REGULATORY ROLLBACKS | MONEY FOR WATER | SALLY JEWELL SPEAKS OUT

High Country News

For people who care about the West

FOLLOWING ANCIENT FOOTSTEPS

In the Southwest, Pueblo people are helping archaeologists untangle the science of human migrations

By Krista Langlois

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A man hikes past unexcavated remains of a building at Yucca House National Monument in southwest Colorado, home to Ancestral Pueblo people from 1150 to around 1300, when they "disappeared." BOBBY MAGILL

On the cover

A prehistoric trail worn into the rock at Tsankawi Mesa in what's now Bandelier National Monument, New Mexico, where the Tewa paused during the 15th and 16th centuries en route to their current homes in the northern Rio Grande Valley. GEORGE H.H. HUEY

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Editor's note

Migrations, old and new

I noticed them immediately: A couple in their late 50s, with salt-and-pepper hair, enthusiastically poring over the menu at my favorite coffee shop in *HCN*'s hometown, Paonia, on Colorado's Western Slope. Clearly, they'd never seen it before.

"Where are you from?" I asked.

"Oh, we live outside Denver, but we just bought a house and we'll be moving here permanently next year," said the man.

"I just *love* this place," the woman added. "It's so quiet, *and* it's still affordable."

It won't be for long if people like you keep moving in, I thought darkly. In recent months, stories of "outsiders" snapping up local real estate for more than the asking price have become common. Traffic has become just this side of annoying. Our town, once dominated by agriculture and coal mining, is absorbing a new population, mostly aging Anglo baby boomers from the West's burgeoning cities. It's unclear how they will reshape the community, but change is obviously afoot.

Of course, who am I to complain? I'm also an aging baby boomer, and 25 years ago I was the spanking-new outsider who was going to ruin the place. The truth is, very few of us are from here. Even the ranchers who cite multiple generations on the land were outsiders 150 years ago. They came after the government forced the Ute people, who had lived here for thousands of years, onto reservations elsewhere.

Major human migrations are a fact of history. Perhaps none has stirred the imagination more than the sudden, seemingly mysterious "disappearance" of the people of the Four Corners area. Centuries ago, an estimated 25,000 people farmed, hunted and raised turkeys around Colorado's present-day Mesa Verde National Park. Then, over a few decades in the 1200s, they left. Where they went, and what happened to them, has long been the subject of intense scientific inquiry. In this issue, correspondent Krista Langlois reports that researchers are paying new attention to some previously overlooked evidence — the oral histories of the Puebloans living along the Rio Grande River hundreds of miles south. Though not everybody agrees on the narrative, the Puebloans say there is no mystery: They have always known that they are descended from the people who built Mesa Verde's cliff dwellings. They still feel a deep attachment to that landscape.

It's hard for me to imagine what a thousand-year connection to a place feels like, let alone 100 years. As I say goodbye to the couple at the coffee shop, I wonder how deeply rooted any of the millions of us streaming into and out of the West can ever be. Then again, the people of Mesa Verde pulled off a dramatic, successful relocation in a matter of decades. Maybe we modern-day immigrants can do so as well.

—Paul Larmer, executive director/publisher

New Forest Service Chief Tony Tooke addresses the audience after his swearing-in by Department of Agriculture Secretary Sonny Perdue in the White Mountain National Forest in early September.
LANCE CHEUNG/USDA

A new chief for the Forest Service

With the West experiencing one of its most severe wildfire seasons ever, the newly sworn-in Forest Service chief, Tony Tooke, has walked into a challenging situation. Tooke has worked for the Forest Service since he was 18, but unlike his recent predecessors, the Alabama native has held no positions in the West. "It's hard to tell how he will translate what he knows about that Eastern fire environment into the West," says Don Falk, a professor in the School of Natural Resources at the University of Arizona.

Tooke will have to confront the Forest Service's long struggle with increasing firefighting costs, which now swallow up more than half the agency's budget. Though Congress recently passed legislation that included emergency funding to fight wildfires this year, the long-term problem remains unsolved. "We desperately need a fire-funding fix," Tooke said during a visit to Oregon to see the damage caused by the Eagle Creek Fire. If he can achieve that, he'll have the opportunity — and the budget flexibility — to chart a new course for the agency. **REBECCA WORBY**
MORE: hcne.ws/southern-leadership

10 million

Population of Western monarch butterflies in the United States in the 1980s.

300,000

Population today.

35

Years before the Western monarch population could stop migrating altogether, if current trends continue.

The population of monarchs living west of the Rocky Mountains has shrunk by 97 percent in the last 35 years, according to an analysis published by Washington State University in September. The butterflies take generations to migrate from overwintering habitat on California's coast to breeding habitat throughout the West. They face serious threats, including development, which destroys overwintering trees, and the increased use of genetically modified agriculture, which encourages farmers to spray pesticides that kill milkweed. **MAYA L. KAPOOR** MORE: hcne.ws/threatened-monarchs

PETER MILLER, CC VIA FLICKR

> **"When you have an administration that is in denial mode about climate change, to have a senator as prominent as McCain make an opening — I think it's an opening we should take advantage of."**
>
> —Arizona Rep. Raúl Grijalva, D-Ariz., the top Democrat on the House Natural Resources Committee, speaking about Arizona Sen. John McCain's appearance on CNN, during which he suggested the time has come to readdress climate legislation. **ELIZABETH SHOGREN**
> MORE: hcne.ws/mccain-agenda

Why is a Trump operative interested in the Bundys?

Roger Stone, an on-and-off adviser of President Donald Trump, has become a public supporter of Nevada rancher Cliven Bundy and his co-defendants, who are currently awaiting federal trial. The case stems from Bundy's 2014 armed standoff with the Bureau of Land Management and National Park Service over his illegally grazing cattle. Stone made public appearances in July in Nevada to urge Trump to officially pardon the Bundys, and name-dropped them at a conservative leadership conference in Las Vegas in mid-September. Stone is an odd bedfellow for the Bundys, since he is a longtime Washington, D.C., insider with no obvious connection to ranching or public-lands issues. Stone has served as a consultant for four past presidents and foreign dictatorships. The Florida resident worked as a lobbyist on behalf of Trump businesses in the 1980s and served as a consultant during Trump's presidential campaign. At a Las Vegas rally in July, Stone told a crowd the "jackbooted" government had "lost all sense of law or morality." That kind of message could continue to play well, inciting the kind of anger and vitriol that have become the hallmarks of this presidential era. Whether it would yield a pardon remains to be seen. Cliven Bundy's trial begins Oct. 10. **TAY WILES**
MORE: hcne.ws/pardoning-Bundy

Tip form

Send us tips on state land management

With the push to transfer federal lands to states, *High Country News* is looking into how states are managing the territory already under their control. Got any tips for us on how your state is managing — or mismanaging — its trust lands or parks?

Yes	No	
☐	☐	Has your state made significant changes to its approach to managing state lands?
☐	☐	Is your state a good steward of the revenue it earns from trust lands?
☐	☐	Has your state changed how it approaches management during budget crises?
☐	☐	Are certain uses prioritized over others on your state lands? For instance, oil and gas development over grazing and recreation, or vice versa?
☐	☐	Does your state require industry operators to comply with environmental regulations on state land? If so, how do those regulations compare with rules for federal lands?

Which state? _____

Details: _____

_____

_____

Name _____ Email _____

State Lands Tip Form, P.O. Box 1090, Paonia, CO 81428 MORE: hcne.ws/state-lands

Trending

Memorials glorify inequality

With the national conversation over Southern statues honoring the Confederacy, Civil War memorials in the West have also garnered attention. A fountain built in memoriam to the Confederacy was removed in Helena, Montana, after prodding by local American Indian leaders. Some locals disagreed with the city's decision, saying the memorial's creators were not racist. But state Rep. Shane Morigeau, a member of the Confederated Salish and Kootenai Tribes, pushed back. "The United Daughters of the Confederacy were out to rewrite history, to make the Civil War about states' rights rather than slavery," Morigeau said. "When you put the monument in (this) context, then you can understand it as a glorification of inequality."
GABRIEL FURSHONG

You say

LARRY MAMMOSER: "There is nothing admirable about Confederate monuments. They memorialize people who fought a civil war in order to continue slavery."

MARSHALL MASSEY: "While I nearly always support the positions of the Native American tribes here in Montana, where I live, I do not share their belief that the dubious motives of the United Daughters of the Confederacy justified taking the monument down."

BRIAN ERSKINE: "There are places Confederate monuments belong, and reasonable people can differ about what those places are. But Montana isn't one of them."

MORE: hcne.ws/monumental-inequality and Facebook.com/highcountrynews

Send letters to editor@hcn.org or
Editor, HCN, P.O. Box 1090, Paonia, CO 81428.

BOAT BURIAL

Thanks for the nice article about the Elwha ("The Elwha, Unleashed," *HCN*, 9/4/17). It jogged some memories and provided some amusing solace and closure. Twenty-five years ago, I owned a one-quarter interest in an offshore racing sailboat. On the already very eventful return trip from a race to Hawaii, our boat hit a log in the permanent gyre off the mouth of the Elwha, and sank within 30 minutes. So close to home. It sank out of reach of salvage, and those on board (not me) got off into a U.S. Coast Guard rescue boat with only the clothes on their backs.

I now am pleased to know that the boat is most certainly being entombed in the silt coming down the Elwha.

Robert Henry
Seattle, Washington

NO FREE LUNCH FOR HYDROPOWER

Editor-in-Chief Brian Calvert described dams as "providing clean hydropower" ("Compromise amid the canyons," *HCN*, 9/4/17). Actually, a spate of new research shows that there is basically no free greenhouse-gas lunch when it comes to generating electricity, and the burden of hydropower is increasingly coming into focus. The news is not good. For example, a recent peer-reviewed study published in the journal *PLOS ONE* predicts that the greenhouse gas emissions from Lake Mead, compared against the hydropower it produces, are as bad as burning coal on a kilowatt-hour basis.

Reservoirs are basically methane factories, and methane is a potent greenhouse gas, carrying more than 80 times the warming effect of carbon dioxide on a pound-per-pound basis. Reservoirs contain a stew of microbes that feed on organic matter in the water column, and in the deeper depths where oxygen is depleted, the microbes release methane as a by-product of their metabolism. Concentrations can reach extremely high levels in the depths from which water is channeled into the turbines that produce hydroelectricity. Once that methane-rich water exits downstream, it's off-gassed into the atmosphere, where it joins the increasingly dangerous mix of greenhouse gases that are radically warming our planet. Manufacturing the concrete used in constructing hydroelectric dams also carries a giant burden of emissions that silently continue warming the planet for centuries to come.

Mark Easter
Fort Collins, Colorado

MIKE KEEFE/CAGLECARTOONS.COM

DAMMED IF WE DON'T

Krista Langlois' article "Busting the big one" (*HCN*, 9/4/17) aptly describes the existential dilemma of whether or not draining Lake Powell into Lake Mead would increase/maximize the amount of water available for human use.

If more studies are carried out to determine the best storage of available Colorado River water now and into the foreseeable future, I suggest that yet another variable should be evaluated and factored into any decision. Based on a well-documented geologic record, the possibility exists that a lava-flow dam may originate about midway between the concrete Hoover and Glen Canyon counterparts, restricting any "controlled" flow between the two. The probability of such an event taking place within whatever window of time is considered for the useful life of Hoover and Glen Canyon Dams is uncertain, but greater than zero.

About 20 lava-flow dams serially blocked the river in Grand Canyon during the past several hundred thousand years. Some of these were as tall as the Hoover and Glen Canyon dams; one was nearly 2,000 feet taller. The youngest lava dam was created about 100,000 years ago. There is no reason to conclude that yet another will not occur.

A key and presently unanswerable question is will this happen before Hoover and Glen Canyon dams have reached the ends of their useful lives. The youngest eruption in the river-neighboring area (Toroweap), where volcanoes repeatedly fed lava for the dams, happened only about 900 years ago. It begs the question of when will the next eruption take place. Planners for the continuing use of Hoover and Glen Canyon dams might be wise to include a lava-dam probability in the body of decision-making data.

