

High Country News

**RIPPLE
EFFECTS**



Vol. 55 / January 2023
No. 1 • hcn.org

The body of
the Snake

La Niña
hat trick

Memories
of Club Q

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Coyotl + Macehualli volunteer José “Gama” Gama Vargas holds black walnuts collected in various parts of Northeast Los Angeles. **Noé Montes / High Country News**

Know the West.

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After the fire

AS THE YEAR TURNS OVER, I'm drawn back to a memory from last spring. For several weeks in April and May, northern New Mexico smelled like smoke. The immense plume of the Hermits Peak Fire, filled with the ashes of the burned village of Mora, hung over the mountains, and refugees from the fire flooded into Santa Fe and other nearby communities.

The fire, which started as a prescribed burn and grew to be the largest in state history, brought to the surface long-standing tensions over how to care for the region's forests. For a century, local Spanish settler communities had resisted, at times violently, restrictions on wood harvesting and other practices. That historic resentment fed modern distrust and bitterness, and after the Hermits Peak Fire, some rejected the Forest Service and its use of intentional fire-setting.

The months since have shown — again — the grievous flaws in the systems we use to respond to disasters like Hermits Peak and the resulting conflicts. Almost a year later, local communities remain immersed in the work of caring for those who suffered during the burn. Federal support has been limited, and many have been denied aid. Some remain displaced. Historic homesteads may never be rebuilt. That has left residents frustrated and deepened their distrust.

The question of whether we can use fire for good lingers, too. In Mora and elsewhere in northern New Mexico, some would like to see an end to prescribed burning. But research from both scientists and Indigenous communities overwhelmingly suggests that it's essential to forest health in many ecosystems. Indigenous communities are just beginning to reintroduce burning methods refined over generations and banned for the better part of the 20th century. Even the Forest Service has shifted away from its historically oppressive approach to fires.

In this issue, we explore tensions like those around the Hermits Peak Fire — the frictions endemic to environmentally stressed regions. There's no easy way to resolve these differences, and a disaster like a fire can make conflict seem inevitable and intractable. Too often it's made worse by historical wrongs and the failure to offer the support people need. But in the quiet of winter, when the fear of flames has faded, I wonder how different those frictions might seem if we'd reached them by a more just path — one that wasn't marked by stolen land and cultural scars.

Kate Schimel, news and investigations editor

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Editor-in-Chief Jennifer Sahn is on leave.

Mike Tuell, deputy director of production for the Nez Perce tribal hatcheries, holds up a fish he caught in the Rapid River, within the Snake River watershed.
Hayley Austin / High Country News



ON THE COVER
Chinook salmon keep pace at the fish ladder at Lower Granite Dam on the Snake River in Lewiston, Idaho.
Kiliii Yüyan

FEATURE

The Body of the Snake 34

Debate over the lower Snake River dams’ removal has gone on for decades. What will it take to protect the river’s health?
PHOTOS BY HAYLEY AUSTIN | TEXT BY ANNA V. SMITH

REPORTAGE

Fire map goes up in flames 7

In Oregon, an attempt to mitigate wildfire risk sparks a property rights fight.
BY KYLIE MOHR

Femme fire 9

A first-of-its-kind training works to extinguish hypermasculinity in firefighting culture.
BY B. “TOASTIE” OASTER

Assisting the Rio Grande cutthroat 12

Scientists wage an upstream battle to save trout in a warming West.
BY BEN GOLDFARB
PHOTOS BY LUNA ANNA ARCHEY

The black walnut is an organizer 17

Neighborhood activists use environmental protections to fight gentrification.
BY CAROLINE TRACEY | PHOTOS BY NOÉ MONTES

Office of the lost 20

To identify the remains of missing migrants, a Borderlands medical examiner’s office transforms itself.
WESTERN WORK BY CAROLINE TRACEY
PHOTOS BY ROBERTO (BEAR) GUERRA

Troubled tides 24

Climate change, immigration crackdowns and housing costs squeeze workers at the nation’s largest shellfish farm.
WESTERN WORK BY MARA KARDAS-NELSON
PHOTOS BY JOVELLE TAMAYO

La Niña hat trick 28

The weather pattern hits the West for a third consecutive winter.
FACTS & FIGURES BY JONATHAN THOMPSON

BOOKS, CULTURE & COMMENTARY

Plainsong 11

POEM BY J.P. GRASSER

Why are Saudi farmers pumping Arizona groundwater? 46

A conversation with Natalie Koch, author of *Arid Empire: The Entangled Fates of Arabia and Arizona*.
Q&A BY CAROLINE TRACEY
ILLUSTRATION BY LAUREN CROW

Growing up queer in Colorado Springs 48

Reflections on an adolescence in the ‘Evangelical Vatican’ in the wake of the November Club Q mass shooting.
ESSAY BY BRANDON SWARD
ILLUSTRATION BY MADISON RUBENSTEIN

#iamthewest 52

Jody Potts-Joseph, Han Gwich’in tribal leader, mother, guide from Eagle Village, Alaska.
BY EMILY SULLIVAN

OTHER MATTER

3 EDITOR’S NOTE

6 LETTERS

30 HCN COMMUNITY

33 DEAR FRIENDS

50 HEARD AROUND THE WEST



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SCIENCE RIGHT-ING

Just wanted to share my appreciation for your exceptional science communications (“Pink alert for Western snowpack,” December 2022). I have spent 40 years working on glaciers in the Pacific Northwest and during that time have had many reporters join us in the field from local papers. The ability to provide science details and tell the story of the field experience and the people in a seamless way is something you do exceptionally. It is difficult, I know, to focus on more than one aspect in a story.

Speaking as a research scientist, just know you are hitting the “write” notes.

Mauri Peltó
Dudley, Massachusetts

CARBON CAPTURE COMPLIMENTS

“Carbon capture convolution” (December 2022) laid out the environmental costs of trying to continue using coal-burning power plants but pumping the climate-warming CO₂ underground. Reopening the shuttered San Juan Generating Station with carbon capture comes with the high costs of

methane pollution, coal mining, mercury, chromium, arsenic, nitrogen oxide, and sulfur dioxide release, coal ash and slag, and particulates. A Marshall Plan-level effort to supply electrical needs with solar and wind makes so much more sense.

Robert Brayden
Golden, Colorado

Jonathan Thompson will surely take flak from Enchant Energy for his revealing “Carbon capture convolution.” He showed that Enchant Energy’s proposal will reap millions of taxpayers’ dollars for pumping CO₂ into oil fields ... to get more oil that will then be burned to emit more ... CO₂! But carbon capture and “sequestration” by permanent burial has been, to date, a proven failure in dealing with climate change. Spend the money on renewable energy instead!

Charles Bagley
Seattle, Washington

NATURE’S BALANCE

In “Stories for a swiftly tilting planet” (November 2022) I was struck by the statement: “The vaunted ‘balance of nature’ is

more or less a mirage.” This seems to underestimate the natural world and misrepresent it as one in chaos. The biological, chemical and physical processes of the natural world are always seeking a balance that might last for a minute, a month, a few years or millions of years. The small window of variability needed to maintain this balance is key to the natural world’s survival. Too much CO₂ produces a Venus hothouse and too little results in an arctic Mars. When there are too many predators, they wipe out their prey, and both species may disappear.

Once we lacked technology, so we had to live in balance with the natural world; once our population was insignificant; once we were not addicted to consuming natural resources. At this point, *Homo sapiens* has the ability to ignore the balance that the natural world is seeking. We are creating an imbalance that is not sustainable and, like too many predators, we will be faced with extinction, and the natural world will continue to seek the balance that makes the Earth habitable.

John Spezia
Steamboat Springs,
Colorado

SWITCH TO COPPER

I have been a hunter for decades. Until about 10 years ago, I shot lead bullets and thought nothing of it (“Freeing eagles from a deadly threat,” November 2022). Then I started seeing data based on scientific research that clearly showed a real problem with lead in gut piles as well as micro lead fragments in meat consumed by hunters. I don’t want to ingest lead that may be contaminating meat, and I don’t want to unwittingly poison wildlife. I switched to solid copper bullets and have found

the ballistics and performance to be equal to lead. It is a little more expensive, but if you are an ethical hunter, you should be taking careful shots looking for a quick kill. Hunters spend thousands of dollars on pickup trucks, campers, packs, clothing, food and gas for a typical hunting trip. Even with the increased cost of copper, the amount I spend on ammo is pretty insignificant — especially if I end up with a few hundred pounds of prime meat from a \$2.50 bullet.

A national ban on lead bullets for hunting does not seem unreasonable. I encourage all hunters to do the right thing and switch to copper. Hunters by definition should be conservationists.

Chris Scranton
Stevensville, Montana

KNOWLEDGE TO MAKE

A DIFFERENCE

My hat is off to all who write your well-documented and informative stories. There is no magazine that digs at the heart of America’s issues and their causes.

Awareness is the first step in having a voice that, united with like-minded readers, can and *will* make a difference. Please keep up the extraordinary depth of real-time coverage on critical issues that affect all of us who live in the United States, on either coast or in between.

Wendy Taggart
Pueblo, Colorado

NOVEMBER NICETIES

The November issue was *the* best issue in years. Guest editor Michelle Nijhuis hit it out of the park. The explanations of collaborations in Oregon and inter-related ecosystems in J. Moyer’s story were particularly noteworthy. More issues like this, please!

Steve Woods
Shoreview, Minnesota

CORRECTION

In “Carving a future for the Tongass” (November 2022), we said that 1 million acres in Southeast Alaska were logged; it should have been 800,000 acres of productive old-growth. Also, a quarter to half of the region’s stands of large old-growth trees, not half of all old-growth, were lost to logging. We regret the errors.



REPORTAGE

Fire map goes up in flames

In Oregon, an attempt to mitigate wildfire risk sparks a property rights fight.

BY KYLIE MOHR

IN JULY, A THIN white envelope appeared in 150,000 Oregon mailboxes, with a short letter inside that sparked a statewide controversy. The Oregon Department of Forestry (ODF) was assigning wildfire risk levels to property, and residents in high or extreme risk areas and in the wildland-urban interface — where development and flammable vegetation collide — would likely become subject to new building codes and standards for creating defensible space.

Mitigating fire risk is an urgent issue throughout the West, including Oregon, where wildfires burned a record-breaking number of homes in 2020. Oregon's new property assessment, part of broader wildfire legislation, marked an inflection point in its state-level wildfire response; for the first time, the state designated

wildfire risk with the intent of regulating statewide home-defense measures. Conversations about the new legislation began in 2019, and new codes and standards became law in July 2021. But some Oregonians weren't familiar with the process, and the letter caught them off guard, prompting anger and angst over what many saw as a costly attack on private property rights. Were the new regulations necessary to protect life and property? Or just a financial burden and an imposition on people's land?

On the risk map, orange and red swaths indicating heightened wildfire risk cover much of the state. Statewide backlash was swift. Officials had planned public meetings in July to discuss the map, but after they received at least one call threatening violence, they held the Grants Pass meeting on Zoom instead. Many attendees accused the ODF of incorrectly categorizing their property and trying to hurt their pocketbooks. The meeting lasted more than two hours, but that still wasn't enough time for

everyone who wanted to voice an opinion to speak.

After a tumultuous few weeks, the ODF withdrew the map and canceled the notices it sent. It's now working with Oregon State University, which helped develop the map, to refine it and issue a revised iteration in 2023. "We underestimated and didn't pay attention to the need to communicate, to start the dialogue with citizens, earlier," said Sen. Jeff Golden, a Democrat from Ashland who sponsored the original legislation. "We're talking about a new area of regulation of private property. That's a very big deal."

The botched rollout illuminates the challenges of making wildfire-preparedness regulations socially and politically palatable. "It's sort of a condensed version of the climate change test," Golden said. "Which is: Do we have the capacity to respond and save ourselves, or not?"

WHEN THE MAP was released in July, residents were confused about what they'd be expected to

do as a result; the new building codes and standards were still in development. "A lot of folks are already going above and beyond what the standards are going to ask for, frankly," said Alison Green, public affairs director for the Oregon Office of State Fire Marshal. The map's midsummer drop also coincided with peak fire season, and state fire officials were already stretched thin responding to blazes.

Many railed against the designations, calling them government overreach. Historically, Oregon has delegated more decision-making authority to local communities, said Peter Walker, a University of Oregon professor who studies social-political adaptation to wildfire. "That's not what (this bill) did."

But others believe wildfire management needs to occur at the state level. Flames follow fuel, not property lines, and when a county's firefighting capacity is exhausted by a bigger burn, it can ask the state for help. "The state should manage the risk, because, ultimately, they

Bly, Oregon, residents Tim and Dee McCauley on the charred wreckage of their property after the Bootleg Fire in July 2021. **Mathieu Lewis-Rolland / Getty Images**

pay the bill,” said Bob Horton, former fire chief for Jackson County Fire District 3, who supports the comprehensive fire law. “The important part of the map, and what I liked about the (legislation), is that it looked at it as a statewide problem. This isn’t a county-by-county issue. ... Risk is interdependent.”

In public meetings, state officials and residents talked past one another. Agency staff provided technical explanations about how the map was created, while citizens wanted specifics on its implications. “This is going to hurt me,” one woman said in a public meeting. “It’s going to hurt my property; it’s going to hurt my family.” One couple asked if they could surround their property with a moat to lower their risk designation.

What many perceived as errors on the map further eroded public trust. The ODF heard numerous complaints, for example, about a duplex where half the property was deemed high risk and the other moderate. ODF spokesperson Derek Gasperini said the landscape-scale model’s pixels don’t perfectly align with each lot, which can result in “awkward” flaws.

Jean Hart, a longtime resident of Rogue River, is one of hundreds of upset rural property owners. Even though she said she’s already established defensible space and removed dangerous trees, her property was designated “extreme.” Other landowners had similar complaints.

The risk model, however, also takes into account weather, climate and topography; the only factor homeowners can control is vegetation. While land modifications like thinning or

irrigating might help a house survive flames, it’s not always enough to overcome an area’s overarching risk.

SOME HOMEOWNERS FEARED that their insurance companies would jack up rates or cancel their policies. In the July Zoom meeting, one man shared a story of dramatic cost increases and claimed that the insurance company blamed the new map. Similar anecdotes followed.

