TIMBER AND THE CLIMATE | DESERT COLLABORATION UNDONE | URANIUM RESURGENCE

High Country News

For people who care about the West

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Little Weed, Big Problem

A genetically modified grass is loose in Oregon. It could have been much worse.

By Julia Rosen

Genetically engineered creeping bentgrass that has escaped weed control efforts in an Ontario, Oregon, ditch.
OTTO KITSINGER

On the cover

Genetically engineered creeping bentgrass grows along a gated irrigation pipe by a field of hay and orchardgrass in Ontario, Oregon.
OTTO KITSINGER FOR HIGH COUNTRY NEWS

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A genetically modified grass is loose in Oregon. It could have been much worse. By Julia Rosen

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Editor's note

Miraculous misdeeds

In September 2012, the Scotts Miracle-Gro Company was fined $4 million for illegally applying pesticides that were known to be toxic to birds — to a line of birdseed. The company pled guilty to adding the two pesticides to its seed to prevent insect infestation during storage, even though the Environmental Protection Agency prohibited their use.

Scotts sold the birdseed illegally for two years, and ignored warnings from its own employees for six months before it finally recalled the product in March 2008. By then, Scotts had sold more than 70 million units of seed, according to the Justice Department, and committed 11 criminal violations of federal law. The $4 million criminal fine was the largest to date under the Federal Insecticide, Fungicide and Rodenticide Act. A subsequent $6 million in civil fines and $2 million on environmental projects were similarly unprecedented. Yet added together, that $12 million or so was a mere kernel in the seed silo for the company, which a year later reported a net sales of $2.82 billion and adjusted income of $174.4 million.

A few years earlier — presumably with similar dedication to the bottom line — the company had developed a golf-course grass that was resistant to Roundup, the controversial, potentially carcinogenic herbicide produced by Monsanto, a biotechnology company with total assets last year of $8.65 billion. In its attempt to build a better putting green, Scotts lost control of its experiment, allowing the wind to spread the modified plant far afield, literally, in eastern Oregon. The U.S. Department of Agriculture later fined Scotts $500,000 for the fiasco. As writer Julia Rosen reports in this issue's cover story, that plant, a modified version of creeping bentgrass, is now a headache for eastern Oregonians and a pointed demonstration of a dysfunctional regulatory system.

For these two misadventures, which blatantly ignored any non-commercial value in the natural world, Scotts paid about $13 million, a touch more than half the compensation it paid its chief executive officer and board chairman, James Hagedorn, in 2017. So while in some ways this cover story is a question about regulatory and corporate accountability, it also forces us to ask whether we've established a society that properly reflects our values. Has the punishment fit the crime here? After all, this obdurate turf-grass is now a part of Oregon's landscape, an outcast child of mega-corp parents and a portent of worse to come. To top it all off, thanks to political wrangling and regulatory shortcomings, Scotts is not longer on the hook for bentgrass containment — leaving a rural community with a mess on its hands and Scotts with all the more money to work on its next miraculous product.

Brian Calvert, editor-in-chief

The Navajo Generating Station, the largest coal-burning power plant in the West, is expected to close in 2019. PAUL SOUDERS

Arizona utility dodges coal

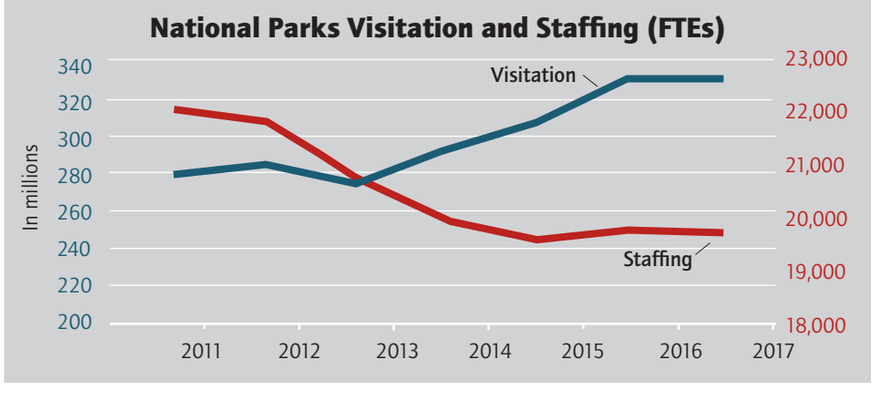
The Navajo Generating Station, the West's largest coal-burning power plant, is one step closer to its planned closure in 2019. In June, its main customer, the regional water utility known as the Central Arizona Project, voted to sign a 20-year power purchase agreement with a solar company. Those working to save the plant fear that CAP's decision to move forward with alternative suppliers will prevent buyers from investing in the generating station. The utility has said it will still consider purchasing electricity from the power plant if a new owner can "provide competitively priced power." The CAP's decision runs counter to the coal-friendly Trump administration, which has tried to bolster the country's coal production. Utility Board President Lisa Atkins stated that the contract did not mean the utility was "at war with coal." Rather, it is seeking a "long-term, cost-effective, reliable and diverse power portfolio." Coal, it would appear, no longer has a prime spot in that energy mix.
JESSICA KUTZ
Read more online: hcne.ws/choosing-solar

