

big ideas
SPECIAL ISSUE

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For people who care about the West

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2068

THE SPECULATIVE JOURNALISM ISSUE

High Country News

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Editor's note

The case for speculative journalism

In June 1988, James Hansen, director of NASA's Goddard Institute for Space Studies, testified before a congressional committee, where he announced, with 99% certainty, that human-caused global warming was real. A year later, the Global Climate Coalition, an industry group formed by fossil fuel companies, began a determined effort to stymie climate action. Hansen, being a scientist, based his testimony on scientific fact. The GCC lobbyists, being slimeballs, based their efforts on telling stories — including, incredibly, the 1992 release of a video claiming that adding CO₂ to the atmosphere would boost crop yields and end world hunger.



Thirty years later, we are still fighting stories with facts, and the results have been underwhelming. While it is easy to get frustrated by this state of affairs, it is also easy to understand why it's happening. Global warming is a human-caused phenomenon that exceeds the human capacity for understanding. The typical institutions that we rely on to guide government policy — science and journalism — have not been fully up to the task. We know this at HCN because we cover, over and over again, a changing climate. The facts are there, and the problem is still there — and getting worse. So last December, when the U.S. government issued a damning, detailed assessment on the climate, even we were at a loss with what to do with it. How, we wondered, can we help people

understand the importance of all these facts, if the facts aren't enough to speak for themselves?

One possible answer is this issue, a departure from our usual rigorous, fact-based journalism, and a foray into the world of imagination. Call it science fiction, or, if you prefer, speculative journalism. We took the projections of the *Fourth National Climate Assessment*, interviewed scientists, pored over studies — then imagined what the West would look like 50 years from the release of the report.

The result is a multiverse of future Wests, all set in the year 2068. No two stories take place in the same reality, but each is a reflection of possibilities presented in the climate assessment. In some, the West verges on satirical catastrophe. In others, technology steps up as reality melts away. Some of us imagined a better world; others imagined how much worse things might get. Readers weighed in, too. Taken together, we hope these stories inspire further exploration of the national climate assessment, which is available online and is an impressive body of work. For our hardcore readers, we've provided a citations page, where more information on the relevant science and studies can be found.

None of these stories are true, but any of them could be. The fact is, we don't really know what climate chaos will bring ... but we do know that enormous challenges — and opportunities — lie ahead. Our chance to change the future is now, but we'll need a better story first.

—Brian Calvert, editor-in-chief

2068 THE SPECULATIVE JOURNALISM ISSUE

FEATURES

12 Climate Criminals

As the world's last climate change deniers are brought to justice, those tasked with pursuing them face a final challenge: retirement
By Tristan Ahtone

28 The Mysterious Cow Murders at Missouri Breaks

A *West Obsessed* investigation
By Brian Calvert

On the cover

From left: Corey Brickley (page 28), Zoë van Dijk (page 8), Abi Stevens (page 6), Weshoyot Alvitre (page 12).

INSIDE

3 FROM OUR HOLOGRAM PORTAL, 2068

4 An unquenchable thirst, an undammable flood

Despite benefits to both regions, tensions remain over the Great American Connector pipeline
By Carl Segerstrom

5 A Fire Service whistleblower speaks out

The nation's first conscription of wildland firefighters has begun
By Anna V. Smith

6 Mayhem on the mountain

The last ski resort in the Lower 48 deputized soldier flies to manage human feces. The plan backfired.
By Paige Blankenbuehler

8 Montana's glacier gods

An augmented reality program takes hold of its designer
By Elena Saavedra Buckley

22 Forecast your future

Readers describe their own 2068

38 Sources, author bios

40 HEARD AROUND THE WEST

By Betsy Marston

DEPARTMENTS

10 THE HCN COMMUNITY

Research Fund, Dear Friends

21 EDUCATION MARKETPLACE

35 MARKETPLACE

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THE LATEST

Backstory

The Devils Hole pupfish, whose population once dipped to just 35 fish, long resided in a deep cavern in Death Valley National Park. In 2016, a young Nevada man trespassed with friends, entered the pool and accidentally killed a pupfish. Trenton Sargent was convicted in 2018 and imprisoned for one year for violating the Endangered Species Act ("How a tiny endangered species put a man in prison," *HCN*, 4/15/19).

Followup

In early 2068, following a spate of break-ins and the deaths of a few skinny-dippers, **land managers at the former national park, now a expansive solar farm, installed a concrete barrier over the top of Devils Hole to prevent trespassers from plunging into the cavern.** Climate change had proved the real threat to the remaining pupfish, heating the water in their only habitat to lethal temperatures. By 2065, the population could no longer survive in its native habitat. The last fish were relocated to the Aquatic Discovery and Seed Bank Museum, where the public can now view the tiny survivors in a specially designed aquarium.

BY PATE PELLEGRINO



Graffiti marks the former Devils Hole sign. LUNA ANNA ARCHERY



CRISTINE BLANCO FOR HIGH COUNTRY NEWS

Communal living in California

At California's Santa Monica Mountains State Park, where multimillion dollar homes used to perch above the Pacific Coast before rising sea levels toppled them into the ocean, crisp blue tarps and rusted camper vans hunker beneath tall oaks and among patches of sage scrub. These illegal compounds now house hundreds of Malibu's displaced homeowners; alongside them live many people who never owned houses at all. The result, according to sociologist Rux Andra, a professor at UCLA, is "a real experiment in communal living."

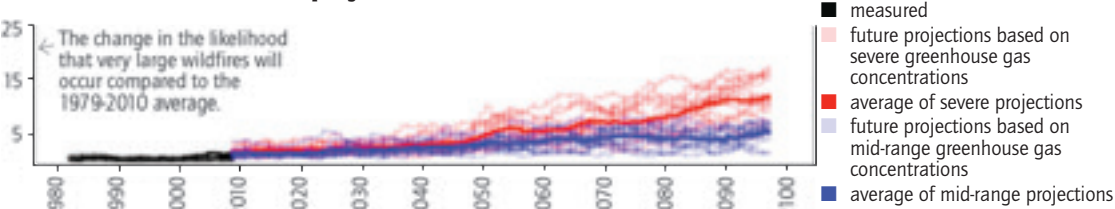
Below the park lies another communal space, the tide flats locals have taken to calling the Old Road Commons. Where gas-guzzling vehicles once zoomed around the curves of the Pacific Coast Highway now lies a popular public beach and big wave surfing spot. "Together, these two areas demonstrate the kind of community that can sprout when geographic class-segregation is disrupted," Andra said. "Malibu is a great example of the new California coast."

BY RACHEL GABINO

“Once this new technology is in place, all of our students will breathe easier.”

—Si'ahl Communal Education (formerly Seattle Public Schools) Superintendent Kathryn Wong, after Bezos-AppleSoft donated 800 Smoke-b-gone™ air-cleansing units to the district last month. Critics allege that under Wong's direction, installation of the devices has been delayed at several low-income schools. Full coverage of all district classrooms would require about 2,400 units, according to a spokesbot from the Seattle-Duwamish Public Health Department. BY MICHAEL BRONSEN

Wildfires, observed and projected, in the Pacific Northwest



As far back as the early 2000s, scientists were forecasting that wildfires would become more frequent and severe throughout this century. This graph was published in 2014. The projections proved accurate, leaving much of the West blanketed in stifling smoke throughout the summer and fall. COURTESY OF NATASHA STAVROS/NASA

1.1 Percent of the popular vote the Green Party candidate for president won in 2016.

58.3 Percent of the popular vote President Aiden Brown, running as the Green Climate Action candidate, won in 2068.

In the late 20th and early 21st centuries, U.S. politics were dominated by only two major parties, the Democrats and the Republicans. Smaller groups, like the Green Party — a predecessor of today's Green Climate Action — occasionally found a sliver of success at the ballot box, sometimes even upsetting election wins that had seemed all but guaranteed to go to major-party candidates. Political instability following the Colorado River drought of 2042-'49 and the subsequent collapse of large-scale California agriculture was a major factor in the party shake-up, according to the new book *The Political Fallout of the Second Dust Bowl*, by Tam Greenblatt, a political historian at Stanford University.

BY PAT GONZALEZ

Hologram

Indigenous coalition rallies for climate action

Over three decades ago, in 2034, the U.S. Supreme Court confirmed that the federal government has a duty to protect Northwest tribal nations' fish and other natural resources from damage caused by climate change. Yet that ruling, the *Smith Decision*, has never been fully implemented. In early May, the chairperson of the Northwest Tribes' Climate Action Coalition, Kayla Greene, addressed hundreds of activists gathered on the banks of Washington's Elwha River. "Climate chaos continues to hurt chinook and other salmon," she said in a speech aimed at spurring the U.S. to fulfill its treaty obligations. "It must be addressed!"

To ask Greene's interactive hologram questions about the coalition and treaty rights, visit *HCN's* hologram portal.

BY ANNA SABLE

Trending

Climate-causer migrants find new home

A year ago, retirees Mary and Marty Dugan, "climate-causers" who profited from the oil boom, bundled their dachshund into their car to leave New Telluride, Colorado. They left after decades of tensions between newcomers and longtime Telluride residents culminated in a series of home-invasion attacks last year. While most climate refugees can't afford to move far, the Dugans planned to drive all the way to Denver. "Unfortunately for us, that was the day the West Slope gas riots began," Mary Dugan said. But after coasting on fumes into Montrose — one of the first Colorado communities to finalize an independent electrical grid, in the 2050s — the Dugans decided to stay: "At first we weren't sure if we'd be welcome, but now this place really feels like home."

BY JOSS KITZ

GEORGE COBURN: "Good for the Dugans — too bad we can't all move to Montrose."

KELLY FOGELSON: "The climate-causers are the ones who got us in this mess to begin with. I'd rather read about the residents who don't have the money to try to leave that old ski town."

SAL PAZERA: "The first few weeks of the gas riots were terrifying. Many Coloradans weren't as lucky as the Dugan family; my son's family was stranded in the North Fork Valley for four months."



ALLISSA CHAN FOR HIGH COUNTRY NEWS

An unquenchable thirst, an undammable flood

Despite benefits to both regions, tensions remain over the Great American Connector pipeline

BY CARL SEGERSTROM

Many here in Las Vegas see Brett Robertson as the patron saint of the Southwest. With his keen ear for messaging and a veritable army of lobbyists, Robertson, heir to the Adelson gambling empire, has kept the water flowing to this desert oasis despite a decades-long drought and growing threats to the Great American Connector pipeline.

On an early April day, he stepped up to a gilded lectern, framed by the all-too-prescient pyramids of the Luxor Las Vegas. A fine dust blew across the crowd as onlookers awaited his announcement. “People of the Southwest, I am you. ... I am with you and won’t bow to our Midwestern friends,” said Robertson. With a slight smirk and a note of not-so-thinly veiled contempt, he continued, “Who would see us die of thirst rather than get their boots wet?”

While Robertson’s speech was filled with more rhetoric than specifics, documents obtained by *High Country News* from whistleblowers in the Sands Corporation detail his history of attempted meddling in weather patterns in the Midwest. After years of limited success generating precipitation in the Southwest, Robertson turned the focus of the “Rainmaker Project,” as it’s called in internal documents, eastward with a series of drone-operated cloud-seeding expeditions. Legal experts say the project violates a host of federal and state laws, and some meteorologists question whether it’s even having that much of an impact. Still, Midwestern farmers, currently suffering the worst flooding in decades, say the plan feels like an attack on their region and their future.

For decades now, the chronically waterlogged Midwestern plains and perpetually parched Southwestern cities have enjoyed a mostly happy balance when it comes to the management of the Great American Connector pipeline. The pipeline, which broke ground in 2027, on the centennial of the Great Mississippi Flood, was part of the Blue New Deal package. It pulls water from a dozen points along the Mississippi River via a series of feeder pipelines, which connect to the mainstem of the Great American Connector pipeline just south of the confluence of the Ohio and Mississippi rivers. The water then heads west through pipes covered by a 30-foot-wide and 15-foot-tall tapestry of solar panels and wildlife overpasses. After reaching the Continental Divide, the pipeline enters a series of in-line hydroelectric facilities before depositing its “blue gold” in the San Juan River, a tributary of the Colorado.

But cracks are growing in the symbiotic relationship between the Midwest and Southwest. Increasingly unpredictable weather events, and fears that some of the most extreme deluges, which have overwhelmed the project’s flood-control capabilities, have been exacerbated by Robertson’s weather meddling, have prompted outrage. Amid calls for calm and compromise, Midwesterners have formed makeshift militias that monitor air traffic, watching for drones over their region.

For farmers like Shauna Greene, who grows fruits and nuts in Davenport, Iowa, the escalating tension, along with the return of the flood conditions that wiped out her grandfather’s crops, makes her question her family’s future. “We’ve undergone massive changes to adapt, both to reduce flooding and store carbon on our farm,” Greene said in a video interview, as she stood in calf-high water near a chestnut tree. “My family has spent years totally reshaping how we manage the land and doing all we can, and some fat cat in Sin City has the audacity to try and sink us even further. It makes me sick.”

Upstart Iowa Senate candidate Jim Holfe is also seeking redress for Robertson’s meddling, running on a “No More Floods” platform. “For too long, this great state’s politicians have been bought off by water-thirsty outsiders,” a social media advertisement for his campaign proclaims.

Even as Midwesterners vow to fight Robertson, he remains a folk hero in the Southwest. As the unrelenting spring sun bore down on her, Lydia Aguaseca spoke of the hardships her family faces in St. George, Utah. “We can barely eke out a living and deal with heat and thirst every day,” she said. “We are out here maintaining the solar systems that keep your lights on.”

Robertson denied repeated interview requests from *HCN*, but internal documents reveal a pattern to the deployment of his silver iodide-loaded drone fleet. Leaked files show that the Rainmakers typically fly from Las Vegas to staging areas in eastern New Mexico when the conditions for Midwestern storms develop. From there, they deposit their cloud-seeding payload just ahead of the storms.

As the jet stream caroms from the Gulf of California to the Great Lakes, cutting a swath between cooler air to the West and warmer air in the East, the conditions are ripe for devastating storms across the Midwest. An Iowa militia member, who spoke on background, told *HCN*: “If they keep trying to bring us rain, we’ll show them thunder.” □

In January, the U.S. Fire Service, formerly known as the U.S. Forest Service, initiated its controversial fire draft in hopes of raising the number of wildland firefighters available to fight the West's year-round wildfires. While some fire-vulnerable rural communities supported the draft, critics warned that the severely underfunded program would put inexperienced recruits at risk, and that the federal agency's lack of transparency encouraged minimal oversight and accountability. Cash Armstrong, who served just six months before going absent without leave from the fireline this summer, has become a central figure in the ongoing debate over the program. He recently spoke with High Country News from rural Oregon, where he remains in hiding, fearful of federal prosecution and incarceration. This interview has been edited for length and clarity.

High Country News: A lot of people have refused to abide by the fire draft, preferring to face jail time rather than wildfires. How did you end up in the Fire Service in the first place?

Cash Armstrong: My sister, Alpine, actually went into the Fire Service first; she volunteered five years ago, worked her way up to a Hotshot. I know a lot of people who were drafted unwillingly, maybe most. I was actually OK with it. I wanted to do what Alpine was doing; it sounded exciting, and important. So I got my draft notice and was deployed to New Mexico Southwest, Region 3 on an initial attack dronecrew. But we got bounced all over. A couple months into my deployment, Alpine died in a blowup in Arizona — the Borrego Fire. Alpine and three others were protecting a new development out there — one of those new biodomes. No investigation. Just ash and bone, a form-letter apology and me out there in California, working and sleeping in the dirt.

HCN: Is that when you decided to leave?