But the Oregon Division of Financial Regulation, which regulates insurance, says that insurance companies in Oregon have not used the state wildfire risk map, nor did they plan to use it. “The level of misinformation that we were dealing with was astronomical,” said Brian Fordham, the division’s property and casualty manager. Companies must justify raising rates or dropping consumers, and they can be penalized for lying to regulators. In an official request for information made by the division, nobody cited the new map; instead, they said they rely on their own internal models. California recently became the first

state in the country to require that insurance companies reduce premiums for customers who decrease their fire risk by removing flammable vegetation or having a fire-resistant roof. But so far, Oregon has no such regulations on the books.

MEANWHILE, A RESISTANCE movement has mobilized against the legislation in southern Oregon, including calls to repeal it entirely. The Facebook page for a landowners’ interest group serves as the nucleus for the movement. The group’s 2,400 members, including Hart, use Facebook to organize strategy meetings, share concerns and lobby insults at politicians and state staff. “This law was ‘the straw that broke the camel’s back,’ after several years of unwanted mandated legislation and orders in Oregon,” Hart wrote in an email.

The group’s members express suspicion of elected officials and land-management agencies and say further land-use restrictions and wildfire codes violate their property rights.

“‘They’ aren’t interested in homes being protected from wild-

fire ... they appear to be much more interested in simply forcing everyone to live in town or city,” one commenter wrote. “Mostly the area that the map put on high was because most of us are Rep(ublican) party,” said another. Alexander Reid Ross, a geography professor at Portland State University who focuses on extremism, said he wasn’t surprised that the new rules were received coldly. “There’s often a sense of, ‘If I give them an inch, they’ll take a yard,’ when it comes to government regulation,” he said.

The Department of Forestry plans to release a new map in late 2023 following more outreach meetings and an education campaign statewide, though an agency spokesperson said the map is unlikely to be fundamentally different. What will happen when people are told, for the second time, that they live in high or extreme risk areas? Walker thinks reissuing the map won’t change the public’s response. “I think it’s potentially even more explosive,” he said. “You can put lipstick on a pig, but it’s still a pig, and people are going to recognize it’s the same thing.” ☀



An aerial view of homes destroyed by wildfire in Talent, Oregon, in September 2020. **David Ryder**



During the first Karuk Women's TREX, an engine crew works together to tame the flames climbing a tanoak tree.

REPORTAGE

Femme fire

A first-of-its-kind training works to extinguish hypermasculinity in firefighting culture.

BY B. "TOASTIE" OASTER
PHOTOS BY REN BROWNELL /
COURTESY OF KARUK WOMEN'S TREX

IT WAS SATURDAY, a hot one. In the remote mountains of Northern California, a group of mostly Indigenous women took a break from conducting prescribed burns. Some sat on mats in the early October shade, pounding woodwardia fern, splitting maidenhair ferns and weaving the stems into baskets, while others stood at a stump by

the fire pit, using a wooden paddle to stir hot rocks into a big pot of acorn soup, steaming it from within. Salmon heads and fillets smoked on stakes around a fire pit. Children ran and shrieked until scolded by elders, who were listening to cultural presentations about prescribed fire and weaving. This was the midpoint of the two-week

inaugural Karuk Women's TREX, or prescribed fire training exchange — the first-ever such training tailored specifically for Indigenous women.

Historically, in Káruk society, women were responsible for maintaining village areas with fire. Men burned, too, but farther away, usually on remote hunting grounds. But cultural fire was suppressed in 1911, when the Weeks Act outlawed igniting fires on public lands. Today, that colonialist law is still considered a conservation landmark.

Recently, however, prescribed burns have gained favor with the Forest Service, and in 2008, it worked with The Nature Conservancy and several agencies from the Department of the Interior to organize the first TREX. They've occurred around the country ever since.

The events spread the theory and practice of prescribed burning. But they

are also a way to change mainstream fire culture, which has long been "very exclusive, very militaristic, very socially and culturally homogenous," said Lenya Quinn-Davidson, fire advisor for the University of California Cooperative Extension and director of the Northern California Prescribed Fire Council. The U.S. still tends to see fire as a battlefield adversary and has long rejected using intentional burns as tools for forest management; many of modern firefighting's tactics and tools have military roots. Prescribed burns typically follow the hierarchical incident command system for safe operation management. Daily briefings before burns are peppered with military jargon: The land to be burned is called the "unit," teams are "squads," and the final dousing of embers is the "mop-up," a term the U.S. Marines sometimes use to

describe capturing or slaughtering holdouts after battle.

Fire management is predominantly white and around 90% male, Quinn-Davidson said. So, to counterbalance the militaristic, hyper-masculine firefighting culture, she has hosted five women's training exchanges since 2016. These aim to be 90% women, and participation demand is high. This time, she collaborated with Káruk organizers like Vikki Preston, a cultural resources technician at the tribe's Department of Natural Resources, to tailor a TRES specifically for Native women. It wasn't exclusive, said Preston, who is Káruk, Yurok, Paiute and Pit River. "But for the most part, we really tried to go through and pick Native women and femmes and nonbinary folks."

Preston, who's also a weaver, described the Karuk Women's TRES as a prescribed burn with cultural objectives. "Prescribed burning is a lot about simply, purely fuels reduction," she said, whereas cultural burning involves cultivating resources for food and basketry, tending to ceremonial grounds, maintaining forest access and other cultural needs that prescribed burns often overlook.

Preston consulted with elders and tailored the burn plan to nurture Káruk basketry plants: river willow, hazel shoots

and ceanothus, which provide a basket's structure; jet-black maidenhair fern, sun-bleached beargrass and woodwardia fern, dyed red with alderwood bark for a zing of color. These plants benefit from fire, which kills pests and encourages new growth of straight and tender shoots. After too long without fire, the plants become crooked, brittle and unusable.

As one of the burn's ranking organizers, Preston held the title of "Incident Commander," which she pronounced with air quotes and an eye roll: "Ugh. I hate to use that word." The patriarchal military jargon of a typical TRES, however, isn't set in stone; the first term the Karuk Women's TRES changed was "mop-up," replacing it with *iship*, Káruk for "extinguish."

"We've changed one word so far," said Preston. "But there's so many."

Indigenous women traveled from communities across the continent — even from as far as Australia — to attend the



Participants Annelia Hillman and Alex Lacey light a pitch stick in preparation for the test burn (top).

Karuk Women's TRES organizer Vikki Preston supervises participants as they light wild grape after a successful test fire (middle).

Participants Naomi Huddleston, Jesse Kidd and Ayuthea LaPier work together on an engine to hold the fire line and apply water as needed (bottom).

event and share their knowledge. During one morning briefing, an Anishinaabe woman from Thunder Bay, Ontario, spoke with Indigenous Australian fire practitioners about the legal implications of burning on federal land versus “crown land” — land the British monarch has laid claim to. It was a conversation born out of the women’s shared colonial conditions.

“For such a long time, it has always been just old white fellas that were burning our lands and had no idea of what was there and what was sacred to us,” said Kylee Clubb, a Gambir Yidinji cultural heritage protection officer and volunteer firefighter with Queensland Fire and Emergency Services. “The vision for me as a cultural fire practitioner is to come into one of these brigades (and) have an Indigenous person there,” signing the permits to burn on Indigenous lands, she said. “That’s the whole point of this space.”

At the Karuk Women’s TREX, Indigenous practitioners answered to Indigenous organizers, and women supported women. After a week spent getting comfortable on a squad, Alex Michel, a Mexican American prescribed burn organizer with the Central Coast Prescribed Burn Association, served as a squad boss, leading a small team of women through the day’s burn. Leadership was an adjustment. “I was raised with a lot of machismo,” Michel said. “It’s the men telling you what to do. Whatever he says is what goes, and you don’t get to ask questions.” But at this burn, she stopped asking questions and started making decisions. “That’s my biggest takeaway: to not be scared, not pose everything as a question,” Michel said. “It’s more like ‘This is what I think. It’s based off of my experience.’”

LuLu Alexander (Káruk), who works for the tribe’s Health and Human Services Program, had never worked with prescribed fire before. She signed up when she learned that the TREX would take place at the village where her family has lived for innumerable generations.

On the burn line that Sunday, after hours of briefing and preparation, Alexander crouched and nudged a flaming stick of pitchy pine into a shock of dry grass. Flames crept low, rippling into a forest of crooked red manzanitas and sneaky patches of poison oak. In about 15 minutes, the burn cleared away the overgrown mess of blackberry bushes and invasive grasses, giving the trees space. If not for the embers, you could have strolled around gathering acorns and hazel shoots.

The other squads went to work, too, igniting more sections of the “unit.” On the burn line, a participant with a drip torch and the chin tattoos traditional to lower Klamath tribes smiled as she drizzled flames around a hazel bush — “giving it some love,” she said. Drip torches usually contain a mixture of diesel and gasoline, but when Káruk burners treat hazel, they use pitch sticks or fill their drip torches with propane. Propane burns off more thoroughly, making it safer for weavers to put the shoots in their mouths, a processing step in basketry.

Alexander said lighting the first fire that day was emotional. “It strengthens my connection to my village.”

“Everybody’s really happy to see other Indigenous women,” Preston said. “It’s very relatable, for one, but I think that we have a very strong sense of relationship to plants and ecosystems, and I think that’s super special to share that with each other.” 🌿

POEM

Plainsong

By J.P. Grasser

Hotter days than ever curl the paint
from the barn’s broadside, if not from the same loafing shed
where our ladders and stepladders fold in

on themselves, but even now, it’s endless,
rolling distance, that familiar wavering
where road crosses

road—which way?—out
of signal with no sign
to lean on, but the pastures, they do end.

So, enough. Enough with this kingdom
of pure loneliness wherein certain grace
certainly lies. Enough wielding

fields of the seeming-particular—sandberg
bluegrass, american sloughgrass, nutsedge, mullen,
needleandthread—for no name can contour

flatlands like these, locked in heat. See, a cloud is,
by nature, deliberation. A decade
looking for you in the inkblots

spreading a leopard
frog’s back is what I spent, then lo, lo
and behold, out of the blue arrives a text

with plenty to glean on cruciform structures
in plant DNA, which neared
the feeling, I guess, I guess it did, but to think

of what I most wanted and what I loved most
swept to one side, and to consider you
neck-deep in switchgrass and strangletop

makes nothing happen at all. To look at it
now, you’d never guess, but two horses lived
behind this old house, one grulla and one tobiano,

who made a kind of plain music, at dusk, swishing flies
from each other’s eyes and whickering after the good,
sweet hay, for whom dust was dirt and what dies doesn’t.

WEB EXTRA Listen to J.P. Grasser recite his poem
at hcn.org/plainsong

Assisting the Rio Grande cutthroat

Scientists wage an upstream battle to save trout in a warming West.

BY BEN GOLDFARB | PHOTOS BY LUNA ANNA ARCHEY

THE HELICOPTER VAULTED over Music Pass and touched down in an alpine meadow, kicking up grit, October sun sparkling off its cockpit. Estevan Vigil swung out, hustled away from the rotors, and peeled off his flight suit. The chopper rose, a speck against the snow-dusted wall of southern Colorado's Sangre de Cristo Mountains, leaving me, Vigil and Vigil's backpack, which contained about 700 Rio Grande cutthroat trout.

"This is the best day of work I've had in a long time," Vigil, an aquatic biologist with Colorado Parks and Wildlife, called over the helicopter's receding whump. "Coolest part of the job, hands down."

Vigil was here to empty his backpack's piscine contents into Sand Creek, which wends 12 miles from the Sangres to the glittering quartz and volcanic folds of Great Sand Dunes National Park. Sand Creek, like many of the drainages that filigree southern Colorado and northern New Mexico, is the Rio Grande cutthroat's historic domain. For centuries, "Rios" — which, like their eponymous river canyon, come in a range of ruddy pastels — fed the Taos Pueblo, various Apache bands and Spanish-speaking shepherds, including Vigil's great-grandfather, Felipe. "He'd be up there all summer with his flock and his rifle, catching and eating these same fish," Vigil said. "If you'd asked me my favorite fish when I was 5 years old, I would've said Rio Grande cutthroat trout."

But Vigil's beloved fish has fallen on hard times. Cities and ranches drained southwestern streams, roads and logging operations fragmented rivers, and humans loaded watersheds with nonnative species. Today, Rios occupy approximately 12% of their erstwhile habitat. One of the places from which they likely vanished was Sand Creek, which was colonized, early on by brook trout — feisty

Eastern fish, likely planted by miners — and, later, a distantly related cutthroat subspecies that state biologists stocked for anglers. The interlopers overwhelmed Rios, and some interbred with them, swamping their gene pool. By the 21st century, the native trout were gone.

In 2020, after years of planning, Vigil and his colleagues began the laborious process of returning Rios to Sand Creek. That September, a team of biologists and technicians dosed the stream's upper reaches and its headwater lakes with a fish-killing poison. This mass piscicide wasn't fun — "you get kind of depressed when you're killing fish," Vigil acknowledged — but eliminating the invaders was a necessary prelude to restoring the native inhabitants. A year later, biologists stocked thousands of genetically pure Rios in the lakes. Now, Vigil planned to release more, this time in Sand Creek itself. "When you consider the size and remoteness, this is probably the biggest restoration project we've ever done," Vigil said.

Yet Sand Creek's reclamation is about more than returning Rios to their former kingdom; it's also about securing their future. Cutthroat need cold water, and climate change is shrinking their range; Rios, the southernmost of the West's dozen cutthroat subspecies, are especially vulnerable. Sand Creek is a refuge from the warming. Several icy tributaries pump snowmelt and spring-fed water into the stream, keeping its mainstem cool even as ambient temperatures climb. Right now, these feeder tributaries are fishless, too frigid for eggs to develop, and boulders prevent trout from swimming up some of them. But as Sand Creek warms, biologists may someday release Rios into them. "Species need us in the climate change era to get them into the habitats where they'll be safe," Fred Bunch, Great Sand Dunes' chief of



resource management, told me later.