> "It's just wrong. This is really an ancestor here, who's been stuck on this shelf next to animal skulls."
>
> —Louellyn White, professor of First Peoples Studies at Concordia University in Montreal, talking to a reporter about the display of Indigenous human remains.
> GRAHAM LEE BREWER *Read more online:* hcne.ws/honoring-past

7-2 Ratio by which the U.S. Supreme Court ruled that a Denver baker was within his rights when he refused to make a wedding cake for a gay couple. A lower court had ruled that the baker violated Colorado's public accommodations law, which forbids discrimination by businesses serving the public, including on the basis of sexual orientation. DAVE MISLIN/THE CONVERSATION *Read more online:* hcne.ws/religious-freedom

National parks endure rising visitation and less staff

On Memorial Day weekend, one of the busiest weekends for national parks, some parks didn't have enough staff to even take payment from visitors. Funding levels for staff have been dropping for years as parks open their gates to growing crowds. While politicians mull how to pay for parks, the unpaid costs of maintaining important infrastructure have piled up to $12 billion. Further cuts to park funding proposed in the 2019 budget show why "America's best idea" now has the label of being "loved to death."
CARL SEGERSTROM
Read more online: hcne.ws/ailing-parks



Despite an increase in visitation, full-time equivalent, or FTE, staff numbers continue to fall.
NATIONAL PARKS CONSERVATION ASSOCIATION USING PARK SERVICE DATA

Attorney General Jeff Sessions speaks during the Western Conservative Summit in Denver, publicized as the largest conservative gathering outside of Washington, D.C.
AARON ONTIVEROZ/THE DENVER POST VIA GETTY IMAGES

Jeff Sessions speaks in Denver

Justice Department Attorney General Jeff Sessions spoke at the Western Conservative Summit held in Denver recently. Amid a standing ovation, he praised his boss — President Donald Trump — for governing as a "law and order president." Under Trump's leadership, Sessions said, his department was reducing crime, combatting the opioid epidemic and cracking down on illegal immigration. When Sessions mentioned the quantity of drugs seized at the border, someone in the audience yelled, "Build that wall!" The attorney general paused: "Build that wall, I hear," he said. "We absolutely will." SARAH TORY
Read more online: hcne.ws/denver-sessions

Trending

Actually, I think stoke *will* save us

In a response to Ethan Linck's recent essay, "Your stoke won't save us," Outdoor Alliance Policy Director Louis Geltman counters: "Stoke is going to save us." He argues that the outdoor recreation community is primed to take action to protect public lands. "Stoke is what motivates paddlers to spend their careers advocating for dam removals," he writes. "Stoke is what inspires thousands of adventurists to write Congress in defense of the Arctic, a place most of them will never visit."
LOUIS GELTMAN

You say

JIM WALSETH: "My concern is that stoked persons do a lot more traveling than less-stoked naturalists. Being active in the outdoors typically has quite a carbon footprint."

MICHAEL J. DAX: "The author misunderstands Ethan Linck's argument. It's not the idea that their motivations are self-serving that he's criticizing. It's the idea that in their self-service or impurity, recreationists' needs fall woefully short and are relatively narrow compared to those of species, watersheds, etc."

PHIL BROOKE: "The article misses the vital role stoke plays in revitalizing struggling rural communities, which used to rely on extractive industries for livelihoods."

Read more online: hcne.ws/praise-stoke and Facebook.com/highcountrynews

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

SYSTEMIC DISCRIMINATION

Thanks for Wayne Hare's article on Portland segregation (" 'Alienated' in Portland," *HCN*, 5/28/18). The process by which blacks are segregated and redlined is common everywhere. Our church here in Louisville, Kentucky, recently hosted a four-part series on systemic racism. We learned there that the same thing happened here — and happens everywhere. I had no idea that the Federal Housing Authority deliberately ensured that blacks were unable to get mortgages. Discrimination expert Richard Rothstein, whom Wayne mentions, has written a book, *The Color of Law*, which goes into great detail about the whole process. Heavy reading, but worth it.

