate elimination of Indigenous food sources.

"Somehow, a group of hunters saw the destruction that was going on, and then, in the true American spirit, wanted to do something about it," said Land Tawney, president and CEO of Backcountry Hunters and Anglers, one of the country's fastest-growing hunting and fishing organizations. "It was kind of self-serving in some ways. It's like, 'Let's save the things so we can shoot more things.'" But it worked. In the early 1900s, market hunting largely ended. Habitat began to be protected, and much of the wildlife that remained rebounded. The conservation movement was born.

And that singular movement grew and became broader. In the 1960s and '70s, lawmakers passed the Endangered Species Act and the Wilderness Act, and established the Land and Water Conservation Fund and the Environmental Protection Agency. But as more politicians took up the cause, conservation became more explicitly political. "Instead of conservation and the environment being universal, all of a sudden that became something only being represented by one party," said Tawney. Over time, the

right generally threw its support to gun rights while the left more often backed the environment. "And it used to be both represented both," he said.

Brian Nesvik, director of Wyoming's Game and Fish Department, said that a philosophical divide also developed between groups that strongly supported preservation and those who favored sustainable use. Nesvik doesn't see those camps ever fully reuniting — the fringes will never agree — but in recent years, environmental and hunting groups have found ways to collaborate on issues such as wildlife migration corridors and habitat conservation. Non-lead ammunition, he believes, could prove to be another common cause.

ABOUT FIVE YEARS AGO, on a stretch of Wyoming's high prairie where wind turbines blink their eerie red lights at night and their blades pulse in every season, raptor researchers Vincent Slabe and Ross Crandall came up with an idea. With enough funding, they could offer hunters free boxes of non-lead ammunition and study whether the switch could help offset the number of raptors killed by wind-turbine blades.

Lead poisoning isn't the only way that humans kill eagles: The birds are also shot, either accidentally or intentionally, electrocuted by power lines, hit by cars and killed by wind farms. When wind energy companies pay fines for killing eagles under the Migratory Bird Treaty Act, as Duke Energy Renewables did in 2013, the money is used, in part, to offset future eagle deaths, largely by retrofitting powerlines. But even if all the power lines are retrofitted, Slabe said, eagles will still die. He and Crandall hoped to show that hunters switching to non-lead ammunition could be a valid source of mitigation.

The two-year study, which the researchers paused during the major ammunition shortage in the U.S., restarted again this fall. And early results show promise: Four hundred and thirty-four

hunters signed on, used \$35,000 in ammunition, and left behind 240 lead-free gut piles. Slabe can't say exactly how many eagles were saved by the use of non-lead ammunition, but preliminary numbers, he said, "are positive."

Efforts at persuasion are showing results across the West. From 2008 to 2018 in Arizona, thanks in part to a consistent hunter-education campaign, 88% of hunters in a major deer-hunting area located in critical condor habitat either switched to non-lead ammunition or removed their gut piles from the field. In 2019, that meant that condors were protected from an estimated four tons of contaminated flesh. Another study showed that the switch to non-lead ammunition in Teton County, Wyoming, has decreased lead exposure in bald eagles.

Wyoming hunter Erik Kramer picked up his first box of non-lead bullets after drawing a tag for a special hunt in Grand Teton National Park, which required non-lead ammo. Fortunately for Kramer, a nonprofit group in Jackson Hole was giving away free copper ammo to hunters willing to try it, so he took home a box. About a month later, he shot an elk, butchered it, and froze individual packages of hamburger, steaks and roasts — the same way he'd learned from his dad.

"I hadn't really considered switching to non-lead," he said. "But I thought, 'I have a box of non-lead ammo, I will hunt with it until I run out and then go back to my normal cheap Remington Core-Lokts.'" Then he noticed that the shoulders of the elk he shot with

non-lead bullets weren't as chewed up as those of elk shot with lead. The copper didn't fragment quite as badly, and the new bullets killed just as quickly. The free ammo also came with information about how lead fragments poison birds, and Kramer soon decided to make the switch permanent.

Parish and others may get some help for their anti-lead campaigns from the bipartisan Recovering America's Wildlife Act, or RAWA, which would establish new funding sources for state wildlife agencies, many of which support education and incentive programs that encourage the use of non-lead bullets. (RAWA passed the House in June and awaits a vote in the Senate.) Federal prohibitions on lead ammunition have struggled against changing political winds: Under President Barack Obama, the Department of the Interior banned the use of lead ammunition on fish and wildlife refuges, but the rule was overturned just a few days into the Trump administration. In June, the Interior Department proposed a new rule that would open 19 additional wildlife refuges to hunting and fishing but ban the use of lead on those lands.

Meanwhile, Parish and others plan to continue their efforts, which Parish emphasizes "can't be an 'us against them.'"

"The old paradigm was, 'Here's the science, it's obvious, so do the right thing.' And shaming people if they did not," he said. "Well, that's not working anymore. We have to fix it, and when I say 'we,' I mean we in conservation and we in hunting. They're the same. It's the same vat of people." ❁

"I can change myself, but if everyone else is still using lead ... these animals are going to die."

Borderlands wildlife treads a narrowing path

Remaining wildlife corridors depend on international cooperation.

BY SARAH TORY
ILLUSTRATION BY LAUREN CROW



IN LATE 2020, Emily Burns watched in dismay as construction crews graded new roads and blasted off mountaintops, hustling to finish the new border wall in southern Arizona before Donald Trump left office. Burns is the program director at the Sky Island Alliance, an environmental nonprofit focused on the mountains of southeastern Arizona and northeastern Sonora, Mexico. Each new wall section threatens the habitat connectivity that the region's wildlife — from jaguars to pronghorns — needs to thrive. “It was really painful to watch,” Burns said. “We felt like the tide was supposed to be turning, and yet that wasn't happening.”

In March 2020, Burns and I drove along a 30-mile stretch of the border while she installed wildlife cameras for a border wildlife study. When I called her in June to ask for an update on Borderlands conservation, she sighed audibly. “Just hearing that makes my heart hurt,” she said.

Nearly three years into the Biden presidency, conservationists' hopes that his administration would usher in a new era for the Borderlands are fading. But conservationists in the U.S. and Mexico have been working together for decades to protect habitat and wildlife corridors in the Sky Islands, and those alliances are gaining strength.

“IN MANY WAYS, the border is a physical problem, especially for us ecologists, but also it's such a powerful social tool,” said Zach Palma, the Mexico projects manager for the Sky Island Alliance and a former park ranger at Coronado National Memorial southeast of Tucson. The wall blocks wildlife, he said, while the political border impedes the human connections necessary to protect the ecosystem.

Conservationists have worked hard to overcome both obstacles. The Sky Island Alliance works with Mexican NGOs like Profauna A.C. (“A.C.” stands for *asociación civil*, a type of nonprofit) and builds relationships with the ranchers and *ejidatarios* — members of agricultural collectives — who are the de facto land managers in much of northern Sonora. Sky Island Alliance has hired biology graduates from rural Sonoran universities to talk with sometimes-skeptical ranchers about wildlife and conservation. Several ranches have since switched to rotational grazing to help prevent overgrazing, replanted native species, or built water-retention structures to ease the impacts of drought. Some ranchers have become educators within their own communities, sharing knowledge with neighbors, friends and family. Profauna is also working to create a complete database of Sky Islands flora and fauna.

“Both governments are contributing very few resources to the environment” in the Borderlands, said Mario Cirett-Galan, an ecologist for Profauna. “On the other hand, we have a lot of support from NGOs. That collaboration is allowing us to get a lot done on the border.” In August, Cirett-Galan and other conservationists were elated when one of Profauna's wildlife cameras in northern Sonora captured an image of “El Jefe,” a jaguar last seen nearly seven years ago in Arizona's Santa Rita Mountains. Jaguars have been nearly driven extinct in the Borderlands by human encroachment, including wall construction, but El Jefe's reappearance suggested that it is still possible for the species to move between Arizona and Sonora.

MEANWHILE, conservationists are girding for new battles. In July, the Department of

Homeland Security updated its border “remediation” plan, announcing that it would use already-appropriated money to continue construction and installation of stadium lights, including in protected areas such as Organ Pipe Cactus National Monument, San Bernardino National Wildlife Refuge and San Pedro Riparian National Conservation Area. Burns said the artificial lighting is “horrifying” for birds and other species that use these areas as migration corridors and whose survival depends on darkness.

The 30-mile stretch of border that I visited in 2020 crosses the San Rafael Valley and is one of only two major wildlife passageways along Arizona's 372-mile border with Mexico. (The other is a 62-mile segment across the Tohono O'odham Reservation west of Sasabe; smaller gaps that persist elsewhere may become important migratory corridors now that so much of the area has been walled off.) In the San Rafael Valley, the border is marked only by a vehicle fence, and the wildlife cameras the Sky Island Alliance placed along it documented 114 different species or taxa — yet more proof of what's at stake, said Burns.

One species, however, was notably absent: humans. There were 73,000 camera detections, but those that weren't wildlife were mostly cattle and livestock. Less than 2,000 were related to people, and the majority of those showed law enforcement agents and construction workers; since the U.S. government installed a series of surveillance towers, each about 160 feet tall, across the San Rafael Valley beginning in 2019, few migrants attempt to cross there. Even Burns was surprised by the results. In one of the most militarized landscapes on Earth, there are still wild places worth fighting for. ☀



In Colorado, a storied valley blooms

The San Luis Valley is raising
new traditions from multicultural roots.

By Marissa Ortega-Welch | Photos by Jimena Peck





It was 10 a.m. in San Luis, a small town in southern Colorado, and the grocery store had only been open for an hour. But already owner Devon Peña was dealing with a lot. Two workers were out with COVID-19, and the guy he'd hired to operate the forklift in the stockroom was proving unreliable. Then the butcher burst into his office and told him that all the freezers were down.

"Oh, crap," Peña said. "We're going to lose thousands of dollars' worth of meat."

The butcher and another employee began frantically moving food from the freezer into the fridges. Melting blueberries dripped blue goo onto the floor.

For the past few months, Peña had faced a string of similar emergencies. Running a business isn't easy. "I'm a professor and a farmer," he exclaimed. "I don't know how to run a grocery! I'm learning now."

This is not a typical grocery store, and Peña is not a typical grocery store owner. He's the founder and director of The Acequia Institute, a not-your-typical environmental and food justice organization that purchased the market earlier this year. Started in the 1980s and incorporated in 2006, the institute has tackled projects ranging from land restoration in the San Luis Valley to scholarship support for local students entering environmental and health fields. Peña himself is a professor of environmental anthropology at the University of Washington who divides his time between San Luis and Seattle. He sees the market as a way to merge the institute's many goals.

The San Luis grocery store, long known as the "R&R," had been in the same family for 165 years, ever since Dario Gallegos started it in 1857, making it the longest continuously operated business in Colorado. But when Gallegos' great-great-grandson, Felix Romero, decided to retire



in early 2022, nobody in the family wanted to take over. So The Acequia Institute made an offer and rebranded the R&R as the San Luis People's Market.