The National Park Service and its collaborators haven't yet stocked the chilly tributaries, or decided if they ever will, Bunch said. Elsewhere in the West, though, biologists have begun to plant trout in once-fishless waters that may become climate strongholds. Such foresightful translocation has long been a hot topic among foresters, who refer to it as assisted migration and have contemplated transplanting everything from California's sequoias to Florida's *torreya* conifers. But while the assisted migration of trees in the U.S. has mostly remained "a mere research subject," as the journalist Lauren Markham put it, the assisted migration of *fish* is already happening, with less fanfare. To many biologists, the rapidity of climate change necessitates it. Yet this well-intentioned meddling recalls a disquieting history. Trout, unlike trees, are predators, with a track record of transforming ecosystems wherever they're put. A golden



Estevan Vigil, an aquatic biologist with Colorado Parks and Wildlife, pours dye into Sand Creek to determine the river's flow before administering a fish-killing poison to rid the creek of nonnative trout species. The river flow ended up being too high to poison on that particular day (*left*).

Vigil stands for a portrait at the lower reaches of Sand Creek, before it disappears into Great Sand Dunes National Park (*below, left*).

Vigil displays a photo of a genetically pure Rio Grande cutthroat trout caught by an angler in an alpine lake stocked by Colorado Parks and Wildlife (*below, right*).





rule in conservation biology, Clint Muhlfeld, a research aquatic ecologist with the U.S. Geological Survey, told me, is to do more good than harm.

WESTERNERS HAVE ASSISTED trout migration for more than a century. Beginning in the late 1800s, fishing clubs, miners, railroad workers and biologists dumped millions of trout into lakes and creeks to promote angling: brown trout from Germany, rainbows from the California coast, Northeastern brook trout. Stocking techniques were rudimentary — one newspaper recommended conveying trout in “milk cans or some such suitable receptacle” — yet the consequences were profound. Nonnative fish gobbled frogs, salamanders and insects. The West’s native cutthroat, named for the vivid slash-marks along their jaws, were particularly harmed. Browns ate them, brookies outcompeted them, and rainbows interbred with them. “The result is a hybrid,” lamented one manager in 1937, “less productive than either, in which the rainbow type predominates and the native characteristics soon disappear.”

Over time, climate change exacerbated the crisis. Megafires choked creeks with ash, and warmer, lower flows allowed nonnative fish to overtake rivers. Cutthroat and bull trout, another cold-loving Western fish, fled upstream. One 2009 study found that several cutthroat subspecies could lose substantial portions of their habitat within 50 years. Like pikas and whitebark pines, the West’s endemic fish were being driven upslope toward oblivion.

As the situation worsened, scientists considered dramatic measures. Some of the West’s coldest, most climate-proof streams and lakes naturally lay in high elevations near the headwaters and were thus off-limits to fish. Road culverts, dams and various human-made blockades impeded access to others. Trout couldn’t reach these refugia on their own, but, if humans moved them, they might survive. Assisted migration, a 2010 report declared, could “establish or reestablish self-sustaining populations.”

So, managers acted. In 2014, Glacier National Park worked with Muhlfeld to rescue bull trout from Logging Creek, where non-native species threatened them with extirpation. Muhlfeld and his crew zapped the stream with electric probes, netted the stunned

“The result is a hybrid, less productive than either, in which the rainbow type predominates and the native characteristics soon disappear.”



A hybrid species trout caught in Sand Creek, likely a mix of rainbow and cutthroat (above). A helicopter drops close to Upper Sand Creek Lake in the Sangre de Cristo Mountains to pour a bucket of about 3,500 cutthroat fry into the lake. That day, about 10,000 fry were stocked in different areas of upper Sand Creek (left).

bull trout, and hiked them in backpacks to Grace Lake, above a fish-blocking waterfall. Muhlfeld hadn’t removed the fish from their home watershed, merely given them a lift upstream. Still, it showed that human intervention could salvage a troubled population. “All indications are that those fish are growing really well and spawning,” Muhlfeld said.

Other scientists took more drastic measures. In 2017, biologists in Yellowstone National Park poisoned the Upper Gibbon drainage system to exterminate the rainbow and brook trout that the Park Service itself once stocked above and around a waterfall. Rather than letting the Upper Gibbon remain fishless, likely its historic state, the agency then planted cutthroat and grayling, salmonids native to elsewhere in the park. Brian Ertel, a Park Service fisheries biologist, told me that the agency also plans to eliminate invasives and release cutthroat in upper

Buffalo Creek, cold refugia whose natural waterfalls will thwart reinvasion. “The climate modeling, the diversity of habitat, and the barriers all show that, hey, this is going to be a great place for cutthroat trout to survive and thrive,” Ertel said.

Of course, icy headwaters aren’t just refuges for trout; they also harbor trout *food*. Alpine lakes in many Western states sustain boreal toads, a sensitive and toxic species whose tadpoles trout attack. Streams in Montana and Wyoming support the western glacier stonefly, a threatened insect whose reliance on snow and glacial melt makes it as vulnerable to climate change as any fish. Studies have shown that after cutthroat were released into fishless lakes in the Canadian Rockies, mayfly populations plummeted, while midges and roundworms exploded. “(A) liberal policy on assisted colonization,” researchers concluded, “could cause broad

irreversible damage.”

Despite the potential repercussions, research has been scant. One forthcoming review found that just two of more than 200 peer-reviewed studies concerning assisted migration involved fish. Still, biologists have worked to avoid collateral harm. Before moving bull trout to Grace Lake, Muhlfield surveyed its insects, amphibians and plankton to ensure the release wouldn't inflict disaster. Rainbow trout have occupied Yellowstone's Upper Gibbon River for so long that cutthroat couldn't make things worse. “It's already been impacted by nonnative fish, so it's not like we're dumping trout on top of amphibians or other aquatic animals,” Ertel said. We've broken the world so thoroughly that we've created the conditions for its repair.

Yet even proponents acknowledge assisted migration's no panacea. As Muhlfield noted, skinny, high-elevation refugia aren't necessarily trout's preferred habitat, but where they've been exiled. One 2019 study found that the best strategy for preserving Rio Grande cutthroat long-term was to prioritize “large watersheds with intact habitat” and natural downstream barriers — places exactly like Sand Creek. The lesson:

Dakotah Pinkus, lead fisheries technician for Colorado Parks and Wildlife's Rio Grande drainage, empties a bag of cutthroat fry into Sand Creek (left). The fry hesitate briefly before swimming off (right).

While assisted migration can buy trout time, we also need to restore entire ecosystems — reconnect rivers to floodplains, demolish dams, reduce withdrawals, eliminate invasives. The gravest danger from assisted migration may not be its side effects, but that we wrongly conclude it's sufficient.

AS ASSISTED MIGRATION HAS SPREAD, the term's meaning has blurred. The Forest Service says that it means any human-directed movement of a species *in response to climate change*. But when the Utah Division of Wildlife Resources recently produced a video touting its “assisted migration” of cutthroat, it never mentioned climate. Absent the motivation of global warming, was the state practicing assisted migration? Or was it just stocking fish, as states have always done?

Some of this ambiguity is built into assisted migration, which is less a discrete strategy than an umbrella term that encompasses all manner of interventions. *Assisted range expansion*, for example — where you move an organism just outside where it's currently and historically found — is fundamentally different from *assisted species migration*, where you transplant something to a distant locale. Critics who deride assisted migration as ecological gambling sometimes elide these vagaries, making the concept seem more radical than it is. It's one thing to move Rio Grande cutthroat into fishless tributaries within their historic range, another

to consider shipping them to, say, Montana.

Assisted migration in the Sand Creek drainage will proceed slowly and with a light touch, if at all. “Those fishless streams are a good potential option that we'll revisit down the line,” Estevan Vigil told me after the helicopter left. Cutthroat may also move into the cold creeks on their own. “As some of the areas they're reproducing in become too warm, these tributaries are going to provide places for them to go,” Vigil predicted. This possibility struck me as a promising glimpse into the future: By restoring organisms to their former domains, biologists also give them the opportunity to make their own adaptive decisions, a range expansion both human-assisted and self-directed.

Vigil and I hiked down to Sand Creek, his precious cargo jouncing on his back. The stream tripped over boulders; snow clung to its banks. Vigil unslung his backpack and pulled out the bag of 4-month-old cutthroat. The trout, no longer than a pinkie joint, swirled in their plastic bubble like county-fair goldfish. Vigil tore open the bag and spilled a few into a shallow pool — cautiously at first, to make sure they'd acclimate. The fish righted themselves and swam off. Satisfied, Vigil emptied the bag, and we watched fish dart to and fro like campfire sparks. One by one they drifted toward the current beyond the pool. They faced upstream for a moment, Sand Creek flowing through their open mouths and over their gills, and then they were gone. ☀





A mature black walnut tree in the Montecito Heights neighborhood of Northeast Los Angeles.

REPORTAGE

The black walnut is an organizer

Neighborhood activists use environmental protections to fight gentrification.

BY CAROLINE TRACEY
PHOTOS BY NOÉ MONTES

ON MAY 6, 2022, Adam Baz, a resident who lives near El Sereno, a Northeast Los Angeles neighborhood, noticed a freshly cut pile of black walnut wood on the hillside next to his house. The trees are protected by both local and state ordinances and cannot be cut down without a permit; the one Baz observed had even been inventoried and tagged as part of the site's Protected Tree Report.

Disturbed by the sight, Baz wrote to the LA Department of Public Works: "There is also a pile of live walnut branches with leaves and fruit. ... There can be no mistaking that this tree was alive and healthy prior to being cut down."

Micah Haserjian, co-founder of Coyotl + Macehualli, a community organization that advocates for the protection of open space native species, including the black walnut, and Jack Smith, a naturalist who works with the nonprofit urban forestry organization TreePeople, visited the site after Baz observed the damage. They found not just one, but 18

recently cut black walnut stumps. "They were just butchered," said Smith. "Sloppy, aggressive machete cuts."

Haserjian notified the city, and LA's Urban Forestry Division investigated the removal of the protected walnuts. Two months later, he received a report stating that only two trees had been taken, and that they were already dead — contradicting the naturalists' accounts. A representative from the Public Works Department reiterated that the two protected trees that were removed were dead and said the evidence "was insufficient to determine the 'Protected' status of the (other) numerous stumps."

The owner of the 4.3-acre open lot, real estate developer Henry Suarez, has been trying to build Onyx-32, a multimillion-dollar housing development, there since 2014. Many in El Sereno — a hilly working-class neighborhood that is about 80% Latino — opposed it. In 2021, after the California Department of Fish and Wildlife wrote a letter

recognizing the ecological value of the site's dozens of black walnut trees, the city's planning department denied the project. Suarez still owned the land, but he couldn't build the proposed development on it.

Neighbors speculated that Suarez was responsible for the cutting Baz first reported. When asked for comment by *High Country News*, Suarez denied any wrongdoing, saying that brush was cleared, as required by the fire department, and that any cut-down trees were already dead. He also claimed that the city had not contacted him about the investigation, though the service request's log shows that it had communicated with the land owner in mid-June, and the public works department confirmed this.

This conflict over a handful of trees is not an isolated incident. For decades, black walnuts (*Juglans californica*) were essentially protected from development because they tend to grow on steep hillsides. But in recent years, as LA housing values soared, it's become profitable to develop even those accidental refuges. Now, Coyotl + Macehualli is using the tree's protections to simultaneously achieve several goals: limiting gentrification, fighting extreme heat and deepening the community's relationship to its ecosystem.

JUGLANS CALIFORNICA is endemic to Southern California, meaning that it is both native and occurs only there. The trees bloom yellow in the spring. Their walnuts, harvested in early fall, are a food source for the Indigenous Chumash and Tongva peoples, and the husks are used both medicinally and as dyes.

Black walnuts grow in deep, clayey soils on generally north- and east-facing slopes in a band that stretches across Los Angeles County, in habitat that ranges from working-class neighborhoods like El Sereno to some of LA's toniest real estate, like Beverly Hills. They anchor a "walnut savannah" ecosystem that nurtures over 29 species of birds as well as coyotes and other mammals. Though the trees are not considered endangered or threatened, more than a third of their habitat has been lost to urbanization, and their ecosystem is ranked "sensitive" by the state of California.

In 2019, Haserjian and his partner, Brenda Contreras, learned that a Newport Beach-based developer planned to build seven luxury homes on the hillside behind their home, nearly three miles from the Onyx site. Despite the property's multiple black walnut trees, the project had been exempted from state environmental

review. When Haserjian and Contreras read the biological report commissioned by the developer, they were alarmed to see it claimed the site had "no sensitive plant communities" and "did not contain suitable habitat" for black walnuts.

They decided to fight. They initiated a lawsuit over the absent environmental review and their lawyer hired a biologist to write another report, which identified a dozen live walnuts on the site, as well as a three-foot-wide stump that had been a living tree in 2017, according to images on Google Earth. There was no mention of a permit for its cutting.

As Haserjian and Contreras knocked on doors to mobilize their community, they learned that other development projects opposed by their neighbors were also home to black walnuts. That included the Onyx-32 development, as well as another project called Vista El Sereno, which was allowed to forgo a full environmental review despite having over 100 black walnuts. They incorporated Coyotl + Macehualli and sued the city of LA.

Realizing that the walnuts were more than a tool for litigation, they organized Coyotl + Macehualli community events, such as nature walks and "guerrilla gardening" projects where they planted black walnuts in



the nearby hills. Next to the Vista El Sereno site, which is near an elementary school and a bus stop, they planted buckwheat, white sage, black sage and mountain mahogany. At Sunday coffee hours, they spoke with neighbors about the hillside and its habitat.

Today, Coyotl + Macehualli counts around 100 members. In the Indigenous Nahuatl language, *coyotl* can mean “coyote,” while *macehualli* translates to “Indigenous person,” said Contreras. They chose the name to signal their alignment with Indigenous values and a “horizontal relationship between us humans and our animal relatives.”

Wealthy communities have also used environmental protections to fight development, especially in California. But Coyotl + Macehualli’s work is fundamentally different, its members say: For one thing, many of them are renters, who want to protect the ecosystem, not their property values. For another, the neighborhood has less tree canopy than most of LA, making trees increasingly important as the weather gets hotter.