Joy Jamison
Louisville, Kentucky

A TAILINGS-PILE CHILDHOOD

Ah, fond memories of growing up playing in the Animas ("The River of Lost Souls," *HCN*, 5/28/18). I, too, well remember the dust from the tailings pile swirling through the valley and dusting the town. My brother, Woody, used to sneak over and ski the tailings pile. I've always wondered: Did the rare cancer that took his life so early come from these exposures?

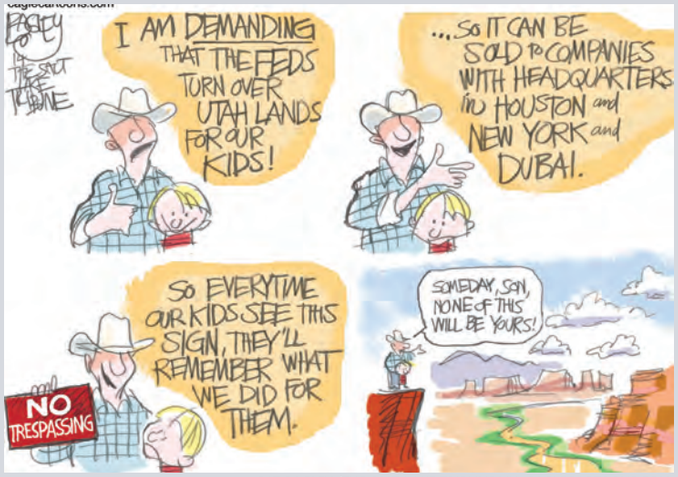
As kids, we sensed some hostility towards the San Juan Basin Health Department, where our father worked, particularly from the county commissioners. Reading about George Moore makes me wonder: Did that spring from resentment toward Moore's research? I can imagine he wasn't too popular in some circles in town.

Dennis Hesselbarth
Poulsbo, Washington

SAGEBRUSH BIRDSONG

What a lovely piece ("The benediction of a bird," *HCN*, 5/28/18). I feel the same about the song of the horned lark — a weightless, upward jumble of notes that never fails to remind me of my home among the sagebrush of the high desert. Thank goodness for birds to fill the air with song when we need a reminder of peace and hope and life.

Jessica Neuwell
Rawlins, Wyoming



PAT BAGLEY/THE SALT LAKE TRIBUNE VIA CAGLECARTOONS.COM

SELF-RIGHTEOUS CHARLATANS

Bravo to Tay Wiles for her insightful profile of the Bundy family and their sympathizers ("Celebrity scofflaw," *HCN*, 4/30/18). It is disturbing that there are actually people and politicians who believe that Cliven Bundy and his family are martyrs or folk heroes who have "legitimate grievances" in their battle with the U.S. government. They don't.

The facts in the Bundy case are simple. For years, they have refused to pay federal grazing fees (rent) of more than $1 million on government-owned land. They don't recognize the authority of the federal government to manage land, and say that the U.S. Constitution and God are on their side.

As a young congressional staffer, I helped write the Public Rangelands Improvement Act in 1978. The federal grazing fee established by that law is a rancher-friendly formula designed by Congress to keep fees low when ranchers are beset by poor beef prices and/or high costs of production. The management plans that the Bundys so revile are based on congressional laws that require grazing on public lands to be balanced with other public goals and needs, such as wildlife and air- and water-quality protection.

Bundy cattle graze on federal lands acquired by the U.S. from Mexico in 1848. Those lands have never legally belonged to the state of Nevada, the Bundys, or anyone other than Uncle Sam. When it was granted statehood in 1864, Nevada received roughly 5.5 percent of the land from the U.S. to benefit its schools. But the Bundys' grazing lands were not part of those conveyances. Arguments that it's time to give the land "back" to the state ring hollow. Nevada can't get something "back" that it never owned.

At best, the Bundys are self-righteous charlatans and thieves. Their attitude that the federal government and courts have no authority over them cannot be tolerated. It's always scary when folks invoke God to justify their thievery. If the Bundys' federal grazing permits continue, it should be on the condition that they pay their fees and honor Bureau of Land Management plans. Otherwise, their permits should be reassigned to hard-working ranchers who are willing to obey the law.