Wendell Duffield
Whidbey Island, Washington

EXPLETIVE (NOT) DELETED

I read Brian Calvert's "Down the Dark Mountain" essay in the July 24 issue. He is entitled to his opinion; however, his language needs cleaning up!

I have been very unhappy with the liberal bias that this publication has developed over the last few years, but seeing the F-word used sealed it for me: You have now become too liberal for me. While I am no stranger to gutter talk, I would prefer to hear it on the street and not in the publication I am reading. The lower classes, with a limited vocabulary, are usually the culprits with such language, or I would expect to see it in fiction writing, but not in an essay in a publication that should know better.

The other problem was Brian's use of the words "Michael Brown's murder." The actions of the police officer were found to be within standard police protocols and black people from the neighborhood supported the policeman's version. The jury and the federal investigation failed to uphold murder charges. Brian's belief that Michael Brown was murdered, in spite of all the evidence to the contrary, is just one example of how liberals change around facts so they match their beliefs.

All I want for my money is some standard of excellence and the lack of bias when reporting. This is what this publication used to provide. I miss the old *HCN*! Even the newspaper format.

Penelope M. Blair
Fruita, Colorado

High Country News

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Trump administration erodes environmental protections

Climate change initiatives are targeted most frequently

BY ELIZABETH SHOGREN

President Donald Trump has been steadily undoing Obama-era environmental protections, especially rules designed to fight climate change. The Administrative Procedure Act and other laws require agencies to go through a lengthy process to rescind or rewrite rules, but executive orders and other policies are easier to erase. Some of the rollbacks have major implications for the West and the public lands:

CLEAN WATER RULE

The Environmental Protection Agency is proposing to rescind the 2015 Clean Water Rule. This rule — particularly important in the arid West — mandates, for example, protecting tributaries that connect to navigable waterways and adjoining wetlands, even if they flow only part of the year. If it's revoked, those tributaries could be filled in, ditched or diverted for construction or farming without federal review.

In October, the Supreme Court will hear arguments about whether federal district courts or appeals courts should hear several pending cases challenging the rule. EPA Administrator Scott Pruitt plans to write a new rule specifying which waters and wetlands warrant federal protection and which should be left to state discretion.

FOSSIL FUEL ROYALTIES RULE

Interior Secretary Ryan Zinke in August repealed a 2016 Obama-era rule designed to ensure that taxpayers get a fair return on oil, gas and coal. The Obama administration estimated the rule would have increased by about $80 million a year the royalties that fossil fuel industries pay to mine and drill federal lands and waters. The rule was meant to eliminate a loophole that allows companies to sell to affiliated companies that then export and re-sell the minerals at higher prices, reducing royalties. Zinke, who said it was too complex, plans to draft a new rule.

BLM METHANE RULE

This Bureau of Land Management rule limits how much methane can be released from some 96,000 oil and gas wells on federal and tribal lands. Methane is a potent greenhouse gas, and the 2016 rule's goal was to reduce emissions that contribute to climate change, smog and health problems, as well as to increase royalties. Industry claims the rule is too onerous and duplicates state rules.

Congressional Republicans tried unsuccessfully in May to erase the rule using the Congressional Review Act. The BLM has drafted a proposed rule to suspend it, and Zinke plans to rewrite it.

EPA METHANE RULE

The 2016 rule was designed to limit methane emissions from new and modified oil and gas wells, compressor stations, pneumatic pumps and similar equipment. It was a key part of President Barack Obama's climate change agenda; his administration projected that industry's costs would be partially offset by revenues from recovering and selling more natural gas. EPA head Pruitt has sought to prevent the rule from going into effect, but environmentalists and the states of New Mexico and California have been fighting him in court. The EPA now has proposed suspending the rule for two years while it redrafts it.

NATIONAL ENVIRONMENTAL POLICY ACT REVIEWS

In an Aug. 31 secretarial order, the Department of Interior "streamlined" agencies' process for analyzing the environmental impacts of major actions. Now, agencies may not spend more than a year to complete an Environmental Impact Statement, nor may their final report be more than 150 pages, or 300 pages "for unusually complex projects."

Environmental groups fear the arbitrary deadlines will hinder public engagement in public-land decisions. But Boise State University Public Policy Professor John Freemuth said environmental impact statements are often long and incomprehensible to most people. "Trying to make this process work better and happen quicker is probably not a bad thing, unless it's done for surrogate reasons, like to get more coal off the land," Freemuth says.

FEDERAL COAL

Obama wanted the federal coal-mining program to better reflect its costs to taxpayers and the planet. So in 2016, Interior Secretary Sally Jewell placed a three-year moratorium on new coal leases on federal land while reviewing the program, which produces about 40 percent of the coal burned in the U.S. for electricity.

This March, Zinke cancelled both the moratorium and review. Given declining demand for coal, however, there's been no rush for new leases, though Cloud Peak Energy is seeking to expand operations in Wyoming's Powder River Basin.

NATIONAL PARKS MANAGEMENT

The National Park Service in August rescinded a sweeping December 2016 policy instructing managers to use an adaptive approach to decision-making, taking into account uncertainties such as climate change impacts, and erring on the side of caution to protect natural and cultural resources. The policy also committed to addressing worker harassment. Now, the Park Service says revoking the order avoids confusion while Zinke establishes his own vision for the parks.

Also in August, the agency ended a six-year policy that allowed parks to ban the sale of disposable water bottles to decrease waste and greenhouse gas pollution. Western parks that had banned bottled water included Arizona's Grand Canyon; Arches, Bryce and Canyonlands in Utah; Saguaro in Arizona; and Colorado National Monument. □

Correspondent Elizabeth Shogren writes *HCN*'s DC Dispatches from Washington. @shogrene

The Cholla Power Plant outside Joseph City, Arizona. The EPA is currently reviewing the Clean Power Plan, which sought to reduce greenhouse gas emissions 32 percent by 2030 compared to 2005.
CRAIG DIETRICH/FLICKR

Freddie Botur crosses Cottonwood Creek, where headgates turned off irrigation water to his hayfield downstream.
JIM PAUSSA/ASPEN JOURNALISM

Money-for-water programs work — but for how long?

In the Colorado River Basin, a pilot project wins over skeptical farmers and ranchers

BY SARAH TORY/ASPEN JOURNALISM

When Freddie Botur, 45, whose ranch spans 72,000 acres outside of Pinedale, Wyoming, first heard about a program that paid ranchers not to irrigate, he was skeptical. But Nick Walrath, a project coordinator for Trout Unlimited, assured him he'd receive about $200 for every acre-foot of water that he allowed to just run down the river.

For Botur, that would mean over $240,000 for fallowing roughly 1,700 acres of hayfields for the latter half of the summer of 2015, letting 1,202 acre-feet of water flow past his headgate on Cottonwood and Muddy Creeks, tributaries of the Green River, instead of to his fields.

"Oh, my God," he thought. "This is insane."

Botur, talkative and athletic, was wearing mirrored sunglasses and a cowboy hat when we met in June on his family's Cottonwood Ranch at the foot of the Wyoming Range. For Wyoming ranchers, he explained, that kind of money could amount to as much as a third of their annual revenue.

Some local ranchers, however, suspected that the program was actually a secret plot to take away water rights. When Dennis Schroeder, who ranches on 355 acres of high desert land outside Pinedale, decided to participate, some people tried to discourage him. "Once you do that, you'll never get it back," one rancher warned him.

Schroeder understood there was a trade-off — turning off his irrigation water early meant he'd lose out on some hay production — but once he did the math, the deal made sense. He participated for the first two years, receiving almost $15,000 each year for turning off his irrigation water in mid-July on 81 acres, letting 74 acre-feet of water remain in Pine Creek, a tributary of the Green River, which flows into the Colorado.

The money-for-water program was an experiment, launched in 2014 by the four largest municipal water providers in the Colorado River Basin along with the Bureau of Reclamation. The goal: Find out whether it was feasible to pay ranchers to use less water on their fields, so that more water could flow down the Green, Colorado and San Juan rivers to Lake Powell and Lake Mead, the Colorado River system's two biggest storage buckets.

After three years, the initiative, known as the "System Conservation Pilot Program," proved popular even with skeptical ranchers. But the program ends after this year, while water officials work out some problems. Meanwhile, climate change is altering the hydrology of the Colorado River Basin — forcing water managers to find ways to adapt a system of century-old water laws to a new reality. If they're successful, a revamped "system conservation program" could help reshape water management for a hotter, drier West.

Correspondent Sarah Tory writes from Paonia, Colorado. @tory_sarah

This article originally appeared at *Aspen Journalism*, an independent nonprofit news organization covering water and rivers.

The year 2014 marked a new level of urgency for water managers along the Colorado. In July, Lake Mead, the nation's largest reservoir, dipped to its lowest level since it was filled in 1937. Upstream, Lake Powell was also in bad shape. Climate models indicated that the drought was a harbinger of a future marked by rising temperatures — a future in which city water providers could no longer depend on the Colorado River to meet their needs.

For water officials in the Upper Colorado Basin states — Colorado, Utah, Wyoming and New Mexico — the ongoing drought posed an additional threat. According to the Colorado River Compact of 1922, which governs the allocation of the river's water, the Upper Basin has to deliver a required volume of water to Lake Mead from Lake Powell. If it fails to do so, the Lower Basin states of Arizona, Nevada and California could make a so-called "compact call." That would force the Upper Basin states to stop diverting all post-1922 water rights from the Colorado River until the Lower Basin got its share. "The cutbacks would go very deep," said Eric Kuhn, general manager of the Colorado River Water Conservation District. And yet, water officials had barely discussed how to avoid such a scenario, said James Eklund, former director of the Colorado Water Conservation Board and now an attorney in Denver. As the drought worsened, officials came to an uncomfortable conclusion. Said Eklund: "If it gets really bad, we had no plan."

The severity of the drought encouraged a new spirit of collaboration among the Colorado River's competing factions. Water officials, environmentalists and irrigators began meeting in conferences, on river trips, in hotel bars and coffee shops, choosing negotiation and trust over potential court battles.

During a 2013 brainstorming session in Hermosa Beach, California, John Entsminger, the general manager of the Southern Nevada Water Authority, and the other big municipal water managers who relied on the Colorado River came up with what would become the System Conservation Pilot Program — a way to strike a balance between their need to avoid a catastrophic water shortage and farmers' reluctance to sell off their water rights.

They brought the idea to officials from the Upper Basin states and the Bureau of Reclamation. Together, they created a $15 million fund to compensate people in the Colorado River Basin for using less water. The program targeted ranchers and farmers — who own the vast majority of water rights on the river — but municipalities could apply, too.

It would be temporary and voluntary — and every gallon of water saved would go directly back to the river. "No one had done that before," recalls Entsminger. "You're investing money, and no one's name is on it."

The pilot program worked by soliciting proposals from people who volunteered to leave a portion of their water rights unused. Applicants submitted proposals describing their intended conservation activities, which were then reviewed to ensure that they would actually leave more water in the Colorado River system. Low-priority water rights, for instance — those dated after 1922 — were unlikely to yield much benefit during dry years, since junior water users would already be required to stop diverting so senior rightsholders could receive their full allotment.

The four municipal water providers contributed $8 million to the program, with an additional $3 million from the Bureau of Reclamation. The fund was spread among projects in all seven Colorado River Basin states, and by this fall, according to Michelle Garrison, who managed the program's contracts for the Upper Colorado River Commission, an expected 21,590 acre-feet will have been left in the Upper Basin (and almost 98,000 acre-feet in the Lower Basin by 2025).

True, that's just a drop in the bucket for Lake Powell, which stores water from the Upper Basin of the Colorado River and had 15,020,378 acre-feet in it as of Aug. 27. But it was the principle, and the experience, behind the System Conservation Program that may prove most important. "Nobody really knew how (the program) would go," said Cory Toye, the Wyoming water project director for Trout Unlimited.