Luckily for Peña, Romero still lives upstairs, and he was in the store when the freezer broke down. "It's nothing major. Don't panic," he said. The freezer, which Romero purchased in the 1960s, had simply iced up. It happens all the time, he said calmly. And he asked someone to bring him a space heater, a box, and the mirror above the desk in the office.

"This is a trick I don't know about, so I've got to learn this," Peña said. Romero set the heater on top of the box in the back of the freezer and plugged it in. Then he used the mirror to look behind the freezer coils. "See? It's all iced up," he told Peña. "Now we'll just check on it and wait for it to melt. Take about an hour."

Like Romero, most people in San Luis can trace their roots back to the mid-19th century, when the valley was part of Mexico. But as in much of the rural U.S., the valley's economy — and consequently its landscape — has undergone radical changes over the past century. In the 1960s, the mountain where people had hunted and fished for more than a century was purchased by a private owner, who cut off all local access. Many residents shifted from polyculture vegetable farming to monocrop agriculture and cattle ranching. Soil health suffered, and as people ate less homegrown produce and more processed food, Type 2 diabetes, once a rare complaint here, became common.

The effects of privatization and industrialization are an old story in the rural West. Here, however, residents still remember how their grandparents — even their great-great-grandparents — used to farm this land and how they used to eat. By helping to revive and strengthen local traditions, Peña hopes to help conserve not just the land itself but the ways in which residents relate to the land and to each other. "I want to reawaken that cultural memory," he said.

The Acequia Institute, with its myriad projects, can seem chaotic, but that's because its goals are so far-reaching. Ultimately, Peña said, it's determined to do nothing less than "change the basic structures that have to do with the well-being of this community." First, though, he needs to upgrade the freezers.

THE SAN LUIS VALLEY is a bowl of high desert enclosed by two towering mountain ranges, the Sangre de Cristos and the San Juans. Besides the grocery store, the town of San Luis has a Family Dollar, a couple of restaurants, a post office, and a beautiful Catholic shrine that

"I want to reawaken that cultural memory ... change the basic structures that have to do with the well-being of this community."

In southern Colorado's San Luis Valley, members of the Move Mountains Youth Project clear sunflowers from a field where they had been planted to shelter the main crop, bolita beans (*opening pages*).

Devon Peña poses for a portrait in what had been the hardware section of the R&R Market, now the San Luis People's Market. This part of the building is slated to become a community gathering place, with a coffee shop and a corn mill to process nixtamal for tortillas (*facing*).

Linnette Ramírez and Felix Romero talk about the changes at the market in San Luis since its renaming (*below*).

sits on a mesa above Main Street. From almost anywhere in town, it's easy to see Culebra Peak, the 14,000-foot-tall mountain that locals simply call "La Sierra" — The Mountain. La Sierra, and the water from its snowmelt, have always loomed large here.

Culebra Creek, which begins high on La Sierra, runs down the mountain and through the valley on its way to the Rio Grande. After it passes through the town of San Luis, some of its water is diverted into a diagonal canal — the San Luis People's Ditch. On the valley's main highway, just above the point where the canal ducks under the road, a commemorative plaque lists the names of the 29 settlers who founded San Luis and dug the ditch.

In the 1840s, the Mexican government granted almost a million acres of valley land to settlers living near Taos, in what we now call New Mexico, to encourage them to move north. The land grants displaced the Ute, Jicarilla Apache, Diné and other tribes, forcing them to the west and south. When Mexico ceded the territory to the U.S. after the Mexican-American War, the U.S. honored the land grant, and San Luis later became the first town in the state of Colorado. From its start, the town was multicultural and multinational, including direct descendants of Mexicans, Indigenous peoples and Spanish colonists.

The town organized itself around an *acequia* system, a Southwestern institution influenced by Spanish, Arabic and Indigenous cultures. Practically speaking, acequias are irrigation ditches that deliver water from streams





to agricultural fields. Culturally, however, they are much more than that. The irrigators agree to share the available water equally, and each participant contributes equally to ditch maintenance. The land-grant recipients divided the valley into long skinny strips called *varas*, so that every landowner had access to acequia water. The mountain itself was communal land, where all valley residents could graze their animals, hunt and gather firewood. Year after year, residents rotated their livestock between the valley and the mountain, giving the pasture in each place a chance to recover. These traditions continued on La Sierra well into the 20th century.

Shirley Romero Otero remembers going to the mountain as a kid with her family and neighbors. “We would bring a lunch and have a picnic, and the kids would run all over the place while the adults gathered wood,” she said. The usual practice was to gather firewood for one family one day and for another the next, so that everyone had enough to get through the long cold winters.

Otero is a retired classroom teacher, a community organizer and the executive director of the Move Mountains Youth Project, which provides educational opportunities for local youth. She’s a descendant of the original land-grant settlers. She drove me from town up toward the mountain, parking where the road ended at a gate, beyond which lay the meadow where she played as a child.

In 1960, when Otero was 5, Jack Taylor, a lumberman from North Carolina, purchased Culebra Peak and almost 80,000 acres of surrounding ridgeline. He put up locked gates and “No Trespassing” signs across the roads that led from the town up the mountain.

Otero left the valley for college, but then, inspired by the era’s Chicano rights movement, she came home to organize a lawsuit against Taylor for blocking local access to the mountain. In 1981, a group of valley residents called the Land Rights Council filed a class action lawsuit. The battle would last two decades.

IN 1984, A FEW YEARS into the struggle to regain access to La Sierra, Peña began visiting San Luis. At the time he was a professor at Colorado College, a liberal arts school in Colorado Springs, and a fellow professor brought him to the area to meet some solar power activists. The region interested Peña as an environmental anthropologist, and it reminded him of his hometown, Laredo, Texas, which was also settled through a land grant. He began spending more time in the valley, and he moved here permanently in 1991.

Peña and Otero did not start out as friends. In the 1990s, while Otero’s organization continued its lawsuit against the Taylor Ranch, Peña became involved in a separate fight to purchase the mountain for the community. Otero’s group opposed this effort on principle, because they

believed that the mountain should not — indeed, could not — be bought or sold.

The movement to buy La Sierra fizzled when Jack Taylor’s son, Zach, inherited the property and refused to cooperate. Later, Peña sent a pound of coffee and a box of cigars to Otero as a peace offering and asked to meet and talk. That was when things began to shift between them, Otero said.

In 2002, the court finally ruled in favor of the town residents. The owners of the *vara* strips that had originally had access to the mountain could once again gather firewood and graze their animals there. Since then, the mountain has changed hands many times, with the most recent owner being Bruce Harrison, heir to a Texas oil fortune. Each new owner inherits the land’s legal history and often ends up back in court with the locals.

Otero now has a key to the gate on the road to the meadow. She can collect firewood on the mountain, but she says it’s not the same as it used to be. Since her access is limited to a few utilitarian purposes, she can’t experience the land the way she did as a kid. “We didn’t get the right to hunt, fish, picnic or gather our medicinal herbs,” she said. “And those are big losses.” As a Chicana with both Spanish and Jicarilla Apache ancestry, Otero sees the privatization of the mountain as part of a cycle of displacement. “We displaced the Indigenous folks for the sake of land grabbing,” she said. And then, after the

United States took over the region, the Mexican land-grant descendants were viewed as second-class citizens and were pushed off their land.

Otero and Peña say that the lack of access to the mountain dramatically changed both the town's economy and the surrounding landscape. Ranchers who previously followed the life cycle of the grasses up and down the mountain had to keep their cattle in the valley, which led to overgrazing. To replace the native grasses the cows used to eat on the mountain, farmers began growing alfalfa, which took a toll on the soil. No one was growing vegetables anymore, so the locals had to buy produce that came from elsewhere. Many farmers gave up and moved away.

"It's not just the soil that's been eroded," Peña says, "but our customary norms of conservation. They've been severely eroded as well." He thinks people forgot how to live in close relationship with the land: "Being kept off the mountain for about 50 years created a kind of weird disconnect." Now, both Peña and Otero are trying to repair that disconnect.

DOWNSTREAM from the roadside plaque that commemorates the establishment of the town's water rights, the People's Ditch and Culebra Creek run almost parallel to each other. Just west of Main Street, they cross a large plot of land owned by The Acequia Institute. In 2005, Peña's father used his estate to help Peña purchase this 181-acre vara strip and start the institute. The creek meanders through the land's meadowy center, while the ditch borders the northern side. On one side of the creek is a field planted with beans and peas; on the other, the land slopes upward into sagebrush and then piñon habitat.

When Peña first bought the land, it wasn't pretty. The previous owner, a cattle rancher, grew alfalfa and irrigated his fields using a center pivot, the giant rotating sprinkler systems common on industrial farmlands. He let his cattle graze in the creek bed. "It was a disaster," Peña said. "The river was so degraded. All the banks were caving in."

Peña put up a fence to keep the cattle on one side of the ranch and allow the creek and upland habitat to recover. Almost 20 years later, willows and cottonwoods stand along the creek. Native blue grama grasses are growing among the sagebrush. "It's all come back," Peña said. "A beautiful regenerative ecological restoration is happening. And it's basically the land doing it itself. All we did was kick the livestock out."

He's switched the farm from a monoculture to a polyculture — growing vegetables like corn, bolita beans and peas, all of which will be sold at the San Luis People's Market. Peña says polyculture farming is better for the soil. And he's



returned to the traditional method of flooding his fields with water from the acequia. Flood irrigation is not the most efficient use of water, but it mimics the creek's natural flooding processes, enriching the soil with mineral sediment from the mountains and creating wetland habitat for birds and other animals. In dry years, Peña said, he'll still need to use drip irrigation, but he'll switch to flooding whenever he can.

The land serves as a working classroom for Peña's students and the local farmers, modeling the agricultural traditions of the valley and of acequia culture in general. The Institute also helps fund Indigenous food sovereignty efforts across the country, from Texas to Alaska. Peña believes that cultural history is key to environmental conservation. "My whole theory is that you cannot pull this off unless a community has a cultural memory of certain things," Peña said. "And people here remember how they used to eat."

What about those who lack those memories, or have no other connections to a landscape? "We can draw from our own ancestors," Peña said. "You have to find out who your great-great-grandma was." He added that it's possible to learn — and learn respectfully — from customs that aren't your own: In the San Luis Valley, for example, farmers grow Native American crops and use a water-governance system with Arabic roots. The system of vara strips is believed to date back to 5th century Europe, when it was developed by the Visigoths.

Shirley Romero Otero, founder of the Move Mountains Youth Project, poses for a portrait with La Sierra, the mountain that was once communal land for the San Luis community, behind her (*facing*).

Alonzo Lobato, with his granddaughter Aspen and daughter Alexis, opens the gate that separates their property from La Sierra. A lawsuit has restored access to the area where generations of the Lobato family have grazed their cattle (*above*).

There's a lot to be learned from the work of The Acequia Institute, but it is not something that can necessarily be scaled up or easily replicated. Rather, the institute represents a radical way of thinking about environmental conservation, one that is less about finding the most efficient way to use water or grow food and more about imagining, or reviving, an economy within which people create meaningful relationships with each other and the land.