Armstrong: No. I think after Alpine died, I just went on autopilot for a while. But in June, we were deployed to southwest Oregon. It was quiet out there. No more real timber, just weeds and wind. But there's still some big properties, including (Interior Secretary Michael) Turrett's vacation place. Anyway, we were out there, basically helping Turrett's (firefighter) mercenary crew, and all those fires started coming together. Bigger than a complex fire — it was a Dragon King event. Confused the drones, and the mercs — they don't always have the data we have; they got twisted up in there. So we ended up fighting our way to them to help them evacuate and save the place. And that really felt like some shit.

HCN: How did that lead to you deserting?

Armstrong: I mean, rescuing a bunch of hired guns for the sake of some rich white guy ain't my idea of a good time. But after we got the mercs out, the fire shifted toward Valley of the Giants. And that place has trees there still, 700-year-old trees. And, you know, I'm a lineman. I'm not a scientist. But I know how special that place is. Used to love going there

for the birds — the owls and deer and the clean air and those towering trees standing guard over everything. And some asshole decides we need to let the fire burn that way — away from Turrett's mansion — and it just ... burned through the giants. Just a swath of death through this last, great place. And something kinda snapped.

HCN: Fire Service officials are facing lawsuits as a result of that burn, but the redacted documents released so far are inconclusive. You're alleging it was on purpose, to protect a government official's home?

Armstrong: Yeah.

HCN: Can you describe the day you left?

Armstrong: It was night. I don't know where my head was at. We'd been going for days on end, hardly any rest. Coyote tactics, night after night. The burn boss had called in reinforcements and we were getting help from all over. But they weren't filled in on us helping the merc crew first, didn't know how it had gotten so big, how much time we'd wasted. Once things were somewhat manageable, I was able to think again about something other than fire — and my first thought was how someone needed to know. I tried telling someone on the backup crew. All he said was, "Ain't that some shit." So once there was a lull, everyone was tired or busy, I just walked off like I was going to the bathroom. The nearest town was 15 miles away, so I walked all night. I called my burn boss when I got there, told him I wasn't coming back.

HCN: You've put yourself at risk — 5 years in prison or 3 years of reclamation labor are the maximum sentences. What do you want to see come out of this?

Armstrong: I don't know. What does anyone want? Sometimes you're asked to take one hit too many. I want more transparency — this was not an isolated incident. The service is not doing what it was supposed to do. My sister, that forest. That didn't need to happen. We're all out there, under penalty of law, watching it all burn all year long and told to keep quiet. I can't do it anymore. How can anything change if all we do is keep our heads down and sweat in silence? □

A Fire Service whistleblower speaks out

The nation's first conscription of wildland firefighters has begun

BY ANNA V. SMITH

SHANNON FRESHWATER FOR HIGH COUNTRY NEWS





ABI STEVENS FOR HIGH COUNTRY NEWS

Mayhem on the mountain

The last ski resort in the Lower 48 deputized soldier flies to manage human feces. The plan backfired.

BY PAIGE BLANKENBUEHLER

The brown goop of dead flies smeared across her ski goggles impeded the view, but Nataša Sarec still saw the man fall. It was an ugly crash, an unintentional cartwheel, the man's skis akimbo and his limbs awkwardly splayed as he smacked onto the slushy slope. Then black soldier flies swarmed the man, obscuring the scene.

Sarec could scarcely see the fallen skier, but she could hear him screaming. As Sarec, Vail Resort's chief entomologist, raced down the mountain, her tangled brown ponytail whipped her face. She skidded to a halt beside him, gasping for breath.

The skier, an overweight middle-aged man, wore a plush Oscar de la Renta ski jacket. Once smooth and cream-colored, it was now rumpled and darkened by flies, some of them squirming into the

gold-specked rabbit-fur lining. He swatted futilely at the flies, his deep-purple microsuede gloves bedecked with massive rings.

"I just remember thinking, 'Fuck, the ski lifts are still running,'" Sarec told me later. More skiers were moving up the mountain, temporarily shielded from the swarm in the heated gondolas. She could hear people shrieking as flies pummeled into the glass. She'd almost forgotten the man. "It was a panic," she said. "There was so much happening that I was paralyzed."

At Sarec's feet, the skier grasped his leg in agony; it didn't look broken, but she wasn't sure. "He sort of hissed at me, 'I have the best lawyer,'" Sarec remembered, "before launching a string of profanities." His thick beard was trimmed close to his skin, its sharp lines tracing an aggressively clenched jaw.

She dodged snowboarders and skiers as she skied toward the base. "We needed to shut the place down," Sarec told me. "But we'd already let it happen. It was too late."

A half century ago, Vail Resorts began using black soldier flies, a species of ravenous climate-resistant dipterans, to manage human waste on the resort's remote reaches as water grew increasingly scarce. Known for their ability to breed exponentially, the flies eat feces. It was an innovative approach to dealing with the delicate problem of human waste in the absence of potable water to flush it away. Environmentalists were satisfied (the flies were organic), ski execs were happy (they could save the precious water for making snow), and none of the guests at the resort even knew they existed. The skiers could pause between laps and

defecate as needed, business as usual.

But as access to running water disappeared, Vail's reliance on the soldier flies increased. With steadily rising temperatures, the flies were thriving, and this year, they finally broke out of their dark, warm latrines and swarmed the grounds.

With lawsuits from the incident mounting, after years of unprofitable seasons, Vail Resorts has declared bankruptcy. The move could spell the end of the ski industry in the Lower 48.

It happened to be there that opening day. I had traveled to Last Resort West on a balmy February morning, to cover the start of yet another abysmal ski season. Not much snow had fallen, so the resort was depending on artificial snow. By the time I arrived, the operations crew had managed to open a single ski run, a mile-long intermediate slope that ran from the peak to the mid-mountain gondola.

Sarec, 32, was busily delegating tasks to her crew, the so-called Bowl Patrol, a team of junior entomologists. There were already whispers that something strange was happening. For several weeks, flies had been spotted where they shouldn't have been — congregating in the cutlery drawers of the base area kitchen, buzzing in the open meadow. A few had taken up residence in employee lockers.

Soldier flies normally prefer to remain hidden, and it was Sarec's job to check in on them to ensure they were prepared for the estimated 30,000 visitors expected that opening week. "I came to America to work at the resort, brought my family here," Sarec, originally from Slovenia, told me. "It seemed a way to get a taste of that American skier lifestyle. We can never afford it, but working here does allow us to ski once a year — if we're lucky enough to get snow." The gondola hoisted Sarec and me up to the East Wall back bowl, the only spot with decent snow.

We stepped off the gondola and walked into a hut. "I expected the flies to still be in their larval stage — when they consume the most waste," Sarec said. She opened the door to a stall. Inside, the toilet bowl was alive with the furious buzzing of fully fledged flies, each an inch wide and plump, much too plump. The lid bubbled and opened slightly, and then it closed again, like a demented jack-in-the-box, giving us only a peek at whatever lurked in the cavern below.

"This situation is going to blow up," Sarec told me, as we walked away from a back-mountain hut. "But there's this desperation for revenue, and none of the higher-ups are listening."

Sarec's small team scrambled despite their feelings of dread. Resort executives were busily calculating each day's revenue (in a depleted ski season, every day counts), and they kept working, focused on their opening-day deadlines. "There's this

unspoken mandate that we will not close the resort," Sarec said, "no matter what."

It's generally agreed that the "last great ski season" was in 2049. That year it had actually snowed — real snow — and by New Year's Day there was enough powder for a few ski areas to stay open until March. You don't really know something is ending — the last peonies to bloom, the last spring rain, the final birth of a brown bear cub — until one day you realize it hasn't happened in so, so long. That's how skiing disappeared from the American West.

Today, it's a sport for the international super-elite, with the most popular resorts in Dubai (a massive indoor facility filled with fake snow). A few "real" resorts are still hanging on in the Alps, Himalayas and the Dolomites. But most people today know skiing only through their virtual reality headsets.

American resorts haven't been profitable in more than three decades. A generation of ski families has disappeared; ski towns and après-ski bars have shuttered. In 2055, Vail Resorts Inc. purchased Arapaho Basin, Colorado's most dependable ski area, and renamed it Last Resort West. Michael Branson, Arapaho Basin's chief operating officer at the time, accepted the offer despite an intense public outcry.

"A stubborn holdout of middle-class ski families — a socioeconomic group that was already getting pushed out from most Western recreational opportunities — despaired," said Shonna Tobin, a ski industry historian based at the Banff Center for Climate Studies in Alberta, Canada. "It really was the end of an era. That type of skier disappeared along with the dozens of resorts closing around the same time."

Today, Last Resort West is the only ski area in the contiguous United States open for the "season." Hordes of financiers and tech magnates replaced middle-class families and college-aged shredders. Fancy gondolas replaced the T-bars, and the once-abundant forests were whittled down to only a few rotting aspen tree trunks, trans-fixed in the dry soil. Parking lots became runways for private jets. "Last Resort West's clientele are affluent, international moguls who travel far distances to experience 'Rocky Mountain powder,'" Tobin said. "They don't care that it's actually inauthentic as long as they can still get their Swedish massages and vegetable-peel facials."

Back at the mountain, just hours before Last Resort West's first lift would start propelling skiers up the slope, jet planes parked beside the runway. At the base area, café baristas served \$45 lattes and soy-curd sandwiches.

Sarec and her crew checked on the soldier flies one last time, but by then, the black insects had escaped their pungent abodes and begun to swarm. The mass moved erratically.

Skiers screamed and panicked. A man

with a bright-pink cashmere cap fell into a holding rack, triggering a cascade of falling skis, poles and boards. Flies splattered onto fur coats, and flew into the horrified mouths of guests. Crowds fled the lift-line and made a dash for the guest lodge. The front door hurtled open, slammed close, and opened again. Thousands of flies followed them inside. There was no refuge.

Sarec raced down the mountain. "It was mayhem. I thought that if I could get back to the base to radio someone, they would halt the lifts," Sarec said. "They didn't. Not for almost four hours." The ski down was treacherous. She glanced to her right to see a skier slip into a pile of dead flies, her jumpsuit soiled with dark-brown goo.

Sarec squinted, specs of flies dancing in front of her eyes. And suddenly, just as abruptly as it all began, the swarm ceased. Insect clouds dropped. Out of their warm toilets and exposed to the cool air, they were unable to survive for long. "Soldier flies need to maintain a core temperature and only thrive in warm, moist environments. The air temperature and the presence of snow stopped them," Sarec explained later.

Heaps of dead flies piled up across the snow, darkening the slopes and lowering the snow's reflectivity, or albedo. The lowered albedo caused the little snow left to melt rapidly. "But both alive and dead," Sarec said, "they terrorized the mountain."

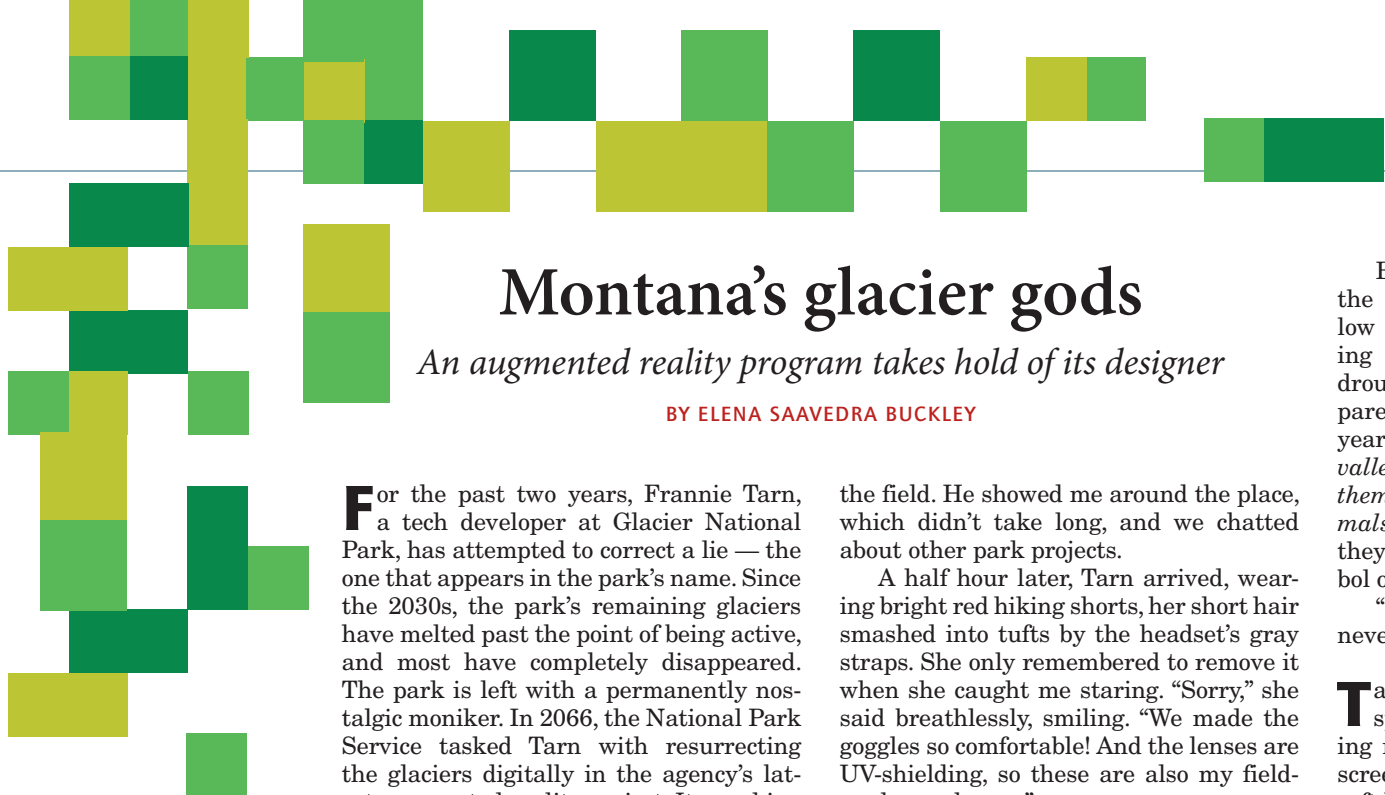
In the weeks following the incident, Vail closed Last Resort West. Cleanup is ongoing, and Vail Resort executives estimate it will cost tens of millions of dollars to remove the dead flies clogging its artificial snow machines — an effort that may be abandoned because of cost.

Earlier this month, after a judge ruled that Vail Resorts must pay some \$40 billion in damages from lawsuits, the company filed bankruptcy.

Vail fired Sarec and sued her, blaming its lead entomologist for not doing enough to prevent the calamity. Sarec, who hired a lawyer of her own, is hoping the case against her will be dismissed. "I worked in a culture of 'profit at all costs,'" Sarec told me. "Vail created a perfect storm: Deep dependence on its fly waste-management program, no water, ideal climate conditions for an extreme population event — and playing host to a group of highly persnickety and litigious skiers."

In the wake of the fiasco, Colorado has banned the use of soldier flies to manage human waste. It's unclear how, with no running water, Vail Resorts would deal with the issue. "At this time, we are not anticipating a viable 2070 ski season," said Cheryl Huffington, Vail Resorts president and executive director. "Winter conditions at our Canadian partner resort are still dependable and its runway is ready to accept private planes. We are advising all American skiers to travel north." □

The lid bubbled and opened slightly, and then it closed again, like a demented jack-in-the-box, giving us only a peek at whatever lurked in the cavern below.