There was a lot of doubt over whether the farmers and ranchers would even consent to participate. For many of them — wary of the legacy of big-city "water grabs" — accepting money from Las Vegas or Denver seemed like a form of betrayal. Entsminger knew they had to tread carefully; convincing Western ranchers and farmers that Las Vegas was "here to help" would not be easy. The program's architects agreed that it would not look good if Lower Basin water managers were seen as paying for Upper Basin water, so the two basins used the funding separately. The Bureau of Reclamation would fund projects in both basins, but money from Denver Water would fund only Upper Basin projects, while funding from the other municipalities was reserved for the Lower Basin.

Water law, in some states, poses another hurdle. If farmers use less water than their allotment, they risk losing some of their water rights. In the future, Garrison hopes to see other states adopt legislation similar to Colorado's, where enrollment in approved conservation programs means changes in water use cannot cause a farmer to lose a portion of his water right.

There is also the question of how to guarantee that the saved water actually reaches Lake Powell and Lake Mead, as downstream users with the necessary water rights can divert water from the river, whether that water was destined for Lake Powell under the system conservation pilot program or not.

This year, heavy snows in the Rocky Mountains helped offset persistent drought throughout the Colorado River Basin. Just how much climate change will reduce the Colorado's flow remains uncertain, but the pilot program at made least one thing clear: Ranchers and farmers proved surprisingly open to accepting money from metropolitan water providers in exchange for leaving some water in the river.

Last May, Botur traveled to Washington, D.C., with Trout Unlimited's Toye and several other ranchers who participated in the pilot program, to help secure more federal funding and support for the program's future. In two years, Botur had gone from skeptic to lobbyist. It was better, he believed, to have a voluntary program that rewards people for doing what you need, rather than using regulations to force them to do your bidding.

Botur shut off his water even earlier than his contract required, and he knows other ranchers who did so, too. Saving water was part of it, but Botur also believes the program helps promote other goals as well — conservation of wildlife habitat, fisheries and overall watershed health. Not to mention the value of avoiding future conflicts that will likely arise from population pressure and climate change.

"It's more than just money," he said. □

Bison graze on the North Rim of the Grand Canyon.
SHANNON MCGEE/FLICKR

THE LATEST

Backstory

In 2003, drought drove a herd of bison into Grand Canyon National Park from the adjacent Kaibab National Forest, where they had been imported in the 1930s to crossbreed with cattle. **State-permitted hunts kept the herd under 200, but as its usual range dried up, the huge animals sought greener pastures on the North Rim, wallowing in riparian areas and damaging archaeological sites.** Park managers, worried about impacts to land and visitors, sought to remove the unwanted herd ("Bison arrive in Grand Canyon uninvited", *HCN*, 4/28/03).

Followup

In September, **the National Park Service announced that over the next three to five years, it would cull the North Rim herd, now about 600 animals, to fewer than 200**. The agency plans to round up some bison and ship them to tribes and cooperating agencies. Skilled volunteer shooters, chosen by lottery, will hunt the rest. Without culling, biologists say, herd numbers could hit 1,500 within 10 years.

JODI PETERSON

Big Spring in Snake Valley, where the Southern Nevada Water Authority holds applications that still need the state's approval.
UTAH GEOLOGICAL SURVEY

THE LATEST

Backstory

Nevada has the smallest share of the Colorado River – just 300,000 acre-feet. **As Las Vegas boomed in the 1990s, the Southern Nevada Water Authority proposed piping groundwater from eastern Nevada, home to several national wildlife refuges and a national park.** The project, which would siphon up to 84,000 acre-feet annually, has spent more than a decade in court. Its projected cost has soared from $1.5 billion to at least $15.5 billion ("The water czar who reshaped Colorado River politics," *HCN*, 3/02/15).

Followup

In late August, **a federal court ruled on a lawsuit filed by environmentalists, tribes and local governments over the BLM's granting of a right of way for the 250-plus-mile pipeline.** The judge said the agency had fulfilled its duties "for the most part," but needed to provide better plans for mitigating wildlife habitat lost to pipeline construction. A separate lawsuit challenges the amount of groundwater involved; the state engineer will take public comment until Oct. 20.

JODI PETERSON

Exit interview – Sally Jewell

With Obama's policies under threat from the new administration, his last Interior secretary reviews a legacy at stake

BY BRIAN CALVERT

Sally Jewell was Interior secretary under President Barack Obama from April 2013 until his term ended in January 2017. At the department, the former CEO of Recreational Equipment Inc. undertook a "forward-looking reform agenda," emphasizing science-based land and water conservation, renewable energy development on public land, and better relations with Native American tribal nations. High Country News *recently caught up with Jewell as she prepared for a fellowship at the Institute of Politics at Harvard's Kennedy School, where she will educate students in economics and environmental sustainability.*

HCN Which of your achievements as Interior secretary are you most proud of?

Jewell We really built, I think, a strong nation-to-nation relationship with Indian Country across the board — Alaska Natives, American Indians, and we have a pathway to recognition for the first time with Native Hawaiians, which is the only Indigenous group in the United States that has not had any form of federal recognition.

That took the form of prioritizing settling lawsuits against the federal government for not upholding our trust and treaty responsibilities. In some cases these lawsuits have been going on for decades and costing the tribes a lot of money, and the federal government had not upheld its trust and treaty obligations. We also focused a lot on: What's the pathway to the future for Native Americans, and where are we falling short? One of the areas we're falling short is in tribal education. The Bureau of Indian Education just has been dealt a pretty tough hand in terms of educating Native youth, many of whom are disconnected — it's a long commute to school on oftentimes very rough roads. Sometimes it's too far out, and they have to be in boarding schools. And the family situations, there are a variety — fully supportive families and families that struggle. All of that's really tough, and we worked very hard to see what's wrong with the way we're structured. How do we make better use of the funding we do have to better serve tribal youth? And there was a big effort there. It's unfinished business and it's something I will continue to engage in in the future, but it's an area I think we made good progress, at least in raising awareness, getting support from Congress, getting additional funding.

Another area where I feel really good about our term was in engaging the next generation broadly. Recognizing that as time marches on and we have new technologies available to us, we see — and there's been a fair amount of research on this — the growing disconnect between children and nature and in general the great outdoors. We can't expect future generations to care for these places that we so uniquely have in the U.S. if we don't introduce them and say, "Hey, these are your public lands, you belong here." And that's particularly true for urban youth and youth of color who have not felt welcome, or for whom the outdoors has represented a scary place for a variety of historical reasons. And so we worked hard on doing that and creating this continuum, which starts with play — just let kids play unstructured outdoors. Play, then learn, serve, work. We got 100,000 young people working on public land. And we had to raise private money to do that because we didn't have sufficient money in the federal budget. But I think for all the federal land-management agencies, Youth Conservation Corps crews are very much on their radar, and that will continue.

HCN It looks like the Obama-era outreach to tribes is already starting to erode. The Land Buy-Back Program is not going to be continued after funds from the Cobell Settlement are disbursed. James Cason, the associate deputy secretary for the Bureau of Indian Affairs, has suggested the funds be distributed to fewer tribes, especially those with cheap land in rural areas.

Jewell The settlements we did make with tribes — over 100 settlements — those are done and the money is out the door. The water rights settlements we did with tribes, we did a record number, those are out the door and that helps bring certainty to not only tribes but also farmers and ranchers and others, municipalities that depend on that shared water. So I know that tribes are stronger as a result of the time President Obama was in office, and I think that their voice and solidarity has increased during that time. They've been around for a very long time, they've been dealing with the government a very long time, and it's fair to say they've had their ups and downs, mostly downs. So they're not going to go anywhere, and they're going to continue to stay engaged, and they will hold this government accountable as they should. Secretary (Ryan) Zinke talked about being an adopted son of the Assiniboine Sioux and the Fort Peck Reservation. I hope he lives up to that.

HCN What do you make of the claims that all parties weren't heard in the designation of Bears Ears National Monument?

Jewell I think that's nonsense. All parties were heard. We worked very hard, for the entire four years I was there, with Congress and Utah Rep. Rob Bishop's office on

Sally Jewell meets with stakeholders during a visit to Utah for a public meeting about community visions for the management of the region's public lands.
CHRIS WONDERLY/DEPARTMENT OF THE INTERIOR

Brian Calvert is *HCN*'s editor-in-chief.
@brcalvert

As part of the Obama administration's Every Kid in a Park initiative, Interior Secretary Sally Jewell visits Saguaro National Park with a class of Native American students from Santa Rosa Ranch School — funded by the Bureau of Indian Education — in the Tohono O'odham Nation.
TAMI A. HEILEMANN/DEPARTMENT OF THE INTERIOR

his public lands initiative. And there were many, many players that spent thousands of hours. Congressman Bishop likes to, I'll say, brag, that he held over 1,000 meetings on the public lands initiative. That was not wasted. We heard many of those comments from his staff as we worked with them on drafting the bill. He talked to me about it in 2013, but he didn't drop the bill until I was actually visiting the Bears Ears area in Utah and meeting with three county commissioners and tribal members that were pro- and con- monument designation, and when he did drop the bill he changed the language. But there was a tremendous amount (of public input) between the meetings that he held, the meetings that we held, and the four-day visit that I had down there, which was the largest public meeting with, I think, 1,500 or so people, so to say voices weren't heard is not true. I think that what Rep. Bishop would have preferred is that the voices of a few dominate the voices of the many. And the fact is these are federal public lands; they belong to all Americans, and the voices of the many are appropriate — with due respect to people in the local community who we did hear, and whose concerns were addressed in the language of the proclamation, when we felt our only choice to protect this was to do a monument because the legislation wasn't going anywhere.

HCN REI is pledging to oppose changes to national monuments. Patagonia launched a major ad campaign to support public lands. How effective can outdoor recreation companies be as a political force?

Jewell I think that this whole monuments review has awoken the outdoor recreation industry in recognizing that if you're not at the table, you're on the menu. Outdoor recreation as an industry is almost as big as automobiles, automobile parts and pharmaceuticals combined. For the entire U.S., it's $887 billion in consumer spending, $65 billion in federal tax revenue, so when my successor says oil and gas from the Department of Interior generates $12 billion in revenue to the Department of Treasury, OK, that's great, but it's a small fraction of what taxes are paid by people enjoying outdoor recreation and tourism; $59 billion on top of that in state and local tax revenues, 7.6 million direct jobs. That's more than all of the other industries combined that use public lands for other purposes. And it's not that those other purposes aren't important, but outdoor recreation and tourism is a very legitimate use of federal public lands, and the industry is finding its voice and making sure people are aware of that.

HCN What are you expecting to teach at the Kennedy School, and where are you going to go from there?

Jewell I've chunked out eight to nine sessions that will address each one of the various aspects that I feel are important in having that economically successful and environmentally sustainable future that I think we all want to leave to our children. And the overarching theme is my favorite proverb — I did not invent it, wish I had — "We don't inherit the Earth from our ancestors. We borrow it from our children." And so how do you create an environment — economic and natural and cultural and historical — that honors the fact you're handing this over to the next generation, and you want to be proud of what you give them?

If you've got people that aren't convinced climate change is real, what needs to be done to help them understand? They may be skeptical of the science, but if you bring it home to them, to where they understand it, you've got a different picture. So all of that stuff is important, and I'll be practicing at Harvard and putting it to use in some way in the next chapter, whatever that might be.

I'll be staying in the West. Other than three more months in the East, I'm a Westerner. □

"The fact is these are federal public lands; they belong to all Americans."

–Sally Jewell, former Interior secretary, on whose voices were heard when determining monument and land designation in Utah

▲ **Reader's Choice: Double Rainbow, All The Way**
This bright double rainbow lasted more than 30 minutes in the photographer's backyard in Carbondale, Colorado. DAVE MAYER

Photo contest winners

Show us your backyard

This year's reader photo contest was dedicated to the "backyards" of our region. Readers submitted more than 300 photos showing the wonders of the West, farm to field, cityscape to wilderness. We offer here the readers' favorite and our editors' picks.
See more online at **hcne.ws/photos-17.**

▶ **Editors' Choice: Tundra Monarch**
On a trip to Rocky Mountain National Park, the photographer waited for the sunset, and an elk happened to walk into his frame.
KEN HENKE

▶ **Runner Up: Fox Fight**
The photographer witnessed a foxing match in the Lamar Valley in Yellowstone's Northern Range. It only lasted about 10 seconds, and the defeated fox stayed for half an hour after the fight was over, licking his wounds.
HUNTER GRAHAM

▶▶ **Runner Up:**
Waking the Sleeping Ute
The photographer watched thunderstorms roll in from the Four Corners and light up the Sleeping Ute in Dolores, Colorado.
MICHAEL SCHMIDT

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Continued on next page

Robin Melville, her baby and her daughter Nava, Pyramid Lake, Nevada, 1967.
COURTESY OF THE LISA LAW PRODUCTION ARCHIVES

VOICES OF COUNTERCULTURE IN THE SOUTHWEST
Edited by Jack Loeffler and Meredith Davidson
208 pages, hardcover: $34.95. Museum of New Mexico Press, 2017.