Ethnobiologist Gary Nabhan, who has worked with Peña, said The Acequia Institute is teaching living history. "This isn't just retro or nostalgia," he said. "It has importance in the future." In a future with more demands on a decreasing water supply, the ability to work together through times of scarcity will prove crucial to survival.

"OUR LITTLE FARMERS! Good morning, gentlemen!"

On a Tuesday after a three-day weekend,

Alonzo Lobato opens the ditch to irrigate the soil where beans, peas and habas are growing (right). Lobato holds a San Luis pea pod that he just picked from the fields. He has been growing native crops in hopes of recovering the quality, resistance and nutritional value of the heirloom varieties (below).



Otero greeted a group of teenage boys, all of whom had somehow managed to arrive on time for their summer job at 8 a.m.

“Thanks for showing up. I know it’s rough,” Otero said.

The institute received a grant last year to partner with Otero’s Move Mountains Youth Project. The grant pays local farmers to convert an acre of their alfalfa or hay to vegetables, and the farmers train the youth in exchange for help in the fields. The farmers get to keep a percentage of the crop, and the rest will be sold at the market.

On this day, the teens used a seeder to plant lines of corn in a plot of county-owned farmland. Alonzo Lobato, one of the adult farmers, guided the boys. “Make sure you guys don’t get too excited planting the seeds, because then they come out too close,” he told them.

Fifteen-year-old Amado Montoya used a hoe to make rows in the field for planting. He was wearing a Cabela’s ball cap and red suspenders over his T-shirt. Montoya, who lives on a ranch with his grandfather, said he enjoys this work because it teaches him about the land. “Land is a way of life. And it just provides for the people — like the corn that we’re planting now is gonna go to the San Luis People’s Market.”

“The youth we’re working with are one of two generations that have been removed because of people not growing food anymore,” Otero said. “We’re trying to revive those practices and keep them alive in order to come up with the next generation of farmers.”

Even more than teaching young people to farm, though, Otero wants to use farming as a way to help them connect with the land and their community. It’s a connection that she formed

when she was a child, spending her summers on the mountain, running in the meadow and playing in the creek. “Our youth have not been able to go up there and enjoy that,” she said. “I would love to take them camping up there, to teach them mitigation, forest restoration, the love of the resources — just so they could set their feet on the ground.” Instead, she ends up driving them three hours to Crested Butte every summer to camp. “That’s the irony, when it’s all right here.”

“We’re going to turn on this pipeline pretty soon,” Lobato told the youth. Because of the drought this year, Lobato is using well water to irrigate this plot. The teens helped him line up the irrigation with their planted rows of corn. “OK, I think we’re ready to rock and roll!” Lobato said. He switched on the electrical pump to the well, and water gushed out of the pipe gates, flowing in glistening lines down the rows of corn the youth planted.

“I love that sound!” Otero said. “Irrigating — it’s like a ritual. We’re lucky we got water.”

IT WAS 8 A.M., and the grocery store wouldn’t open for another hour, though the customers didn’t seem to know that. As Peña pulled baskets of Red Delicious apples and navel oranges out of the produce fridge and set them on shelves at the front of the store, someone popped in to ask if he could buy *tripa* for menudo. “Let me see what I can do,” Peña said. He went back to the office, where the staff were having a meeting, and asked the butcher. But she hadn’t had a chance to prepare the meat counter, so Peña returned to the customer. “Do you mind waiting?” he asked.

Peña helps out a lot at the store. His goal,

however, is for the business to one day be run as a cooperative by the staff, many of whom have worked there for years. Peña has a lot of other plans, too: By the end of the summer, the Red Delicious apples on the shelves will be replaced by local produce grown by farmers working with the institute. Within a year, the store expects to open a commercial kitchen, complete with volcanic rock corn mills for making traditional tortillas, and it will start offering cooking and nutrition classes featuring valley produce. And The Acequia Institute just received an endowment from the Ceres Trust to provide no-interest loans to local women and young adults who want to start their own farms — an echo of the mutual aid society that started in 1900 to support valley farmers through times of hardship. Every project is ambitious, and each will require time, effort and lots of supporters.

“WHAT’S UP, BROTHER?” A few minutes before the store opened, another young man popped his head in. He’d supplied the cement for the store’s new floors, but today he was a customer, hoping to have a key made in the hardware section.

Peña told him they weren’t quite open yet, and thanked him for waiting.

“You’ve got my business, brother,” the customer assured him, as he left to wait in his car.

“*Gracias, hermano.* I truly do appreciate that.”

“I love that sort of relationality,” he said after the man left. “In a way, it slows down what we do. But that’s OK. You can have all the refrigeration up to date and the nicest building, but if the relationships don’t work and people don’t have the commitment, it won’t survive.” ☀

The extremism vaccine

Amid rising political tensions, one strategy can inoculate communities against anti-government ideologies.

BY SARAH TRENT | ILLUSTRATION BY LAUREN CROW

ON JAN. 2, 2016, ARMED anti-government extremists led by Ammon and Ryan Bundy occupied the headquarters of the Malheur National Wildlife Refuge in eastern Oregon's Harney County. They'd hoped to ignite a national uprising against federal land management, but after 41 days, they accomplished little beyond creating a \$2 million mess of trash and trenches. After the Bundys were acquitted of conspiracy and weapons charges, Ammon led an attack on the Idaho Statehouse in 2020 and urged his followers to travel to Washington, D.C., for the rally that preceded the Jan. 6 storming of the U.S. Capitol. Now he's running for governor of Idaho.

Meanwhile, in Harney County, the work of conserving the refuge and its surrounding rangelands has continued almost uninterrupted. Here, locals consider the occupation a mere bump in the road — though its failure was no accident, according to political ecologist Peter Walker, whose book, *Sagebrush Collaboration*, tracks the refuge takeover from start to fizzle. Thanks in large part to a land-management strategy that local ranchers, conservationists and federal employees developed 15 years before the Bundys arrived, the community was

largely inoculated against their simplistic solutions and fiery but empty rhetoric. Through years of homegrown collaboration led in part by the nonprofit High Desert Partnership, the community was already tackling many of the issues that inspired the Bundys to take up arms: fences, water access, poverty. To many locals, these were not ideological struggles, but tangible problems they were solving together.

Western states are home to the vast majority of public lands, and anti-government sentiment runs deep in the region. Nearly three-quarters of Harney County is managed by federal agencies for logging, grazing, conservation and other purposes; agriculture and forestry drive the economy, and cows outnumber people by 14-to-1. Frustration with agencies is common, especially in places where livelihoods depend on land-management decisions, and for more than a century, extremists have periodically harnessed that tension for their own ends. Researchers say that recent national and global upheavals — economic recession, the pandemic and the accelerating effects of climate change — have encouraged a further embrace of extremist views, as people on both

left and right feel increasingly helpless in the face of disaster and ignored by those in power.

Harney County's approach is, in many ways, an antidote to that sense of alienation. "Very few people would go away from one of our collaborative meetings saying they weren't heard," said Brenda Smith, director of the High Desert Partnership, which now oversees six collaboratives working on issues from wildfire prevention to youth empowerment. The organization was founded in 2005 by Gary Marshall, a local rancher, and Chad Karges, then director of the Malheur Wildlife Refuge, who realized that the area's history of litigation and conflict over public lands had created more problems than solutions. Today, Karges said, restoration work on Forest Service land is generating biomass that heats local institutions; planned fire-resilience projects on Bureau of Land Management acreage involve a once-unlikely alliance of ranchers, scientists, tribal members and government staffers; and refuge staff have partnered with nearby landowners to remove invasive carp. None of this was possible 20 years ago, he said, and the collaboratives are still gaining momentum.

Interest in collaborative conservation is rising across the West. "It's the direction a lot of communities are moving," said Walker, who is now studying southern Oregon collaboratives that were created to manage wildfire risk. The approach is well-suited to the complex problems facing society today, said Peter Harkema, who leads Oregon Consensus, a state program for resolving public policy disputes that has facilitated several collaboratives in Harney County. "There's a recognition that in many cases no one entity, no agency, no decision-maker can really solve it on their own," he said.

Which is not to say the work is easy: Karges said it took two years to overcome the initial distrust between the conservation and agriculture communities. Friendly relationships had to be established before a single formal meeting could be held. While many community leaders and funders are used to pushing their pet agendas, that strategy doesn't work here, Smith stressed. Instead, she said, participants need to trust that a shared mission will emerge from the process itself. Harkema added that the process only works when "the full diversity of perspectives are willing to engage."

This kind of inclusive collaboration, Harkema said, is more vital than ever. "Every opportunity we have to bring people together across our divisions, to understand one another, to work together, to see and cultivate community — those are important, and they're especially important right now." ☀



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From top: Estee Rivera; Greg Hanscom and Pam Peters; Michael Leveton; Tammy York, Gary Love and KHowe; and Raynelle Rino.
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—Richard Posey, Beaver Creek, Ohio (pictured with his wife, Anne)



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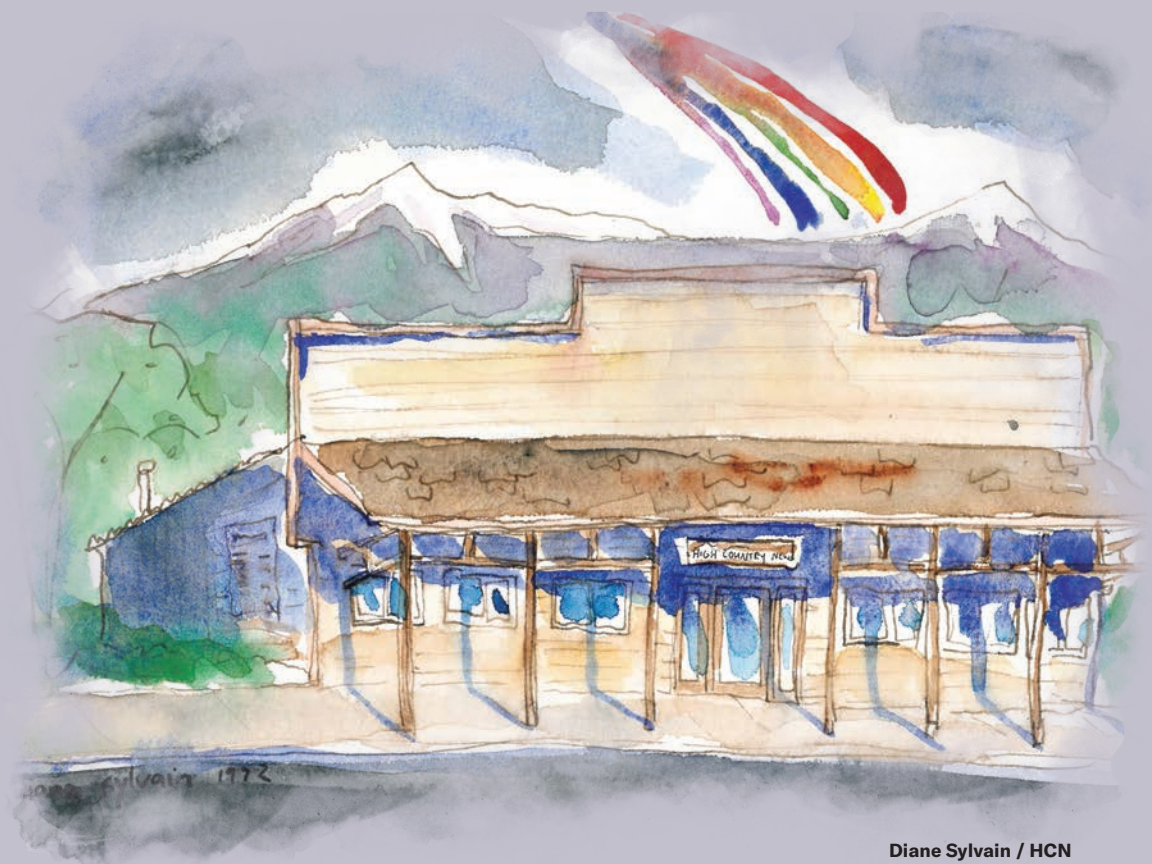
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DEAR FRIENDS



Diane Sylvain / HCN

Goodbye to Grand Avenue, but not to Paonia

The *High Country News* board of directors met in Seattle in September to approve our annual budget and kick off a strategic planning process that will result in a road map for the organization for the next three years. It was only the second time we've been able to meet in person since COVID hit, and it was wonderful to see each other face-to-face again.