José “Gama” Gama Vargas, who works for an urban forestry nonprofit, said he joined Coyotl + Macehualli because he saw the value of the group’s “adversarial” approach — suing the city — as a complement to that work. Forestry projects target neighborhoods

that lack shade, which often have many low-income residents and residents of color, he said, but gentrification often happens faster in those areas than grant-writing, permitting and ecological restoration can keep up with.

“By the time we start doing the project, it feels like half the community is already gone. We’re planting trees for wealthier people,” he said. “The best way to have canopy is to keep the large trees that we have.”

Coyotl + Macehualli’s lawsuits are having an effect. In November, the judge in the Vista El Sereno case ruled in the group’s favor, which means the developer, True Life Companies, will be required to submit an environmental impact report. (Asked for comment, Aidan Barry of True Life said that the company was disappointed by the decision, noting that it had planned to replace the walnuts.) But in the case involving the hillside behind Haserjian and Contreras’ house, the judge upheld the environmental review exemption on the grounds that black walnuts were not sufficiently threatened. That case is not over; the judge is requiring additional briefs regarding the project’s air quality and noise impacts.

As the court makes its decision, Coyotl + Macehualli’s work continues with hikes, walnut propagation, and more gardening.

“There’s going to be conflict,” said Gama Vargas. “But with it, there’s going to be resolution and learning. I do feel we can create an approach to protecting our ecosystem where nobody is left out. People say plants are teachers — but the black walnut is an organizer.” ☀

Coyotl + Macehualli members (left to right) José “Gama” Gama Vargas, Brenda Contreras, Micah Haserjian and John Urquiza (*opposite left*).

A member of Coyotl + Macehualli holds a young black walnut tree before planting it during a community event in December (*opposite right*).

Black walnut, *Juglans californica* (*below left*).

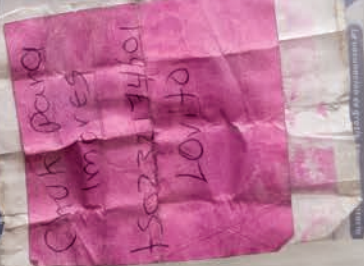
Mature black walnut trees are seen in the foreground as one looks south toward downtown Los Angeles from Elephant Hill in El Sereno (*below right*).



PERSONAL EFFECTS

ML#: 22-0300

NAME: unidentified



Office of the lost

To identify the remains of missing migrants, a Borderlands medical examiner's office transforms itself.

WESTERN WORK BY CAROLINE TRACEY
PHOTOS BY ROBERTO (BEAR) GUERRA

Editor's note: This story contains sensitive images of human remains.

WHEN DR. GREGORY HESS, chief medical examiner at Tucson, Arizona's Pima County Office of the Medical Examiner, offered to show me around the facility at the end of June, I didn't expect to end up in a parking lot at the back of a semi-trailer. As Hess pushed open the trailer's long bar lock, I noticed a paper sign taped to the

metal door, the letters "B.B.T." hand-drawn in bone-shaped lettering. "The Bone Box Trailer," Hess explained.

He opened the door and pulled out an access ladder. "Don't be a risk management problem," he deadpanned as I stepped onto it. To steady myself, I wrapped my fingers around the inner edge of the open door, whose hot metal attested to the morning's temperature: 96

degrees Fahrenheit.

The trailer's nickname made sense once we got inside. It was filled with stacked cardboard boxes, and inside each one lay the remains of a life cut short. Hess opened one box to reveal a human skull, pelvis and femur, along with a Ziploc bag containing a cellphone, a Mexican voter's ID and a wallet carrying a few pesos.

While all medical examiners work in the aftermath of violent and unexplained deaths, there are few medical examiner's offices like Pima County's. Over the past two decades, border enforcement policies that funnel migrants deep into the Sonoran Desert, combined with extreme and rising temperatures, have killed thousands of people in southern Arizona, overwhelming the medical examiner's office with unidentified human remains. In response to the crisis, the county has transformed the traditional role of a medical examiner — and in the process established a

global standard for responding to border-related migrant deaths.

LOCAL GOVERNMENTS EMPLOY medical examiners to determine the causes of sudden and medically unsupervised deaths: the bodies of people who die in car crashes, homicides and suicides, as well as those who die of natural causes at home, all go to a medical examiner's office. Unlike the remains discovered in the desert, these bodies are usually examined shortly after death, and in the majority of cases, next of kin are available to identify them.

For many years, discoveries of bodies in the Borderlands deserts were relatively rare. But in May of 2001, 14 people — 13 migrants and a suspected guide who remains unidentified to this day — died in the desert southeast of Yuma, Arizona, during a period when temperatures reached 115 degrees Fahrenheit. Their bodies were found more than 50 miles from the highway;

A rosary, a phone number, a COVID-19 vaccination card (from Guatemala), a few pesos and a cellphone were all that were recovered with one individual who was found this year (*left*). (Personal details have been blurred.)

Dr. Bruce Anderson and Emma Brewer, a University of Arizona anthropology student intern, examine the skeletal remains of two individuals who were found murdered outside of Tucson, Arizona, more than 20 years ago. Anderson and Brewer will prepare samples for DNA testing, which they hope will help identify the remains as those of two young men — one of whom is thought to have been a migrant from Mexico or Central America — who went missing at that time (*right*).



the group had been lost for days.

"It hit us over the head like a brick, like a bunch of bricks, that there was a change occurring," said former Chief Medical Examiner Bruce Parks, Hess' predecessor. "And the numbers kept going up."

In an effort to identify the remains, which were not being investigated by law enforcement agencies because they were presumed to belong to undocumented foreigners, the medical examiner's office began to innovate. They increased their technical capacity and helped found an affiliate organization that supports the families of the deceased. By turning this difficult work into a group effort, the office has successfully identified about 64% of the more than 3,600 border-related migrant deaths it has recorded since 2000 — a much higher rate than that of Borderlands medical examiner's offices in Texas and California.

"In terms of identifications, treating loved ones and remains with dignity and compassion,

and making data and information available, Pima County is the pacesetter globally," said Geoffrey Boyce, a geographer whose research makes use of data from Hess' office.

In many cases, DNA is the surest way to identify remains, but the technology is expensive. Office staffers are constantly writing grants to fund analyses of the small cubes of bone that they extract from the skeletons.

Robin Reineke, a cultural anthropologist, has helped to match these hard-won data with DNA samples from relatives. In 2006, as a first-year anthropology graduate student, Reineke began working alongside Bruce Anderson, a forensic anthropologist at the Pima County office. (Forensic anthropologists study bone, while medical examiners are pathologists, doctors who specialize in soft tissue.) She still remembers the conversation that sparked their collaboration: "He said, 'Yes, I'm happy to mentor you, but I need help.'"

At the time, Anderson had

amassed what he described as "hundreds of handwritten reports" of phone conversations with families searching for their loved ones. Reineke organized the reports into a database. In 2013, she and three of her colleagues expanded that project into the Colibrí Center for Human Rights, which now works with medical examiners throughout the Borderlands to identify remains and provide bereaved families with answers.

The Colibrí Center also supports the work that families and friends of the missing are already doing. Bereaved families' determination to resolve their cases, said Reineke, helps keep the office staff committed. "The families investigate. They research. They interview people. They collect data. Every family's home I've visited, they have a box or binder full of an archive about what happened. It's a massive, massive amount of labor. Their work has prompted us to do what we do now," she said.

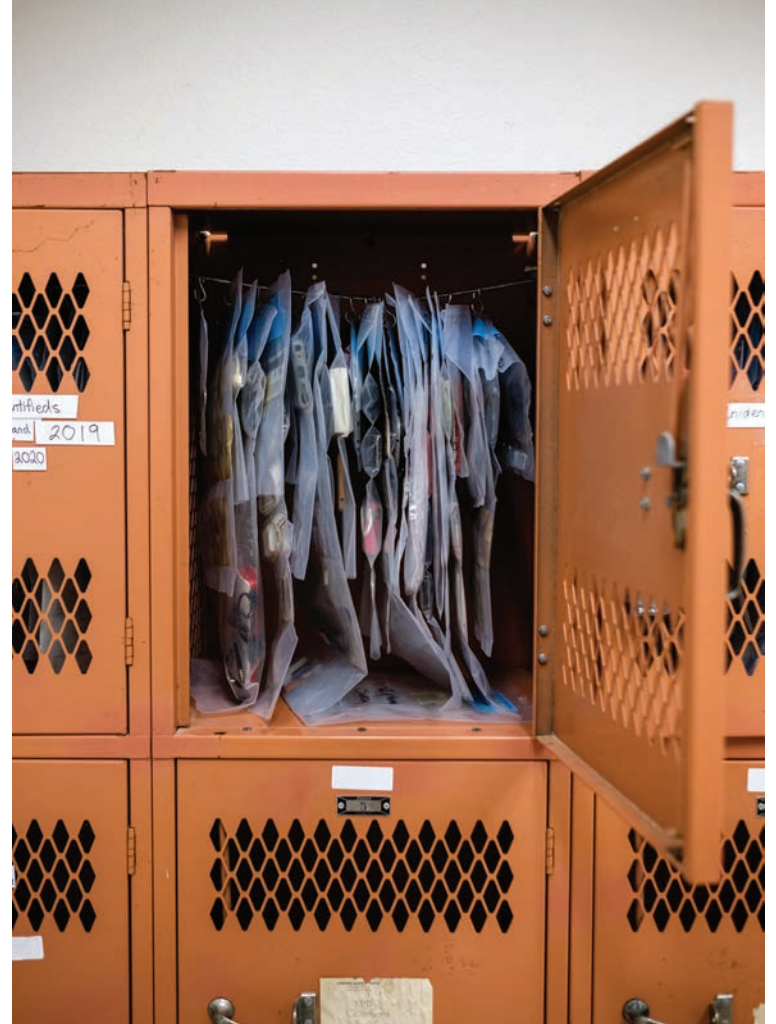
Anderson told me that

he used to think that when the migrant deaths reached a certain number, they would stop. "When the numbers hit 1,000, they'll get Washington (D.C.'s) attention, and they'll stop it," he remembered thinking. After about a decade, Reineke finally convinced him that no number would be high enough to galvanize federal action.

Medical examiners, as public employees, are paid far less than other medical specialists, and no matter where they work, their days are permeated by tragedy. In the Borderlands, hundreds of lives continue to be lost in the desert each year. But for the staff of the Pima County medical examiner's office, the importance of the job is worth the challenging circumstances. "It's not just sitting at a desk or microscope all the time. It's not a pristine white-coat environment," said Parks. "It's a more blue-collar type of work, work with your hands. You're in the thick of it, trying to help the community." ☀



Dr. Gregory Hess, the chief medical examiner at the Pima County Office of the Medical Examiner, at his desk in Tucson, Arizona. Over the last 20 years, the office has led the way in working tirelessly to identify missing migrants (left).



“In terms of identifications, treating loved ones and remains with dignity and compassion, and making data and information available, Pima County is the pacesetter globally.”

Clockwise from top left: Boxes of unidentified remains of missing migrants are stacked against the walls of the “Bone Box Trailer” outside of the Pima County Office of the Medical Examiner in Tucson, Arizona. One of the lockers used to catalog recovered possessions in the hope of identifying missing migrants. An open box in the “Bone Box Trailer.”

Troubled tides

Climate change, immigration crackdowns and housing costs squeeze workers at the nation's largest shellfish farm.

WESTERN WORK BY
MARA KARDAS-NELSON
PHOTOS BY
JOVELLE TAMAYO

SHELLFISH FARMERS like Ramiro Cordero, who works for Taylor Shellfish Farms in Bay Center, Washington, are used to being in uncomfortable positions and places. Farmers stand in the sand, elbow-deep in muck, to pluck oysters from the water. They hack away at mudflats to extract clams. They blow high-pressure water hoses into the ground to uproot geoducks that can be as long as their arms, sometimes their torsos.

The job would be difficult anywhere, but it's particularly taxing in Washington. Here, winter-time low tides — shoreline shellfish are harvested when water levels are low — occur at night. Sometimes farmers like Cordero are out at midnight, in the freezing cold, in January.

Like many of the 600-plus workers at Taylor, the nation's largest producer of farmed shellfish,



Shellfish farmers harvest oysters in Bay Center, Washington.





Cordero started out young. The physical demands of the job mean the company's workforce tends to be youthful. Many young people are also drawn to the prospect of working outdoors, in scenic coastal Washington, and in an industry known for its sustainability. Solid, if unspectacular, pay is an attraction, too; even entry-level workers can earn well above minimum wage.

It used to be that Taylor could fill a job opening within a few weeks. Now, amid a remarkably tight labor market, it can take up to four months to fill certain roles; the company needs technicians to grow oyster larvae, as well as farmers. Last summer, its workforce was about a third slimmer than it was two years prior.

Part of the problem is COVID-19. Taylor slashed its workforce when demand for

shellfish fell. When it tried to rehire workers, many didn't come back: They had left the industry, or the region, or even the workforce entirely.

In some respects, the job is getting harder. Summer is the busiest season for shellfish farming — and climate change is making summers hotter. In 2021, during a weeklong "heat dome," temperatures in the region reached nearly 120 degrees, instead of the usual 70s and 80s.

During the heat dome, workers at Taylor's hatchery, in Quilcene, Washington, near the Puget Sound side of the Olympic Peninsula, came in at 3 a.m. to protect baby shellfish — and themselves — from the worst of the heat. They moved the animals from warm, shallow water to deeper, colder water. They skipped maintenance that

would have required disturbing shellfish, so that the creatures wouldn't be exposed to high temperatures. Despite their best efforts, some of the carefully curated algae that feed growing shellfish died. The extreme conditions also sparked a massive shellfish die-off, both at farms and in the wild. At Taylor, workers put in extra hours to sort the dead oysters from the living.

The heat, unpredictable spawns, algae blooms and changing water pH levels, all worsened by climate change, have created an overwhelming sense of precarity within the industry — even at Taylor, a company that's more than a century old.

THE LIVING CONDITIONS of shellfish-farm workers are less stable, too.

Back in 2017, Trump

Ramiro Cordero (top), a shellfish farmer, drives his crew to a harvest site at Taylor Shellfish Farms in Bay Center, Washington.

administration officials exerted a significant immigration crack-down around Bay Center, where Cordero works. Dozens were arrested. The shellfish workforce, which skews heavily Latino, was hollowed out. Many left the region, and some left the country entirely.