As Peter Coyote points out in his contribution to *Voices of the Counterculture in the Southwest*, providing fresh insights into the heavily chronicled 1960s and '70s is not easy. But through personal stories and thoughtful reflection, this new book seeks to highlight the ways that the countercultural narratives of that era, many of which played out across the sage-dotted deserts of the American Southwest, have seeped into and deeply influenced our own.

Though some of the means have changed — with underground newspapers replaced by social media — many of the issues rippling through society half a century later hark back to that earlier time, as racism, violence and environmental crises provoke new calls to "resist." Amid all this, as Meredith Davidson writes, "It seems we are once again seeking a more wholesome approach to living and an awareness of something greater than ourselves."
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Taking trips and putting our tribal coverage to the 'bingo test'

September has been full of comings and goings. *High Country News* staffers enjoyed Labor Day weekend, hiking, relaxing and visiting friends and family across the region. And there have been plenty of exciting work trips, too. It seems like every time we welcome someone back, someone else jets off! Meanwhile, the office crew is looking forward to a publishing break. We'll be back Oct. 30.

Zoe Newmarco from Rochester, Vermont, stopped in while visiting friends in Paonia. She interned at a newspaper back home and enjoyed watching how we put the magazine together. She's not yet a subscriber, but we have hopes: Zoe left with a couple of fresh issues.

Mary Kwart of Ashland, Oregon, came through as a self-described "climate refugee" — after being smoked out of a planned hike on Montana's Sacred Door Trail, she was on her way to a Buddhist retreat in Pagosa Springs, Colorado. We're sorry your hiking plans got derailed, Mary, but we're glad you came by.

Longtime readers **Pam McBride** and **Pete Fitch** visited while on a multi-month Western road trip. Now retired, Pete worked in fire management for the Forest Service, and Pam writes grants for hospitals. Though they lived in the West for many years, they now live in Hawaii — our "far-West bureau," **Paul Larmer**, our publisher, quipped. (They didn't drive here from Hawaii, of course; they keep a camper in Reno for just such trips. Smart idea!) They enjoy our coverage and find it refreshing to see "real journalism still in effect."

Jamie Sudler and **Frani Halperin**, executive producers of *H2O Radio*, stopped by while reporting on youth and agriculture on Colorado's Western Slope. Denver-based *H2O* is journalism all about water, a topic we love. Keep up the great work, guys!

In our ongoing efforts to improve reporting across Indian Country, *HCN* sent three staffers — **Brian Calvert**, editor-in-chief; **Kate Schimel**, deputy editor-digital; and **Paige Blankenbuehler**, assistant editor — to the annual conference of the Native American Journalists Association in Anaheim, California. We learned a lot and were proud to work with *HCN* contributing editor and then-NAJA Vice President **Tristan Ahtone** on a new journalism tool: a bingo board that helps writers avoid stereotypes and clichés.

Lastly, we recently said a bittersweet "see you later" to Associate Editor **Maya Kapoor**, who has returned to her home in Tucson, Arizona, to work remotely after spending nine fun and educational months here at *HCN* headquarters. In a parting note, Maya thanked us for taking in "a wayward biology nerd" and teaching her the ways of *HCN*. It was our pleasure, Maya, and we miss your witty wordplay and healthy snacks already. Come back as soon as you can.

—Rebecca Worby, for the staff

Tribal coverage bingo board.
NAJA AND HCN

FOLLOWING ANC

In the Southwest, Pueblo people are helping archaeologists untangle

Long ago in the north
Lies the road of emergence!
Yonder our ancestors live,
Yonder we take our being.
Yet now we come southwards
For cloud flowers blossom here
Here the lightning flashes,
Rain water here is falling!
—Tewa song

The drumming is inescapable. It's a sound you feel in your gut, like thunder from a summer storm. Its rumble fills the pueblo, resonating off adobe walls, shimmering in the white-hot sun, guiding the moccasined feet of the dancers. It asks the clouds looming over distant mountains to come closer. It calls to them for rain.

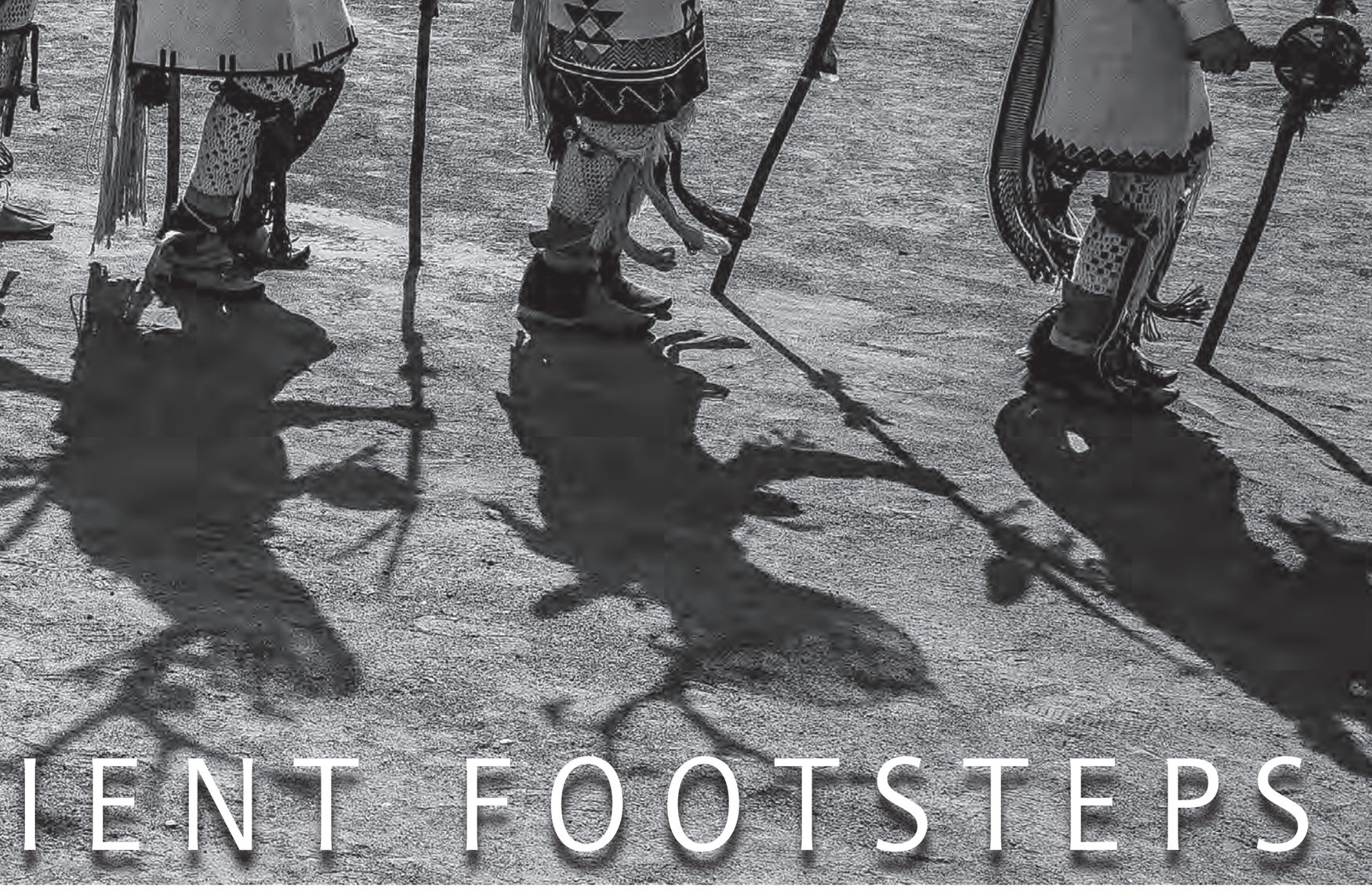
The drum bodies are made of cottonwood, sanded to a smooth blond and stretched over with cowhide. A line of men beat them with drumsticks — *tumbe feh* in the Tewa language. Some of the younger men wield their *tumbe feh* with a fervor that makes the muscles in their arms stand out, but Arthur Cruz's style is different. He lets his right arm fall with the weight of gravity, so measured that after hours of drumming and singing in 100-degree heat, he barely breaks a sweat. After more than two decades of this, he still gets lost in the rhythm.

On this, the feast day of St. John the Baptist, northern New Mexico's Ohkay Owingeh Pueblo is filled with people — extended family, friends, Anglo and Hispanic visitors. The pueblo is one of six in the Tewa Basin, a bowl in the high desert intersected by the Rio Grande, and although the day's festivities ostensibly honor a Roman Catholic saint, they are just as much a celebration of the summer solstice. All weekend, people gather in homes to share bowls of posole, enchiladas, red chile, yams with marshmallows, chocolate chip cookies, potato salad. There's a footrace one afternoon, and a carnival hums just outside the pueblo, the Ferris wheel drawing neon circles above 500-year-old adobe buildings.

But the defining event of the weekend is the dancing. Again and again, Tewa drummers, singers and dancers make their way around the kiva, a ceremonial building at the center of the pueblo. Sometimes the dancers move like shambling buffalo; other times they imitate Comanche warriors from the east, hollering and whooping in feathered headdresses and bone breastplates. Always there is the drumming, accompanied by songs as staccato as the drumbeats themselves. I watch with other guests on Arthur Cruz's shaded front porch, absorbed in the music but understanding nothing of the lyrics.

It's only later that Cruz explains their significance. We're sitting in his living room under a fan, the curtains drawn, the air cool. As he talks, Cruz removes the accessories he donned for the feast — the leather wrist cuff, the dangling shell earrings, the yellow moccasins — until he's once again a regular guy in an easy chair, weaving his way through a thousand years of history as casually as if he were relaying last week's baseball game.

Many Tewa songs ask for rain, Cruz tells me, but one song in particular alludes to the 1680 Pueblo Revolt. It was then — following a century in which invading Spaniards enslaved and tortured Pueblo people, burned their religious objects and tried to suppress their culture



IENT FOOTSTEPS

the science of human migrations

FEATURE BY KRISTA LANGLOIS

The Deer Dance, meant to ensure prosperity in the coming year, is performed at Ohkay Owingeh Pueblo, 2013.
ROBERT VILLEGAS

— that a leader from Ohkay Owingeh united Pueblo tribes to drive the Spanish out of the northern Rio Grande. The atrocities that precipitated the revolt are still felt so deeply that in 1998, a group of Pueblo artists removed the foot from a bronze statue of Juan de Oñate, a Spanish governor who cut off the right feet of 24 Acoma Pueblo men.

The Pueblo Revolt remains relevant to Cruz and other Tewa people because it illustrates how deftly they've withstood hundreds of years of colonization. The Tewa are one of five linguistic groups that fall under the umbrella of Pueblo Native Americans, and like other Pueblo groups, they speak a distinct language and have a unique culture. And because they were never forced off their land or corralled onto reservations, their place-based religious, agricultural and oral traditions have continued unbroken. Generations of Tewa storytellers have kept the history of the Pueblo Revolt alive, whispered and sung in a language that invading Europeans couldn't understand. They repeated stories of the revolt the same way they repeated even older stories, ones that told of their great migration from the north and the formation of Tewa clans.