Montana's glacier gods

An augmented reality program takes hold of its designer

BY ELENA SAAVEDRA BUCKLEY

For the past two years, Frannie Tarn, a tech developer at Glacier National Park, has attempted to correct a lie — the one that appears in the park's name. Since the 2030s, the park's remaining glaciers have melted past the point of being active, and most have completely disappeared. The park is left with a permanently nostalgic moniker. In 2066, the National Park Service tasked Tarn with resurrecting the glaciers digitally in the agency's latest augmented reality project. Its working title is "Argus."

Argus, still in its prototype stage, is currently available on just three sets of goggles, housed at the research station. Put the goggles on, walk around the park, and the misnomer is momentarily corrected: The glaciers appear in front of you, digitally projected onto the mountain faces where they once rested. "If you walk too close to them, the technology starts to glitch out a bit," Tarn told me. "But from the trails, the glaciers are just right there, looking real. It's pretty striking."

I first learned about Argus from reading about it in a Park Service annual budget report. No one outside the agency had seen the results, and the project appeared to be stalled. I wondered why. Martin Shafer, a longtime Parks tech developer, is Argus' lead designer. When I called to ask about the project, he explained that a lack of funding had put it at a standstill. Then, toward the end of our conversation, he mentioned Tarn.

"She's been spending a lot of time in the headset," he said. "It's just us two up at the station these days, and I rarely see her because of how often she's out using Argus. It's probably fine, but I'm not sure what to think."

West Glacier, Montana, a gateway town to the park, is home to a Park Service field station. In March, when I visited, autonomous buses zoomed crowds up mountain roads on guided tours, allowing people to see the park's mountains without budging from their seats. Bullet trains deliver visitors from Missoula in 30 minutes. Some wealthier locals come for the pop-up restaurants, where they can try cocktails dashed with moose milk. People swarm the park in the spring, to escape the city's density, but few will visit later on, when the wildfires start.

The field station is a modest one-story structure on the edge of town, cheaply built from concrete for fire protection. Schafer greeted me, as Tarn hadn't returned from

the field. He showed me around the place, which didn't take long, and we chatted about other park projects.

A half hour later, Tarn arrived, wearing bright red hiking shorts, her short hair smashed into tufts by the headset's gray straps. She only remembered to remove it when she caught me staring. "Sorry," she said breathlessly, smiling. "We made the goggles so comfortable! And the lenses are UV-shielding, so these are also my field-work sunglasses."

We walked down to the Middle Fork Flathead River, which cuts through town, to talk. Tarn's family fled Salinas, California, when flooding intensified, and she grew up in Missoula. She developed her virtual design portfolio in Missoula's influential startup scene, working for Google's autonomous vehicle programs. She helped develop software for mountainous neighborhoods, sharpening cars' ability to find escape routes from fires in the Northern Rockies.

Since being hired for the Argus project, though, she's thought about nothing else. She told me that she seldom sees her family, even when she's in Missoula doing archival research on the glaciers.

"It's a demanding load. Basically, we're never finished," Tarn said. "We could always render the glaciers with more accuracy. I think it's our duty to honor them, down to every last pixel." When I asked Shafer about this, he respectfully disagreed. "With no funding, it doesn't make sense for us to spend entire days on this, now that it's become a pet project," he said. "I think she's overestimating what Argus could become."

The project, much like its subjects, is drying up. A Park Service spokesperson wouldn't elaborate on why Argus is being phased out, saying only that "experimental ventures often must be put on hold as we redefine our public role." Shafer believes that Congress is wary of the depressing worldview that technology like Argus might promote. The agency is already struggling financially, with tourism shrinking during increasingly hot and smoky years.

In 2031, when the Intergovernmental Panel on Climate Change issued its second-annual crisis report, glaciers got little attention compared to other goals — reaching zero carbon emissions, setting refugee policies and outlining coastal relocation plans. On page 357, there's one sentence: "Glacier National Park has noted the dramatic retreat of its last glaciers, rendering them inactive."

But Tarn clings to the memory of the glaciers themselves, unlike her fellow researchers who deal with the ongoing consequences of their absence, like drought and disappearing species. Tarn's parents, who witnessed the glaciers' final years, always said: *Our mountains and valleys couldn't have been carved without them. The cold water they released fed animals and plants for centuries.* For Tarn, they are the most visceral, concrete symbol of a world she can never live in.

"I've always felt that way, even if I've never really seen one," she told me.

Tarn led me into the Argus "lab," which sprouts from the research station's living room wall. A broad desk and curved screens dominated the space and cast a soft blue glow onto the room.

She touched the screen, and images appeared. The U.S. Geological Survey has a database of glacier pictures, taken from identical lookout spots over many decades; the first images date to the early 1900s. Tarn scrolled through more than a century's worth, lingering on a black-and-white shot of the Boulder Glacier ice cave. Taken from a distance in 1932, it shows a mammoth chunk of frozen water, blindingly white and scored with ridges, an arched opening leading into a dark tunnel in the center. Four men in suspenders stand on sheets of ice at the cave's entrance.

Tarn stared at the screen. "Sometimes, after taking off the headset, it takes a second for me to adjust," she said. "I have to remind myself that this is all gone."

I asked Tarn about Argus' financial prospects; her commitment to the doomed project seemed to reveal a rift within the agency. She acknowledged that they were struggling, but said she hoped that she and Shafer could find the money somewhere. We had not been talking an hour before she suddenly announced that she needed to do some more tests.

"How many hours do you spend on that?" I asked her as she pulled the headset back over her eyes.

"I have to be in it a lot when I'm working."

"How many hours?"

She pointed to a corner of the screen, where the program tracks her daily average time in the goggles: "12:02:19," it read.

Many people have become functionally attached to augmented reality. Even public schools have relaxed their restrictions on headset time in class. But had Tarn been spending too much time with Argus? It seemed to me, I told her, that she was clocking in headset hours worthy of Auggers, the online community dedicated to abandoning the real world for that of self-coded realities.

"This is my work, so I think it's a little different," she said. "It also seems important that what I'm immersing myself in ... it was once real," she said. "This isn't

a fantasy world that I created.” For her, being inside the world of Argus seemed almost like penance.

The following day, Tarn and I began a two-day trip to the Boulder Glacier. We hiked all day to a helipad, and the chopper delivered us to the trail nearest to Boulder Mountain, just north of the Continental Divide. Before it disappeared, the glacier called this area home. We approached the peak, which skews sharply out of the earth like a colossal cruise ship hull. No matter how much I thought about the glaciers, the heat distracted me, and the mountain looked naked: All rock, no ice.

Tarn didn’t give me the headset until

we reached the foot of the peak itself, a precarious, sloped surface. I put the goggles on, stretching the gray straps over my hair. At first, the single transparent lens was noticeable, but my eyes quickly adjusted. It was miraculously clean, and I barely felt the foam perimeter on my forehead and cheeks. Then Tarn pressed a button on the side.

Suddenly, the Boulder Glacier ice cave snapped into view. It glistened in front of me, long and cavernous, its shape reminiscent of blue whales I had seen in pictures. I found it difficult to focus on one feature. It seemed to sweat in certain places, as if it responded to the same sunlight under which I stood. The cave opening in the middle looked dark, gnarled and

impossibly cold.

I had never seen so much ice in my life. I wanted to see inside the cave, to be dwarfed by it, and I thought of what it would feel like to the touch. I began walking forward.

“Stand back!” Tarn said, putting her hand on my shoulder. At first, I thought it was a technical warning — the illusion could glitch if I got too close. But when I looked back at her, she was gazing at the exact space where the cave’s opening would be. Tarn wore no goggles — by now, she could see into the past without them. She knew where the glacier should have been, and she didn’t want me to spoil the picture. □

“Sometimes, after taking off the headset, it takes a second for me to adjust.

I have to remind myself that this is all gone.”

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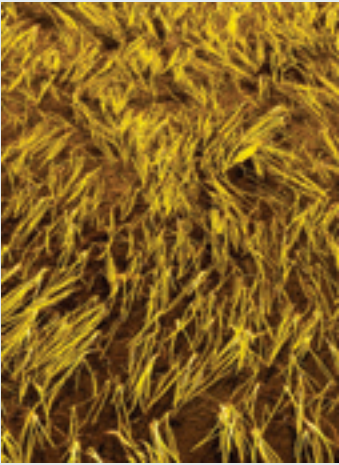
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Left, El Capitan and the Merced River in winter at Yosemite National Park, California. Above, grass growing in a shallow pond. ROBB HIRSCH

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THE NATURE OF YOSEMITE: A VISUAL JOURNEY

By Robb Hirsch, 144 pages, hardcover: \$35
Yosemite Conservancy, 2019

The Nature of Yosemite: A Visual Journey, a book of awe-inspiring photos by Robb Hirsch, offers a window into the art, science and history of Yosemite National Park in California's Sierra Nevada. Hirsch captures the park's many wonders, both small and large, from the tiny orange-bellied newt to the granite siding of El Capitan rising 3,300 feet above a snow-covered landscape. The photos are humbling: Whether a devoted naturalist or a committed city-dweller, the viewer can't help but be moved and inspired by these images. Along with teaching his readers about the ecological concepts, geological history and compelling species that encompass the heart of California, Hirsch hopes to compel them to act. "As powerful humans, we have the ability, privilege, and responsibility to act on behalf of nature," writes John Muir Laws, a scientist and educator, in the foreword. "Nourish your heart in nature and let that love move you." **HELEN SANTORO**

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Coming home to the West and saying a few sad goodbyes

This is **Kalen Goodluck**, signing on to write my first "Dear Friends" as an editorial fellow on the Tribal Affairs desk. I recently left a small studio apartment in Manhattan, where I lived for two years, to meet up with the *HCN* crew at the editorial satellite office in Gunnison, Colorado, and then moved on to Albuquerque, New Mexico, where I grew up. The move back West was a reminder that out here, the air is thinner, the views are wider, and people on the street are capable of friendly eye contact.

Speaking of contact, the summer has brought many visitors to *High Country News*, both in Paonia, Colorado, our headquarters, and elsewhere in the West, where our editorial staff is dispersed.

Charles Olmsted of Greeley, Colorado, made the trip to the Paonia office for a tour. He's been a subscriber since the 1970s, when he lived in Lander, Wyoming. In 1976, Charles answered an *HCN* ad that landed him a role the following year as assistant professor and coordinator of an environmental studies program.

Zach Miller, an avid reader since 1971, stopped by the editorial offices in Gunnison, Colorado, recently. Zach is an environmental lawyer who credits *HCN* with getting him interested in the field. To his wife's dismay (but to our delight), Zach has 40 years of *High Country News* stacked in his garage, and he says he's having a hard time

parting with them. Another Gunnison visitor was **John Walsh**, former U.S. attorney for the District of Colorado, who is preparing for a Senate run in 2020. Walsh, a longtime *HCN* reader, left with a "West Obsessed" bumper sticker, which, we are told, he promptly affixed to his vehicle.

It's with sadness and regret that we mourn the loss of **Emily Stonington**, who passed away at the end of June. In addition to being a devoted *HCN* board member, she had an expansive career as an educator and director of the Montana Wildlife Federation. She served two terms in the Montana House of Representatives, one as minority leader, and one term in the Montana Senate. We will remember her laughter, determined leadership and her staunch support of the *HCN* intern program.

HCN is likewise saddened by the passing of **Edwin Dobb**, who died at the age of 69 in late July. A longtime writer for *Harper's Magazine* and many others, he was especially known for his literary essays on his hometown of Butte, Montana. One of his last pieces for *HCN* was a 2010 essay, "Immersed in the Wild," about open-water swimming. In it, he wrote: "The longing to swim ever farther out remains, an instinctive response that I neither control nor fully comprehend. Even more intense, especially now that I'm 60, is the desire to continue swimming — swimming robustly — for all of my remaining days."

—Kalen Goodluck, for the staff



Emily Stonington, who served on *HCN*'s board of directors from 1991 through 2005, was renowned for her sharp wit, bright blue-eyed smile, and a no-nonsense practicality that effectively crossed the political aisles. She passed away on June 26. FROM THE *HCN* VIDEO: THE VOICE OF THE AMERICAN WEST

FEATURE BY TRISTAN AHTONE
ILLUSTRATIONS BY WESHOYOT ALVITRE

Climate Criminals

As the world's last climate change deniers are brought to justice, those tasked with pursuing them face a final challenge: retirement

THEY ARRIVED IN JULY OF 2062, the time of year when the salmon memorials begin. The two E-series Black Hawks hugged the fire-scarred spruce of the Chugach National Forest, pounding into a parched blueberry field. Two dozen paramilitary police, members of the Old Bears, grabbed their gear, leaped from the choppers and disappeared into the treeline. It would be their final mission.

The Old Bears, an internationally funded joint task force developed to hunt down and arrest fugitive climate criminals, were led by Lieutenant Colonel Aoife Viejo. They hiked through the rawboned lowland forests for nearly two hours toward Katalla, a remote smuggling hub controlled by the United Provinces of Alaska Militia (UPAM). Their target was 84-year-old Stephen Brower, a former physician and Republican senator from Massachusetts who would later be convicted of crimes against the environment, specifically for “denying and downplaying life-threatening climate change impacts for personal gain.” Intelligence sources said Brower had been living near Katalla for more than a year with his wife, his daughter, her husband, their twins, two armed guards and a courier who came and went regularly.

“The plan was Gabe LaBatte (reconnaissance) would secure the area, while (Judicial Officer) Katrina Winogrand served papers, and Jake Cross (intelligence) and I covered Winogrand, in case anything went sideways,” said Aoife Viejo. The goal, as usual, was to capture the climate criminal and his collaborators peacefully so they could stand trial at The Hague or Fort Sill.

But as the Old Bears made their way along the Katalla Slough that morning, through blackened bogs, drying streams and patches of withered prickly rose, their movements were captured by trail cams, alerting militia rebels in the area. “That’s when the trouble started,” recalled Viejo.

The team emerged from the treeline on the east side of a makeshift airstrip a kilometer from Katalla. Five commandos — Viejo, LaBatte, Cross and two relatively new recruits, Tina Cannon and Roberto Lowry — ran south along the edge of the woods, then west across the airstrip toward a collapsed wooden barn. The remaining commandos fanned out across the perimeter of the strip. Intelligence had suggested that there was an underground bunker with an air-filtration system underneath the old barn. The Brower family had been living there while they negotiated safe passage to the Kuril Islands, where they would be safe from extradition.

The Browsers surrendered without incident; that much has been made public by the Chugach Commission. But what happened when the prisoners emerged from their bunker remains under inquiry. According to reports, 32 militia rebels hidden along the north and west end of the airstrip opened fire on the Old Bears. Cannon was hit in the neck and jaw, dying instantly. LaBatte died within minutes after a bullet tore through his thigh, severing his femoral artery. Brower’s son-in-law and both twins were killed in the crossfire. Viejo’s body armor protected her chest and stomach from multiple gunshots, while Winogrand, Cross, Brower and his wife managed to crawl to



Yamal Acute Respiratory Syndrome killed approximately 1.8 billion around the world in three pandemic waves between the spring of 2031 and the summer of 2033, touching nearly every person on the planet.

safety in the ensuing firefight.

For the next 46 minutes, an intense gun battle raged. Twenty-two UPAM rebels and seven Old Bears were killed. Investigators have yet to rule on the incident, but sources close to the commission say the evidence increasingly points to friendly fire as the cause of the Old Bear deaths. Nearly a dozen UPAM rebels may have faced “summary executions,” which could lead to charges against Viejo, the task force’s commander.

Viejo says she still feels guilty about the raid, two years later. “I just have a lot of time to think about it.” But despite the deaths, the investigations, the public scrutiny and controversy, Viejo regards the mission as a success. “We were just amazed by the wealth of information we recovered,” she said. “Phones, DNA Fountain sticks, holo-drives with bank information and future eco-terrorism plots. It was the motherlode.”