Those who stayed are finding life increasingly difficult. During the pandemic, city dwellers flocked to Washington's coast. In tiny Bay Center, a place that rented for \$800 a month a few years back now goes for \$1,200. Around Quilcene, the site of Taylor's hatchery, many houses that used to be rentals have been sold. The rentals that remain

now go for \$2,000 or \$3,000 a month, not the \$1,000 pre-pandemic price. One Taylor worker who lives in Port Townsend, a trendy town of about 10,000 people, pays \$1,600 a month for a two-bedroom apartment.

The housing crunch has worsened the worker shortage, with applicants turning down jobs because they can't find a place to live. "They look at the paycheck and they look at how much rent costs around here, and it's really challenging," said Molly Jackson, the Quilcene hatchery manager. One woman Jackson recently hired parked her RV at the hatchery for three months until she found a more permanent place.

Jackson now scrolls through Facebook and Craigslist and calls friends to help would-be employees find housing. Taylor even briefly considered buying land in Quilcene for employee-owned houses. In part because of high housing costs, the company raised starting wages — rates now range from \$16.50 to \$27 an hour, depending on the position — on top of the health and dental care and 401(k) matching plan already on offer.

Taylor is also changing how the work itself is done. It has turned some of the hatchery's more onerous and time-consuming tasks — flipping the screens that hold baby oysters in water tanks, for example — over to machines. The company sees mechanization as a win-win: a way to keep production up even with a significantly smaller workforce and make work easier for the remaining employees. Maybe, the company hopes, these changes will entice workers to stick around a bit longer.

That might be true of Ramiro Cordero. For most of his 25-year career, he has harvested

oysters one by one, straight from the water, a tiresome task that required long hours and repeated stooping. Now, instead of growing oysters on the seafloor, Taylor plants them in bags, some of which hang off the sides of boats. When the oysters are ready to be harvested, a machine hoists them up so that workers can pluck them from eye level.

The task is still outdoors, in the rain or sun, in increasingly extreme weather. But a harvest that used to take a week can now take just a few hours, and it's far less backbreaking. Another Bay Center farmer, who had been considering retirement, now thinks he can hold on for another few years.

But he will retire eventually, as will Cordero. And it's not yet clear whether Taylor's higher wages or assistance finding housing will be enough to draw new employees. Although Taylor has hired nearly 100 new people in the last year, positions at Bay Center are still 40% vacant.

Ricardo Morales, one of Cordero's colleagues, said he doesn't mind the long hours in the pouring rain, although he added that come "October, November, December, you'll be wishing that you took that job at McDonald's or Dairy Queen instead." He loves working outside and doesn't think he'll ever leave the industry. Many of his friends and family have, though, either pulled by the \$20-an-hour starting wage in the logging industry or pushed by the immigration crackdowns.

I asked Morales how the industry had changed during his career. He looked at the four men around him, all standing in the middle of a large empty warehouse in Bay Center, and didn't hesitate. "There are fewer people," he said. "A lot of people have just left." ❀



A crew from Taylor Shellfish Farms unloads old shells from a boat to prepare for a harvest (top). Instead of growing oysters on the seafloor and harvesting them one by one, Taylor now plants them in bags that are easily loaded onto the work boat at harvest time (center). Ramiro Cordero stands on a boat full of harvested oysters (bottom).

La Niña hat trick

The weather pattern hits the West for a third consecutive winter.

BY JONATHAN THOMPSON

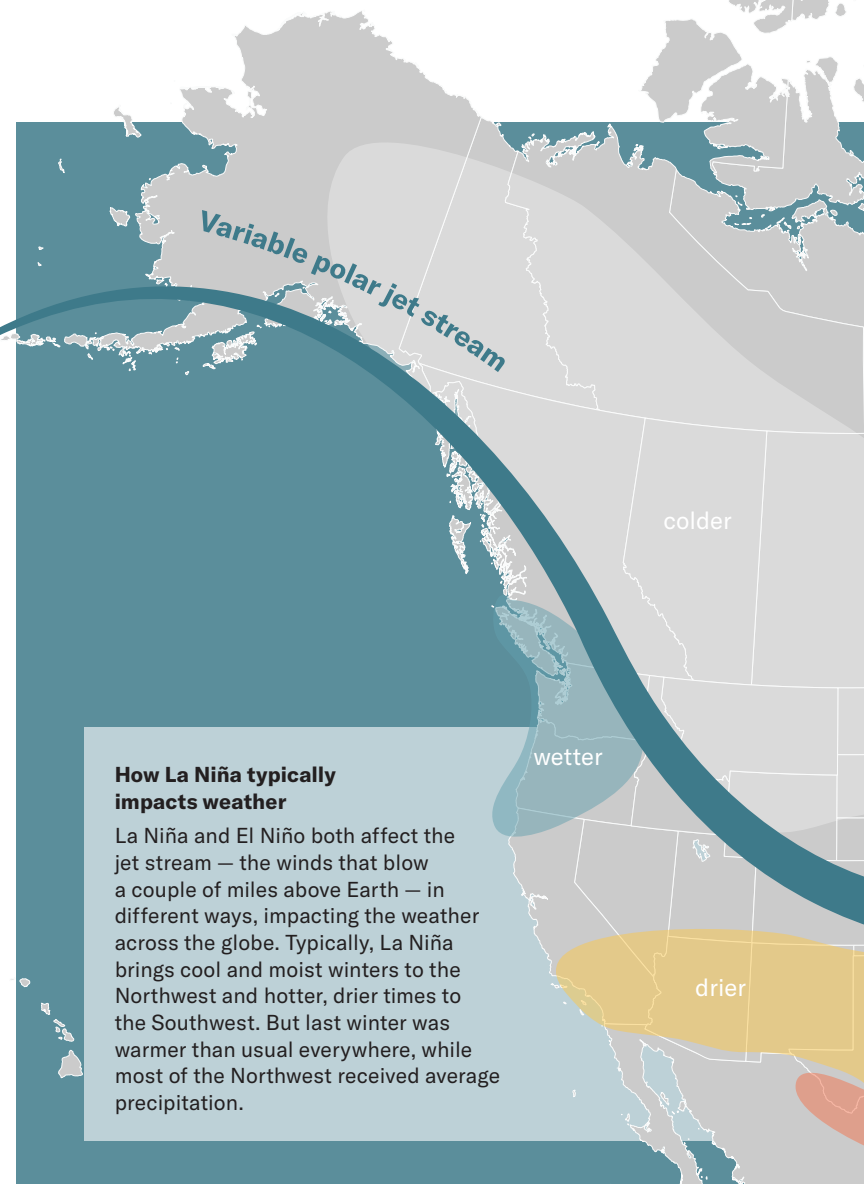
SHE'S BAAAACK! For the past two years, La Niña, the cooling of ocean temperatures in the equatorial Pacific, has wreaked havoc on weather around the globe. Now the World Meteorological Organization expects the phenomenon to return for a third consecutive year, a rare occurrence that forecasters predict could bring wackier-than-usual winter weather to the West, once again.

La Niña is the yin to El Niño's yang. Normally, trade winds — the tropical winds near the Earth's surface — blow west along the equator, moving warm Pacific Ocean water from the Americas toward Asia. This cycle is disrupted every two to seven years by El Niño-Southern Oscillation, or ENSO, events, which typically last about a year. During El Niño, the winds weaken, and warm water is pushed back toward the Americas. La Niña, meanwhile, strengthens trade winds, bringing cool water to the surface of the Americas' West Coast.

A study published this summer by University of Washington researchers suggests global warming could be to blame for this year's La Niña encore. The two weather phenomena have different effects: El Niño tends to bring wetter conditions to the Southwestern U.S., while La Niña usually brings moist, cool weather to the Northwest and hot, drier conditions to the Southwest.

Still, you might not want to plan your winter around these predictions. Meteorologists have been tracking these phenomena and their impacts on Western weather for about seven decades, but it's hard to forecast exactly what they mean for any particular location. Pretty much the entire West was unusually moist during the La Niña winter of 2007-'08, for example, and all of it — including the northern regions — saw above-average temperatures last year. When it comes to weather, it's best to hedge your bets. ☀

SOURCES: World Meteorological Organization; National Oceanic and Atmospheric Administration; National Weather Service; U.S. Geological Survey; National Resource Conservation Service; R.C.J. Wills, Y. Dong, C. Proistosescu, K.C. Armour and D. Battisti. S. (2022). "Systematic Climate Model Biases in the Large-Scale Patterns of Recent Sea-Surface Temperature and Sea-level Pressure Change," *Geophysical Research Letters*, 49, e2022GL100011. Climate schematics based on those by Emily Eng/NOAA. **Infographic design by Luna Anna Archey / HCN**



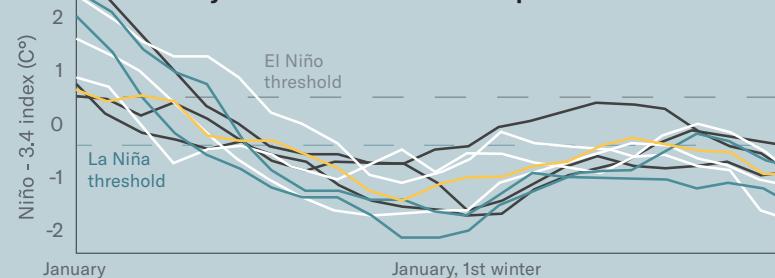
How La Niña typically impacts weather

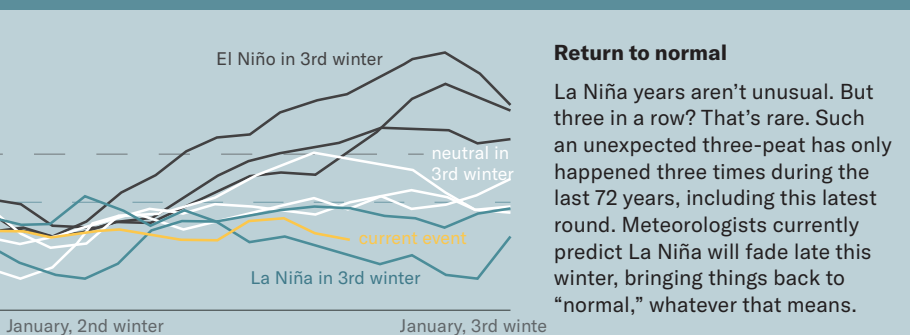
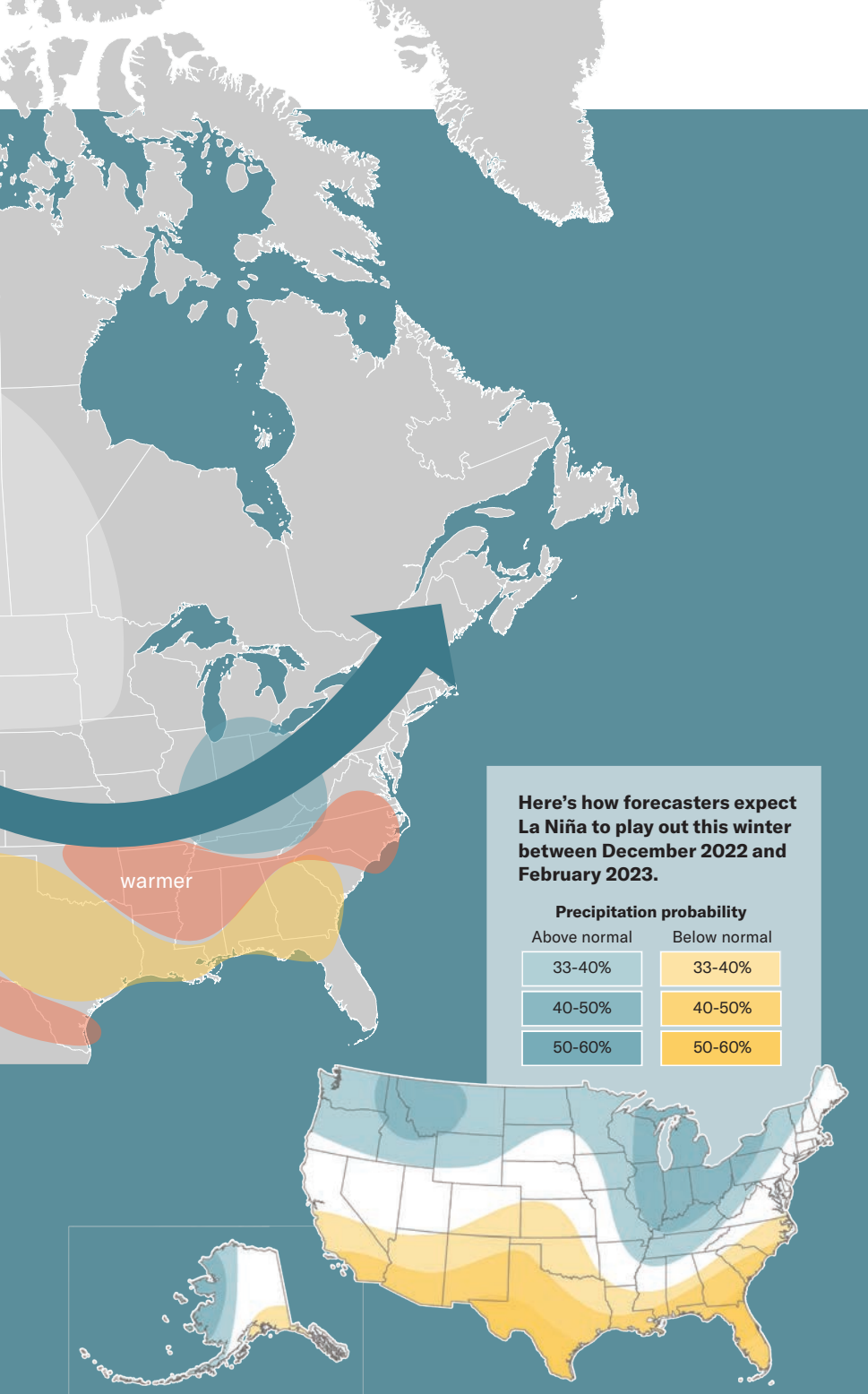
La Niña and El Niño both affect the jet stream — the winds that blow a couple of miles above Earth — in different ways, impacting the weather across the globe. Typically, La Niña brings cool and moist winters to the Northwest and hotter, drier times to the Southwest. But last winter was warmer than usual everywhere, while most of the Northwest received average precipitation.