Growing up in Ohkay Owingeh, Arthur Cruz heard these stories. He learned the songs. They helped shape his identity. And now, they're helping reshape scientists' understanding of the pulse of human life across the Southwest. Combined with new data analyses and a multidisciplinary approach that incorporates linguistics, genetics and other fields, archaeologists working closely with Pueblo people like Cruz have begun to fill in the gaps of migration patterns that have long puzzled Western scientists. The story that's emerging is a testament to the resilience of culture — and the scientific value of Indigenous knowledge.

IN THE MID-1200S, an estimated 25,000 people lived in an 1,800-square-mile area surrounding what's now southwest Colorado's Mesa Verde National Park. Over the 700 years they lived in this area — known as the central Mesa Verde region — the people built huge villages of stone and adobe. They traded for turquoise and obsidian from across the Southwest and for shells from the Pacific Coast. They raised turkeys for feathers that were used in blankets and ceremonies, and mastered the art of growing corn, beans and squash in a landscape that receives around a foot of rain a year.

And then they left. By the 1280s, there's no evidence that anyone remained in the region. In some places, homes were abandoned as if their occupants had walked out the door one morning to tend the fields and never returned — pots left on earthen floors, intricately patterned mugs hanging from pegs on the wall. Elsewhere, smashed skulls and hints of cannibalism suggest that some people met a violent end. In a place called Castle Rock Pueblo, some 41 men, women and children appear to have been massacred, their bodies left unburied, their kivas burned. In still other places, kivas may have been burned ceremonially, a ritualistic farewell as people walked away from a place where they had roots stretching for generations.

The first non-Natives to find and study these ruins speculated about where the original inhabitants had gone. Nearby

Arthur Cruz at his home in New Mexico's Ohkay Owingeh Pueblo. Cruz regularly makes pilgrimages to the Mesa Verde region, which is referenced in his tribe's oral histories.
KRISTA LANGLOIS

Utes claimed no ancestral connection to the people who once called this place home, while Navajos said the civilization had belonged to the Anasazi, a term that translates as "ancient foreigners." Early settlers figured the Anasazi had either died off or vanished without a trace — a romantic notion that persists to this day.

Hundreds of miles away, though, Tewa and other Puebloans knew they were descended from the people who built Mesa Verde's cliff dwellings. Their oral histories told them so.

Tewa origin stories, however, aren't backed by the kind of hard evidence that archaeologists traditionally rely on. Often when people move, they take their "material culture" with them — styles of architecture, tools or pottery that can be tracked across a landscape, like a trail of breadcrumbs leading from one site to the next. But the trail out of the Four Corners quickly peters out. Although the area around the Tewa Basin saw a rise in population around the same time that Mesa Verde's population waned, scant traces of Mesa Verde-style architecture and pottery have been found in New Mexico or Arizona's Pueblo villages — certainly not enough to account for a large migration of people. Today, while it's widely accepted that Pueblo people are in some way descended from Mesa Verde's cliff dwellers, there's no scientific consensus on exactly how the two are related, or what paths Mesa Verde's inhabitants took as they spread across the Southwest.

In the Tewa Basin in particular, scientists continue to search for architecture or pottery definitively linking the region to Mesa Verde, and they continue to come up empty-handed, fueling a debate that's divided archaeologists for over a century: Did large numbers of Mesa Verde's final inhabitants migrate south and set up a new society in the Tewa Basin? Some prominent scholars, such as New Mexico Office of Archaeological Studies Director Eric Blinman, maintain that they did not.

Archaeology exists "because our stories are intended to be criticized," Blinman says. He doesn't deny some connection between Mesa Verde and the Tewa Basin, but he and others in New Mexico's state office believe that a few families trickling out of Mesa Verde integrated with Tewa who had already been living in the Northern Rio Grande for two thousand years.

This might seem like an academic quibble, but it has real repercussions for people like Arthur Cruz, who serves as a consultant for archaeological surveys and regularly makes personal pilgrimages to the Mesa Verde region. Not only does it undermine Tewa oral history, but without consensus from archaeologists — typically considered the experts in legal cases involving land rights or historic preservation — the Tewa people's power to weigh in on what happens to ancestral sites in southwest Colorado remains tenuous.

As new technology unravels the mysteries of the past, though, that's starting to change.

DRIVING WEST FROM CROW CANYON Archaeological Center in Cortez, Colorado, it's difficult to believe you're in the middle of one of the world's densest concentrations of archaeological sites. A nearby dam has turned the sagebrush desert into a quilt of irrigated green fields, stitched together by gravel back roads and dotted with tidy houses. Here and there cows graze alongside newborn calves.

Crow Canyon Vice President Mark Varien has a knack for peeling back the veneer of modern agriculture to see things most people don't notice. Once, at a seemingly random spot on the road, he stops and points to a cluster of trees indistinguishable from dozens of others we've passed. "You see that little stand of junipers?" he asks. "A Chacoan road ran right through there. Ran right through Leslie Black's old place. And see that sagebrush? That's a collapsed archaeological site. The farmers can't plow it because of the rocks, so they just plow around it. Those clumps of sage are the remains of a pueblo. The big one's probably the kiva."

Although this region seems to stretch to the Utah border in a plain, it's crevassed with wild canyons. Together, the canyons and uplands harbor a staggering 18,000 sites where Ancestral Puebloans lived, worked, hunted, worshipped and fought. Some, like the kiva Varien points out in the middle of a red-dirt field, are on private land. Others are protected by national parks, monuments or other federal land. And each of the thousands of archaeological sites here has been captured through pages upon pages of data, meticulously recorded by generations of archaeologists.

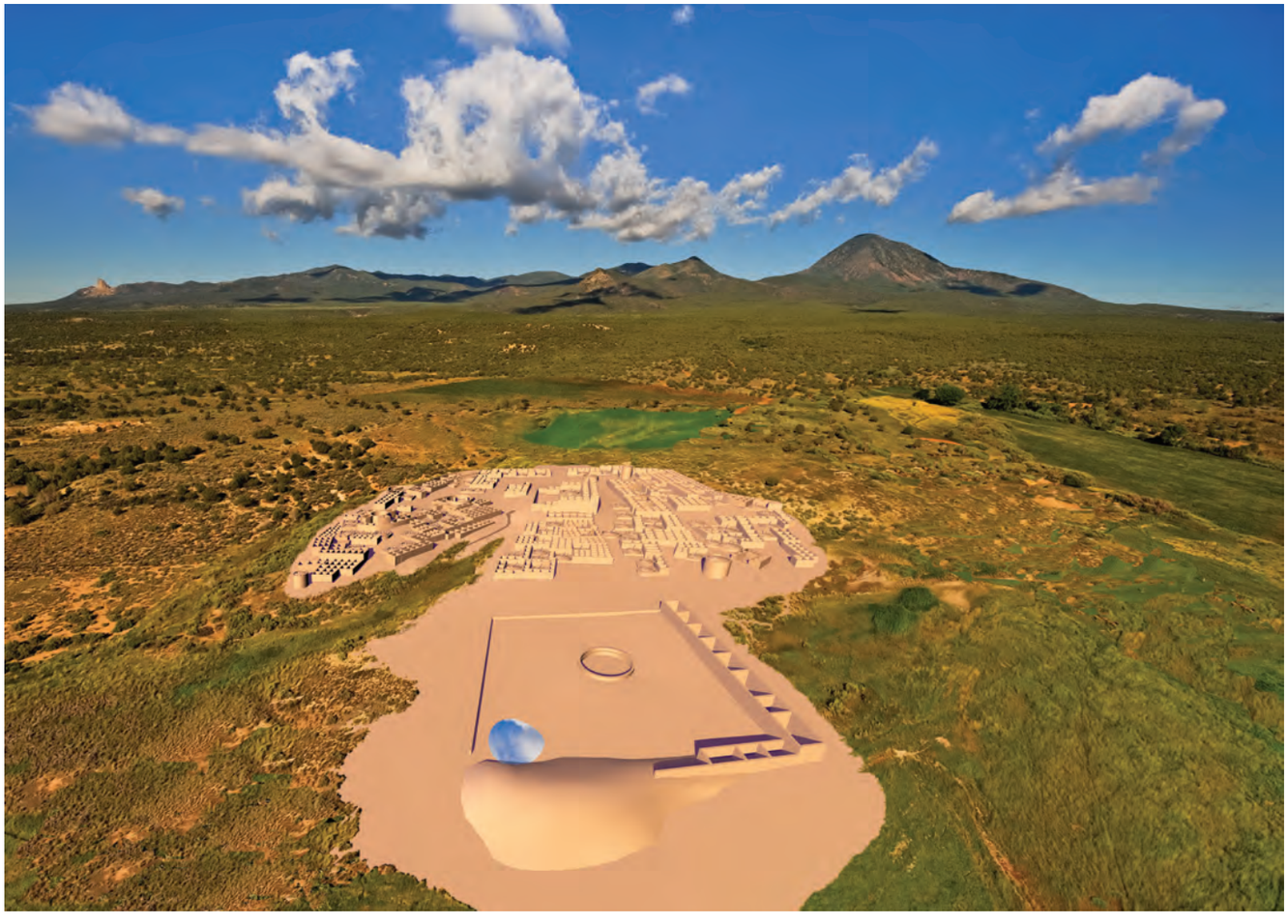
Until recently, the sheer quantity of data flowing from this country made it difficult for scientists to assess landscape-wide patterns. It was easy enough to conclude, for instance, that up to 800 people lived in Yellow Jacket Pueblo, in modern-day Montezuma County, over a 200-year period. But fitting that lone puzzle piece into the bigger picture of how the population waxed and waned across time and space was nearly impossible, which meant correlating peoples' movements with changing environmental conditions was also riddled with uncertainty.

Now, data-crunching software and computer modeling are helping scientists mine Mesa Verde's trove of archaeological data like never before, revealing new details about the conditions that precipitated southwest Colorado's mysterious depopulation.

In 2001, Varien and a team of archaeologists, geologists, hydrologists, geographers, computer scientists and economists formed something called the Village Ecodynamics Project. From 2001 to 2014, the researchers analyzed all known habitation sites in the Mesa Verde region, as well as 7,000 more in the Northern Rio Grande. They used site-specific information to piece together the population history of the two regions, then

▲ **Ancient structures at the head of the McElmo Canyon, below Sleeping Ute Mountain in the Mesa Verde region of southwestern Colorado, photographed by William Henry Jackson in 1874.**

DEPARTMENT OF THE INTERIOR. GENERAL LAND OFFICE. U.S. GEOLOGICAL AND GEOGRAPHIC SURVEY OF THE TERRITORIES. (1874 - 06/30/1879)



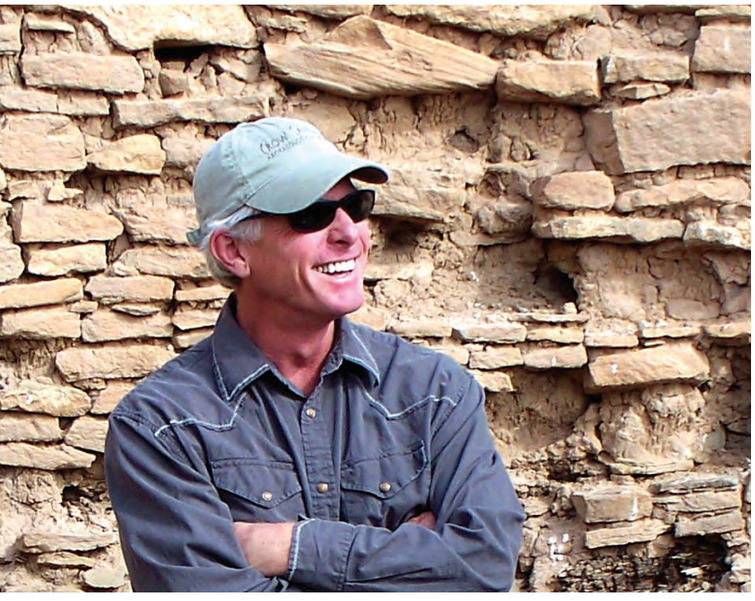
◀ **A simulation of Yucca House, below Sleeping Ute Mountain in the Mesa Verde region of southwestern Colorado.**

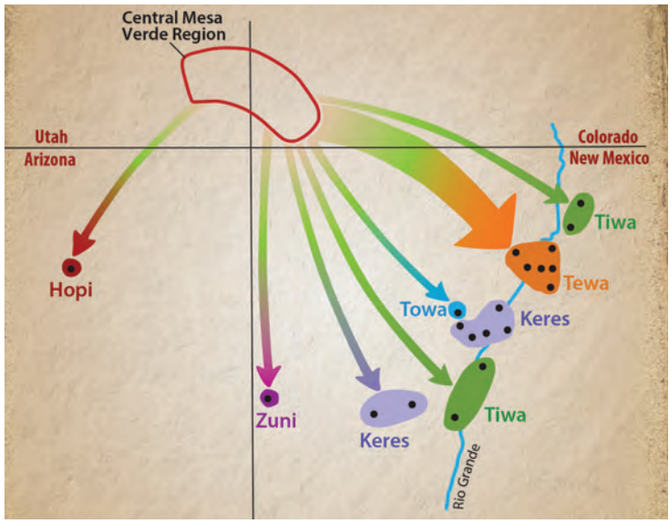
RECONSTRUCTION BY DENNIS R. HOLLOWAY, ARCHITECT; AERIAL PHOTO BY ADRIEL HEISEY. USED WITH PERMISSION BY CROW CANYON ARCHAEOLOGICAL CENTER

combined the demography with granular climatic and soil data to reconstruct past environments, including year-by-year, place-by-place estimates of agricultural yields and natural resource availability. The researchers then compared computer-generated yields with those from studies in which Hopi farmers grew corn using traditional methods, and found them to be believable.