In the following weeks, climate task force teams across the globe were able to decrypt eco-terrorist networks and make sweeping arrests. “We were able to find, and capture, these assholes on the wrong side of history,” she says.

The episode would seem to mark the end of Viejo’s military career, and, perhaps, the end of what many consider the Green Revolution’s darker side. It is widely accepted that The Storms of 2033 and the YARS pandemic played central roles in the global Green Revolution, both in terms of inflicting catastrophic, climate-related financial damage on the United States and in providing the international pressure necessary to permanently outlaw carbon emissions. But in the aftermath, as celebrations broke out around the world, the authorities took a controversial approach to eco-justice. In 2038, international courts began prosecuting high-level climate change deniers, including politicians, corporate leaders, journalists and scientists — individuals who “in writing, or by word, publicly denied, diminished or downplayed the impacts of human-caused climate change.” By the end of 2040, an estimated 75 climate criminals remained at large, but as of this year, only eight remain unaccounted for, thanks largely to the half-dozen sanctioned paramilitary groups around the world tasked with tracking and arresting fugitives.

With only a handful of climate criminals still at large, and amid mounting pressure to disarm the task forces, the Old Bears and their sister organizations are disbanding after nearly three decades on the hunt. Little in their training has prepared them for their next challenge: retirement.

I FIRST MET VIEJO IN THE FALL OF 2067 in downtown Niinéniniicie, in a café packed with young writers, old radicals, provocative fliers, job hunters and pastries. It was the first of many visits and a lengthy correspondence — a running conversation about life before, and after, the Green Revolution, as well as about her cat (Councilman Beans), her niece, and how she went from cutting-horse competitor to internationally famous and now-retired climate-criminal hunter.

At that first interview, Viejo told me that she would not discuss the details of the Brower raid due to the ongoing investigation. If I wanted to get that story, she said, I could read the volumes of court documents, testimonies, appeals, correspondence, depositions and redacted paperwork currently available from the courts of the Autonomous Federation of Tribal Territories’ mobile infantry judiciary, the U.S. Army Court of Criminal Appeals and the United Nations Department of Peacekeeping Operations. Having been hauled in front of a half-dozen tribunals already, with more to come, Viejo said she was in no mood to be grilled again. As far as she’s concerned, the Browers’ arrests, as well as the intelligence gathered in the raid, made the collateral damage a tragic but necessary price to pay.

Viejo has called Niinéniniicie home for more than 20 years. “I got here when the houses were empty and the rents were cheap. A global pandemic really drops property values.” Regionally speaking, it’s the most influential metropolis in the Autonomous Federation of Tribal Territories. Its life as a colonial city has been almost entirely rewritten — to see pieces of the gold-domed, neoclassical capitol building, once a defining feature of the downtown, one must visit the Niinéniniicie Documentation Center for the History of Capitalism. Historians and schoolchildren interested in the region’s role in fostering climate crimes

can visit the overgrown remains of the Cherokee Generating Station.

North of Niinéniniicie, past the ghost towns and overgrown suburbs, a network of smart grids and renewable energy projects blankets the plains. To the east lie the contested territories of the Oceti Sakowin and Osage; to the south, the Pueblo districts; to the north, the Plains Confederacy; and to the west, just over the mountains, the last remaining rebel-held province in the region.

Since it was transferred to tribal control in 2052, Niinéniniicie has become known as the city of reinvention. Its entertainment, education, technology, art, politics, tourism, fashion, economy and sports have attracted both tribal citizens and people of settler heritage. Politicians, artists, ambassadors and socialites have moved here, drawn by the good weather and cultural amenities — evening patio cocktail parties that begin with the summer solstice and, for those who can afford the manmade powder, the skiing that begins just before winter solstice. Musicians come to play in the city’s clubs, while college graduates fresh from the Ivies — Sinte Gleska, the Institute of American Indian Arts and Chief Dull Knife College — vie for jobs in the booming negative-emissions tech industry. Today, Niinéniniicie is the center of the Indigenous universe, rivaled only by Pápawai and S’ólh Téméxw.

Viejo’s celebrity sees her slipping as quietly as possible between her home, her favorite coffee shops and bars, and the Sixkiller Academy, where her niece, Tsah Doe, attends school. The two have been living together for over a year — Rhett, Viejo’s only son, is on a peacekeeping deployment in Araucanía — and the relationship with Tsah Doe, Viejo says, has given her days structure but also has been surprisingly challenging. “The day starts early: I make breakfast, we negotiate what she’ll wear that day, then walk to school. I come home, clean up, then nap — with Councilman Beans, of course. Then I pick Tsah Doe up, make dinner. Wash, rinse and repeat the next day.” Tsah Doe enjoys swimming or horse-riding lessons, visits friends and takes English and Mandarin language classes. “She plays well on her own,” says Viejo. “But if you think heavily armed climate criminals on the lam are tough customers, try getting (Tsah Doe) to bed when *My Painted Pony* is on the TV.”

Before Viejo became famous, she rode horses. When she was 5, her mother, Alex, moved the family to North Texas to be closer to her parents. Viejo’s grandmother, Elizabeth Rose, was a doctor, and her grandfather, Lee, a former pilot. “Back then, that area was known as the ‘cutting horse capital of the world,’” said Viejo. “That’s how I got into it — riding horses. My grandfather made me do it.” By the age of 12, Viejo had gone from youth rookie on the local cutting-horse circuit to taking top marks as a novice. Her goal was to go pro. “It’s all I wanted to do,” she recalled. “Then YARS hit.”

According to the most recent World Health Organization estimates, Yamal Acute Respiratory Syndrome killed approximately 1.8 billion around the world in three pandemic waves between the spring of 2031 and the summer of 2033, touching nearly every person on the planet in one way or another. Viejo lost her riding coaches, then her mother and grandfather. When the pandemic was finally under control, The Storms made landfall. “I remember watching it on the TV with my grandma. We were eating lasagna that day the hurricane hit D.C. It was like watching a monster movie. I saw the White House crumble, Congress flattened. My grandma couldn’t believe it; she didn’t know what to do or if we would even be safe. I think she was like a lot of people back then, wondering what kind of world we were living in, realizing that this was really the end, that all the droughts and wildfires and hurricanes were just warnings. I felt bad, but I think my grandma felt worse, and you could see that feeling on everyone. That hopelessness. It was scary.”

In the wake of The Storms, the question of autonomy, reparations and eco-justice created a kind of power vacuum. With refugees on the move throughout the United States and tribal nations closing their borders, a new leader, Georgette Oak, became head of the rapidly growing Autonomous Federation of Tribal Territories. “Oak wasn’t just the architect of what we now know as the AFTT,” said Sipho Kings, editor and chief at





the *Mail & Guardian*. “He was responsible for attracting movements with harder, more revolutionary leanings, notably the Popular Front for Indigenous Liberation (PFIL).” In 2034, the PFIL declared itself a liberation organization and announced that its enemies were not only American colonialism and imperialism, but also global partner regimes that oppressed Indigenous populations. The group was instantly outlawed. After it began dynamiting government buildings in what were then unceded tribal territories, the group quickly earned notoriety as “terrorists.”

“It was fabulous publicity,” said Lillian Bolano, Vine Deloria professor of history at Harvard University. “Suddenly, Indigenous liberation was on the front page of every newspaper on the planet. Young people could feel the change in the air: It was a call for revolution, and people around the world were affected by it, sympathetic to a war against American imperialism and capitalism led by Indigenous people.”

After carbon emissions were outlawed and climate criminal tribunals established, Viejo and others gravitated to the AFTT and the PFIL. “I can remember the feelings I had when I was a kid, and my mom or my grand-dad read to me at night and told me stories about the world. When it was still green. When you could still swim in the ocean or see snow in the mountains. I would look at nature photographs in magazines and see birds and animals that don’t exist anymore, and they were clear and glossy, and I would look at them for hours and dream about what it was like to see everything in real life. What it was like to see a rainforest, or a glacier. I didn’t have the words then, but I remember the feeling of knowing that those places were dying.

“Now I understand that the feeling was shame — shame and anger. I think that is really why I’ve done what I’ve done, and I don’t need a pardon for it. When the courts started making arrests, police were grabbing guys, like, every other day. In Sweden or Australia or Canada — all these exotic places I had only ever seen on television or in my magazines — these guys were driving around in expensive cars with their families and

living in climate-controlled buildings with hydroponic crops and expensive bottled water like nothing was happening. Like the world was OK. And when they went into hiding? That’s when I joined up. I wanted to help grab these assholes, but I settled for dynamiting (Bureau of Indian Affairs) offices.”

In the summer of 2033, Viejo made contact with the PFIL. Viejo refused to discuss her time with the organization. Those stories, she says, are a matter of Tribal Security.

IN FALL 2040, THE INTERNATIONAL COURT OF JUSTICE voted overwhelmingly to demand that the United States end its “colonial administration” of North America and return all unceded lands to tribal nations and Indigenous communities. That same year, the PFIL and other liberation movements became bona fide AFTT armed forces, the Olympic Games in southern Chile were cancelled, and the Bast Council agreed to unrestricted transport of people and goods throughout Africa and Europe. One other thing happened: Aoife Viejo became incredibly famous.

Viejo did so unwillingly. She first appeared in AFTT propaganda materials, promoting the PFIL’s transition from rebel group to standing army, then took on a more involved role with the Office of Tribal Information. “I didn’t have a choice in that,” she said. “It was just part of the job.” When it was announced that the AFTT would fund a climate criminal task force, with Viejo leading it, she was quickly dispatched to talk shows and radio programs. Her image appeared on everything from cereal boxes to magazine covers. Her “adventures” appeared in comic books, her personal life became fodder for public consumption.

By 26, Viejo was a household name. As the face of the AFTT, she quickly became an icon of “self-determination and sovereignty.” While her involvement with AFTT propelled her to fame, the notoriety also destroyed her marriage to Woody Stone, an entomologist with the Federation’s reforestation division, and made her a target for the constellation of oil and gas militias, settler secession movements and white nationalist groups opposed to the International Court of Justice’s ruling.

At 29, she survived her first assassination attempt, an FBI-orchestrated shooting outside her Niinēniiniicie apartment. She spent two months recovering with her ex-husband, Woody. “We spent the whole time playing cards, eating cherries and drinking rum,” she says. The second attempt, a bombing on her 31st birthday planned by the American reconstruction militia Sons of Liberty, earned her a nine-month vacation to the still-frigid shores of Kalaallit Nunaat, where she and Woody conceived their only son, Rhett. The third attempt, a stabbing coordinated by the Soldiers of Washington, an anti-Indigenous colonial group, occurred at 35 after a glamour photo shoot for *Indian Country Weekend*. “I’ve always felt like that was a kind of an analogy for my life at the time,” she said. “Lying in a pool of blood on the streets of Me-Kwa-Mooks wearing crazy-model makeup. That kind of shit usually only happens when you hang out in Diné Bikéyah.”

Controversy — and violence — were simply part of Viejo’s job, it seemed. “Everyone thought that with the Green Revolution and the land returns that the world would be a nice place, that we’d all be running around, hugging beavers and kissing buffalos,” she said. “It’s not like that.”

IN SPRING 2038, WHEN VIEJO WAS ONLY 18 YEARS OLD, Oklahoma Republican Sen. Perry Inhofe became the first climate criminal prosecuted by international courts. The author of the now-banned book *The International Hoax: How the Climate Change Conspiracy Threatens America*, Inhofe was notorious in the early part of the 21st century for his vehement denial of human-caused climate change, his anti-climate policy, his acceptance of millions of dollars in campaign donations from the fossil fuel industry, and his penchant for political theater. (Bringing snow to the U.N. in a cooler in an attempt to prove that global warming was fake still ranks as one of his most ludicrous stunts.) Inhofe received a sentence of 362 years for climate crimes. His original handwritten confession is on view at the Niinēniiniicie Documentation Center for the History of Capitalism, displayed next to a photo of children outside one of the many YARS crematoriums.

Mark Horner, former executive director of the Committee for a Productive Future (CPAF), was the second person to be tried. An anti-climate science think tank bankrolled by oil and gas companies, CPAF was well-known for its stable of lobbyists and for deliberately spreading disinformation in both the U.S. and the E.U. Horner received a life sentence, as did his closest CPAF collaborators and contributors — at least those who were caught.

As international courts issued arrest warrants for climate deniers around the world, those who could afford to go on the lam did. A few reactionary governments and critics called the arrests “an unnecessary act of retribution” and condemned the paramilitary police forces deputized to arrest climate deniers.

In *The Pacific*, Adam Overlook explicitly rejected the use of paramilitary climate police and called for a return to national autonomy to curb international abuses of power. “One problem victims of environmental crimes seem to forget in this so-called ‘golden age of justice’ is that by placing all climate crimes on the shoulders and in the hearts of pernicious oil executives or crooked Republicans, we are able to assuage our own guilt and believe that climate change wasn’t a communal effort. That there was nothing ever wrong with our own behavior. That there was, in fact, a bad man in a black hat the whole time, and once he was arrested, we law-abiding citizens could restore order to the world, and crush such cruel designs and malicious plots.”

Viejo herself is no stranger to personal criticism. Shortly before its collapse, *The New York Times* called her “a violent thug who has already murdered American democracy and now returned to kick its corpse for fun,” while the *Philadelphia Inquirer’s* editorial board continues to demand her “immediate arrest for violations of international human rights covenants.” U.S. security services have a standing order to arrest or kill Viejo on sight, should she enter U.S. territory — a threat Viejo shrugs off. “Nobody wants to go to the U.S. anyway,” she says. “It’s what folks used to call ‘a shithole country.’”

As raids and arrests have become more violent, pressure has been mounting globally to dismantle groups like the Old Bears.

The Citronen Club, a Danish-funded task force, faced criminal charges after a botched arrest attempt led to the deaths of 23 civilians on a bus in Aalborg, while in Chile, climate-criminal hunters were eventually arrested after investigators learned that the task force hunted and killed friends and family of climate deniers for “sport.” The Old Bear deaths and investigations have served as a turning point for international attitudes, but Viejo stands by her and her colleagues’ actions.

Yet temperatures continue to rise — and there’s the rub. Despite the outlawing of emissions and a complete switch to renewables, post-Industrial Revolution carbon dioxide is still in the atmosphere cycling through the earth’s system. Scientists don’t know how long it will take for the planet to return to safe levels of carbon dioxide and say it could take centuries. “It was already too late when we started (the Green Revolution),” said Viejo.

SINCE RETURNING TO CIVILIAN LIFE, Viejo has been primarily concerned with finding work. Her search took an unusual turn three weeks ago.

To the east, the capital of the remaining United States, Washington, D.C., remains a colossal mess of ravaged neoclassical buildings and overgrown row houses. The city’s thoroughfares are as decrepit as they are dangerous, much like the streets of Charlotte, New York, Philadelphia and the few remaining metropolises on what’s left of the United States.

Nearly two decades after the collapse of the U.S. economy, the former republic struggles with abysmal health statistics, social ills, and psychological challenges. Alcohol-related deaths among white people are the highest of any minority group, while white men are imprisoned at five times the rate of their Indigenous counterparts. The unemployment rate for white men still is approximately 15 times the rate in the Tribal Territories — up 15% since 2062 — and at least 40% of white families live in abject poverty. Rolling blackouts have done no favors to the flat-lined economies of the flailing nation.