Perhaps the biggest news to come out of the meeting was the decision to sell *HCN's* office building in Paonia, Colorado. It's an idea that has been percolating for several years now, and we didn't make the decision lightly. But we're excited about what this represents: a new chapter for *HCN*, in which we'll grow and spread our roots across the West.

Paonia is still *HCN's* home base, as it has been since 1983, the year Ed and Betsy Marston took the helm and moved what was then a 16-page newspaper to Colorado from its birthplace in Lander, Wyoming. We simply don't need as much space as we did when we had our entire

staff and all our equipment under one roof. We still have 12 full- or part-time employees who live in the North Fork Valley, though only a handful still use the office. Most moved to home offices when COVID arrived and are happy working there. The rest of our 30-odd employees are now scattered from Tucson, Arizona, to Moscow, Idaho, and from Seattle to Santa Fe. Tools like Zoom and Slack allow us to stay in touch while enabling staffers to put their boots on the ground in the many communities we cover.

Moving forward, we plan to rent a small office in Paonia for our customer service team and provide a few shared desks for others who need a temporary place to work. It won't be the same as our old sun-filled offices at the end of Grand Avenue, but we'll still be around, and we'll be happy to visit with any readers who pass through the area.

—Greg Hanscom,
executive director and publisher

Salutes to departing board members

Two members of *HCN's* board stepped down this fall, and will be dearly missed.

Laura Helmuth has been a role model for many of *HCN's* editors and writers. She joined our board in 2014, when she was an editor at *Slate*, and served in top positions at *National Geographic* and the *Washington Post* before landing in her current post as editor-in-chief at *Scientific American*.



(In 2020, *SciAm* made its first-ever endorsement of a presidential candidate, Joe Biden. Laura says the handful of folks who canceled subscriptions in response were far outnumbered by the wave of new folks drawn to the magazine for having such guts.) Laura was a quiet leader on the board, ever supportive of staff and committed to our work on justice, equity, diversity and inclusion. When she spoke, people listened.

Departing board member **Seth Cothrun** has had many productive professional detours, including fighting wildland fires and serving five years at the Tucson-based Sonoran Institute. He now works for a multitrillion-dollar international financial



management firm. Seth was instrumental in instituting best practices for financial planning and management at *HCN*, and he committed many hours of his time to

training sessions with senior staff. We're forever grateful to him for helping us make this a more professional, and sustainable, organization, and for encouraging us to build reserves that will safeguard *HCN* during turbulent times.



Carving a future for the Tongass

In Southeast Alaska, youth help manage a forest
and protect an ancient art.

Photos by Bethany Sonsini Goodrich
Text by Victoria Petersen



Allison Mills cradles a core from a western redcedar between her fingertips. Mills, who is Tlingit and Haida, and other members of the Prince of Wales chapter of the Alaskan Youth Stewards program collected data on red and yellow cedar trees that meet the stringent requirements for cultural uses, such as totem pole and dugout canoe carving. Trees of this quality are increasingly rare.



ALLISON MILLS MANUALLY DRILLED A BIT into the base of a massive yellow cedar tree on Prince of Wales Island, in Southeast Alaska. The drizzly August day filled with the dull squeak of metal rubbing against wood. Once she reached the center of the tree, she gently pulled the delicate core sample free, lifted it to her face and inhaled the wood's slightly spicy, medicinal scent. "I love the smell so much," she said.

Mills, 16, is Tlingit and Haida, and had enthusiastically volunteered for the task. She is part of the Prince of Wales Island chapter of the Alaskan Youth Stewards, or AYS, a collaborative program that provides job experience, teaches leadership skills and gives rural youth a chance to support their communities and cultures. For 10 weeks this summer, her crew worked on natural resource and cultural stewardship projects serving their community. The session culminated in a four-day camping trip in a remote forested area, where the crew members searched for trees that might someday be transformed into totem poles or dugout canoes. The search — and the program itself — are part of a regionwide revitalization of carving and other cultural wood practices.

The crew was exploring the Tongass National Forest, the largest national forest in the United States and the largest intact temperate rainforest in the world. At 16.7 million acres, it stretches across more than a thousand islands and encompasses 32 communities in Southeast Alaska. The forest sequesters carbon, provides drinking water and hydropower for thousands of people, and supports large fish and wildlife populations. It's the foundation for sustenance, culture and a way of life for the Tlingit, Haida and Tsimshian, who have lived in the region for millennia.

Over the last several centuries, Russians, Europeans and Americans colonized the region, and between 1902 and 1909, the U.S. government established the national forest on Tlingit, Haida and Tsimshian homelands. The logging industry boomed a few decades later, with the first large-scale mills built in the 1950s. Global, state and national interest in the region's timber intensified, peaking in the 1990s, when thousands of loggers clear-cut more than 1 million acres, taking out half of the forest's



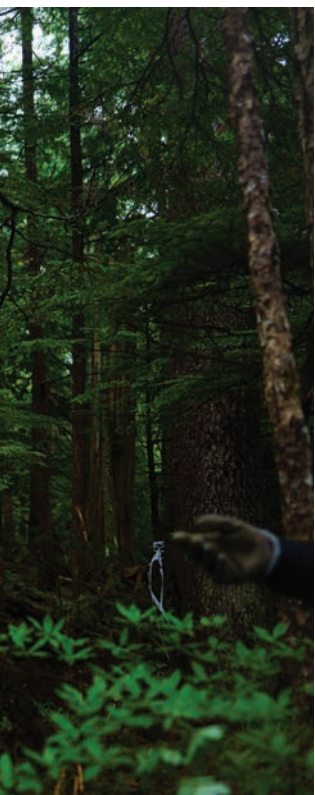


Mills uses a clinometer to estimate the height of a cedar tree, a skill the Alaskan Youth Stewards crew learned from foresters with the United States Forest Service and Sealaska, an Alaska Native Corporation. Indigenous carvers, builders and weavers worked with tribal governments and local land managers to outline the ideal attributes of trees for cultural use, including size, minimal trunk twist, location, concentration and distribution of branches, and more. Cultural-use harvests, which are selective and much smaller in scale than timber harvests, are part of a land-management shift focused on sustainability rather than short-term economic gain (*left*).

Michael Melendrez of the Forest Service takes measurements with Olivia Vickers of Alaskan Youth Stewards. AYS is a partnership among the Forest Service, Sealaska, local and regional sovereign tribal governments, community and conservation organizations, school districts, the National Forest Foundation and others. Forest Service personnel joined the AYS crew for a field day to answer questions and support the crew members as they collected data. The information they gathered will join a growing database documenting trees suitable for cultural uses (*below, left*).

Justin Reno measures the diameter of a tree. Reno, a Forest Service employee, grew up on Prince of Wales Island. Programs like the Alaskan Youth Stewards initiative are meant to boost local and Alaska Native representation in outdoor and natural resource jobs (*below, center*).

Alaskan Youth Stewards crew members take turns measuring the diameter of each cedar tree they inventory. Participants are paid for their work, during which they learn about data collection and river restoration as well as teamwork and responsibility. AYS prepares crew members for culturally relevant careers working on the lands and waters of their rural communities (*below*).



“I love learning about our forest and our village, and learning how I can help protect it.”

old-growth trees. Clear-cutting remains a threat, since federal management of the forest changes with each administration. Tribal nations and local residents have sought more involvement in managing the forest, but tribal governments have at times felt that federal agencies have discounted or overlooked their expertise.

The AYS program may be helping to change that. Founded in 2017, it's a partnership among tribal governments, tribal corporations, conservation groups, federal and state agencies, nonprofits and community organizations.

AFTER LETTING HER FELLOW crew members smell the core, Mills carefully placed it in a protective container to be shipped to the College of Wooster Tree Ring Lab, in Ohio. Scientists will analyze it to better understand the decline of yellow cedar in Alaska and Canada, and how much of it is driven by climate change.

Meanwhile, four other crew members got to work assessing the tree. They measured the trunk's circumference and height, looking for a minimum of 34 inches around and a height of at least 36 feet. They perched on fallen moss-covered logs to observe the twist of the trunk and the number of limbs and knots that obscured its face, factors that can hamper carving. They shouted the numbers to another crew member, who sat on the damp, spongy forest floor, recording data on a U.S. Forest Service-issued tablet. The information will join a database of trees that have the right characteristics for cultural uses.

It's not clear how many of the rare forest giants known as monument trees are left. This inventory is part of an effort to shift away from unsustainable logging toward long-term management that supports cultural needs and new growth. “I love learning about our forest and our village, and learning how I can help protect it,” Mills said. “So even someday when I'm older, I can show my kids and grandkids everything, and just be able to have this beautiful place stay alive.”

Charlene Wolfe (Haida name: *Jaat Giigangaa*), a Haida and Tlingit carver from Craig, joined the search for totem trees on the last day of the campout, sharing her knowledge of trees suitable for carving. Wolfe told stories about growing up on the island and about her art, and she spoke of the hope local youth inspire. “I think it's pretty phenomenal to see these kids out here, learning the things that they're doing,” Wolfe said. “They're the future. ... We lost out on a lot of this because our culture, our native language, was taken away from us.” Forced assimilation included federal bans on cultural practices. “But we're coming back stronger now. These kids here already have two steps ahead of what we had back in the day.”

After breaking camp, the crew traveled to the town of Klawock and met with Jon Rowan Jr. (Tlingit name: *Tooyeek*), a Pueblo and Tlingit carver



and teacher, to get an idea of the possible fate of the trees they cataloged. Still in their muddy camp clothes, they gathered around a half-carved log inside Rowan's carving shed, a large shop filled with loud rock music, the scent of cedar and piles of wood shavings. Rowan talked about the spark he felt the first time he saw a totem pole being carved in Klawock, in the 1990s. At that time, the practice of carving was rare in the area. “Now it's happening all over the place,” he said. “It's really cool.”