What's happening in the ocean?

Normally, trade winds blow westward along the equator, pushing warm water away from the Americas toward Asia. Cold water swells up from the deeps along the Americas to replace the warm water that headed west. During El Niño, the trade winds weaken, causing warm water to head back east. The opposite happens during La Niña: The trade winds get stronger, pushing more warm water westward and increasing upwelling along the Americas, bringing more cold, nutrient-rich water to the surface. These disruptions of the normal pattern typically occur every two to seven years and last for about a year.

Three-year evolution of all double-dip La Niñas





To get some sense of what we might expect this year, we look back on some of 2022's notable weather events and trends to see how they followed — and diverged from — the expected La Niña patterns.

71 Number of monthly high-temperature records tied or broken in the West in February 2022. This included a 93 degrees Fahrenheit reading in Chula Vista, California, but also several readings in the 70s in Oregon. The Southwest was indeed warm, as is typical of La Niña, but the heat in the Pacific Northwest was unusual. Chalk it up to climate change.

40 The high temperature in degrees Fahrenheit in Utqiagvik, Alaska's northernmost city, on Dec. 5, 2022. That shattered the previous high record of 34 degrees, set in December 1932, and also set a new record mark for the latest date the mercury hit 40 degrees F. It was also only the third December day on record that the temperature climbed above freezing. Much of Alaska is roasting — relatively speaking — under warmer-than-average temperatures so far this winter, even though the La Niña pattern would normally cause the state to be colder than usual.

13.4 Inches of snow water equivalent — a measure of snowpack — in the Upper Colorado River Basin at its 2022 peak on March 23. Normally, the peak is about 16 inches and occurs more than two weeks later. It was, in other words, a dry, warm winter, following the typical La Niña pattern. But by summer's end, precipitation for the entire water year had risen to the median level, thanks to heavy summer rains — unusual for La Niña.

113 Percent of median precipitation the Yellowstone River headwaters received during Water Year 2022 (Oct. 1, 2021, to Sept. 30, 2022), in line with the typical La Niña pattern.

50,000 Peak flow, in cubic feet per second, of the Yellowstone River at Corwin Springs, Montana, on June 13, 2022, about four times the median flow for the date. This 500-year flooding event was caused by abundant winter snowmelt, combined with an "atmospheric river" storm system that dumped record-breaking rainfall — as much as 3.6 inches in 24 hours — in and around Yellowstone National Park.

July 24 Date that the Rio Grande's flow through Albuquerque, New Mexico, fell to zero cubic feet per second. While the river often dries up farther downstream, this was the first time since 1983 that it happened that far north.

1,810 Cubic feet per second flow of the Rio Grande through Albuquerque on Aug. 7, less than two weeks after it had gone dry. An unusually bountiful monsoon dropped 2.48 inches of precipitation on Albuquerque that month, the second-highest monthly amount since 1995.

48 Number of all-time high temperature records tied or broken in the West during a September heat wave. Temperatures exceeded 115 degrees in several cities in Northern California.

1,160 Cubic feet per second flow of Mill Creek upstream from Moab, Utah, on Aug. 21 following a sudden deluge. The stream had been running at about 15 cfs just moments earlier, and the unexpected torrent flooded Moab streets and businesses. This does not jibe with typical La Niña patterns.

.76 Inches of rainfall in the Phoenix, Arizona, area on Dec. 3, the wettest 24-hour period of the year — not what you'd expect for a La Niña year. Total precipitation in November was just .08 inches.

A photograph of a moose and its calf walking on a rocky path in a forest. The moose is in the foreground, looking towards the left, and the calf is slightly behind it, also looking left. The background shows a rocky hillside with green foliage.

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DEAR FRIENDS

We're not moving after all

IN NOVEMBER, we announced that we'd decided to sell *HCN's* longtime office building in Paonia, Colorado. Our staff has dispersed across the region in recent years, and even the dozen employees who still live in the area generally prefer to work from home.

Well, the deed is done. In late November, I signed the closing papers — and, in a surprise twist, promptly signed an agreement to rent back one corner of it.

The former production room, where Art Director Cindy Wehling laid out the magazine and the editors proofread the final version of each issue is now a cozy new workplace for *HCN's* Customer Service team, and a place where visitors are always welcome.

The building's new owner, a local graphic designer, has an exciting new vision for the place. She plans to rent the other offices as art studios and use the open areas for classes and gatherings. The "morgue," where we stored back issues, will become a library of community art supplies.

A whole lot of history

We're delighted to be staying put, with all the *HCN* history in that building. When I told former staffers about our plans to sell it, I was deluged by their memories.

Several folks recalled the previous office across the street, where *HCN* was housed in the 1980s. "Every inch of wall space was lined with desks, stacks of paper, file cabinets or other equipment," wrote **Linda Bacigalupi**, who was *HCN's* associate publisher at the time. "The walls were cold, the floors were cold. ... Irritating gas wall furnaces rattled and blew hot air and then went deadly cold."

The current office was formerly a hardware store. We haven't been able to find a complete list of readers who contributed to the massive remodeling project that began in the early 1990s, but we know longtime *HCN* board member **Andy Wiessner** played a central part, and that **Connie Harvey** and **John McBride** gave generously to create a spacious, light-filled and warm workplace that included in-floor heating and lots of natural light. By the 2010s, the building housed more than 30 employees, including editors and designers and interns, as well as the business and customer service teams.

Who wants our papers?

There are some things we won't miss about owning a building, most notably paying the bills for insurance and maintenance and the old phone system and a hundred



other little things. But we do miss working together in person — it's hard to retain that sense of community when we're scattered to the winds. And those of us who don't live in Paonia miss the frequent visits from readers, who would drop by to say hello and grab some fresh corn or peaches from the local farm stands.

We're looking for creative ways to build camaraderie among a far-flung staff, and we're always excited to connect with all of you. Keep an eye on this column for news of upcoming gatherings and events, both online and in person around the region.

The other challenge we're facing is a more practical one. We also sold the adjacent storage building, which holds decades of papers and records, including some things that might have historical value. I found one box, for example, that contains a collection of files that *HCN* founder Tom Bell kept from the paper's earliest days in Lander, Wyoming.

I have a few calls out to universities and libraries that might have room for this material in their archives, but suggestions would be welcome. Please email me directly at greghanscom@hcn.org.

Best wishes for the new year from the whole *HCN* staff, in Paonia and across the big, beautiful West.

— *Greg Hanscom, executive director & publisher*

Some of the staffers who will continue to work at 119 Grand Avenue in Paonia, and at home nearby: from left, Carol Newman, Kathy Martinez, Mary Zachman, Dorothy Punderson, Tammy York, Mark Nydell, Pamela Peters and Hannah Stevens.
Luna Anna Archey / HCN

Saving resources

You might notice that the pages in this magazine are slightly smaller than the December issue. We've adopted more typical magazine dimensions, allowing us to save money and limit our waste by using a standard paper size. In addition to the resources it saves, we hope it will mail better, be easier to take with you and be more comfortable to read.



The Body

The warm, slack water behind Lower Granite Dam on the Snake River creates a stagnant environment that can be lethal to salmon. In 2015, nearly all of the river's sockeye run perished due to heat, according to the National Oceanic and Atmospheric Administration.



of the Snake

Debate over the lower Snake River dams' removal has gone on for decades. What will it take to protect the river's health?

Photos by Hayley Austin | Text by Anna V. Smith



Lee Whiteplume (Nez Perce) stands on a platform on the Clearwater River, a tributary of the Snake, where he uses a hoop net to catch salmon (top). Mike Tuell, deputy director of production for the Nez Perce tribal hatcheries, fishes with a dip net on Rapid River, in the Snake watershed (bottom right). An 1855 treaty between the U.S. and the Columbia River Basin tribes guaranteed tribal fishing rights. In 2020, however, the Nez Perce were only able to catch 3,982 salmon in the spring and summer, not even two fish per tribal member. Salmon can no longer reach other tribes at all, including the Shoshone-Bannock Tribe. Johnson Ancheta (Nez Perce) cleans a coho salmon he caught in Lapwai Creek, a tributary of the Snake River (bottom left).



THROUGH MILLENNIA OF LAVA FLOWS and erosive flooding in the Columbia Basin, a river emerged. The Snake River writhes some thousand miles from Wyoming through southern Idaho, forming the Oregon border before curving into southeast Washington, where its waters meet the Columbia River and then, eventually, the ocean. It journeys from the Rocky Mountains through the desert, punctuated by dams.

A river is not a body, but people have always seen a resemblance. It has a head(waters), veins and arteries. Salmon enter the Snake River the same as nutrients to a living being: through the mouth. After swimming miles from the Pacific Ocean to the cold home waters from which they came, they spawn and die, leaving empty-eyed carcasses bobbing at river's edge. Studies have shown how dead salmon contribute to the abundance and diversity of a region's birds, the richness of the soil, the greenness of a forest's canopy. The deep intertwining of salmon with the ecosystem beyond the riverbanks is something the Nez Perce Tribe has always known. But, partly due to the dams, "that gyre of nutrients that should be flowing back and forth is stopped," Shannon Wheeler, vice chairman of the Nez Perce Tribal Executive Committee, told *High Country News* last fall.

The river is changing, its salmon stocks at the edge of extinction and drought depleting its waters — its lifeblood, as well as that of its basin's crops. And for decades, people who care about the river and rely on it have debated removing four of the lower Snake River dams — the four that most impact the restrained waterway.

IN EARLY 2021, Idaho Rep. Mike Simpson announced a \$34 billion plan for dam removal. After interviewing hundreds of people in the region and surveying the costs, existing reports, Endangered Species Act requirements and climate change projections, Simpson, a Republican, said in a virtual presentation that "in the end, we realized there is no viable path that can allow us to keep the dams in place." In an act of political imagination, his proposal asked: "What if the dams came down? What compromises can community leaders make? Fears aside, what is possible?" The proposal offered answers, and it felt significant: It was comprehensive, and it came from a member of Congress. "It had never happened before," Dave Johnson, manager for Department of Fisheries Resources Management for the Nez Perce Tribe, said.

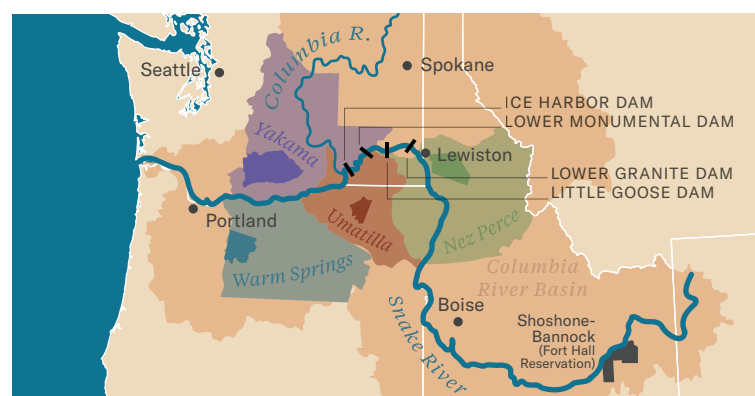
The Nez Perce, Yakama Nation, Shoshone-Bannock Tribes and Confederated Tribes of the Warm Springs and of the Umatilla Indian Reservation have long seen the Snake as a living being, both in its ecological functions and through the relational act of fishing. The dams upset tribal relationships to the river and violate treaty rights by causing the loss of salmon and land and restricting tribal lifeways. So the tribes have vocally supported dam removal — and Simpson's proposal.

The surgical removal of the four dams would rapidly and

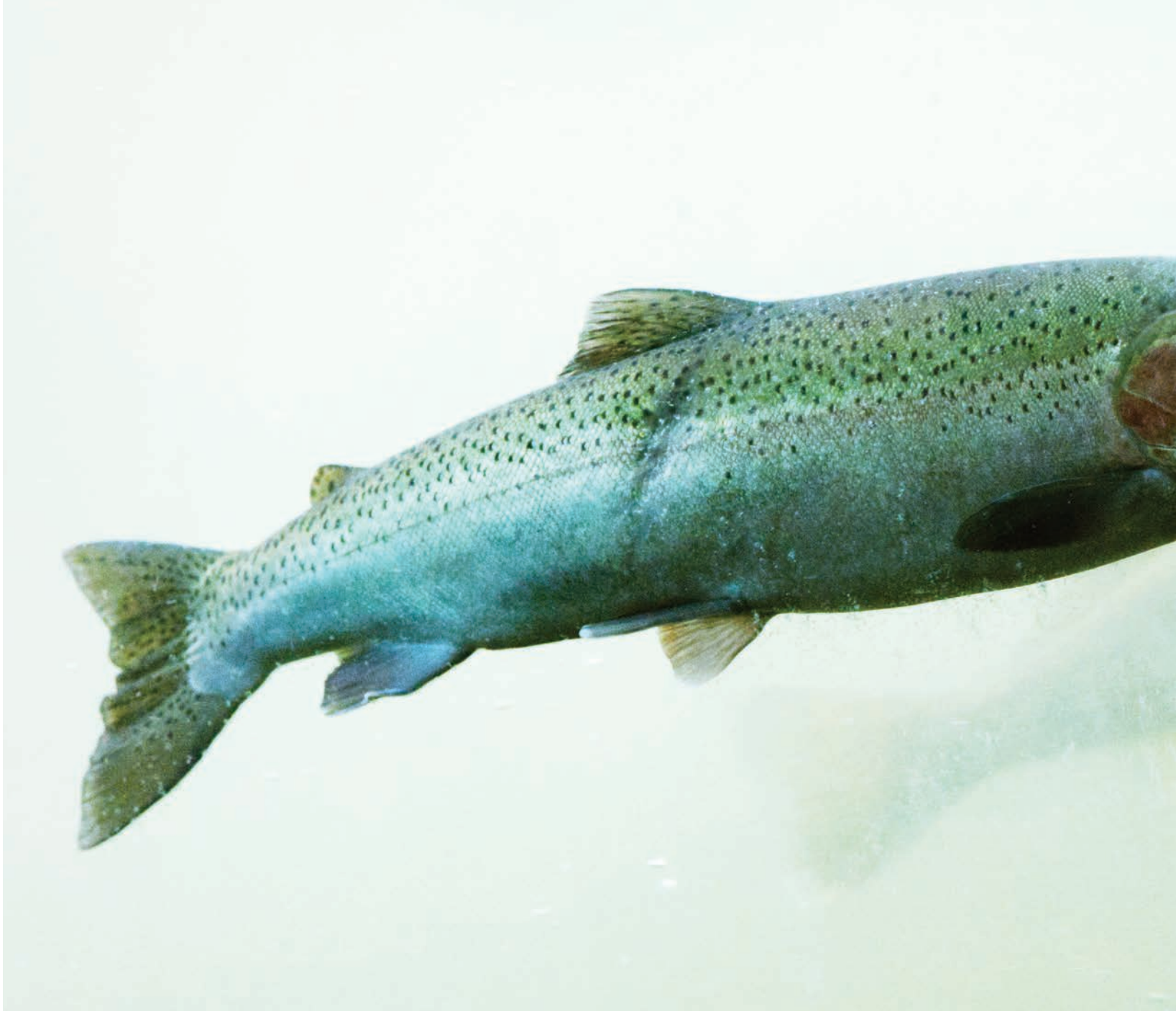
dramatically change the river. Federal agency reports estimate that breaching would take about two years, but up to seven years could pass before the river flushes out the built-up sediment behind the dams and finds a balance between sediment flow and water. Water levels would drop, with dams no longer keeping them artificially high. Connective streams would re-emerge. Salmon numbers may improve, and, eventually, the three hatchery operations run by the Nez Perce might be pared down.