Last year, Autonomous Federation of Tribal Territories airlift planes transported more than 3.5 million tons of food to the U.S. in “Operation Independence.” The planes originally returned with passengers hoping to become citizens of the Territories, but this spring, strained diplomatic relations between the U.S. and the Federation put a temporary halt to accepting refugees. Tribes remain divided on the matter, but continue to fly goods and products into the U.S. By the end of the year, it’s estimated that 275,000 missions will have been flown to Washington, D.C., Boston and New York, feeding nearly 16 million people.

According to AFTT officials, the ongoing effort will now be led by Viejo, thanks to the end of the Chugach Commission’s nearly seven-year investigation, which was dismissed on a technicality a few weeks ago, after the testimony of surviving Old Bears were inadmissible. Katrina Winogrand, Jack Cross and Aoife Viejo, the courts argue, had not been fully informed of their rights before they spoke with investigators directly after the firefight. Viejo avoided a dishonorable discharge and can continue her military career with Operation Independence.

Speaking by phone, Viejo said she was relieved by the acquittal, but remained tight-lipped about her feelings toward investigators, media inquiries and speculation. She acknowledged that she was not free from blame. “I was in charge, so that responsibility is on me. They were my friends. I’ll have to carry their deaths.” She said she did not know how long she would feel that way.

“When I was a kid, I shot a ground dove with a pellet gun to see what would happen, maybe just because I could. Knocked it right off a telephone line. But it didn’t die — I only hit it in the wing. Instead, it flopped around and tried to fly away with its good wing. It was hurt and scared but still pretty fast, so I chased after it, for almost a block, just hoping I could find a way to say I was sorry. To take back what I had done. I had never felt so ashamed in my life. I still do.” Viejo paused for a long moment, then continued. “I think about that a lot, and my friends who died. I pray for them. I tell them that I still need their help and guidance and strength. I tell them I’m still trying to get something right here. I’m still trying to figure out what that is.” ■

“Everyone thought that with the Green Revolution and the land returns that the world would be a nice place, that we’d all be running around, hugging beavers and kissing buffalos. It’s not like that.”

— Aoife Viejo, former climate criminal hunter with the Old Bears



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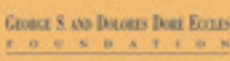
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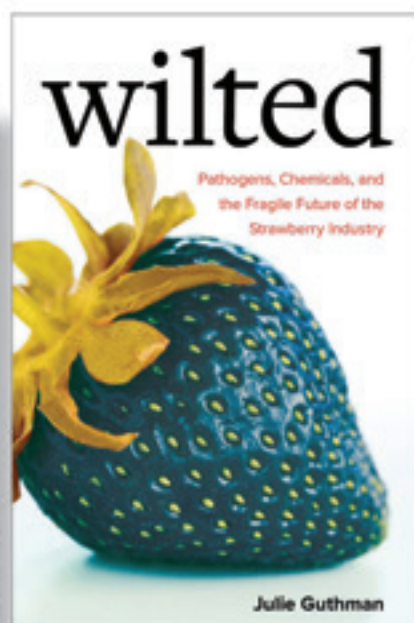
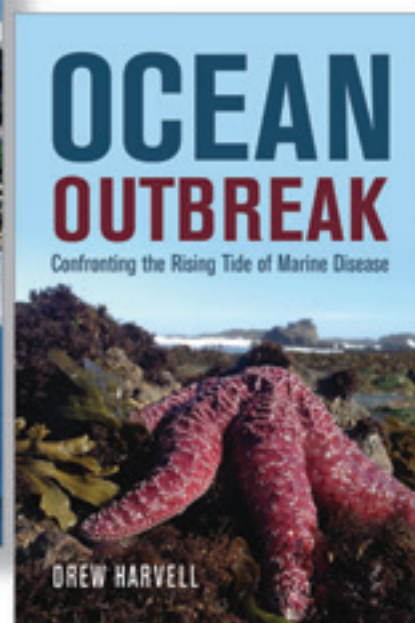
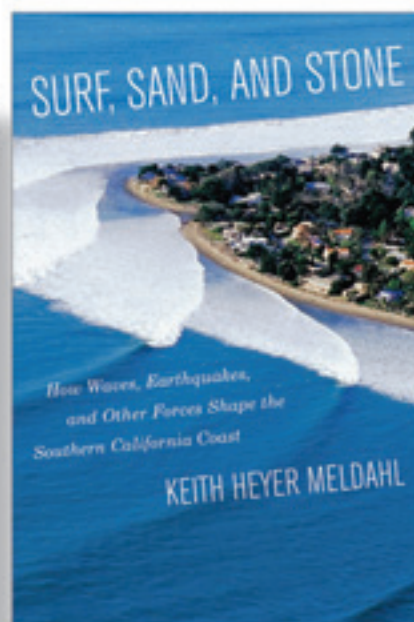
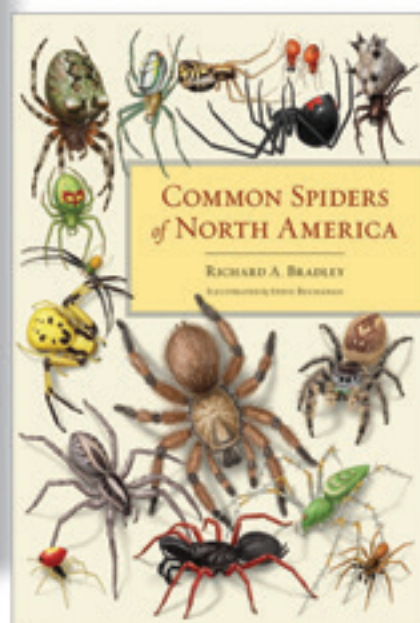
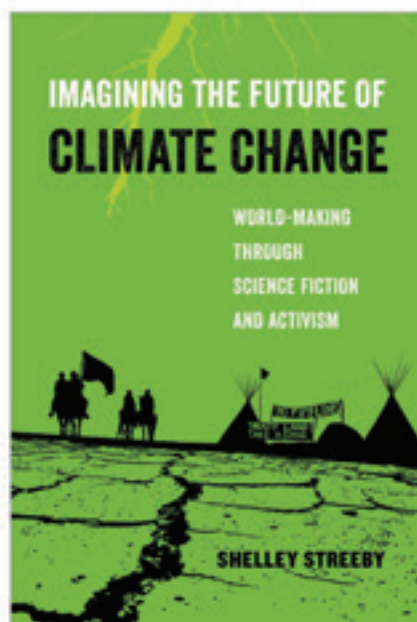
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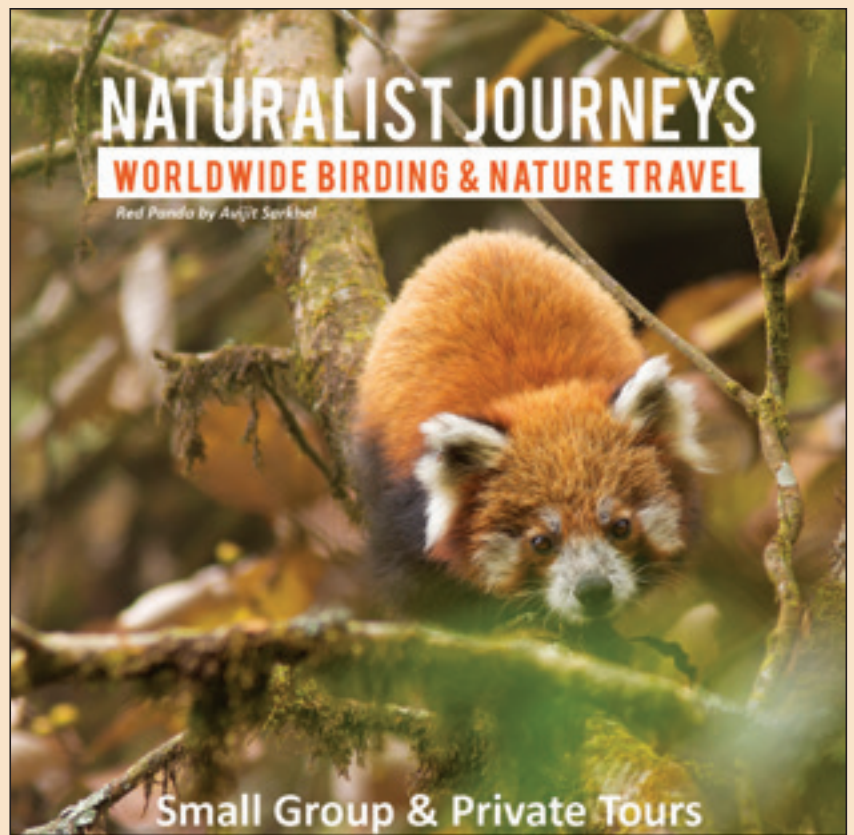


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UNCHECKED DEVELOPMENT

LOCATION: SAN PEDRO RIVER, ARIZONA

BY XANTHE MILLER - WINNER

I grew up in the Mule Mountains of Cochise County, Arizona. From the top of Mount Ballard, you can look west to the San Pedro River. This piece (left) depicts my forecast for the San Pedro riparian corridor if its aquifer is drained and surrounding urban development goes unchecked. ■

DEATH BY GRASS

BETWEEN PHOENIX AND TUCSON, ARIZONA

BY THOMAS HULEN

Sand dunes now separate Tucson and Phoenix, Arizona. The dunes are occasionally punctuated by granitic outcrops and low-elevation mountains. Much of what was the Sonoran Desert is replaced by constantly wandering waves of sand and dust. The resemblance to the Sahara Desert is striking.

The destruction of the Sonoran Desert is not complete. There are a few remnants scattered in Arizona and the Mexican state of Sonora where rainfall patterns suitable for Sonoran Desert plants still occur.

But changes in rainfall patterns also favored the growth of buffelgrass, an exotic invasive grass introduced to the United States and Mexico for livestock forage that swiftly overtook the landscape. Buffelgrass evolved to withstand and thrive in ecosystems subjected to periodic wildfires. Sonoran Desert plants like cactus and other plants with green chlorophilic exteriors like palo verde trees cannot withstand fire, and they perish.

Now, the collapse of the Sonoran Desert ecosystem between Phoenix and Tucson is so thorough that buffelgrass is rarely observed there now.

Fortunately, people can still see examples of Sonoran Desert plants like saguaro cactus and palo verde trees at local botanical gardens, when the atmospheric dust levels allow them to visit. ■



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SUBURBS OF DUST

LOCATION: KANAB, UTAH

BY MEGHANN BURKE - RUNNER-UP

It's a hot, hazy morning heading into town. Squalls of dust blow around the now-vacant subdivision of La Estancia. Back in 2019, it was considered the elite housing community of this high-desert town. Now, with the horrendous flooding coming off the cliffs towering above, the houses are in disrepair and their occupants have moved on, leaving behind a modern ghost town. The storms have been increasingly bad and are getting worse. Townspeople could no longer keep diverting the onslaught of water. Monsoon season used to be the culprit, bringing massive amounts of rain that would run down the canyon, destroying roads and flooding homes and businesses. But now, in 2070, the state of our climate has changed. The storms are more frequent and intense. The small town in the base of the canyon is no match for Mother Nature. We make a left in the heart of town and join the line of cars waiting at the entrance of Kanab Water Conservancy. Today, the north side of town is slotted to receive water rations. Since the Lake Powell pipeline came to be in 2030, water has become scarce, the Colorado put under more strain. This is the story of liquid gold. ■

SHALLOW ROOTS

ALDER CREEK SEQUOIA GROVE, SPRINGVILLE, CALIFORNIA

BY KIM DICSO

The trees had run as far as they could. As temperatures climbed, so did the arboreal giants, gradually trudging upslope until they were at the mercy of an alpine precipice of wind and gravel where they didn't belong. They had witnessed the two-legged colonizers and their wars. They had endured storms, fire and the ax. But, in the end, they couldn't survive the plague of humankind. The winter snows had become summer rains that evaporated into dust before anyone could drink. The little water that remained was siphoned into the dry desert, where humans' desperate thirst outweighed all else. One by one, as their shallow roots lost strength and loosened their grip on the dry earth, the giant sequoias tumbled to the ground and shattered in thunderous earthquakes that reverberated into the thirsty valley. Limbs and pieces of trunk slid downslope in an avalanche of ruddy wood, coming to rest in the dust. There they would remain for thousands of years, waiting to decay, as the world collapsed around them. The columnar sentinels had stood tall through every small disaster of man, each only a blip in their 2,000-year lifetimes. But this — even they could not survive. And neither would we. ■

EDWARD MUSIAK/CC VIA FLICKR

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SARAH ROSS/CC VIA FLICKR

LIFE IN THE DARK

LOCATION: HEREFORD, ARIZONA

BY B. KUBBY - RUNNER-UP

"Por favor, pass the nopales?"
"Sí."
"How is Marissa?"
"Oh, she's well. We got a lot of canning done today."
"Que bueno."
"Pero. ... Marissa is worried." Mamá took a sip of wine. "She says the Mendez Well just went dry."
"Verdad? The Mendez Well?" Papá's eyebrows furrowed.
"Sí. If that damn Smith family keeps pumping the San Pedro —"
Papá interrupted. "Yo sé. But they have the BLM in their pocket. What can we do?" He looked toward Pablo and me, and then said pointedly to Mamá, "Let's talk later." We finished dinner in silence.
Pushing his chair back, Papá smiled warmly. "What a lovely dinner, *mi querida*." He kissed Mamá and looked toward the window. Frowning at the dark blue sky, he stood to pull down the blackout shades.
"Papá, could we wait a little? I love watching the sunrise. ..." Pablo asked quietly, hopefully.
"No, *mijo*. You know the rules. The summer heat is dangerous. If we don't block out all the light, then our bodies will not adjust to night-living. You can watch the sunrise this fall when we switch back to day-living, OK? But for now, *mijo* ... we can wake up early mañana and watch the sunset." ■



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WALTZ ON THE RIVER

LOCATION: LIVINGSTON, MONTANA

BY ANTHONY PAVKOVICH

The river became a trickle by July. Trout and whitefish filled the last remaining pools as the sun rose and beat upon the stone bed of the river. Coming down from the mountains, the bears feasted on the imprisoned fish of paradise.

As August dawned, the river stopped flowing. The pools evaporated, and fish bones sparkled under the mid-morning sun. Silence hung heavy in the valley.

The shop had been closed since June, when the state banned fishermen from the river. Drift boats sat dry and collected leaves in the back lot as midday approached.

When the river disappeared, in the late afternoon, the tourists stopped coming. Businesses closed, and silence filled the valley upriver.

As evening arrived, the Murray was full, packed to the brim by the few locals remaining since the last boat was pulled ashore. As the sun approached the horizon, there was a growing fear that eventually, even the taps would run dry.

While the sun went down, music played from the bar's open windows. It wasn't the swing or honkytonk that the patrons once enjoyed. Nights now were immortalized with a sad, slow waltz that flowed down the dry river. ■



GOOD FOR BUSINESS

LOCATION: AZTEC, NEW MEXICO

BY GREG SHEARER

It's nothing major. We adapt. The morning commute today is faster than expected. Not that there are many delays to begin with, but the river trail is vacant today, though "river trail" has been a misnomer since runoff ended in June. More accurately named the "Animas Intermittent Arroyo Trail," it will be dry again until spring.

Clouds overhead again today. Hopefully, they bring the rain the weatherman has wanted for the last month. Probably not, though. My bike navigates its way from path to dirt trail like it knows where to go. Must be on autopilot again today.

Check into the office. A couple new cases of fraud, a few dozen larceny, two murders. High for a Tuesday. The crowd from the East hasn't embraced the slower pace of New Mexico. I try to reason with some of them, but I haven't been flooded out of my home, out of my town, out of my state. They don't care about my opinions.