The recent resurgence is part of a larger push toward community and cultural healing. Healing is happening in the woods where AYS crews work on rehabilitation projects and catalog cultural-use trees, in the carving sheds where the doors are always open, and at the pole-raising events that bring everyone together to celebrate.

“I feel like it's a really cool thing that we're doing, being able to look at all the different cedars and decide which ones are good for people in the future,” Mills said. “Maybe they won't be used, but it's still cool to have those trees noticed so that carvers could maybe one day be like, ‘Oh, yeah, that is a good tree.’” ✨

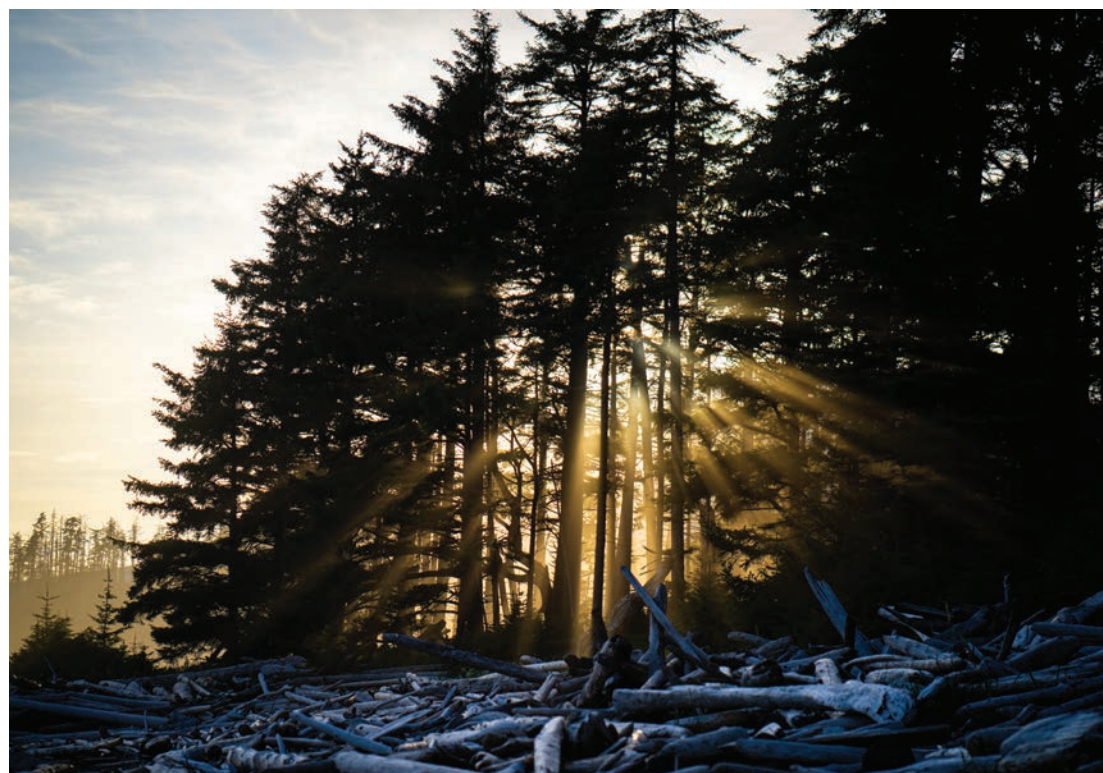
Editor's note: Photographer Bethany Sonsini Goodrich is an employee of the Sitka Conservation Society, a member of the Sustainable Southeast Partnership, a collaborative of community organizations, tribal governments, native corporations, land managers and others that supports the Alaskan Youth Stewards program.



Elizabeth Thomas (Tlingit name: *Kinda.aat*), who helps oversee the regional Alaskan Youth Stewards program, cores a cedar tree. For Thomas, who works for the Central Council of the Tlingit and Haida Indian Tribes of Alaska, supporting the health of the local environment begins with equipping rural and Indigenous youth with the skills, confidence and experience needed for land-management positions (*above*).

Allison Mills shows her grandfather, Edward Thomas (Tlingit names: *TSA Xoo* and *Shaans Kadake*; Haida name: *Skil Quidaunce*), president emeritus of the Tlingit and Haida Central Council, a core that she collected from a cedar tree. Mills, whose father works with Sealaska, was eager to share her new skills with the family members who inspired her desire to work in forestry. As an aspiring land and resource manager, Mills may one day make decisions about this forest that help sustain it, and the cultural practices it supports, into the future (*above, right*).

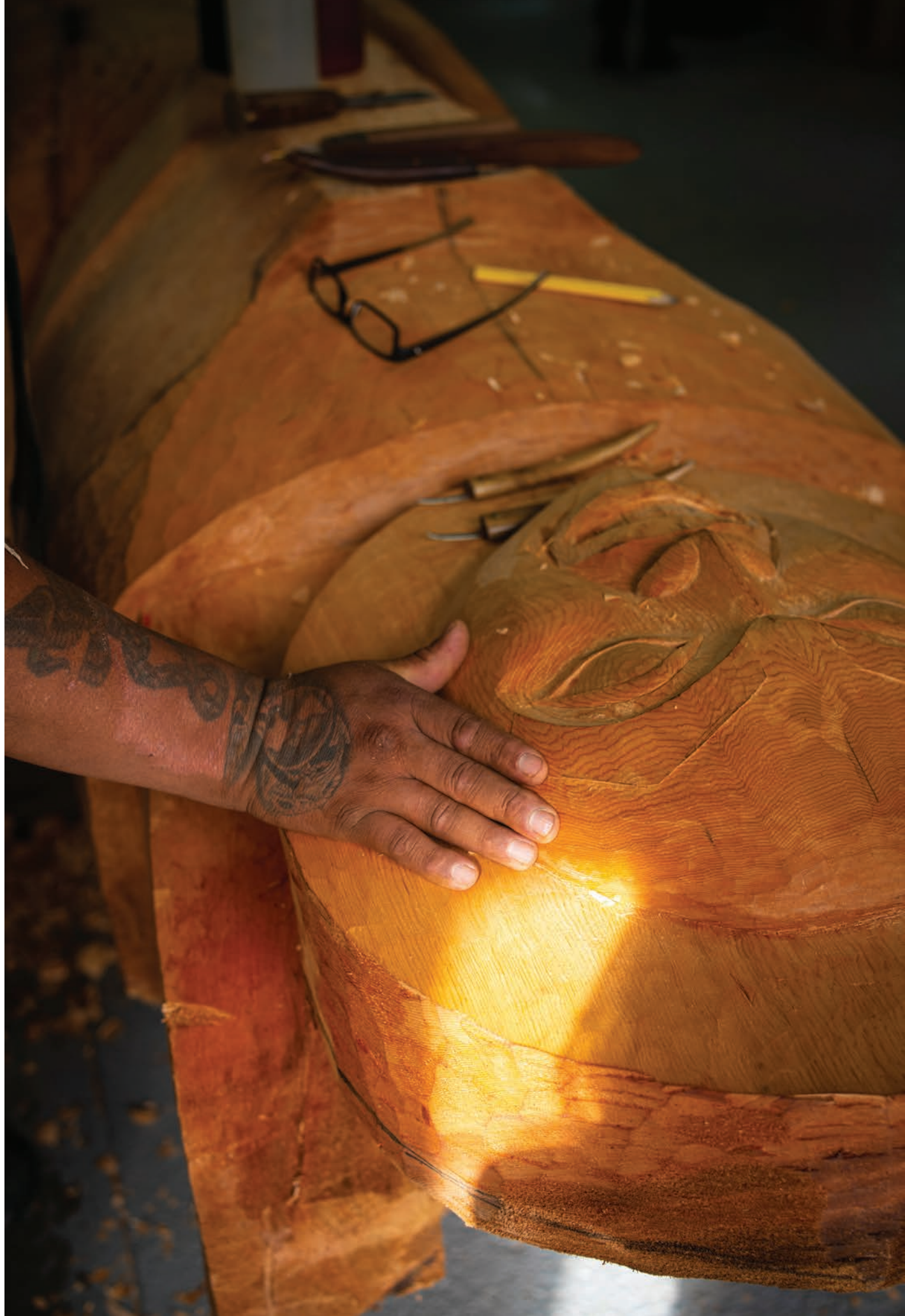
The sun sets through the Tongass National Forest; loggers have clear-cut half the forest's old-growth trees. During the 20th century, federal management often prioritized timber interests over the needs of Alaska Native communities, and high-value cedar trees were logged and exported. Forging stronger relationships among tribal governments, federal agencies, land managers and local youth is a first step toward improving overall management practices (*right*).



At his carving shed in Klawock, Jon Rowan Jr. (Tlingit name: *Tooyeek*) rests his hand on a pole with crests belonging to the Ishkikhittaan people.

Rowan and two young apprentices are carving it as part of the Kootéeyaa Deiyi (Totem Pole Trail) for the Juneau waterfront. The trail is a project of the Sealaska Heritage Institute, an Alaska Native nonprofit that promotes Tlingit, Haida and Tsimshian culture. Its existence highlights the cultural value of large trees, as well as the contribution that selective harvesting can make to the region's tourist economy. Trees large enough for totem poles typically take more than 450 years to grow (*right*).

A totem park sits in the heart of Hydaburg, beside the school. The practice of carving and raising totem poles and then letting them return to the earth has been part of the rhythm of life here for thousands of years. Carvers, land managers, culture bearers and local youth are working hard to care for the old-growth forest that sustains this practice and the lifeways tied to it, determined to help them endure for thousands of years to come (*facing, bottom*).





TJ Young (Haida name: *Sgwaayaans*) blasts Elvis Presley from his boombox while smoothing the curves of a pole he is carving in Hydaburg for the Juneau waterfront project. Young grew up in Hydaburg, a Haida community with fewer than 400 year-round residents and a thriving carving community. As a child, Young remembers being excited to buy new books of photos by master carvers, which he would share with friends. Today, he mentors local youth (*left*).

In Klawock, Jon Rowan Jr. (Tlingit name: *Tooyeek*) discusses totem pole carving with the Alaskan Youth Stewards crew and learns about their experiences in the forest. One of his current apprentices served on the 2021 AYS crew. In 50 years of carving, Rowan has completed about 30 poles and trained many young carvers (*below*).



Bethany Sonsini Goodrich is a Southeast Alaskan writer and photographer who is deeply passionate about the power of story to inspire positive social and environmental change. When she's not behind the camera, you'll find her hunting, fishing, foraging, surfing, playing or sharing all sorts of tasty wild foods in the Tongass National Forest — her home.

Victoria Petersen is a freelance journalist living in Anchorage, Alaska. Previously, she was a reporting fellow at *The New York Times* and a *High Country News* intern. Follow her @vgpetersen

This project was supported by a 2022 *High Country News* Western Communities photo essay grant.