Dam removal doesn't guarantee a full recovery, though, given the turbulent ocean conditions and degraded freshwater quality. Habitat elsewhere is also involved — other bodies in a larger community are experiencing their own pains. Still, last year the National Oceanic and Atmospheric Administration agreed that breaching is necessary for salmon recovery, the first time a federal agency has come to such a conclusion and an important sign of support.

IN ARID SOUTHEASTERN WASHINGTON, the Snake supports vast fields and groves of wine grapes, apples, onions, cherries and wheat. Irrigators use a system of wells and pumps that draw from the guts of the Snake to water the crops that embank it. Around 50,000 acres of farmland could be affected by the dams' removal. Last summer, a joint congressional-state report laid out what needs to happen before the dams can be breached: The barges that transport millions of tons of wheat so cheaply, the jewel-like fruits that rely on the river to flourish in a desert, the carbon-free hydroelectric turbines



The lower Snake River dams, and the reservations and ceded lands of the Columbia River Inter-Tribal Fish Commission tribes. **Luna Anna Archey/HCN**



A fall chinook salmon swims upstream inside a fish ladder at Lower Granite Dam (*top*). These populations are at high risk of extinction. A dam employee counts salmon passing through the fish ladder (*bottom left*). Nico Higheagle (Nez Perce), who works at the Kooskia National Fish Hatchery, shows some of the injuries a spring chinook sustained while returning from the ocean (*bottom right*).





— all those benefits built upon the Snake — would need to change, or alternatives would have to be found. Wheat producers would require more highway or rail transportation, and utilities would have to build new carbon-free energy elsewhere.

As the river's levels fall, irrigators would need to deepen wells and alter pumps to reach the lowered water table. Katie Nelson, who uses Snake River water for Kamiak Vineyards, her family's farm, told *High Country News* that their 112-foot-deep wells would need to go even deeper. Nelson's farm could keep producing, "as long as the pressure was there and the supply reliable," she said. "And those are two things we just don't know." Nelson's father, who founded the farm in the mid-1980s, has long opposed dam removal. Katie Nelson says the farm would likely fail if the dams are removed. "It's probably not a gamble we would want to take." (Not all irrigated lands along the Snake are small-scale family farms like Nelson's. The Church of Jesus Christ of Latter-day Saints is the largest landowner that uses irrigation water from Ice Harbor Dam. It has over 15,000 acres, alongside other out-of-state owners).

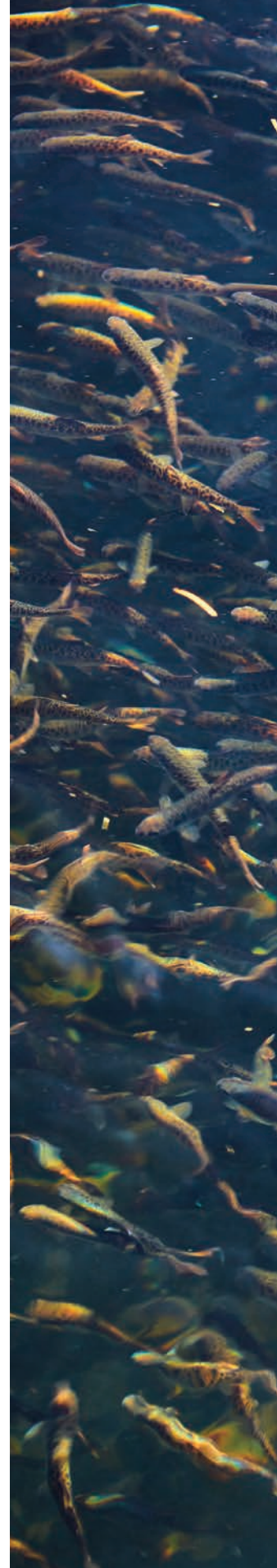
Irrigators know that the Columbia River Basin, the home of the Snake, is changing. The Pacific Northwest's unprecedented "heat dome" in summer 2021 blistered and desiccated crops, causing a 10% loss in yields. Last year, the Columbia-Snake River Irrigators Association proposed a compromise: drawing down two of the reservoirs to help salmon recovery while avoiding total removal. But wheat growers upriver oppose the idea, since it would cut off the barge transportation they rely on.

Removing the dams could cost up to \$2 billion for breaching, revegetation and protection of previously inundated tribal sites and artifacts. Simpson's \$34 billion proposal includes plans for carbon-free energy, irrigation system adaptation and broader habitat restoration. It's a steep price, but there is also a cost to maintaining things as they are. Keeping the dams in place for another half century will cost between \$4 billion and \$8 billion in dam maintenance and hatchery operations, subsidized by the federal government and taxpayers. The Bonneville Power Administration, which owns and runs the dams, has spent almost \$25 billion over 40 years to restore endangered salmon. Aside from coho, however, the fish are closer to extinction than ever.

THE DEBATE OVER DAM REMOVAL has created its own kind of river ecosystem: Scientists and task forces study the river's intricacies, tribal nations and conservation groups dispute the dams in court, politicians argue over their costs and trade-offs. But underneath all that, below the wells and dams and other infrastructure, lies the river, whose health is failing. All bodies have their limits, and the Snake may soon reach its own.

Some years ago, Wheeler's father died from heart disease. Wheeler, a Nez Perce tribal leader who has witnessed the decline of the Snake River's ecosystem, sees a likeness between what happened to his father's body and what's happening to the river. "The sediment that collects at the bottom and what it does to the flowing of your blood through your veins or the water through the system — that's the way that I view the dams, as far as harming something that's living." ❀

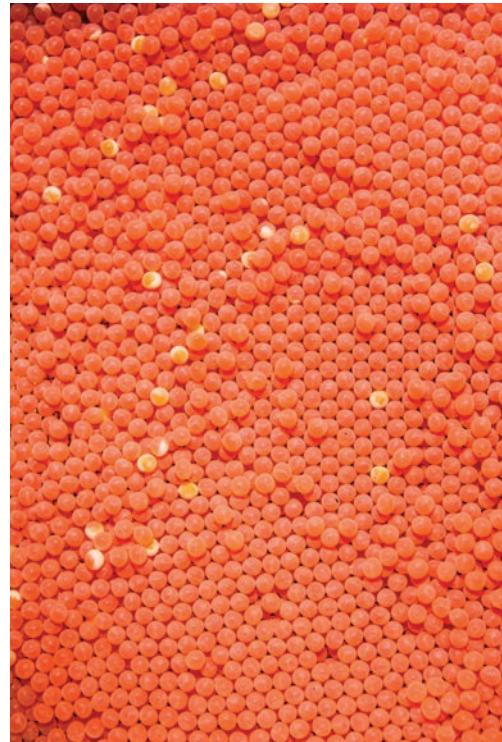




In August 2021, the Nez Perce fisheries department collected salmon below Lower Granite Dam and transported them to their cooler natal river, the Clearwater, to protect them from the dangerous dam passage and the hot reservoir. Here, workers trap and sort out salmon that are ready to spawn (*top*). Mark Drobish, hatchery manager for the U.S. Fish and Wildlife Service at the Dworshak Hatchery, tosses a live steelhead into the back of a truck filled with water. In the mid-20th century, the federal government ignored biologists' warnings that wild salmon would be decimated by dam construction (*bottom*).



Juvenile chinook salmon swim in an acclimation tank at the Dworshak Hatchery (*left*). Once they're large enough, they'll be released into the Clearwater River. In summer 2022, the federal government handed over management of Dworshak to the Nez Perce Tribe. Hatcheries were originally created to help support wild salmon harvests, but now the survival of chinook, steelhead, coho and sockeye largely depends on them. Today, about 80% of the salmon in the Columbia River come from hatcheries.



Fertilized salmon eggs spend several months in trays at the facility before hatching (*top*). A Nez Perce fisheries employee holds up a bag of salmon sperm and eggs at the tribal hatchery (*bottom*).



In southeastern Washington, workers harvest cherries at one of Kamiak Vineyards' orchards (top left). Ten years ago, this housing development in Kennewick, Washington (center left), was covered by wheat fields. Before that, it was arid desert. In the distance, green alfalfa fields are



irrigated with water from the Snake River. As the region's population increases, its demand for water and energy is exploding. The river is visible from Kamiak Vineyards, which relies on its water (bottom left).

Brandon Bisbee fishes with a dip net on Rapid River (above). The government has spent over \$17 billion on hatcheries for the Snake and Columbia rivers, yet salmon continue to decline. Biologists, conservationists, federal fisheries managers and tribal leaders believe more is needed to save the fish, including dam removal.

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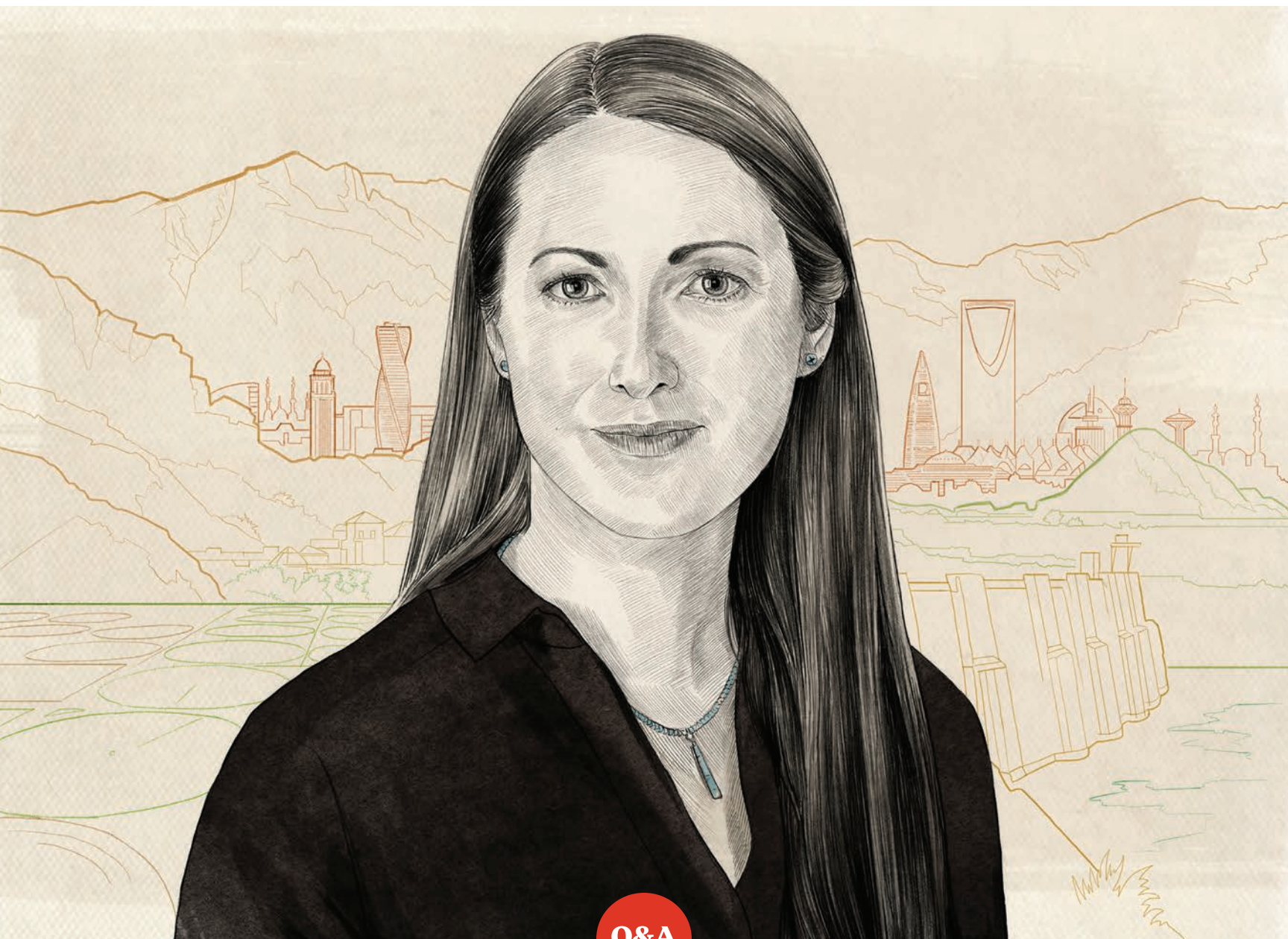
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Q&A

IN AUGUST, Arizona's attorney general called for an investigation into a 2015 sweetheart deal between the Saudi agribusiness company Fondomonte and the Arizona State Land Department, which had allowed Fondomonte to lease desert farmland west of Phoenix at one-sixth its market value and pump groundwater from Phoenix's water reserves. Geographer Natalie Koch, a professor at Syracuse University who grew up in Arizona and studies the Arabian Peninsula, began researching the deal in

Why are Saudi farmers pumping Arizona groundwater?