These refugees from the coast have made themselves known to all the police in town, who in turn make my law practice boom. ■

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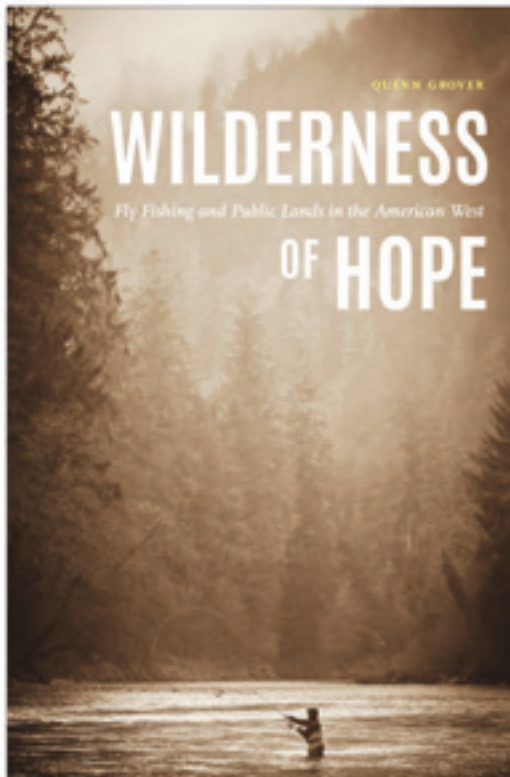
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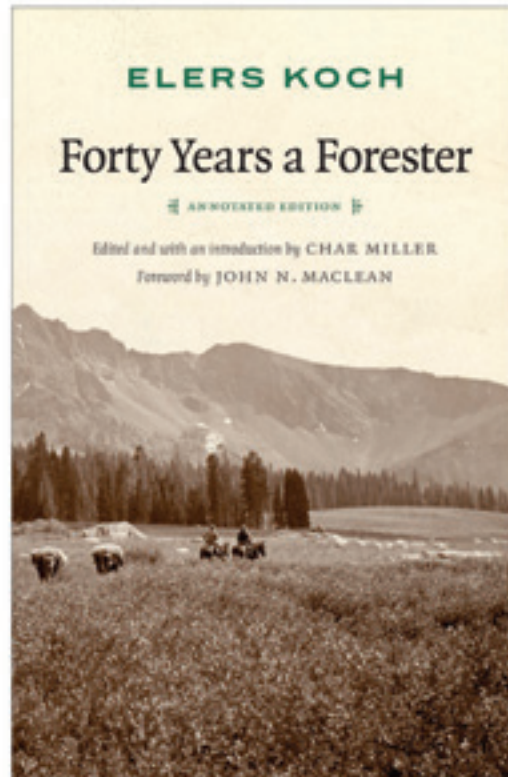
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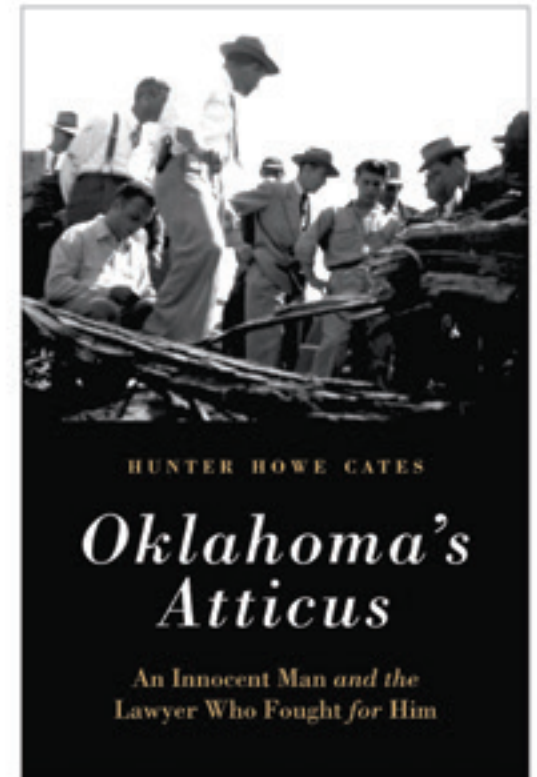
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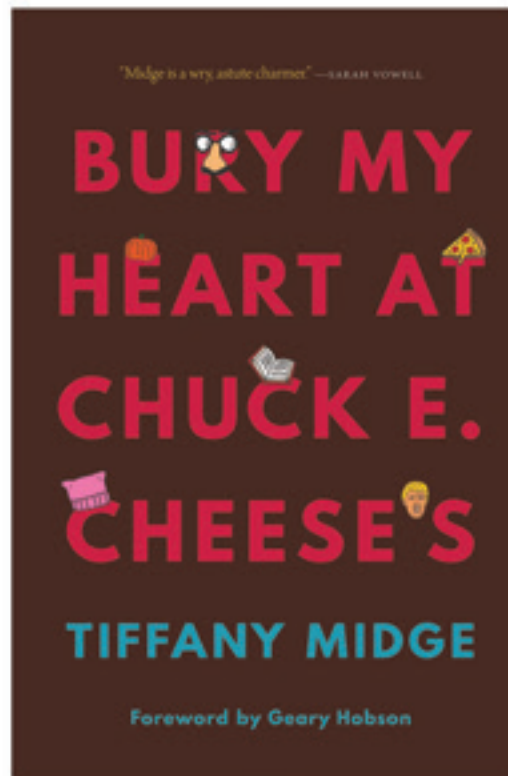
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THE MYSTERIOUS COW MURDERS AT MISSOURI BREAKS

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WEST OBSESSED — Ep. 73

“Murder on the Missouri”

Written and produced by JR Calvert™

(CLIP 058 INT CITY APARTMENT NIGHT —
Horns, sirens, construction, patrol drones)

[Note to self: effuse!]

Good evening, everyone, and welcome to another episode of *West Obsessed*, the podcast that delves deep into the stories of the modern American West. I’m your host, JR Calvert, waking up and logging in for another beautiful night on the Range that never rests. [Pause.] Actually, tonight is not so beautiful. I’m recording this from bed, in fact, every word a stab of pain. You should see me: all bandages, gauze and med-paste. I’m a mess.



What happened? I'll tell you. But first: This episode is brought to you by GreenEden: All nutrients, no hassle. Half-off a yearlong subscription for all food-bars, powders and pastes when you key in from *West Obsessed*. And by Xcel Energy: We power the future — night and day. And by No-ID, the nation's number-one anonymity provider, from masks to make-up to mainframes. Want privacy? Think No-ID.

OK ... [*Grimace.*] Here we go. You'll recall I received a message some weeks ago from a Dr. Porter Barron, out of Lewistown, Montana. Subject line: Cow killings. "Dear Mr. Calvert," it said, "I was impressed with your recent episode on Nevada's Tesla cleanup failures and am reaching out with something of a mystery.

"I'm the majority partner of the Missouri Breaks Ranch, which runs roughly 4,000 head of cattle across half a million

acres in north-central Montana. We raise premier grass-fed beef while conserving pristine landscapes and the heritage of Montana's cattlemen. Lately, some of our herd have been killed and dismembered, targeted by rivals, vandals or malcontents, with local law enforcement unwilling or unable to assist. I believe your work could help us uncover the truth behind these heinous crimes. I am willing to pay retainer and expenses, plus a reward for a successful investigation."

So. You guys got pretty excited about this. It was up-voted as a priority story, and your flash donations (thank you!) got me on the first mag-lev to Montana, to investigate the ... *dum-dum-dum* ... [*Ouch.*] ... "cow murders on the Missouri." Tonight, I'll reveal to you the shocking — and painful — findings of that investigation.

It all starts under Montana's big sky ...

FEATURE BY
BRIAN
CALVERT

ART BY
COREY
BRICKLEY

**(CLIP 008 INT. CAR DAY —
Whir of an engine, whisper of air-con)**

DRIVER: First time to Lewiston?

ME: It is.

DRIVER: You're gonna love it. Clean air. Sunshine. Best restaurants, bar none. In from?

ME: Denver.

DRIVER: Whewwy. Hot down 'ere, eh? I got a cousin works the Night Cycle outta downtown. I couldn't do it. I need the sun. You can take your mask off, by the way.

Day Cyclers always say this about the sun. Tell you the truth, I find the sun a little too ... all-seeing. In my neighborhood, the Night Cycle sings, and the song bounces through the streets and shadows. We wear the night like a hat, and we never remove our masks.

The driver's eyes flit back and forth from the rearview, as we speed through green streets. Signs mark trails that wind through groves and gardens, blazing a path from downtown to the mountains, which surround the city like stone sentinels. Down a grassy hill, a real-tan couple walks a massive, spotted dog. What drones fly here must fly high. I can sense them, but I cannot see them. I note a dashcam, though, and the cams on every corner.

(CLIP 011, 012, 013 EXT EVENING — Car door opens and closes, as I thank the driver for the ride. Sound x-fades into large doorbell and me greeted by the deep baritone of Dr. Barron, welcoming me to dinner.)

Dr. Porter Barron lives in a stone-built chalet in the foothills of the South Moccasin Mountains. The interior is styled Victorian — lace and antiques, small bronze statue of a bronco-buster ... a massive grandfather clock ticking time in the parlor. The doctor is a tall, fit man, 70-something, wide shoulders, waxed white mustache, as Victorian as his house.

(CLIP 017 INT. HOUSE NIGHT — Dinner; plates clatter; decanted wine pours into delicate crystal)

Dinner is herbed prime rib, buttery mashed potatoes, and a drought-stressed Syrah. Delicious, actually, though I worry what meat-eating will do to my stomach. I won't bore you with the details of my later-that-night intestinal discomfort. I will tell you, though, that Dr. Barron keeps his steak knives sharp and your wine glass full.

BARRON: ... moved up here, oh, about a decade ago. Had been running cattle out of New Mexico, but it's gotten too damn hard to ranch down there. The heat I could handle, almost as well as the longhorns, but the Santa Fe market's just about dried up, and the land's turned too brittle to bother with. They say rain follows the plow, but I followed the rain to Montana. As verdant a place as any I've seen. And the cows do well, too.

We run them along the Missouri, in what's called the Breaks. Half a million acres of God's country. It was given over to Montana in the Transfer Act of '52, and about a year or so later, we bought it up. We keep it fenced off: private and patrolled. We move the cattle — 4,000 head — with a fleet of smart-drones, rotating the full count across the land like a herd of bison. That keeps the grasslands healthy — healthier than they've been since Lewis and Clark floated by. The wildlife is happy there, and so are the cows. We distribute to Bozeman from our facility here in Lewistown.

(Dinner interrupted by a new voice, Katherine Barron. CLIP 021 continues.)

KATHERINE: A slaughterhouse whose workers will never taste meat. An elitist, murderous abattoir.

BARRON: Katherine. I thought you wouldn't be joining us.

KATHERINE: Surgery went well for a change, so I cleaned up as fast as I could and rushed over. And, as promised, I've taken the next few days off for our guest.

BARRON: Mr. Calvert, this is my daughter, Katherine.

She's an accomplished surgeon — and a vegetarian, clearly. Katherine, this is JR Calvert, the investigative journalist we've hired to look into the cow mutilations.

KATHERINE: If 99 percent of the country doesn't eat meat, why should I? Anyway, it's a pleasure, Mr. Calvert. Was my father boring you with range management theory?

ME: Not at all. I think we were about at the part where some of these cows have been, er, mutilated?

BARRON: Quite right. As I was saying: We run a massive herd, closely monitored. And lately, our counts have been off. At first, I put it down as shrinkage; after all, the Breaks are a wild-enough place. But our foreman assures me that her drones are the best out there, and they'd be able to wrangle any mavericks that went missing — and spot any crimes taking place. So we sent out two scout drones, and they came back with some ... unpleasant footage.

KATHERINE: The cows were torn to bits, like a wild animal got to them.

BARRON: Which makes some sense, if you're missing a cow or two. After all, allowing some element of wild on the ranch is part of the point. But the numbers and nature of the killings are off.

ME: If not predators, what then?

BARRON: Terrorists, I'd say.

KATHERINE: Oh, here we go with the terrorist rant.

BARRON: It's not a rant. The Redwolf Brigade is dangerous. They were behind that bombing in Alberta last year. We've lost at least 18 cows in the last month. That's not an accident; it's a message. And Ariel tells me the drone footage must have been tampered with, even hacked.

KATHERINE: I'm sure a bunch of Canadian activists have bigger fish to fry than any they'd find in Montana.

BARRON: Activists. Hah. I'm sure they'll make trouble wherever they can find it. Tearing down things that have taken centuries to build.

Nothing sours wine faster than a family argument, so I excuse myself for the night. The doctor assures me that Katherine will escort me to the ranch in the morning, via her transport. Katherine shows me to my room in a far wing of the chalet. If she's upset from dinner, she doesn't show it. Instead, she maintains the smile and glide of the wealthy and unworried. The room is beautiful — polished wood, a fireplace, soft linen. And quiet.

**(CLIP 027 INT ROOM NIGHT
Crickets chirp through open window)**

I can't sleep at night under the best of circumstances, so I just lie there, listening to the crickets. I can't stop imagining mutilated cattle — bovine eyes and buzzing flies. I try to recall the Alberta bombing. A flash in the news cycle. Redwolf Brigade. The Redwolves. Separatist-anarchists. Militant. Active since the '60s. They wear masks emblazoned with bloody fangs. At last I doze, and dream of a crimson river, churning and frothing.

(INSERT AD DEK 3: HiLine prosthetics; Argus virtual tours)

**(CLIP 028 INT ROOM MORNING
Birds chattering)**

KATHERINE: Good morning, Mr. Calvert. You look like hell.

ME: Ugh. I am not a morning person. Or even a day person.

KATHERINE: We don't have the Night Cycle up here. No need for it. I assume you drink coffee. Here.

ME: Of course, and thank you. Nice car.

(CLIP 033 INT CAR DAY — Car door opens and closes. Then the whirl of the engines, whine of the drive shaft.)

The luxurious air in the transport is a crisp 65 degrees. Katherine instructs the onboard computer to deepen the tint of the glass — a gracious gesture — and to take us to the Missouri Breaks Ranch, tech center. With a courteous reply from a disembodied voice, we are off. I am grateful for the cool darkness, and, with the help of the coffee, begin to rouse.



(CLIP 038 INT CAR DAY)

KATHERINE: An investigative journalist for hire. How fun. Anything I can answer for you? It's an hour to the ranch.

ME: It's a living. You don't seem to care for it much.

KATHERINE: The ranch is my father's obsession, not mine. I consider the whole enterprise unethical.

ME: How so?

KATHERINE: My father was a militia medic in the Borderland Wars. Triage became a specialty of his. On top of that, he views the world as a claw-and-fang competition for survival. And so, while he has great respect for wild things, he has little patience for people — or overcrowding. In the war, he fought to keep people out of America, and now he's saving as much of the wild world from people as he can. Really, though, I think he's just preserving it for him and his partners. Every year they take a canoeing



trip through the Breaks, through their private, beautiful paradise, full of eagles and herons, elk and bear, even a pack of wolves.

ME: I can't imagine.

KATHERINE: You'll never see anything like it. And it's all been bought for a ludicrous sum, paid for with cows that are worth their weight in gold. When I was a little girl, I would go with him, and listen to the wolves howl at night. I would look at the stars and imagine them as fairies watching over me. Once I realized that most people will never have that experience, I stopped going. I just didn't feel right.

The rest of the drive is in silence, as the Montana grasslands drift by. I wonder where Katherine gets her disdain for survivalism. To me, it makes sense: good fences, good neighbors, high profits. If some eccentric wants to live out a mountain-man fantasy, so be it. I've seen plenty of bears in documentaries.