Next, they plugged the human and environmental history of the 4,500-square-mile study area into a computer simulation — a sort of Sim City for the ancient Southwest. They ran the simulation more than 500 times, each time tweaking parameters such as how far hunters were willing to walk to find game.

As they studied the results, patterns began to emerge. Scientists noticed, for instance, that people moved out of certain canyons and into more agriculturally productive uplands around the same time that wild deer populations would have declined from hunting. As deer declined, the number of turkey bones in midden heaps increased, suggesting that people had started to butcher and eat the birds instead of using them only for feathers. This had sweeping repercussions: Corn already accounted for up to 80 percent of the people's caloric intake, but as corn-fed domestic turkeys surpassed deer as the main source of protein, the entire system became dependent on a single crop. Putting all their kernels into one basket meant that if there wasn't enough rain to grow corn, people were in trouble.





Mark Varien, top, vice president of Crow Canyon Archaeological Center in Cortez, Colorado, was part of the Village Ecodynamics Project, which analyzed 18,000 sites in the Mesa Verde region, plus another 7,000 near the Rio Grande. Above, a map based on research from the project shows that the number of people who "disappeared" from Mesa Verde during the 1200s was roughly the same as the number of people who moved into the Tewa Basin shortly thereafter.
ILLUSTRATION BY JOYCE HEUMAN KRAMER, IMAGES COURTESY OF THE CROW CANYON ARCHAEOLOGICAL CENTER

This seemed to fit with the dominant explanation that a drought in the 1200s drove people away from the Mesa Verde region. But the Village Ecodynamics Project also cast doubt on this theory. Hydrologists found that groundwater seeps and springs were more common in the region than previously suspected, and that such water sources probably didn't dry up during even the most arid years. Nor did people deplete piñon-juniper woodlands so badly that a lack of wood would have forced them off the land. And the soil's ability to hold moisture meant that the land was still more than capable of producing enough food to support the population.

In other words, after centuries of successfully adapting to and surviving the mercurial weather of southwest Colorado, it's unlikely that drought alone was responsible for driving people away from a place to which they had deep spiritual and emotional ties. After all, they'd withstood earlier droughts that were even harsher. And even more striking, the Village Ecodynamics models show that many of Mesa Verde's inhabitants were already gone by 1276, when the infamous drought really took hold.

There are still numerous plausible explanations for why people left, including that it was simply time to go: In many Pueblo cosmologies, the Pueblo people's true home was in the south, and they were always meant to end up there. But the evidence of social strife in the years leading up to the exodus is hard to ignore.

That's led Scott Ortman, a University of Colorado Boulder archaeologist and Village Ecodynamics researcher, to develop a theory based not just on the scarcity of resources, but on the social fabric that dictated how people shared them. Between 900 and 1200 A.D., the population of the Mesa Verde region tripled. Still, each family seems to have farmed its own plot of land, its members centering their lives around a family-sized kiva. This may have worked when there was enough space for each family to stake out a productive plot, but as more families were forced to support themselves on marginal land, it created a system of haves and have-nots. That, Ortman believes, "is where the whole thing blew up."

ORTMAN, A TALL MAN with sandy hair and a measured, thoughtful manner, became an archaeologist for the same reason as many of his colleagues: because he was fascinated by the past. But early on, aspects of the field troubled him. On tours led by Anglo archaeologists in the 1990s, he noticed they presented themselves as the experts, even when Native American elders were present. Once, Ortman watched a Southern Ute man address a room of archaeologists at a workshop. "We've been trying to explain to you why we find excavating archaeological sites offensive," the man said. "We tried to ask, 'Why do you think archaeology is worth doing, given that we feel this way?' Doing it because it's interesting isn't enough."

That observation shaped Ortman's career. So when the Village Ecodynamics Project showed that the number of people who "disappeared" from Mesa Verde during the 1200s was roughly the same as the number of people who moved into the Tewa Basin shortly thereafter, Ortman began searching for other evidence linking the two regions. But rather than studying potsherds and midden heaps, he turned to the Tewa people themselves. He studied modern Tewa language and culture, and invited elders to join him at ancestral sites to compare traditional knowledge with archaeological evidence. Instead of viewing Tewa stories merely as metaphor or myth, he began combing through them for clues harking back to Mesa Verde.

"His work deals with taking Pueblo perspectives seriously," says Patrick Cruz, one of Ortman's graduate students and a cousin of Arthur Cruz. "It's not just dismissive of oral history. That's hugely important to me."

Ortman is part of a growing cadre of scientists who are beginning to use oral histories to help answer some of their fields' most puzzling questions. In coastal British Columbia, for instance, geologists unearthed evidence of an earthquake that First Nations people had long told stories about, revealing a seismic history that may help predict future earthquakes. In the Canadian Arctic, a 2014 analysis of ancient DNA corroborated Inuit accounts of a vanished tribe that lived in the region for thousands of years before the Inuit's own ancestors arrived.

"Native people have been telling us what they knew all along," Ortman explains, "and it's proving to be closer to the reality than many of the stories archaeologists have developed."

Unlike the Inuit, though, Puebloans in the American Southwest haven't consented to a DNA analysis. So to investigate the roots of Tewa oral history, Ortman compiled measurements of human skulls taken from 858 people who lived across the Southwest between 1000 and 1600 A.D. (The remains of many of these people have been repatriated, but measurements recorded in the 19th and 20th centuries are still available.) The results "suggest that the ancestral Tewa

◀ ▼ **In a lab on the University of Colorado Boulder campus, professor Scott Ortman looks through artifacts excavated from a New Mexico archaeological site. Ortman, one of the researchers in the Village Ecodynamics Project, uses nontraditional methods to study theories about what happened to the people of Mesa Verde.** KIRA VOS

population was, biologically, essentially identical to the people of the Mesa Verde region," Ortman says. He also studied turkey bones from both regions and found strong evidence that a genetically distinct population of turkeys appeared in the Tewa Basin in the 1200s. The turkeys' DNA differed from that of earlier Tewa Basin turkeys, but it perfectly matched the DNA of turkeys that had lived at Mesa Verde.

The most intriguing findings, though, came from less tangible sources like the Tewa language. The word *t'uuphadi,* for example, which refers to the roof of a church, literally translates as "a basket made of timber." While the roofs of modern Pueblo churches look nothing like baskets, the timber-framed roofs of ceremonial kivas from Mesa Verde bear a strong resemblance. And although several Tewa words describing pottery derive from older words for woven objects, Tewa pottery doesn't incorporate aspects of weaving. Mesa Verde pottery, however, with its designs "woven" onto clay, does.

As Ortman followed this line of linguistic inquiry into deeper etymological analyses, he began to hypothesize that Tewa didn't emerge as a distinct language in the Northern Rio Grande, as was commonly believed, but further back in time — likely in southwest Colorado. "There's a pattern of the contemporary vocabulary of the Tewa language that seems to explicitly express the symbolic material culture of Mesa Verde," Ortman says. Or, in layman's terms: Mesa Verde people may have spoken the same language that Art Cruz speaks today.

Ortman is careful to emphasize that the people who left the Mesa Verde region spread far and wide across the Southwest, so all 21 modern Pueblo tribes are in some way descended from them. But the six Tewa-speaking tribes, he now believes, are the "most direct cultural descendants," with up to half of Mesa Verde's famous cliff-dwellers migrating to the Tewa Basin over the course of the 13th century.

The final link between the two regions came from accounts recorded by anthropologists nearly a century ago. In one book, Tewa people cited names for places in southwest Colorado that they themselves had never been to. Another story described a place that perfectly matched an archaeological site called Yucca House. "All of these things center on this one area in southwest Colorado that centers on Yucca House," Ortman says. And Yucca House, it turns out, is one of the most unique sites in the Mesa Verde region.

YUCCA HOUSE NATIONAL MONUMENT is six miles as the raven flies from Mesa Verde National Park, but it feels a world away. Instead of paying a visitor fee, joining a line of cars snaking up a big green mesa, and signing up for ranger-led tours of exquisitely preserved cliff dwellings, you drive uncertainly down a unmarked gravel road littered with old irrigation equipment. The official directions guide you past a "No Trespassing" sign and to-

▲ **Jake Viarrial, left, of Pojoaque Pueblo and CU student Frank Delaney work at an archaeological site in Cuyamungue, New Mexico. Archaeologist Scott Ortman turns to the Tewa people as part of his research, visiting archaeological sites with them and studying language and oral histories.** SCOTT ORTMAN/UNIVERSITY OF COLORADO

ward a white farmhouse with a red roof. Parking appears to be in the farmhouse's driveway, and you wonder again if this can possibly be the entrance to a national monument. It is. Sitting just beyond the house's green lawn is a creaky metal gate leading to what was once a bustling village.

Unlike Mesa Verde, Yucca House has never been excavated, which is how many Pueblo people prefer to keep their ancestral sites. Today, it looks like a thorny patch of desert surrounded by plowed fields, interrupted by a few mounds and a glimpse of crumbling stone masonry. The paths peter into saltbush and cacti, and as I pick my way through it, an ominous rattle causes me to leap back in terror. Once, there were 600 rooms and kivas here, corn and squash growing all around, children playing and shouting, juniper smoke from cooking fires lingering in the air. Now it's silent except for the clicking of grasshoppers and the *tsk-tsk-tsk* of sprinklers watering the nearby lawn. A thumbprint of moon hangs in the afternoon sky.

When Scott Ortman looks at Yucca House, though, he sees something extremely rare in the Mesa Verde region: a communal plaza, similar to the plaza in Ohkay Owingeh that hosts Tewa dancers on the village's feast days. Recent pottery and tree-ring dating shows that Yucca House was one of the last places occupied by Ancestral Puebloans before they left the region, and Ortman suggests that one reason it may have lasted so long was that people there were already trying out a new way of living, one less centered on the family and more on the entire community. "It looks like a prototype of the typical Tewa village," he says.

As Mesa Verde's people realized their society was unraveling into starvation, violence and death, Ortman believes they decided to leave for the Northern Rio Grande, a place they already knew of from obsidian traders. Oral tradition says it took Tewa people "12 steps" to travel from their ancestral home to their current one, which Ortman interprets as the 12 days it may have taken to walk the 250 miles separating the two regions. And once they arrived in New Mexico, the people may have been so traumatized by Mesa Verde's final years that they discarded the art and architecture associated with that period and replaced them with something more closely resembling the Yucca House model.