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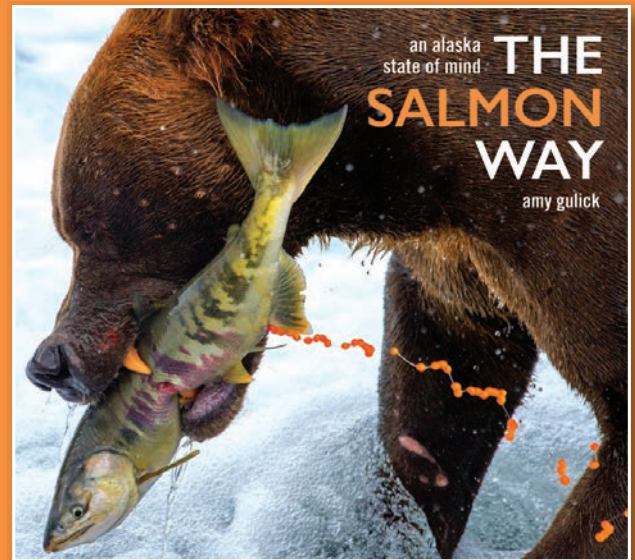
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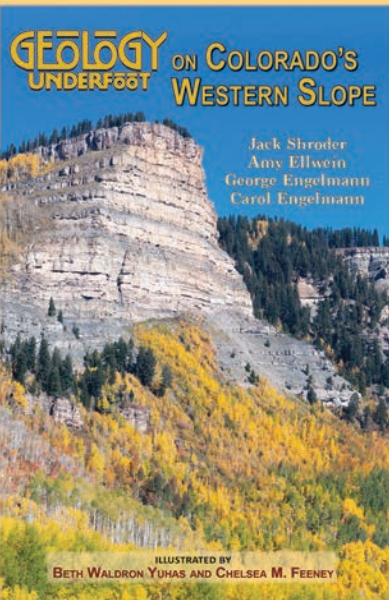
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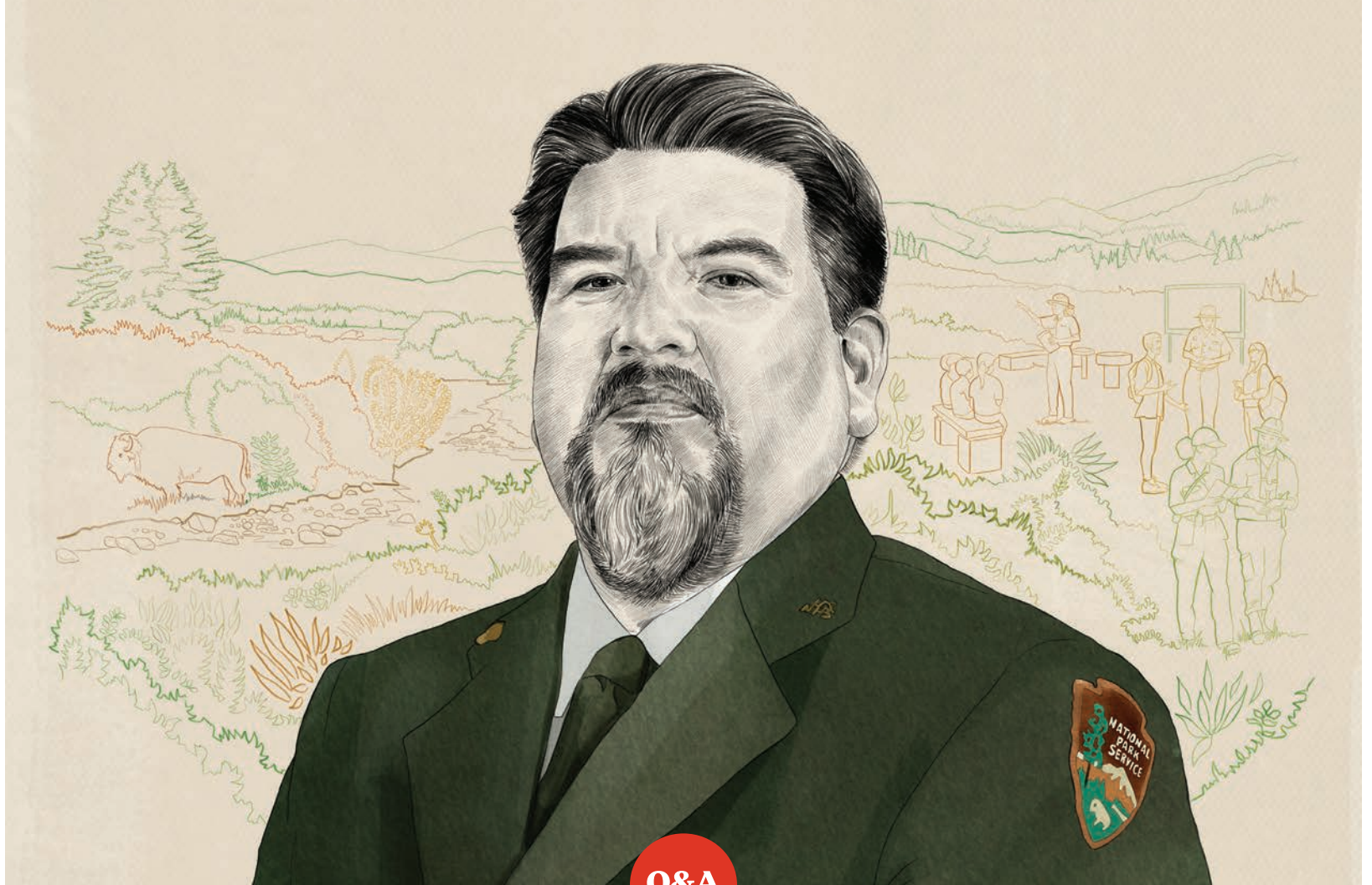
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High Country News



Q&A

LAST DECEMBER, in front of the Lincoln Memorial, Chuck Sams (Umatilla) made history when he shook hands with Interior Secretary Deb Haaland (Laguna Pueblo) and became the first Native person to lead the National Park Service. He is also the agency's first permanent director since 2017. Sams, who is Cayuse and Walla Walla, is enrolled with the Confederated Tribes of the Umatilla Indian Reservation — a true Native Oregonian. *HCN* sat down with Sams to hear about his approach to his position.

This conversation has been lightly edited for length and clarity.

Last year, Congress met with tribes to discuss co-management of federal lands. Now tribal co-management is happening in Bears Ears National Monument. How do tribal nations, the National Park Service and the public benefit from co-management?

Tribes benefit because they're exercising either their treaty rights or pre-existing Indigenous rights

that they've always had, managing these lands for thousands of years. But more importantly, it is the recognition by the federal government, through Secretarial Order 3403, that we have a trust responsibility as a federal agency to ensure that we're upholding those rights for tribes.

It's a very exciting time. When I look across the service, we currently have over 80 different agreements where we're doing some type of co-management, co-stewardship, or partnership with tribes. This gets them back

on the landscape where they have that reciprocating relationship between the flora and the fauna that they've managed as horticulturalists since time immemorial.

Can we expect this list of co-managed parks and monuments to expand? What are some provable benchmarks needed to justify expansion?

We will see them expand. We're going to watch this continue to grow. I think the benefits we're going to see are recovery and strengthening

of both the flora and fauna. We're also going to see ways to look at climate adaptation and climate resiliency, by bringing traditional ecological knowledge to the forefront.

At Acadia (National Park), we're working on sweetgrass propagation with the tribes. We're working with the tribes of the Seminole down in the Everglades on traditional plant use and propagation. At Yellowstone, Superintendent Cam Sholly works with 49 different tribes who have an interest in bison.

Along with co-stewardship and co-management, there has to be capacity building, and we're going to have to work with Congress to ensure that funding becomes available to tribes.

When you were nominated, we asked tribal leaders what they wanted from you. One answer was signage and visitor engagement illuminating Native histories of the parks without sanitizing dispossession. Non-Natives can still visit these places without realiz-

From dominance to stewardship

Chuck Sams, the National Park Service's first Native director, on leading the agency into the future.

BY B. TOASTIE | ILLUSTRATION BY LAUREN CROW

ing they had to be emptied before they could become parks. How far are we from implementing those kinds of presentations?

With tribal communities and other people of color, we want to ensure that everybody actually sees themselves in the parks. So we're looking at that with tribes, of course, but we're also looking at it with the African American community, the Latino community, the Asian community, the LGBTQ (community), to ensure that they can tell their story in the parks. They will still go through rigorous academic review. That's part of the process that the National Park Service has done so well.

One of the best examples I've seen in my own lifetime is at Wallowa-Whitman Mission. We've seen the story go from a "massacre" to really telling a broader history of what Dr. Marcus Whitman did when he set up his mission in Waiilatpu Country, the country of "the people of the rye grass," the Cayuse. We've also seen signage change to talk about tribes in the present tense, and to help drive folks to the idea that (tribes) are co-managers and co-stewards of these important places.

Some publications have said we're "loving the parks to death" with high visitor rates. This aligns with a non-Native worldview that sees humans as separate from nature. Do you think a shift to a more Native, reciprocal view of nature would improve human impact on the parks, and what could the Park Service do to encourage that shift in thinking?

Absolutely. Man is part of the natural world, and therefore we must figure out that reciprocal relationship that we have to ensure that we protect and preserve that.

As I go around the country and have conversations with folks, I remind them that wilderness is a colonial, Western European ideal. What people call "wild," we've called home for thousands of years. And there is literally no word that I can find when I talk with Indigenous

tribes around the states that has an equivalent of the word "wild." Among my own people, there is Chinook Jargon, and the word *skookum*. But *skookum* means "crooked," anything that's just not straight, and doesn't necessarily mean "wild." We never refer to the land in that way. Once we remove that idea (and see) that these places were actually managed, maybe not through agricultural purposes, but through horticultural purposes, and that reciprocal relationship with humans and nature are important for sustainability, we can have a much stronger stewardship value, rather than a dominance value over the landscape.

We have something similar in Choctaw. I've tried to find a word for "wild" in our dictionaries. There is a word, but it really means "shy," which is so different from the idea of "wild" and its connotations of "ferocious" and "untamed." It reveals a very different worldview, doesn't it?

It does. I've been very fortunate in my travels. I've worked (with) over half the federally recognized tribes in the United States in the last 25 years. And in my discussions with tribes, most of them say, "Well, we have a word for 'unbalanced,' but we don't necessarily have a word for 'wild.'"

How do people respond when you challenge this idea of wilderness and talk about how that's not a Native concept?

It's mixed. The National Park Service does a wonderful job in its interpretations. Our job is not to tell you what to think. Our job is to help you become a critical thinker. We have the largest outside classrooms in the United States, in managing 85 million acres. And so I think it's important that we bring these conversations forward, and we let people think for themselves to determine how that relationship is going to play itself out.

Last year, about a month before you were appointed, our maga-

zine published a report called the Voices Tour Report, which the Park Service had conducted in 2018. It revealed a widespread culture of sexual and racial harassment, tokenism and white supremacy amongst park employees. After we published it, more people came forward with stories of harassment, discrimination and assault by colleagues while working for the parks. What specific actions has the agency taken to overhaul its systems and protect people of color, women and LGBTQ+ people working in the Park Service?