A conversation with Natalie Koch, author of *Arid Empire: The Entangled Fates of Arabia and Arizona*

BY CAROLINE TRACEY
ILLUSTRATION BY LAUREN CROW

2018. In doing so, she discovered that the arrangement was not an anomaly, but rather part of a long history of collaboration between Arizona and the Arabian Peninsula. *HCN* spoke with Koch about her book *Arid Empire*, out this January from Verso Books, which delves into the conjoined history of the two desert landscapes.

You open the book by talking about a double exposure: a slide with an image of a camel and a Coke advertisement layered on

top of each other. Why did that strike you as symbolic of the relationship between Arizona and the Arabian Peninsula?

A double exposure — two images mapped onto one another — is understood as an error in developing a photo. But to me, the double-exposure image was something that helped to see the past and the present together.

When I started this project, I thought it was going to be about the (contemporary) Saudi-owned farm in Arizona. But I kept finding that there was a circular nature to the stories I was uncovering. I would start with a contemporary question, like the Saudi farm deal, and then immediately get looped back to its deeper history. So the double exposure is a way of thinking about that past and the present together — to be able to focus on both simultaneously.

Recently, there's been a lot of uproar in Arizona about the Saudi farm you mention. How did a Saudi-owned farm end up in Arizona?

The Saudi company that owns the farm, Fondomonte, is a subsidiary of a bigger dairy and agribusiness company called Almarai. Almarai has a number of international landholdings to source their grain for the massive dairy herds they have in Saudi Arabia; they're now sourcing most of their grain from other parts of the world.

Part of what upset so many people in Arizona is that the farm is producing alfalfa, a hugely water-intensive crop. But Arizona has cultivated alfalfa for a long time, because in the desert you can get multiple harvests in a given year, as long as you have enough water. So for the Saudis, it was appealing for the same reason. The other farm that Fondomonte owns is in Blythe, California, not very far from the

site outside of Phoenix.

Arizona also has a deeper historical role. Almarai is headquartered in the very center of Saudi Arabia, just outside of Riyadh. The farming industry has been really important there since the 1930s, when King Ibn Saud wanted to develop it. The U.S. government sponsored a team of Arizona farmers to go over in 1942 to share their experience of growing alfalfa and all the water-extraction techniques they had mastered in Arizona.

Then it circled back: King Saud and his family made a royal visit to Arizona. They did this whole tour of Arizona agriculture and looked at the Arizona dairy industry. King Saud went back to Saudi Arabia and pushed to set up a dairy industry there. What we see now is the legacy of that. But it's not the only connection between Arizona and the Arabian Peninsula.

Your book discusses the earlier role of the Arizona Experiment Station in the colonization of Arizona. *High Country News* has previously reported about "land-grab universities." What is the role of the Arabian Peninsula in the University of Arizona and its agricultural efforts?

The idea to create the University of Arizona began in the 1860s, but (the territory) didn't have the money to start it. Then, the regents realized that there was new federal funding that was being given out through the (1887) Hatch Act, an add-on to

the Morrill Act, (which created the land-grant universities), to establish university agriculture experiment stations. The regents figured out that they could get \$15,000 to set up an agricultural station — just on paper — and use the money to help fund and start the university.

But eventually, they had to make the agricultural station legitimate. And the first directors thought along the lines of the camel promoters, looking to the Middle East: How do we colonize this desert we don't know anything about? What are the crops that are productive and valuable in the Middle East? Arizona agriculture and boosterism had already been focusing on fruit production, so they did a survey of farmers around Arizona, and there was strong interest in date farming. So they got experimental date palms sent to Arizona. The first one came from Oman. And that eventually led to this big investment in agriculture that continues to this day at the University of Arizona. Like the story in the *HCN* article, the interest was helping Arizona farmers — not Indigenous farmers who had been doing irrigated agriculture in Arizona for centuries, but the white settler farmers who wanted to come to Arizona and be part of that colonization project.

Before these agricultural exchanges, Arizona had other relationships to the Arabian Peninsula — including camels.

Why did camels end up in Arizona?

Camels came to Arizona in the mid-1800s. Jefferson Davis, who at the time was secretary of War, signed off on an expedition to go collect a bunch of different kinds of camels from across the Middle East and bring them back.

It's easy to forget how difficult it was for the U.S. government to take control of the territories we now call Arizona once they became part of the country. The government — the Army and other branches — was trying to integrate these areas into the United States, but they didn't know how you were supposed to establish state power in this place that not only doesn't have roads, but also has a really difficult environment. So the idea was to import a bunch of camels that would carry the huge heavy loads that they needed to establish the military outposts in the Southwest.

Camels also figured prominently in biblical stories and the imagination of the desert as biblical. Even though nobody was personally familiar with them, they felt familiar in that religious sense, which helped in establishing state power — which was also a Christianizing project. So the camel promoters and the first directors of the experiment station were thinking on the same terms: How do we promote this desert that we don't know anything about? And their thought process was to look to the Middle East. ✨

How do we colonize this desert we don't know anything about? What are the crops that are productive and valuable in the Middle East?

Growing up queer in Colorado Springs

Reflections on an adolescence in the ‘Evangelical Vatican’ in the wake of the November Club Q mass shooting.

BY BRANDON SWARD | ILLUSTRATION BY MADISON RUBENSTEIN

AFTER I CAME OUT AS GAY at age 15, my family’s home was vandalized. No note was left, but the safe-sex poster taped to the front door made it clear that I was the target. My parents said that I was putting my younger sisters at risk with my “lifestyle choices.” Years later, my mom told me how many friends she’d lost because of my coming out, as though expecting an apology or thanks.

In 2004, the country looked much different. Marriage equality was yet to come, and the military’s “don’t ask, don’t tell” policy was still in effect. Gay representation in popular culture ranged from the coiffed whiteness of *Will and Grace* to the satyric whiteness of *Queer as Folk*. Some things have not changed; LGBTQ people everywhere still face ostracism and violence. And Club Q was — and remains — the only LGBTQ club in my hometown of Colorado Springs, a city of almost half a million.

At 15, I was very sad and very alone. I understood the concept of gayness, but I didn’t know any gay people. My coming out was a reaching out, a bid for understanding, although one therapist told my parents that I was just “going through a phase.” My parents, who didn’t have any gay friends, treated me like a stranger; I spent an entire summer under virtual house arrest.

I felt as if I’d done something horribly wrong, and in a sense I had. From my house, I could see both the campus of the U.S. Air Force Academy and the headquarters of Focus on the Family, one of the most virulently anti-LGBTQ organizations in the United States. Colorado Springs, which has been called the “Evangelical Vatican,” is home to

no fewer than five military bases and 81 religious organizations.

The influence of these twin forces on my town, and on my adolescence, was unmistakable. After 9/11, the advent of the War on Terror kicked patriotism into overdrive, triggering a concurrent war on difference that was magnified by the intense military presence in the city. Same-sex couples were banned from my prom. The school’s theater department faced opposition to its production of *The Crucible* because of the play’s examination of witchcraft. Students argued with librarians about the categorization of religious texts; some LDS students, for example, wanted the Book of Mormon separated from the other “false” Christianities. My almost completely white choir once performed an African American spiritual about picking cotton.

I hung out with the bad kids, the only ones who seemed aware of the absurdity of it all, the ones who circled the mall like a watering hole. They smoked on the hill before class, had sex in public restrooms, and couldn’t have cared less about my nascent sexuality. I grasped for any means of control: I wore all black and stopped eating, until, at 5 foot 9, I weighed just 111 pounds. I slept less and less and began to spend my nights wandering my neighborhood’s streets. Eventually, I ended up in a psychiatric institution, where my fellow patients included a girl in withdrawal from crystal meth and a small boy who said a red fox had told him to kill his mother.

I only went to Club Q once. That was in the summer of 2007. I was 18 years old, just

out of high school, working at Old Navy to earn some money before leaving for college. That evening, I met up with one of my managers, who was bisexual. I turned into the Club Q parking lot, which is shielded from the street by a wall of trees. I wasn’t sure I was in the right place, but then I saw the club’s multicolored sign glowing softly in the nighttime haze.

It was my first time at a gay club — probably my first time at any club — and the novelty of each experience crashed gracelessly into the next. After the bouncer checked my ID, I entered a shadowy hallway that opened into a single large room dimly illuminated by reddish lights. T-Pain’s “Bartender” blared over the speakers: *I like the bartender ... I’m at the bar with her. ...* The clientele was mostly young, male, thin. I found my manager and her friends, and we danced in a loose semicircle, shuffling slowly from right foot to left. I tried to focus but was distracted by the proximity of the bodies of strangers. Strangers, but not really strangers.

I’d been out for three years by then, but the only other queers I’d met were through school — a severely limited pool. That night at Club Q, a world opened to me. I didn’t talk to any of the gently swaying dancers, but the air between us crackled with electricity. The shift from long-held fantasy to flesh-and-blood potential was almost too much to bear, its erotic jolt as powerful and unexpected as the flash of a Victorian woman’s bare ankles. In the semi-darkness, the differences between us melted away, holding out the possibility that, together, we could be whole. ✨



*My coming out was a reaching out,
a hope that I would someday meet others.
That we would talk and laugh and perhaps even fall in love.*

ARIZONA

The National Park Service wants the public to please refrain from licking toads, specifically the Sonoran Desert (formerly the Colorado River) toad. You might be wondering, “Why is that?” Or, more likely, “WTF?” Turns out that this toad — “one of the largest toads found in North America, measuring up to 7 inches” — has evolved an ingenious defensive feature: a toxic substance secreted from its glands. *High Times* reports that it contains the “compound 5-MeO-DMT, a tryptamine-class psychedelic drug” that’s also found in certain plant species, including some traditionally used by South American Indigenous cultures for spiritual ceremonies. Meaning that, yes, you can theoretically get buzzed by binging batrachian biofluids. But you can also get sick — the Park Service notes that the secretions “can be toxic” — and it’s not healthy for the toads either. Plus, it’s just plain rude. Like, toadally.

WYOMING

Kendall Cummings and Brady Lowry, two Northwest College wrestlers, survived a nightmarish grizzly attack while hunting for antlers in the South Fork area outside Cody. Cummings, who grabbed the bear by the ear in an attempt to pull him off Lowry, described the attack in excruciating detail to *Cowboy State Daily*: “I could hear when his teeth would hit my skull, I could feel when he’d bite down on my bones and they’d kind of crunch.” A surge of adrenaline kept him from noticing the pain at the time, though the encounter sounds like something out of a horror movie; the grizzly’s breath was “putrid,” Cummings said, and “filled him with a sense of dread.” Once the bear gave up, the men staggered five miles back down the trail despite their

horrific injuries. Both needed multiple surgeries; Cummings received 60 staples in his head and has a badly lacerated face, arm and leg, while Lowry’s arm was broken and his back, shoulders and legs were wounded. No one knows why the grizzly quit grappling with the young wrestlers, but Cummings’ counter defense must have been amazing. Lowry said he owes his life to Cummings: “We’ll be friends for the rest of our lives.”

ARIZONA

If you have to spend 26 hours trapped in a cave somewhere, best pick one with a \$1,000-a-night hotel suite and food service. That’s what hap-

pened to five unlucky — or maybe lucky? — folks who otherwise might have found themselves in a perilous predicament. Grand Canyon Caverns in Peach Springs, Arizona, is an adventure destination located 21 stories underground. This October, however, the elevator malfunctioned, leaving the visitors stranded. They couldn’t escape by the stairway, according to NBC News, because it was a bit on the dodgy side, “similar to an old external fire escape.” Still, the stranded tourists had full run of the small hotel and restaurant, and were well tended during their unplanned stay. Eventually, a search and rescue team, used “a tripod apparatus with a



Heard Around the West

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

BY TIFFANY MIDGE | ILLUSTRATION BY ARMANDO VEVE

rope that fed down the elevator shaft” to hoist the group 210 feet up to the surface.

WYOMING

Here’s another “hairy” situation in Wyoming: the 2022 Honest Amish National Beard and Mustache Championships in Casper. The annual event is a celebration of beards, mustaches and goatees galore. The longer and scruffier the better, obviously; no dainty soul patches for these facial hair fanciers. This year’s jamboree was combined with the annual Booze and Bacon Festival — a winning combination, to be sure — and hundreds of folks attended, *Wyoming Public Media* reported. The highlight? Seventy guys set a new world record for longest beard chain: 151 feet, considerably more a hair’s breadth longer than the previous record of 90 feet.

CALIFORNIA

We’ve seen how much collectors will pay for a pair of 19th century jeans, but how much would you spring for an old pair of sandals? A New York City auction house sold a pair of Birkenstocks from the 1970s for \$218,750, NPR reported. The sandals once belonged to legendary tech guru Steve Jobs, and apparently some people are extremely serious about following in the footsteps — and footwear — of their heroes. Jobs’ Birkenstocks will likely appreciate in value; they previously fetched a mere \$2,000 at auction in 2016. The markup is impressive, but nothing like Michael Jordan’s 1984 Nike Air Ships, which sold for \$1.47 million last year. Or Kanye West’s (aka “Ye”) Black Nikes, which sold last year for \$1.8 million — although at this point we suspect the owner would pay even more to make them quietly disappear. ☼



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#IAM THE WEST

JODY JOSEPH-POTTS
Han Gwich'in tribal leader,
mother, guide
Eagle Village, Alaska

"My parents raised my brother and me here, all over the lands around Eagle, with a traditional subsistence way of life. I feel really fortunate to be raised on this land — I'm not separate from the land, I'm a part of it. It's my driving force for the work that I do and my passion to protect this place.

There's this place in the high mountains where I take my kids to look for caribou, where our people have been making rock stacks on high points. When I think that my ancestors have been here, looking for caribou just like my kids and I are in 2022, it's just so powerful. It ignites a fire in me to make sure that we are able to have these sacred places for the future."

Do you know a Westerner with a great story?
Let us know on social.



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