This rings true for Tessie Naranjo, a 76-year-old Tewa scholar from Santa Clara Pueblo. "Those who came in the late 1200s were, I think, ready to begin again," she says. "It was all about adaptation. The clay might be different here, the vegetation is different, the medicinal plants are different. So naturally they had to learn new things. That's what I have to think about why their pottery and architecture were different once they came here."

Eric Blinman of the New Mexico Office of Archaeological Studies finds this difficult to swallow. For Ortman's model to be true, it would mean that when a tide of some 15,000 Mesa Verde refugees arrived to augment the 6,000 or so original inhabitants of the Tewa Basin, the refugee population smothered the original population's genes, language and oral history but not their styles of art, pottery and architecture. He maintains that most surviving Mesa Verde emigrants went elsewhere, to Pueblo tribes where the Keres language is spoken. Other scientists who favor conventional archaeological evidence over religious or linguistic connections agree, and recent papers have begun to cast doubt on some of Ortman's conclusions.

Still, Ortman's approach has earned him some of archaeology's highest awards, and today, most archaeologists in the region indeed believe what the Tewa have asserted for centuries.

This reaffirmation of Tewa beliefs may not matter to every Tewa person, but Naranjo finds it validating. Although she herself never questioned the truth of the stories she's heard since childhood, it's intellectually fascinating for her to see those stories interpreted by someone outside the community. "It's very important for those of us who are curious about such things," she says.

The support could also provide contemporary Tewa-speaking communities with a legal tool to protect ancestral sites in Colorado, says Naranjo's nephew, Porter Swentzell, a history professor at the Institute of American Indian Arts. And it could give more credence to oral histories from other tribes, even those that have not yet been "proven" by science.

Swentzell says his own belief system has enough space to incorporate both Ortman and Blinman's models. Tewa people may have migrated *en masse* from Mesa Verde, he says, but they may also have lived in the Tewa Basin since time immemorial, as Blinman claims. "The Eurocentric philosophy is that there's some kind of true version of the past that can be found out — that there's the actual thing that happened," Swentzell explains. In Tewa culture, though, "multiple versions of the past can exist simultaneously. People can go through the same event and experience it in different ways. I think it's important to throw out there that Native peoples don't necessarily need archaeology to construct the past for us. We already have our own equally valid ways of understanding it."

THERE ARE MANY WAYS to get from Mesa Verde to the Tewa Basin, but geographers believe that ancient people would have likely headed south, through territory that's now the Navajo Nation. It wouldn't

"Native peoples don't necessarily need archaeology to construct the past for us. We already have our own equally valid ways of understanding it."

—Porter Swentzell, history professor at the Institute of American Indian Arts

Drummers, including Arthur Cruz (far left, face turned away), play for dancers at the 2014 feast day of St. John the Baptist, in northern New Mexico's Ohkay Owingeh Pueblo. Below, brothers at the celebration. ALAMY STOCK PHOTOS

have been an easy journey — this part of the reservation seems to go on forever, the horizon unchanging, the land muted and parched. As the Jemez Mountains appeared in the distance, the Ancestral Puebloans would have turned east toward them, perhaps climbing through groves of aspen and ponderosa pine or trudging over passes carrying jugs of water and babies. Most had never been to the place they were going.

"At that time, there were no boundaries or borders to inhibit them," says Tessie Naranjo. "It was about finding a better place. Maybe in terms of water, maybe in terms of rainfall, maybe in terms of beginning again and creating communities again. Maybe all of those reasons."

Coming out of the mountains, the people would have had their first view of the Rio Grande: the green ribbon of cottonwoods swaddling the river, the broad valley, the storm clouds shadowing the mountain range now called the Sangre de Cristos. When I saw this view for the first time, it reminded me of the date-palm oases in Morocco where people have settled for thousands of years. These are the kinds of places humans are drawn to, no matter when or where we live.

Yet droughts in the Southwest are cyclical, and the Tewa Basin, too, was eventually crippled by the same bouts of aridity that may have contributed to the demise of Mesa Verde. Here, though, the challenges seemed to only strengthen local communities. Although villages grew far more populous than any in Mesa Verde had been, the region shows little evidence of violence. The societies and traditions that developed were so strong they persisted through waves of colonization and through industrial development and the large-scale mining of the earth. Like the people who lived at Yucca House, Puebloans in the Northern Rio Grande structured their communities around a central plaza where work was shared, religious dances and rituals were held, and the harvest was equitably distributed.

Some of Arthur Cruz's most vivid memories are from these plazas. When he was young, every family in Ohkay Owingeh worked together to grow corn and wheat, carrying the crops on horse-drawn wagons to the pueblo to be husked and threshed by hand. Fewer families farm today, but on feast days, the plazas look much like they did when Cruz was a kid. Especially on the feast day of St. John the Baptist, it's clear that the songs and dances that keep the Tewa universe spinning still live on. The essence of what it means to be Tewa lives on.

All day, Cruz and the other drummers make their way around Ohkay Owingeh's kiva, pausing to face each of the four cardinal directions. The drumming and dancing go on until I lose count of how many how many times the songs are repeated, of how many people come and go from Cruz's house, bending over to greet his 93-year-old mother on the porch, ducking into the dark home to eat bowls of food served by his daughters. The day becomes a blur, like the spinning lights of the Ferris wheel.

But one moment is fixed in time. By late afternoon, though thunderclouds have gathered in the distance, the sky above the pueblo is achingly blue, the air still and hot. There's a break in the dancing, and people crowd onto Cruz's porch to seek shade and sip watermelon *agua fresca* from Styrofoam cups. Teenagers wearing headdresses and body paint from the Comanche Dance mill around. A group of artists clusters around Cruz's brother, a ceramics expert.

And then, from a lone cloud that's wandered across the infinite sky, I feel a drop of water on my arm. I look around — other people, too, are glancing at their bare skin in disbelief. Within minutes it's raining, actually raining, though there's not a single shadow marring the sun. People say in joking voices that the rain dance has worked. And in the middle of the commotion, a young man silently steps off the porch and stands in awe, his face tilted to the water coming out of the blue sky. □

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Members of the 7th Cavalry Drum and Bugle Corps perform in a parade in downtown Rapid City, South Dakota. The 7th Cavalry, despite its history of conflicts with tribal nations, is still celebrated in the town and surrounding area. STAFF SGT. MICHAEL B. KELLER/U.S. AIR FORCE

In the spirit of understanding racism

OPINION
BY EVELYN
RED LODGE

During my 13 years in Rapid City, South Dakota, I've learned that racism and ignorance almost always go hand-in-hand. The West was "won," many people learn in school, but what did westward expansion mean for the Native people who were already living on the land?

The lure of gold brought explorers, miners and then homesteaders to South Dakota during the 19th and early 20th centuries. I imagine that most of those "invaders" — from my point of view — didn't think twice about booting the local people out of the way. But that was then. The question today is why racism persists when America prides itself on tolerance and respecting diversity.

Here are some examples from my life that reveal the kind of blatant racism I've experienced, as well as some of the unconscious racism that is sometimes almost comical.

I go to a Rapid City council meeting where a white local suggests placing statues of Native Americans in Founders Park, rather than in the proposed First Nations Sculpture Gallery in Halley Park. As Native author Elizabeth Cook-Lynn put it, the suggestion was made "without a hint of irony." After all, who were the original founders if not Native people?

I go to the veterans' parade where the 7th United States Cavalry, formed in 1866 to protect homesteaders and raid Native villages, is still honored. These days, of course, more Natives serve in the military per capita than any other ethnic group, according to the director of the National Museum of the American Indian. But few Natives march with the veterans in the parade.

I find a Black Hills trail guide listing the 7th Cavalry Trail — as if it's fun for people to follow the trail of mass murderers who killed anywhere from 75 to 125 babies, children and women at Wounded Knee in 1890.

I buy a Happy Meal for my daughter, only to find a 7th Cavalry Custer doll inside. She gets upset when I try to explain why I think it belongs in the trash.

In a jewelry shop along Mount Rushmore Road, I look at the gold for which my grandparents' territory was invaded and spot a wine-bottle holder depicting a Native chief chugging a bottle of wine. Old stereotypes die hard. According to a recent study in the journal Drug and Alcohol Drug Dependence, alcohol consumption by Natives is shown to be generally less than that of Caucasians in the United States.

Just walking downtown in Rapid City, the so-called City of Presidents, I spot the stores along the way that used to sport signs saying "No Indians or Dogs Allowed." I go to *He Sapa* — the Black Mountains — where I look upon the faces of past U.S. presidents who helped wipe out so many Indigenous peoples. I remember that Natives were only declared to be citizens by the United States Congress less than 100 years ago.

In 2015, I feared to go to any sporting event after a drunk beer salesman poured beer on Native students at a hockey game and shouted, "Go back to the reservation!" Within days, dumping beer on Natives had become a common occurrence at other venues.

I picked up the local newspaper four days after the drunk hockey fan did his business, and the question was raised on the front page: Had the Native students who were attacked stood for the national anthem? (Not that it should make any difference, but it was reported that the students did stand.)

I feared to walk on the north side of Rapid City in 2009 and 2010, after at least two Native families with children were egged while racial slurs were hurled at them. "Go back to where you came from!" is a laughable favorite. One Native woman, who was disabled, was run off the road while driving her car. Urine-filled bottles were thrown on other Natives. Some Natives were shot with pellet guns.

At the same time — and I am glad to report this — many of the attackers were held accountable after much public outcry:

The jewelry store owner removed the wine holder featuring a drunken Native from her window after local media asked why she'd given it prominence.

The newspaper removed its victim-blaming story from its internet site.

Two 21-year-old women were arrested in the incident involving the disabled woman, becoming the first in the state to be charged with its new hate-crime law, "malicious intimidation or harassment."

As for failures in the quest for justice, the drunk hockey fan was eventually acquitted of his one and only charge of disorderly conduct. And I am unaware of any charges brought against anyone for the attacks involving egg and urine throwing and pellet guns.

Racism persists, I am sorry to report. I still feel it every day.

Evelyn Red Lodge is a writer in Rapid City, South Dakota. She is a correspondent for Native Sun News Today *and member of the Rosebud Sioux Tribe.*

WEB EXTRA
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Light from 'one scrap of earth'

Alaska's writer laureate crosses boundaries, rediscovers home

The Tao of Raven: An Alaska Native Memoir
Ernestine Hayes
176 pages, hardcover: $26.95.
University of Washington Press, 2016.

"Raven Steals the Light," an Indigenous tale beloved across the Pacific Northwest, describes what may be the legendary trickster's finest hour. As author Ernestine Hayes, a member of the Tlingit Tribe, tells it, the story begins "in an unbrightened world, (where) light does not reveal itself. It must be stolen." The darkness hindered life for ordinary human beings, and only Raven was bold enough to seek the light's source and set it free. Reborn as a feisty, cunning child, he won over his reclusive grandfather, who grudgingly allowed him to open the precious bentwood boxes holding the moon, stars and sun. Raven's ensuing theft illuminated the earth. The tale is especially vital to the Tlingit people of Southeast Alaska, but Hayes, a professor and writer who was recently named state writer laureate for 2016-2018, readily admits, "I never really understood the story … until I became a grandmother myself. Then I understood why Raven's grandfather gave him the Box of Daylight when he fussed for it."

Hayes became intrigued by the story when she worked as a summer naturalist for the Alaska State Ferry, one of the first jobs she took after 25 years away from her home in Juneau. Caught between an eroding Tlingit culture and her own teenage recklessness, the 16-year-old Hayes and her mother had tried to build a new life in the Lower 48. Later on, after she returned to the North, Hayes began to see Raven's transformations as a way to brighten the dark spots of her own past. Entering her 50s, Hayes went on to complete a graduate degree from University of Alaska, producing the manuscript that became *Blonde Indian: An Alaska Native Memoir*. A winner of the 2007 American Book Award, this fiercely honest memoir confronted the alcoholism, poverty and injustice that plagued Hayes' early years. Building on the search for belonging, family and home that led her back to Juneau, Hayes' new sequel, *The Tao of Raven*, goes a step further, asking how she might bring healing and light to her world of wounds.