I laid out a couple of different priorities when I first came on board. One, of course, is ensuring that our staff have a voice and an advocate through the director. The other is, of course, looking at our human resources and how we interact to ensure people are respected at every level. I'm very happy and pleased to say that when we laid out these priorities, the National Leadership Council, which are all the senior members of both senior superintendents, the associate directors and the regional directors, are very strong in wanting to make social change to ensure that people are being held accountable at multiple levels when we get these reports.

When I see these reports coming up, we're trying to make sure that they're acted upon quickly and fairly, and that they're well-investigated, that the staff have the resources to do those types of investigations, which includes working with our law enforcement rangers and the U.S. Park Police. And that those investigative responsibilities are being followed up on when there's been a crime or harassment, and that we are reinvigorating our EOC (emergency operations center) staff so that they have all the staff necessary, so that they can conduct their investigations fairly and openly and people can know that they're getting a report back. Because what I understood when I looked at this is that there was communication going up, issues may have been dealt with, but it also may not have been reported back in an appropriate way.

Being a Native person, and also a U.S. citizen who loves the landscapes of this beautiful continent, I feel very conflicted when I see the Indian arrowhead in the Park Service logo. What are your thoughts about the logo?

I think it does give a nod to the tribes who are here since time immemorial. I look at it more in a positive light. And I think that that allows us to tell that broader story, because inside the arrow is the natural landscape. And so I look at it as the idea that we're finally bringing back full circle their ideas around co-management and traditional ecological knowledge.

What is it like to have one foot in your tribal community and one in D.C.? And how do the rising generation of Native leaders balance their responsibility to their tribal communities with the need to be active within the U.S. government?

First and foremost, if you have a strong cultural upbringing, elders and teachers to help you understand and ground you among your people first, I think (that) is extremely important. It does take a lot of balance between the values that you have at home and the values that you're going to see a federal government has and the responsibilities of that federal government.

And you can find that balance. It's not living in two worlds. The late Wilma Mankiller once told me, when I was telling her I was living in two worlds, how wrong I was. I'm living in *one* world. I live in my Native world; it's been influenced by an outside group of people who have come into my world, but it's still my world. I'm responsible for finding that balance.

I'm trying to work, again, (at) getting us back in balance, ensuring that we go from a structure that really was about dominance, to one that is about stewardship. What I see is a younger generation of rangers and staff coming up who are also striving for that balance, wanting to be the good stewards of those resources while ensuring that there's a human presence. ✨

Stories for a swiftly tilting planet

What can conservation learn from science fiction?

BY MICHELLE NIJHUIS
ILLUSTRATION BY DARYN RAY



ECOLOGISTS USED TO BELIEVE that the systems they studied tended toward balance. Over the course of the 20th century, though, they realized that disturbance is not a detour but a destination. Humans can do terrible harm to ecosystems, of course, but disturbance itself is not necessarily a problem; in most ecosystems, the only steady state is a state of upheaval. Relationships between and among species, while indispensable and often enduring, are in constant flux, subject to small and large disruptions. The vaunted “balance of nature” is more or less a mirage.

Science fiction writers and filmmakers seem to have reached a similar understanding. The dystopias and occasional utopias of classic science fiction are akin to what ecologists used to call climax communities — mature forests and other ecosystems believed to be stable until upended by an external force, with the external force in science fiction being your trusty lone hero. Perhaps because these either-or futures exist beyond the “final frontiers” of known space and time, they are often set in imagined Wests: Science fiction and its variants have sent the frontier myth to space (*Star Trek*, among many others), turned the Pacific Northwest into an insular splinter state (*Ecotopia*), and sentenced Los Angeles to any number of high-decibel catastrophes.

Later in the 20th century, some writers — including many living and working in the West — began to build more complex, less certain, and consequently more plausible futures. “Must redefine utopia,” frets recluse Tom Barnard in Kim Stanley Robinson’s *Orange County* trilogy, published in the 1980s and ’90s. “It isn’t the perfect end-product of our wishes, (but) ... the process

of making a better world, the name for one path history can take, a dynamic, tumultuous, agonizing process, with no end.” The fiercely imaginative Octavia Butler, who, like Robinson, grew up in Los Angeles, set her prescient *Parables* series, published in the 1990s, in a California where violence is always present but never predictable. Lauren Oya Olamina, the flawed spiritual leader at the center of the series, preaches that “The only lasting truth / Is Change” — a creed that could have been written by an ecologist.

In Butler’s wake, writers such as Claire Vaye Watkins and Joy Williams have set novels in future Western landscapes, within societies that are fundamentally broken yet continue to evolve. And today, a new generation of Western science fiction writers is exploring possible paths to better worlds. Portland author Rachel Swirsky, in her near-future novel *January Fifteenth*, has imagined the individual and societal consequences of a universal basic-income payment. The novella *Tread of Angels*, by New Mexico author Rebecca Roanhorse, uses its fantastical setting in an alternative-history 19th century mining town to upset the predictable battle between good and evil, asking whether anyone truly belongs on one side or another.

Writer Becky Chambers, who grew up in Southern California and now lives in Humboldt County, is known for her outer-space adventure novels, but her latest series, *Monk and Robot*, is set in a society whose members have survived an excruciating transition from what they describe as the “Factory Age.” They aspire to live less destructively than their forebears, and in many ways they do: Their transportation methods are human-powered, their plastics are biodegradable, and their rivers

and forests are recovering from past harms. Like some fortunate Californians, they live in diverse communities; their gender identities are accepted without question, and their vegetables are abundant and fresh. They also drink a lot of tea, sometimes for therapeutic purposes, and they speak fluently about their feelings. Yet this gentle society is no traditional utopia; its members are actively experimenting with different ways of living and working together, and they are dealing with the ongoing consequences of their past. In *A Prayer for the Crown-Shy*, the second novella in the series, the robot Mosschap revisits human society after a long estrangement between humans and robots — making connections that, while largely joyful, reawaken a painful history.

In science fiction’s ever-expanding universe of subgenres, Chambers is considered a practitioner of “hopepunk,” a label she embraces. “You’re looking at the world exactly as it is, with all of its grimness and all of its tragedy, and you say, ‘No, I believe this can be better,’” she said in an interview last year. “That to me is punk as hell.” Like Robinson’s Tom Barnard, Chambers and writers like her are suspicious of utopias, instead placing their faith in the ongoing possibility of change. “Hopepunk isn’t pristine and spotless,” writes fantasy author Alexandra Rowland, who coined the term. “Hopepunk is grubby, because that’s what happens when you fight.”

These stories about instability and possibility are not prescriptions. They’re experiments that test out new technologies and social innovations by imagining the variety of human reactions to them — reactions that are surprising, entertaining and ultimately familiar, no matter how unearthly the setting or extraordinary the circumstances. If ecology has taught science fiction about the constancy of change, perhaps science fiction can remind conservation that lasting societal change can only be brought about by people. While technology may solve some problems, it can’t transform human behavior, and it certainly can’t fix the relationships between humans and habitats, or between humans and other species. In any future, that work — that dynamic, tumultuous, agonizing process — is up to us. ☀

January Fifteenth

Rachel Swirsky, Tordotcom, 2022

Tread of Angels

Rebecca Roanhorse, Gallery/Saga Press, 2022

A Prayer for the Crown-Shy

Becky Chambers, Tordotcom, 2022

Connecting habitat from the ground up

The future of large landscape conservation begins with Indigenous communities.

BY JODI HILTY AND KELLY ZENKEWICH

IN THE EARLY 1990S, the founders of the Yellowstone to Yukon Conservation Initiative envisioned a network of protected habitats along the spine of the Rockies — one that would allow wolves, grizzly bears, golden eagles, and other wide-ranging species to breed, feed, and succeed. Y2Y was an audacious idea, to say the least, and it attracted plenty of attention, including from skeptics who believed it was unachievable.

During its early years, Y2Y was a loose coalition of groups interested in ecological connectivity, and it had few if any full-time staff. Efforts focused on identifying the pieces of habitat most important to wildlife migration and survival. But while conservation science could pinpoint the places that wildlife needed, protecting those places required forming relationships and building trust with and among the human communities of the Rockies — and that, in turn, required many years of meeting with and listening to local people. As the initiative's first executive director observed, "People, from Yellowstone to Yukon, are the key to our success."

Today, after a quarter-century of work across five American states, two Canadian provinces, two Canadian territories and at least 75 Indigenous territories, the area protected for conservation within the Y2Y corridor has increased by 80%, even as the growth of protected areas declined or remained constant elsewhere in North America. This is due almost entirely to a groundswell of support that includes, crucially, Indigenous peoples and their governments.

In 2002, the Y2Y Initiative hosted Indigenous peoples from throughout the region, seeking to identify and explore our common ground. Importantly, Peter Wesley (Nakoda

First Nation) and Levi Holt (Nez Perce) decided to join the Y2Y board and council. In later years, Dick Baldes (Eastern Shoshone Tribe), Pat Smith (Assiniboine Tribe) and Joe Lougheed (Métis) signed on as well.

By 2003, the initiative was supporting Indigenous-led conservation proposals in Canada's Northwest Territories. A decade later, these efforts culminated in the 1.17 million-acre Nahanni National Park Reserve, co-managed by Parks Canada and Dehcho First Nation, and the 1.19 million-acre Nááts'jch'oh National Park Reserve, co-managed by Parks Canada and Sahtú First Nations.

In recent years, the support of Indigenous communities in Canada has resulted in signed conservation agreements between federal, regional and First Nations governments on approximately 14 million acres of co-managed protected areas. These agreements include the Peel watershed land-use plan in Yukon Territory; a partnership to conserve caribou habitat in British Columbia's Peace River region; and Qat'muk, the home of Grizzly Bear Spirit, in the Upper Columbia River area of British Columbia. The Y2Y Initiative was able to assist these efforts — and support Indigenous leadership in conservation — by helping with grant-making, political strategizing, communications, organizing and more.

New community-led proposals are also underway in northern Canada: The Kaska First Nation in British Columbia and the Yukon has three proposals in progress, including Dene K'éh Kusān — "always will be there" in the Dene language. This Indigenous Protected and Conserved Area, or IPCA, would protect 4 million acres of ancestral homelands in northern British Columbia, southeast Yukon and the southwestern corner of the Northwest Territories. Just this summer, the Gitanyow First Nation declared an Indigenous Protected Area of more than 420,000 acres, in part to protect important salmon runs

in central British Columbia.

In the U.S., there is a long history of tribal engagement in land and wildlife conservation, and Y2Y has worked to support such efforts in the Northern Rockies. The Nez Perce people, who in the mid-1990s exercised their treaty rights by reintroducing wolves into central Idaho, are leading the Camas to Condors Project, which works at the landscape level to protect wildlife from the worst effects of climate change. The Blackfoot Confederacy is advancing the linnii Initiative, an effort to restore free-roaming bison on Blackfoot lands on both sides of the international border.