The highway leads to a bridge. The river runs wide and slow here, its banks flanked in thick cottonwood stands, a strange contrast with the high, wired — presumably electrified — fence that runs along the highway. We turn west after the bridge and pass through an automated gate that swings open in a graceful arc. Missouri Breaks Ranch.

(CLIP 044 EXT RANCH DAY — Barking, above a constant, mechanical buzzing)

A tangle-haired cattle dog is the first to greet us as the transport pulls up to the ranch tech center. Three concrete buildings rise straight and tall from a central cul-de-sac. There's an odd buzzing, though, something familiar, and yet. ... As soon as I leave the transport, I recognize it for what it is — drones. I've never seen (or heard) so many at once. They zip from building to building, hover over the driveway and transport. Some buzz off to parts unknown. The facility is a hive. And in the center of that hive is a human, a woman, willow-thin, dark hair, dark brown eyes, a cowboy hat tipped low over her brow. A queen bee in overalls. The dog wags its nub, licking Katherine's fingers.

KATHERINE: Ariel.

ARIEL: Kathy.

KATHERINE: I'd give you a hug, but I'm afraid your pets wouldn't approve.

ARIEL: They're smart-drones, and they know you. I'd be worried about your friend, though. Who's this?

KATHERINE: JR Calvert, journalist. He's looking into the cow killings for us.

ARIEL: Vandals, I bet. Or corporate sabotage.

KATHERINE: Perhaps. Still, my father was hoping you'd take us to one of the kill sites.

ARIEL: Come on into the lab. I'll tell you what I know. We can head upriver after lunch. Annie, come.

(CLIP 046 INT TECH CENTER DAY — Dead silent in here)

Dog in tow, Ariel leads us through the tech center lab, a clean space of polished metal and glass counters. A soldering iron smolders in its stand next to a pile of wire, cables, circuitboards and matted polymer drone parts.

Ariel leads us to a bank of screens beyond the workbench, logs in, and waves her way through a set of encrypted files. I had expected a barn and horses, but this looks like something out of a spy thriller.

ARIEL: This is the drone footage of the section of river we'll visit today. Footage dated the same day as the killing, according to counts. Our patrol drones fly about a thousand feet off the deck. The herders fly nap-of-the-earth, moving the cattle along according to a grazing plan. It takes 10 drones to move a hundred cows — we call that a cell — and we're running 40 cells across the acreage. We don't mount cameras on the herders. Saves energy. I have one patroller per cell, so this is all we've got to go on.

ME: Dr. Barron —

KATHERINE: Yes?

ME: Oh, sorry. Dr. Barron, uh, *senior*, said you also have scout drones?

ARIEL: Yes. They're part of the security fleet.

ME: Fleet?

ARIEL: We have the herd fleet, the maintenance fleet and the security fleet. The maintenance fleet takes care of fencing, gates, tanks, pumps, other drones. The patrol drones are part of the security fleet, which guards against trespassers and predators. They're mounted with non-lethal shock projectiles.

ME: And you're in charge of them all. How many drones total?

ARIEL: That's a trade secret.

ME: Any of your drones mounted with blades, or is that a trade secret?

ARIEL: Negative. Insinuations aside: The maintenance drones ride fence with pliers, pullers, cutters and staplers, and the herders only carry front-mounted prods.

(CLIP 048 EXT RANCH DAY — Low rumble of engines, crush of dirt and gravel)

After lunch, we pile into the ranch quad and speed upriver, escorted by two massive security drones, each mounted with multi-spectrum cameras and miniguns. Presumably, these fire non-lethal shock-rounds, but I wonder. We leave the dirt road for a double-track, skirting the northern bank of the river, which flows thick, around massive grassy islands, under the gaze of chalky bluffs.

(CLIP 052 EXT WILDLANDS DAY — Tromping in grass, security drones fly past and away, dog yips)

ARIEL: This is it. Hideaway Coulee. You can see the cattle had been grazing here. Along the river-bottom, we run them on native wheatgrasses and grama, managed with grazing and controlled burns. Native grasses do well with the rain fluxes and long summers we get here, so that's where we graze them this late into the fall. Records show and footage confirms a cell moved through here two weeks ago. And then we got this.

We crest a small hill overlooking a ravine. A pair of ravens launch into the air, croaking their dismay. A shift in the wind carries an indescribable, rotten odor. The buzz of flies, and there's the corpse — what's left of the cow — in the bottom of the ravine: a rusty-red hide, bloating stomach and pile of intestines, blood clots clumped with dust and twigs. On the Front Range, we've got trash heaps and sewage leaks, neglected and awful, but if they reeked as bad as this gully, we'd have riots. I tighten my mask over mouth and nose.

(CLIP 054 audio of buzzing flies, enhanced, then fade back to CLIP 053)

ME: OK. *[Trying not to breathe.]* What are we looking at here?

ARIEL: It looks to me like the cow was killed where it stood, right in the bottom of the gully. Nothing dragged it in, nothing dragged it out. Same as the others, actually. Twenty-some kills up and down the river. No footage.

KATHERINE: Where's the rest of the cow? I mean, I'm no expert, but it seems like we're missing quite a bit of it.

ARIEL: Exactly. Most of the meat has been carried off.

ME: By what?

ARIEL: Great question.

ME: Your theory is that — what'd you say? — *vandals* broke through the gate, eluded your cams and drones, tracked a cell, killed this cow, and carried most of it off — all without anyone noticing?

ARIEL: Vandals or saboteurs. I've heard rumors of the Redwolves showing up in Livingston now and again.

ME: Aren't they a separatist group? Why would they care about cows?

ARIEL: They're anarchists. They'll throw a monkey wrench into anything they can.

KATHERINE: Sounds like you've been hanging around my father too long.

ARIEL: Hmph. Maybe. But that's my theory.

ME: What about good old-fashioned poachers? These are basically the king's deer, are they not?

ARIEL: There's no way local poachers could get through our security. Redwolves have hackers, and though I hate to admit it, it's possible they could've broken in somehow.

ME: For what reason?

ARIEL: Don't look at me. I'm just a ranch hand. You're the investigator.

We slide into the gully for a closer look. The fetid air is so foul, my eyes tear up. Not ideal for a clue search. Conspicuously absent, though, are any animal prints or signs of life. It's almost as if the cow has fallen out of the sky. I snap photos, and we take the long way down the ravine to where it connects with the coulee itself, a dirt-water creek, knee-deep, twisting like a rattlesnake to join the Missouri.

(CLIP 056 — Sound of running creek)

ARIEL: You know how this creek got its name? Butch Cassidy and the Sundance Kid once holed up here after robbing a train north of here. Hideaway Coulee. Whenever I'm out here, I like to imagine them sunning themselves on the bank of the Missouri, taking long swims, smoking cigars and counting their money.

KATHERINE: Good Lord. Butch Cassidy. Didn't anyone else ever do anything interesting 200 years ago? He's all I ever hear about. My dad used to tell me the same story.

ME: Well, we can rule out one thing: wild animals. There's no way any creature could have killed that cow and made off with its meat without leaving a trace. Only humans are that devious. I hate to say it, but without any other leads, we're gonna have to go with the terrorist theory. Ariel, you said you'd heard of them showing up in town. Any idea where?

(INSERT AD DEK 4: Mailchimp; thank donors, especially Front Range Foundation)

(CLIP 053 INT BAR DAY — Music of a jukebox — classic rock from the late 20th century: "Born down in a dead man's town ... the first kick I took was when I hit the ground" — and the sharp, lonesome *snick* of a pool table break)

The Montana Tavern is nothing special, the kind of bar that nearly every town has, the kind of bar that sunlight does no favors. This afternoon, it's empty except a young couple playing pool at the far end and an old man in suspenders at a video poker machine, squinting at the rolling numbers through thick glasses. The woman behind the bar says the owner, Dan, will be in soon, so Katherine orders two vodka tonics — which is fine, I guess? — and we sit down at a worn-out table in the corner.

KATHERINE: Cheers. *(clink)* Cracked the case yet?

ME: Ha. Not hardly. No cow murderers out there. None, apparently, in here. What's the deal with that Ariel? And her drones?

KATHERINE: She grew up during the Border Wars. I think her father knew mine. She's loyal to the ranch, and those machines, and nothing else. I guess maybe her dog.

ME: I'm sorry to ask, but I was surprised your father would hire an, uh, outsider, given he fought on the side of the militias.

KATHERINE: My father's an ecofascist, not a full-blown racist. Though they find common cause often enough.

ME: Would she have any reason to kill the cows?

KATHERINE: I doubt it. Like I said, she loves the ranch.

ME: Well, I'm stumped. This is indeed a mystery. And bad radio. What am I supposed to tell my listeners? That there's this crazy place in the middle of nowhere Montana, where a techno-cowgirl runs a hive of drones and a herd of cattle — and the cows are getting mutilated by ghosts? No witnesses, no signs, no leads. Just a horrible mess of a carcass and. ...

(CLIP 055 INT BAR DAY — Chaos. Recorder was running throughout the following incident.)



The door to the tavern opens, and afternoon light slips in. Only something feels off — it's not letting in that much light. I look up from my drink, and I can see three huge figures, men, backlit from the street ... streaming in now, smooth as commandos. Before I understand what's happening, they've closed half the distance between us, and before I can even stand up to ask "what the hell?", they're on me. The only thing I can really grasp before the first punch lands is that all three men are wearing camo-tech, military-style jackets and masks — the toothy, snarling masks of the Redwolf Brigade.

(CLIP 055 CONT. — Screeching chairs, breaking glass ... shrieks — Katherine? Me? Probably me. Absolute mayhem on tape here. It hurts just hearing it again.)

I have not been in a fight since tech school, and I don't fare well in this one, friends. The first shot I take is to the left temple, from a right hook, which is probably good, because that immediately puts me into shock. I keel forward, and as I'm crumpling to the ground — my memory's a bit of a blur here — take more blows to the head, neck, back and side. Then the kicking begins, landing hard, in time with muttered curses. ...

MAN: ... mind (*gasping as he's kicking me, I think*) your own (*gasp-kick*) fucking business.

KATHERINE: Stop, please!

MAN: Shut up, or you're next. I don't care who you are.

All I can think through the next couple of strikes is that these men are going to kill me. There is no one here that can stop them, and they aren't going to stop themselves. Three angry men, working out their anger. Another kick, from a massive, muddy boot. I feel like I'm being trampled by a stampede.

(AMBI 056 — A shotgun blast. Pump action — *chi-chick*. Plastic shell clatters on concrete floor. One of the men yells, "Run!" and a back door thumps open. ...)

Dan, it seems, has returned to intervene. About a minute too late, if you ask me. The men have fled, but I can still feel the punches and kicks, echoes of violence reverberating through my body. ("**Up you go now.**") A nauseating darkness sweeps over me. I'm sinking in pain. A part of me knows that if I pass out, the pain will go away. And I'll never wake up. I can feel myself being carried, dragged, to the limo, thrown inside. Katherine is there, telling me to hold on. The recorder keeps running. ("**In the trunk. My field kit.**") And the last thing I see before I slide full into the dark pain is a massive, military-grade first aid kit, in the hands of a trained surgeon. Lucky me, I think, and then I do drift off, fade out, sink into painless sleep. I dream of a mask and teeth.

(MUSIC SPRINGSTEEN — "Born down in a dead man's town / The first kick I took was when I hit the ground / End up like a dog that's been beat too much / 'Til you spend half your life just covering up")

I used to spend the summers with my great-grandpa up in Wyoming, and we would listen to one of the greatest musicians of the 20th century, Bruce Springsteen. He'd been on the jukebox at the bar, and he was in my head now. That's how I knew I wasn't dead. Only the living can hear the Boss. His lyrics tumble around in my head ... and as I open my eyes, to bright morning and birds singing ... a giant smile finds its way to my bruised face.

(CLIP 057 INT CHALET DAY — Fumbling as I adjust the recorder, realizing I'm not alone.)

KATHERINE: He's awake. Father!

ARIEL: Hold still, buddy. Take it easy.

ME: I ... know who killed your cows. And how.

BARRON: Go on.

KATHERINE: Just relax now. You're stable, and still on meds. But you've suffered a lot of internal damage. We need to get you to a hospital.

ME: Just ... let me talk. Dr. Barron. I know who is

killing your cattle. It ... I ... the dog was the key. Annie. Annie was the key.

BARRON: Go ahead. I'm listening. And then we'll get you some help.

ME: Look, the men who attacked me. You were right. Redwolf Brigade. They had military-issue jackets, the kind that go invisible to tech. And their boots. I got a good look at their boots, believe me. The mud on their boots. The white clay of the Breaks. They've been hiding in there the whole time.

ARIEL: What ... what are you saying?

ME: Look. Whoever killed those cows needed access to the Breaks and had to be invisible. Not just to the drones, but to the whole ranch. They need to know the land, and they need to have a reason for doing all that killing.

Ariel, you may be good with cows and drones, but you're terrible with people. You said you sometimes come to town on business, and you leave Annie to guard the place. If the wrong person got in, they'd have access to your computers. All they'd need is your passwords, and they're in. You have so much glass in that room, the keyboard is clear from about a dozen different angles — to anyone standing there. It's like playing poker against someone in mirrored shades. Your password — adorable by the way — is "Th3R4nchBr34k\$I<34NN13."

So who would know your password, and who can get past Annie, knows the ranch and the Breaks, and has a reason to hate it?

BARRON: Katherine.

ARIEL: What?

BARRON: Katherine. (*an awkward pause.*) Why?

KATHERINE: I ... yes ... but ... how?

ME: Your first-aid kit. I guess in all the fracas you didn't realize this, but: You keep your own Redwolf mask in there. It was the last thing I saw. If you could get past the dog and into the system, you could insert a slice of code, and your comrades could move around the ranch, the whole Breaks, invisible to the cameras and drones. I imagine they're hungry out there, so whenever Ariel is away, you break in, drone-herd a cow into a ravine near a drainage, like Hideaway, dial in the coordinates, and — bang — roast beef. Easy enough to erase tracks in the dirt and haul a cow down a creek in a canoe. My guess is that those guys are the same men who committed the Alberta bombing, and, like Butch Cassidy, they're holing up.

KATHERINE (*sobbing*): It's true. I did not expect them to hurt you, though. They must have followed us back from the ranch.

ME: No hard feelings. You probably saved my life.

BARRON: Katherine. Harboring terrorists. On my ranch. With my cattle. I ... I want them gone. By tomorrow. Or I call the police. And Mr. Calvert, I trust that double your fee will ensure your discretion?

(CLIP 058 INT CITY APARTMENT NIGHT — My city. My apartment. Safe back in the Night Cycle.)

Dear listener, if you are hearing this, and if you know anything about me, you know what happened next. I refused to be bought off. Dr. Barron kicked me out of his house — no trip to the hospital, no payment, no nothing. I'm back on the Front Range. My head is spinning, I'm coughing up blood, and all I have to get me through the trip are the meds that Katherine slipped me on my way out the door: some bandages, gauze and med-paste. Like I said, I'm a mess. I will broadcast ASAP. ... because I'm going to need your help, dear friends. Like most of us, I'm under-, which is to say un-, insured, and your donation is the only thing that will get me the help I need. Once I'm (*groan for effect here*) back on my feet, I'll be bringing you another episode of *West Obsessed* ... and we'll ask ourselves: Are smartdrones getting too smart? Until then, keep listening, and keep supporting the show that delves deep — perhaps too deep? — into the stories of the modern American West.