As with *Blonde Indian*, Hayes blurs the boundaries of genre in *The Tao of Raven*, which braids sharp grandmotherly meditations and gripping personal history into the fictional storyline of another troubled, typical family. Alternating the reality of her own struggles with those of her fictional characters, Hayes takes a radically compassionate approach, entering the lives of others to see how "the trickster is always at work."

Hayes finds the trickster at work wherever we allow deep feeling, including the "ordinary rebellion, commonplace trauma, and mundane heartbreak that have continued to mark (her) generations." In one particularly vivid memory, the young Hayes went to the Juneau town dock with classmates, to try out a new fishing pole. She hoped that "along with their friendship might come comfort, might come knowledge, might come understanding." But instead, they ran into an Indian — Hayes' own grandfather — who was drunk and swaggering with pride over a fresh-caught halibut strung from his fist. "The other children," she writes, "their derision ill-concealed by poor attempts to cover their snorts of laughter, took hesitant steps backward as my grandfather neared. Finally we all stood too close to one another. … The white children I dared to imagine as my friends staging their retreat behind me, ready to dash for the safety of another world, my grandfather in front of me, offering a whiskered smile, saluting me with the heavy flatfish he proudly held up for my regard and admiration, I at the torn seam of two worlds."

For Hayes, storytelling becomes a tool to overcome the gaps that keep us from what we love. Given an education that denied her own Native history, Hayes had to become as curious and creative as Raven to find her way — her *tao* — back into Tlingit culture. Re-imagination becomes her path to re-inhabitation. "We may never truly know," she writes, "until perhaps the knowledge is given to an artist, to a totem carver, to a weaver, to a dagger maker, to a painter, to a storyteller, and we read from that craftsperson's vision."

Hayes never denies her journey's present complexities, hard as it is to face the shame and fear that kept her away from her homeland for so long. But with all their transformations, the patience and grace of her nuanced truths — both fact and fiction — transcend enduring prejudice. In *The Tao of Raven*, her prose is as insistent as it is lyrical, as she urges readers to "take Raven," and find hope in some "scrap of earth." That is all we ever have, really: our pasts to hold our stories, and our places to guide our dreams.

BY ROB RICH

Tlingit art depicting Raven stealing the sun.
ISRAEL SHOTRIDGE

A **bow**, a **hunt**, and a **bond** with public land

BY SARAH JANE KELLER

The author looks across the canopy of the national forest where she harvested a deer by bike. COURTESY SARAH JANE KELLER

The evening before bow season opened in southwest Montana, I loaded up a bike-trailer with camping gear and pedaled into a heavily timbered valley near Bozeman. Arriving at a hillside of very old Douglas firs well past dark, I hastily made camp as irrational fears of bears and people started to creep over me.

Later that night, something stomped on the branches outside my tent. I grabbed my bear spray and tried to stay calm. Then I heard a bull elk let loose a chilling bugle. Seconds later, more eerie whistles erupted from far up the valley.

As I settled back to sleep, fear turned to satisfaction. I was finally living out my bow-hunting fantasy: a solitary camp, eavesdropping on animals and anticipating sneaking into the woods before first light to search for deer or elk. Given a choice, I'd have been hunting deeper in the wilderness. But what I really needed last fall was a place that could accommodate a bum knee and a frenzied work schedule. So I found a familiar, hard-working valley in the Custer Gallatin National Forest, and hoped other archers would overlook its game trails, buck rubs and hidden meadows.

Despite the noisy bulls the night before, the first day passed quietly without the appearance of any elk or deer. On the misty second morning, I walked a gravelly ridge and enjoyed how deep the clouds had sunk into the glacier-carved valley.

I almost missed the two buck deer grazing the edge of a meadow. Crouching behind a ponderosa pine, I took off my boots and pack, for maximum stealth, waited for the deer to turn away, and started stalking them.

Several hours later, those deer were still weaving through the forest, searching for the last of the summer's green forage. I'd been within shooting range of them many times, but either brush obscured them, or else one would turn my way, making it impossible to draw my bow.

My task seemed impossible. Ungulates practice their skills every day — as prey animals, they have to be alert — but this was my first as attempt at being a close-range predator. Small, seemingly insignificant details suddenly demanded all my attention. Shifts in the breeze, the rustle of my jacket, a sniffle, or the snap of a twig could trigger the deer's fine-tuned flight instincts. The hunt hinged on restraining my reflexes, and letting everything line up perfectly.

Finally, both deer stopped moving. Yet from behind a skinny fir sapling, I could only see fragments of their ears and antlers. They seemed to be watching my tree, which didn't so much hide me as break up my shape.

I reminded myself that animals look for movement. Simply breathing deeply felt precarious. After a short while, the deer bedded down, unaware of the predator standing 10 steps away. I no longer felt like an interloper, but just another animal capable of melting into the forest. Had the stalk failed at this point, I'd still have found something I came for, a heightened way of experiencing these woods.

It's these moments during hunts, and subtler ones, too, that make me ferociously loyal to the idea of public land. When you're a hunter, a national forest becomes much more than a recreation destination. It becomes a place to transcend the separation between modern humans and nature, if just for a morning.

In this way, public land is the essence of freedom, an open invitation to exercise a primal form of self-sufficiency, and, in the process, connect with an ecosystem. The gut-level connection to public land that many hunters have gives me hope that the ongoing movement to transfer or privatize it will ultimately fail. Hunting's conservation legacy stems from the late 1800s, when sportsmen faced down robber barons and their political allies. That struggle continues today, as hunters confront politicians who seem hell-bent on privatizing what belongs to every American. As a natural resources journalist, I report on the land-transfer movement, and do so fairly. But as a hunter, I can't stand the idea of losing my public lands, should states sell them off.

Eventually, the deer stood, breaking my trance, and continued grazing. Soon after that, I lost them as they hurried across a trail. I feared they were long gone, but caught up with them in a small meadow flanked by willows. This time, I knew I had a shot. Muscle memory took over as I drew the bow, aimed, and released the arrow. It hit behind the buck's shoulder, and I watched anxiously for a few long seconds as he bounded into the conifers, then fell. As I anticipated his last breath, I felt the weight of ending a life, then a rush of gratitude toward him, his habitat, and the land around me. This anonymous corner of national forest would feed my husband and me through the winter, making it just as spectacular and invaluable to me as any famous wilderness or national park. And just as worthy of protection. □

Sarah Jane Keller is a Montana-based freelance journalist who tries to spend every spare minute on public land.

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HEARD AROUND THE WEST | BY BETSY MARSTON

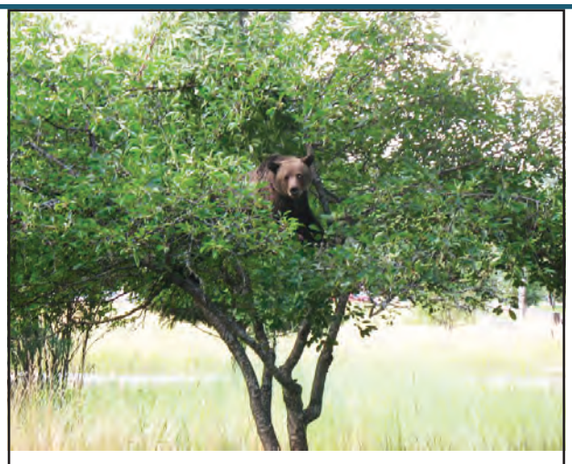
NORTHERN ROCKIES

If any place is a Western icon, it's Yellowstone National Park, which happens to sit atop a massive caldera that could turn into a super-volcano at any time, or so geologists say. Despite that, 4.2 million people visit the park every year. Yellowstone has long been a magical place of boiling springs and surprising geysers, but in 1877, when early visitors Frank D. Carpenter and his companions first arrived, they did other things besides *ooh* and *ahh* at Old Faithful. After an arduous trip on horseback, they had dirty laundry, so "the group put their soiled clothes in a pillowcase and threw it into the geyser's cone. When it erupted, the clothes were sent flying over 100 feet in the air," reports *Atlas Obscura* writer Eric Grundhauser. Once rounded up, the clothes appeared to be boiled clean.

The park doesn't keep an inventory of all of the foreign objects that have been ejected from its many geysers and pools, but anecdotes abound. Certainly, Carpenter and his pals didn't stop at turning geysers into super-powered washaterias, as Carpenter revealed in his book, *The Wonders of Geyser Land*. For its next trick, he and his group piled "at least a thousand pounds of stones, trees and stumps" into Old Faithful, which dutifully "expelled" it all into the air. Carpenter found this an "entertainment of unusual magnitude and duration," and unfortunately, geyser-dumping became a trend. Yellowstone spokeswoman Linda Veress said that in the 1880s, visitors — finding the bubbles delightful — threw so much soap into the geysers that gift shops couldn't keep bars of soap in stock. One man even tried to open a laundromat, but that failed when the geyser blew up his business, along with his tent.

Creation of the National Park Service in 1916 helped discourage these destructive experiments, but increasing numbers of tourists continued to surreptitiously throw coins, trash and rocks into geysers. As a result, the Handkerchief Geyser, once as famous as Old Faithful, stopped functioning in the 1920s or '30s, Veress said. According to T. Scott Bryan's *The Geysers of Yellowstone*, another geyser called Morning Glory was artificially induced to erupt in 1950 in an effort to clean out its debris — a kind of geothermal enema. What emerged included "bottles, cans, underwear, 76 handkerchiefs and $86.27 in pennies." Toss in a penny today, said Veress, and the fine can be up to $5,000 and six months in jail. Yet an unknown number of tourists continue to treat the park's geothermal wonders as trashcans or wishing wells. Recently, a new kind of debris fell into the Prismatic Spring, thanks to a visitor from the Netherlands who was piloting a drone. The drone "was recovered but not returned," said Veress.

So what are the chances of Yellowstone, the earth's largest known potential supervolcano, blowing up and killing everyone within hundreds of square miles? In his new book, *Wonderlandscape: Yellowstone and the Evolution of an American Cultural Icon*, John Clayton is reassuring. Although the last eruption was 640,000 years ago, meaning that another is just about due, the U.S. Geological Survey estimates the probability as about 1 in 700,000 — "about the same as that of an asteroid hitting the earth." Yet we worry, he says, because many of us see the world threatened as never before, making the Yellowstone supervolcano "the zombie apocalypse wrapped in mostly legitimate science." In the summer of 2014, for example, a series of videos went viral and may have alarmed over a million viewers. They reportedly showed animals fleeing Yellowstone in advance of an alleged volcano eruption. Clayton says there was just one problem: "The animals were actually running *toward* the park."



MONTANA **Beary picking.** JAN METZMAKER

WEB EXTRA This was among the entries in the *HCN* photo contest. See the winners on page 10, and a gallery of the best entries at **hcne.ws/photos-17**.

COLORADO

Gathering for conversation at a "Death Café" in the town of Hotchkiss in western Colorado recently, about two dozen people talked freely about getting prepared and trying to make things easy on the heirs, as well as their hopes for a "good death" without too much pain or fuss, and the possibility of suicide, if necessary. One 90-something man, though, took the cake for frankness, reports the *North Fork Merchant Herald*. "I'd be OK if I died tomorrow," said Bob Heid of Crawford. "I'm not afraid of death." In fact, Heid is so comfortable with the inevitable that he said he'd already had a gravestone installed at the Crawford Garden of Memories. He's also had the stone engraved with the date of his expected death — his 100th birthday.

CALIFORNIA

Speaking of death, a powerful rainstorm swept through Death Valley National Park recently, bringing winds of up to 100 miles an hour and fast and furious lightning bolts, said Park Superintendent Mike Reynolds. It only lasted 10 minutes, but the microburst blew the roof off a historic building as well as the windows from several cars. What was most striking, Reynolds said, was watching dumpsters blowing down the road — an extreme form of trash pickup.

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

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

"While publicizing the deaths of wolves is good for headlines and fundraising, the resulting **polarization leaves wolves even more vulnerable to rural anger, poaching and legislative repercussions.**"

Mitch Friedman, in his essay, "Rural communities can coexist with wolves. Here's how," from Writers on the Range, hcn.org/wotr