These accomplishments reflect years of research and negotiations by governments and communities seeking to connect landscapes and people. Close to 18% of the Yellowstone to Yukon region is now protected from development, and more than a quarter of those lands are managed or co-managed by Indigenous communities, not including the 14 million acres of self-declared IPCAs in progress.

As we look ahead to our next quarter-century, we believe that large landscape conservation is more important than ever, given the escalating effects of climate change, habitat destruction and other human-caused harms. But Y2Y has learned that wildlife habitats cannot be reconnected in a meaningful and lasting way unless human communities of all kinds are also reconnected — linked to one another, as well as to their landscapes. By listening to and actively supporting community members and leaders, we can support all forms of life into the future, from Yellowstone to Yukon and beyond. ✨

Jodi Hilty is president and chief scientist at Yellowstone to Yukon Conservation Initiative, and Kelly Zenkewich is the organization's senior communications and digital engagement manager.

Close to 18% of the Yellowstone to Yukon region is now protected from development, and more than a quarter of those lands are managed or co-managed by Indigenous communities.



Antidotes for ecological forgetfulness

Bear witness, make a record, pass it on.

BY JASON MARK
ILLUSTRATION BY JILL PELTO

THE DISAPPEARANCES are almost everywhere, so they are difficult to discern. Since the 1970s, the populations of many of the most common North American birds have plummeted. The number of western meadowlarks has decreased by 37%, and grasslands in general have lost an estimated 720 million birds. Populations of piñon jays — one of the signature birds of the Western piñon-juniper landscape — are down a stunning 85%. Altogether, an estimated 3 billion birds have disappeared from the continent in the last couple of generations. Spring may not be silent, but it's certainly less raucous than it used to be.

Did you notice?

I can't honestly say that I did. I'm a middle-aged backyard birder with middling birding skills, and my corner of the Pacific Northwest still feels full of feathered companions. I regularly hear the sonorous springtime song of the Swainson's thrush, the cheep of chickadees, and the screech of the osprey family that this summer made a nest in a Douglas fir outside my home. Those avian losses may have happened in my lifetime, but they were awfully hard to keep track of. Sure, I noticed that there were fewer red-winged blackbirds in the tule-reed-ringed pond that, for more than a decade, I visited weekly. But how many fewer? And how will my daughter even recognize such losses, since her notion of a "natural" number of red-winged blackbirds was formed in an already-impoverished reality?

Ecological forgetfulness isn't uncommon. When researchers in the United Kingdom interviewed people about the disappearance of common birds, they found that young people were largely unaware of population declines

witnessed by previous generations. A few study participants, old and young, hadn't even noticed the declines that happened before their eyes. The researchers attributed these results to "shifting baseline syndrome": the way our unreliable memories blind us to the magnitude of environmental changes.

Since fisheries scientist Daniel Pauly coined the term in the 1990s, researchers have discovered just how deeply shifting baseline syndrome can disrupt our understanding of the more-than-human world. In one investigation, a researcher reviewed dockside photos of trophy fishermen in Key West taken between 1957 and 2007. During that time, the fish got significantly smaller, and their average weight shrank by nearly 90%. Yet the smiles of the anglers in the photos stayed the same size. As the world got tinier, they kept on grinning.

Shifting baseline *syndrome* — a clinical phrase, like something from psychiatry's formal manual of mental disorders — poses real challenges for conservationists. Studies show that it influences our perception of changing climates as well as how — and whether — children develop a commitment to environmental protection.

It's difficult to know what, exactly, we're trying to save because, as a culture, we risk forgetting what it was we once hoped to safeguard. Amid collective amnesia, the goals of conservation become targets swaying in the dark.

To be good future ancestors, we'll have to actually change our cognitive habits and our tendency toward forgetfulness. We'll have to turn memory into an organ of conservation — because without memory, there's no chance of repair or restoration, rewilding or renewal.

So, what are the antidotes to collective amnesia?

Neuroscience is a good place to start. Many of the same techniques and habits that help to preserve individual memories and keep dementia at bay can also protect our shared ecological memories.

Attentiveness is the most important thing. "Attention is essential for creating a memory of anything," writes Harvard neuroscientist Lisa Genova, and this applies to the declining state of the natural world, too. We forget how many red-winged blackbirds once nested in the pond for the same reason we forget that we parked the car on Level Red-B in the garage: We weren't paying attention in the first place.

When landscape becomes the focus of our attention, something more than a backdrop, we're more likely to remember changes in it. "Our brains have evolved to remember what is

meaningful," Genova reports.

Neuroscience also knows that physical activity boosts memory, and so exercise — especially, in this case, outdoor exercise — is essential. We need to cultivate muscle memory, since (as any carpenter or guitarist knows) physical repetition helps cement neural networks. Embodied experiences — the sight of epic vistas; the feeling of wind in the face; the forest's mossy scent, a sylvan version of Proust's madeleine — can create indelible memories, and those memories can counter the normalization of environmental destruction.

Still, we inevitably forget most of what happens to us. Notes can help. You don't need to catalog the appearance of each bloom with the exactitude of Thoreau or note daily temperatures with the precision of the National Weather Service. A garden log or nature journal will do. And remember to tell your friends and family (especially the littles) about the changes you've experienced. Each of us can become, in our own modest way, an environmental storyteller, passing down the oral histories of the places we inherited.

So an initial prescription for shifting baseline syndrome goes something like this: Be outside as much as you can. Bear witness. Make a record. Pass it on.

These treatments may sound familiar — they are, after all, old-time home remedies for our conservation ills — but they are imbued with new urgency. In the midst of the Anthropocene, or "the Great Acceleration," or whatever you prefer to call this bewildering era of hyper-speed changes, remembering will have to become a practice of the mindful conservationist.

Ecological memory alone won't deliver us from our environmental crises; there's no going back to the past. Yet memory can play an important role in figuring out the future. Remembrances of Earth's past can serve as a kind of cultural touchstone, a common shore from which we can navigate the uncharted waters of this hot, chaotic, fast-moving century. ✨

To be good future ancestors, we'll have to actually change our cognitive habits.

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 ARMANDO VEVE

MONTANA

Weddings aren't usually described as "gnarly," but the word seems right for one ceremony on the scenic shores of Two Medicine Lake in Glacier National Park. Videographer Stanton Giles was filming the August nuptials when his camera was drawn from the groom's promises of everlasting love to a dramatic commotion across the lake: A grizzly bear charged out of the bushes and tackled a moose calf while its mother looked on. Giles told *Newsweek* that the bride and groom were still in mid-vows when the wedding party noticed what was going on, and the festivities were forced to pause until the bear finished killing the calf. "He was there for just about as long as it took to kill the calf," Giles said. "As soon as it died and quit struggling in the water, he dragged it back up into the trees." The shocked guests weren't sure how to react, Giles said — this sort of thing rarely comes up in etiquette manuals — though the suggestion was made to turn up the music to "drown out the sound of death." The entire three-minute-and-30-second scene was captured on video for posterity and uploaded to YouTube, where it's been viewed over 400,000 times. Nature is beautiful and terrifying. And nuptials held in the great outdoors sometimes give new meaning to the words "till death do you part."

CALIFORNIA

As house pets go, tarantulas are an acquired taste. The creepy crawlies aren't for everyone, but arachnid admirers in Coarsegold, California, want everybody to love them as



much as they do. The 25th annual Coarsegold Tarantula Awareness Festival, celebrated on the last Saturday in October in Coarsegold Historic Village, honors the flamboyant fuzzies and their contributions to the ecosystem. NBCLosAngeles.com noted that the festival featured pumpkin cheesecake, a costume contest and tarantula-inspired poetry, not to mention the chance to meet, touch and even hold the guests of honor. The festival organizers seek to educate the public and destigmatize enormous hairy spiders. Another tarantula festival was held in La Junta, Colorado, in the first week of October. According to Fox21news.com, attendees celebrated the arachnids and their annual mating ritual, which doesn't involve a dating app called "Spinder," but occurs naturally on the 443,000-plus acres of the Comanche National Grassland — rather

like Burning Man for spiders, with even more legs for dancing.

MONTANA/WYOMING/YELLOWSTONE

Speaking of legs, a partial human foot, still inside its owner's shoe, was discovered in Yellowstone National Park's Abyss Pool in August, near the aptly named West Thumb Geyser Basin, ABC News reported. Could this macabre discovery have anything to do with the 21 other severed feet found washed up on shorelines in Canada and Washington in recent years? Authorities have puzzled over the gruesome discoveries since Aug. 20, 2007, when a girl found an Adidas sneaker complete with foot on Jedediah Island near British Columbia and Vancouver Island. Just six days later, a black-and-white Reebok turned up on Gabriola Island, 30 miles away. Since then, other disembodied feet have washed up around the Salish Sea.

However, there is an explanation. Forensic scientists factored in body decomposition, footwear fashions and DNA research to arrive at a cause, and no, it's not aliens. Or serial killers. Or shark attacks, or overenthusiastic pedicurists. *Big Think* explained that dead bodies in the ocean are generally picked apart by sea scavengers and bottom-feeders, broken down piece-by-piece in less than a week. Feet, however, might be buoyed to the surface with the help of the lightweight materials found in recent-generation sneakers. Sneakers produced after 2000 are made from lighter foam and have air pockets in the soles. Authorities used DNA evidence to identify most of the feet. But the Yellowstone foot remains a mystery, though we can't help wondering what else might be lurking in West Thumb Geyser Basin. Some things are better left unknown.

ALASKA

We have long admired the terse but evocative prose of small-town police blotters. Occasionally an item rises almost to poetry. Alert readers John and Eileen Eavis sent us such a clipping from the *Seward Journal*, whose Public Safety Report compiles data from various sources, including police, fire, EMS dispatches and court documents. How could one not be intrigued by something like this: "A caller reported on June 19 at 2:09 p.m. that on June 19 at 8:36 a.m. an individual in a gorilla suit broke into their yard and left behind a rooster." It's "just the facts, ma'am," as the old *Dagnet* TV cops would say, but sometimes the facts are enough. ☀

VICTORY AFTER VICTORY FOR OUR CLIMATE

WELC and our valued partners have won more than two dozen court cases to rein in climate pollution since 2019. These victories mean the U.S. government must now consider the cumulative climate impacts of fossil fuel extraction on public lands, opening the door to a better, thriving future for all.

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#IAM THE WEST

STELLA SAMMARIPA

**Nez Perce language program technician
and recent NASA Minority University
Research and Education Project Fellow
Kamiah, Idaho**

My immersion in language and the histories of Nez Perce words steered my education, and my research, into the natural sciences. As a NASA fellow, I created a transdisciplinary habitat suitability model for *Qéemu*, our word for Indian dogbane. My ancestors utilized *Qéemu* to make twine, rope, basketry and nets, and it once thrived on our homelands, but it is now actively eradicated because it is toxic to livestock. We cannot go backwards in time, and I doubt that we will fully restore *Qéemu* to its historical distribution. I can, however, work to mitigate past harm. I understand my *Qéemu* habitat-modeling efforts as an exercise in tribal sovereignty, as my way of building a plan to reconnect our language with our landscapes and regrow both of them.

Do you know a Westerner with a great story?
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