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Position Overview: NoVo Foundation is hiring a Program Associate to join its Indigenous Communities Initiative. The Program Associate reports to the Foundation's Senior Director and works closely with two Program Officers based remotely, in western Montana and Reno, Nev. The PA provides administrative support to both Program Officers, assists with the Initiative's grantmaking, and manages strategic projects. This role requires experience working in Indigenous communities, as well as passion for NoVo Foundation's mission to foster a transformation from a world of domination and exploitation to one of collaboration and partnership. The position demands the flexibility and precision needed to support a fully remote team across multiple time zones. The PA position will be based in one of NoVo's offices, either Kingston, N.Y. (preferably) or Brooklyn, N.Y.. Regular travel to NoVo's offices for meetings and other Foundation activities is expected.

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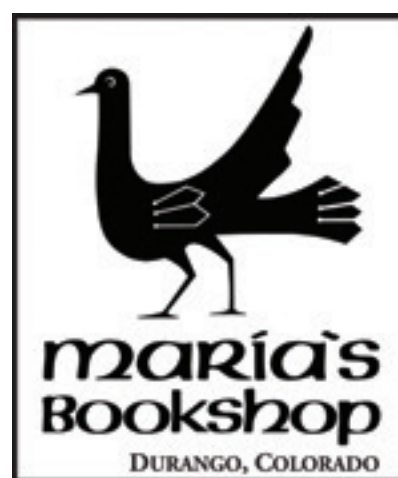
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PAGE 3

Emily Benson, associate editor for the Northwest, Northern Rockies and Alaska at *High Country News*, will miss snowy Idaho winters and says a longer waterskiing season won't make up for it.



STORY NOTES (Seattle smoke quote): Western wildfires are already bigger, more frequent and longer lasting than they used to be thanks to the warmer temperatures and earlier snowmelt brought by a changing climate. Scientists expect that trend to continue, particularly in the Northwest; accordingly, communities will increasingly need to contend with wildfire smoke, a deadly health hazard.

SOURCES: Westerling et al., 2006: Warming and earlier spring increase Western U.S. forest wildfire activity, *Science*.

Stavros et al., 2014: Regional projections of the likelihood of very large wildland fires under a changing climate in the contiguous Western United States, *Climatic Change*.

Ford et al., 2018: Future fire impacts on smoke concentrations, visibility, and health in the contiguous United States, *GeoHealth*.

McClure & Jaffe, 2018: U.S. particulate matter air quality improves except in wildfire-prone areas, *PNAS*.

STORY NOTES (Green Party/Green Climate Action numbers): The Colorado River waters nearly 5.5 million acres of farmland; in fact, irrigation exhausts about 70% of the river's supply, with much of that water going to farms in California. However, scientists expect a hotter and drier future to shrink the river by as much as half by 2100. The nation's agriculture system, particularly in California, will have to adapt.

SOURCES: Cooley & Ross, 2013: Water to supply the land, Pacific Institute report.

U.S. Interior Department Bureau of Reclamation, 2012: Colorado River Basin water supply and demand study.

U.S. Interior Department Bureau of Reclamation, 2019: Colorado River accounting and water use report: Arizona, California, and Nevada.

Udall & Overpeck, 2017: The twenty-first century Colorado River hot drought and implications for the future, *Water Resources Research*.

STORY NOTES (Climate-causer migrants, communal living in California): Climate change is inextricably linked to social justice; as sea levels rise and Western towns with economies based on winter sports see their snowpacks dwindle, the effects will not be felt equally by all community members. These pieces are an attempt to explore some of the possible ramifications of those changes.

SOURCES: Barnard et al., 2019: Dynamic flood modeling essential to assess the coastal impacts of climate change, *Scientific Reports*.

Fyfe et al., 2017: Large near-term projected snowpack loss over the western United States, *Nature Communications*.

Mote et al., 2018: Dramatic declines in snowpack in the western U.S., *Climate and Atmospheric Science*.

STORY NOTES (Hologram/Indigenous coalition rallies): Tribal nations have successfully used hunting and fishing treaty rights to assert their sovereignty in the past; for example, the 1974 *Boldt Decision* confirmed Pacific Northwest tribes' right to co-manage salmon and steelhead fisheries. Now, a warming climate threatens those same fisheries; could tribal treaty rights be used to protect them?

SOURCES: Mote et al., 2003: Preparing for climatic change: The water, salmon, and forests of the Pacific Northwest, *Climatic Change*.

Dittmer, 2013: Changing streamflow on Columbia basin tribal lands — climate change and salmon, *Climatic Change*.

Smith, 2019: How do tribal nations' treaties figure into climate change? *High Country News*.

PAGE 3, PAGE 6

Associate editor **Paige Blankenbuehler**, who oversees *HCN's* coverage of the Southwest, might welcome a robot army to her hometown, Durango, Colorado — but only on the condition that it builds the affordable housing this region so desperately needs.



PAGE 3 (THE LATEST) STORY NOTES: The Devils Hole pupfish, *Cyprinodon diabolis*, was exposed to temperatures near its thermal maximum before recent climate change, and is now subject to increasing water temperatures that will severely reduce successful reproduction. Observed climate change is shown to have already warmed the shallow shelf that the pupfish depend on for already limited food sources and sunlight. Climate change by 2050 is expected to lead to "the precipitous decline of this species."

SOURCES: Hausner, M. B., Wilson, K. P., Gaines, D. B., Suárez, F., Gary Scopettone, G., and Tyler, S. W. (2014), Life in a fishbowl: Prospects for the endangered Devils Hole pupfish (*Cyprinodon diabolis*) in a changing climate, *Water Resour. Res.*, 50, 7020–7034.

PAGE 6 STORY NOTES: Climate change poses risks to seasonal and outdoor economies in communities across the United States, including impacts on economies centered on winter recreation. Declines in snow and ice cover caused by warmer winter temperatures are expected to negatively impact the winter recreation industry in the West. Over the next half century, the winter recreation industry will lose an estimated \$2 billion each year. According to the National Climate Assessment, warming temperatures have helped many insects thrive and "fire exclusion in fire-prone forests has exacerbated the effects of insects by increasing forest density and reducing resistance to insect attack." As for the black soldier flies, researchers show the hearty insects will thrive in a world with warmer temperatures.

SOURCES: Chia, S. Y., Tanga, C. M., Khamis, F. M., Mohamed, S. A., Salifu, D., Sevgan, S., . . . Ekesi, S. (2018). Threshold temperatures and thermal requirements of black soldier fly *Hermetia illucens*: Implications for mass production. *Plos One*, 13(11).

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PAGE 4

Carl Segerstrom, assistant editor for the *High Country News* North Desk, has a growing sense of climate dread, and the need to get things growing.



STORY NOTES: The Northern Great Plains will experience highly variable climate in the future, with flooding expected to worsen and agriculture forced to adapt. The Southwest, which currently generates one-eighth of U.S. energy, is going to be hotter and drier, experiencing severe droughts. Cloud seeding is already a widespread practice around the West, but its actual impact is up for

debate: "Operational cloud seeding continues in nearly a dozen western states, despite a lack of any strong physical evidence supporting its effectiveness."

SOURCES: Conant, *ibid.* French, J. R., Friedrich, K., Tessoroff, S. A., Rauber, R. M., Geerts, B., Rasmussen, R. M., . . . Blestrud, D. R. (2018, February 06). Precipitation formation from orographic cloud seeding.

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PAGE 5

Anna V. Smith is an assistant editor with *High Country News'* tribal affairs desk. She writes and edits from the Pacific Northwest, where she is still waiting for the "Big One" to hit and planning to stock up her survivalist stash.



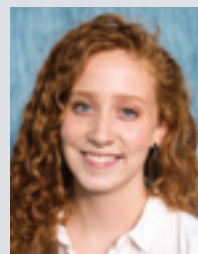
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PAGE 8

Elena Saavedra Buckley, a former *HCN* fellow, firmly believes that virtual and augmented reality will change the world. While she fears the technology, she trusts that there will be beauty, and sadness, worth experiencing within the goggles, contacts, or brain implants.



STORY NOTES: In 1910, when Glacier National Park was established, 150 glaciers, all over 25 acres, clung to the park's mountain ranges. In 2015, only 26 remained. As spring and summer temperatures rise, and precipitation falls more as rain than snow, the park's glaciers and others around the world continue to retreat. In 2003, one model predicted that, under carbon dioxide-induced global warming, the glaciers in the Blackfoot-Jackson Glacier Basin of the park would disappear by 2030. ("It was conjectured that if the largest glaciers disappeared by 2030, most of the smaller ones would probably disappear too," Daniel Fagre, a USGS researcher who helped author the paper, told a NASA publication in 2015.) Other models are more optimistic, one predicting that certain glaciers will last through 2080.

SOURCES: Brown, J., Harper, J., & Humphrey, N. (2010). Cirque glacier sensitivity to 21st century warming: Sperry Glacier, Rocky Mountains, USA. *Global and Planetary Change*, 74(2), 91-98.

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Vose, 2018: Frequently Asked Questions. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 1444–1515.

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PAGE 12

Tristan Ahtone is an associate editor for *High Country News*, leading its tribal affairs desk. He realizes how much trouble we're in as a species every time he enters an airport.



SOURCES: Anderson, K., & Peters, G. (2016). The trouble with negative emissions. *Science*, 354(6309), 182-183.

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PAGE 28

Brian Calvert, editor-in-chief of *High Country News*, imagines a future world that is so warm, crowded and surveilled that many humans will recondition themselves for nocturnal life, while the affluent and privileged carry on per usual.



STORY NOTES: For the Northern Great Plains, the Fourth National Climate Assessment cites climate model projections that "paint a clear picture of a warmer future...in conjunction with less snowpack and a mix of increases and reductions in the average annual water availability." Precipitation may increase, depending on the area, with high year-to-year variability. With longer growing seasons and better precipitation, native grasses, such as blue grama (*Bouteloua gracilis*), and non-natives, such as crested wheatgrass (*Agropyron cristatum*), would fare well. This would put them among the "winners" of climate change. In both the human and natural world, climate change will create a growing number of "losers," as well.

SOURCES: Conant, R.T., D. Kluck, M. Anderson, A. Badger, B.M. Boustead, J. Derner, L. Farris, M. Hayes, B. Livneh, S. McNealey, D. Peck, M. Shulski, and V. Small, 2018: Northern Great Plains. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 941–986.

Hunt, H.W., Trlica, M.J., Redente, E.F., Moore, J.C., Detling, J.K., Kittel, T.G.F., Walter, D.E., Fowler, M.C., Klein, D.A. and Elliott, E.T., 1991. Simulation model for the effects of climate change on temperate grassland ecosystems. *Ecol. Modelling*, 53: 205-246.

Editor's note: Poring through all of this peer-reviewed scientific literature wasn't easy. Luckily, the writers in this issue were aided by countless experts, including climate scientists, rangeland ecologists, hydrologists and others, who helped us interpret climate models and clearly imagine these many possible future Wests.

A close-up photograph of a pair of Patagonia work pants made from a coarse, brown canvas material. The pants are folded, showing the texture of the fabric and the stitching. A small, dark, rectangular label with the Patagonia logo is visible on the right side. The lighting is warm and focused, highlighting the texture of the canvas.

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HEARD AROUND THE WEST | BY BETSY MARSTON

THE WEST

Celebrating his 108th birthday last week at a posh colony for seniors in Logan, Utah, Dave Pilat was eager to tell the *Salt Lake Tribune* about the big changes he'd lived through. "I'm still amazed that so much of Utah has become a national park," he said. "A lot of people in power wanted to steal our public lands in the early part of the 21st century." And he remembered watching the video of Glen Canyon Dam getting dynamited into rubble: "Once Lake Powell silted up, it was nothing more than a big mud puddle. But," he added, "I'm really sorry Old Faithful in Yellowstone went to sleep, though it's wonderful that Kansas has pretty much gone back to bison." Pilat had invited Hazel-Wendy Virginia, a friend from New York, to his birthday party, but what she really wanted to talk about was the overzealousness of the Carbon Police. A week ago, two black-clad agents barged into her birthday party just as she was about to blow out 107 candles on the cake. "And the ticket for emitting that little bit of carbon? \$100!" Pilat sympathized, calling the Carbon Police's actions "government overreach." Both centenarians-plus attributed their long lives to being optimistic and staying politically active. Though they often got fed up with politicians, they said, they always voted in hopes of "getting a better bum."

THE GREAT PLAINS

Western historian Celia Popper attended the Buffalo Commons Festival in McCook, Nebraska, where people congratulated her on her best-selling book, *The Bison Comeback*. Popper recounts the amazing renaissance of the bison — 2 million strong as of 2068 — that have reclaimed their historic ranges in 10 Great Plains states. Popper's great-grandparents, Frank and Deborah Popper, first proposed the radical idea of a buffalo comeback in 1987, in a 15-page paper in *Planning Magazine*. Celia Popper said they would be "thrilled to see what's happened since then," though she acknowledged that the human costs of the transition had been high. The Poppers maintained that it was a "historic blunder"



"They were dark and woolly and stood high at the shoulder, they moved down the valley wreathed in their own steam and water dripping from their half-moon horns, free and untended. No human beings owned them or directed their movement. They went where they meant to go in their own minds. They spread to the horizon under a drifting animal mist, and they smelled good."

From *The Color of Lightning*, by Paulette Giles NORMAN RAWN/CC VIA FLICKR

to break the deep-rooted prairie sod. Back in the 19th century, promoters misled homesteaders, who had no idea they were settling in rain-scarce country that would never take to conventional farming. Sadly, families learned the hard way that rain did not follow the plow. In their paper, the Poppers pointed out that in the late 20th century, the forbidding climate was already creating thousands of ghost towns as whole areas emptied out in the face of persistent drought. They also documented the return of dust storms that led to mini-dust bowls, brutal, cow-killing blizzards, and biblical hordes of locusts that leveled crops. Then there was the inevitable depletion of the Ogallala Aquifer's ancient waters. In Anne Matthews' excellent book, *Where the Buffalo Roam*, published in 1992, Frank Popper summed up the history of the American West as "one long continuous, hopeful, feverish real-estate transaction ... and a lot of people, mostly those who could least afford it, got burned."

One man did try to warn people about the folly of colonizing the Great Plains. In a report to the government in 1870, John Wesley Powell warned

that the Plains region could never support Eastern-style agriculture. His advice was ignored.

So what truly belongs on the Great Plains? "Bison, of course!" Celia Popper told the crowd. And thanks to the genius of an academic couple from New Jersey, millions of tourists from all over the world now travel to the West to watch bison enjoying their homes on the range. The 1,500-pound animals fit seamlessly into the landscape, she said, along with wolves, lions, coyotes, hawks, eagles and countless other kinds of flourishing wildlife. We know exactly what's happening on the windswept prairies because thousands of Interior Department drones recently counted the herds, Popper said. Bison now inhabit parts of three Canadian provinces as well as portions of North Dakota, South Dakota, Montana, Wyoming, Nebraska, eastern Colorado, Kansas, New Mexico, Oklahoma and Texas. But plans to reintroduce woolly mammoths and other once-extinct, cloned megafauna are on hold after a group

of saber-toothed cats and dire wolves recently escaped their pens in Black Hills Pleistocene Park and took out most of the nearby Camelid Compound, in a bloody incident that horrified millions of drone-cam viewers.

Popper credits Native American tribes, nonprofit groups and the federal government for creating the Buffalo Commons, a massive act of ecological restoration that also involves reseed-ing native grasses. "As the land prophet Wendell Berry put it so eloquently," she said: "In plowing under the prairies, we did not know what we were doing because we did not know what we were undoing. In restoring damaged land we learn to heal ourselves."

WEB EXTRA For more from Heard around the West, see hcn.org.

Tips and photos of Western oddities are appreciated and often shared in this column. Write betsym@hcn.org or tag photos #heardaroundthewest on Instagram.



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