Andy Wiessner
Snowmass, Colorado
High Country News *board member*

MILLENNIALS, OF COURSE

"Death in the Alpine" (*HCN*, 5/14/18) reads like yet another article bemoaning millennials and their obsession with social media. However, given the increase in popularity of outdoor recreation reported on this same issue (i.e., on page 9, "Recreation is redefining the value of the West's public lands,") it seems a much more straightforward explanation simply that more people are attempting to summit these peaks than have done so in the past. Attributing these deaths to social media seems to feed into a particular narrative about young people, rather than being based on the evidence. I would be much more interested to know how the number of deaths relates to the overall number of attempts, and whether that number is greater now than in the past.

Mara McPartland
St. Paul, Minnesota

WITHOUT A WHIMPER

Thank you for a well-written article on this amazing animal ("A quiet goodbye to the Selkirk caribou," *HCN*, 5/28/18). Author Ben Long captured my thoughts on how we got them to this place, and the lack of voices for their needs to be heard. I saw them up close just over a decade ago, about four or five caribou. Truly spectacular. It is sad to learn that they are likely to be gone, without, perhaps, an audible whimper.

Martha Jordan
Everett, Washington

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Oregon's biggest carbon polluter? Timber.

A new study finds that forests are key to reducing the state's climate impacts

BY CARL SEGERSTROM

A Weyerhaeuser lumber mill in Coos Bay in Oregon's Coast Range. ROB CRANDALL/ALAMY STOCK IMAGE

Last summer, the skies of Oregon turned a foreboding shade of gray, as wildfires blackened forests and left people gasping for air. Politicians railed about the need to ramp up logging to improve Oregon's air, environment and economy. The combination of fires and heated rhetoric got Oregon State University researcher Beverly Law pondering forests and their carbon storage and emissions.

Because of smoke's human health impacts, the conversation about pollution and forests typically centers on fires. But the study Law and her colleagues put together earlier this year found that wildfire is not the biggest source of climate-warming carbon dioxide in Oregon's forests. The carbon footprint of logging and wood products, including direct emissions from logging and milling and the elimination of forests' carbon sinks, outstrips it. Figuring out the role of forests and wood in carbon pollution could have major policy implications, as Gov. Kate Brown, D, has pledged to meet the emissions goals of the Paris climate accords.

The conversation about carbon pollution often centers on emissions from automobile tailpipes and burning coal, but plants that absorb carbon from the atmosphere play a large role. According to the study, Oregon's ecosystems were able to soak up more than 70 percent of the state's carbon emissions between 2011 and 2015. The forests of Oregon's Coast Range, which are part of an ecosystem that runs from Northern California to Alaska's Tongass National Forest, are some of the best in the world at sucking up and storing carbon.

The Oregon State University and University of Idaho research team found that the wood-products industry is the largest sector contributing to carbon pollution in Oregon. "In a relative sense," Law says, "fires are small for carbon loss." Wood products generated about one and a half times more emissions than the transportation or energy sector emissions reported by the Oregon Global Warming Commission. Wood-product emissions come from fuel burned by logging equipment, timber hauling and milling; wood burned during forestry activities; and the ongoing decomposition of trees after they are cut. Forest fire emissions were less than a quarter of all forest sector emissions in each of the five-year increments studied between 2001 and 2015.

Wood produced under Oregon forestry laws is marketed as being environmentally friendly — eligible for LEED certification, a standard for green building, according to the state-run Oregon Forest Resources Institute. But the researchers' analysis, which calculated the carbon generated by harvest and product emissions, found that, even accounting for the replacement of fossil-fuel-intensive products like steel and concrete, wood is still a major producer of carbon dioxide. "I love wood, and it would be nice to have wood buildings in the Northwest because they take earthquakes better," Law says. But "we think we've been giving wood too much credit" as a green building material.

The study suggests a few ways the industry could reduce pollution and improve Oregon's carbon budget. If forests were clear-cut less frequently and public-lands logging was reduced, for example, there would be significant improvements in carbon capture in Oregon's forests. Habitat conditions and water retention in forests would also improve.

Large privately owned forests, which are typically clear-cut and then replanted with Douglas firs, are the primary source of timber in Oregon. Large private companies own about 20 percent of the state's forestland in Oregon and produce about 63 percent of its timber, according to the Oregon Forest Resources Institute. Currently, these tree plantations are cut roughly every 45 years.

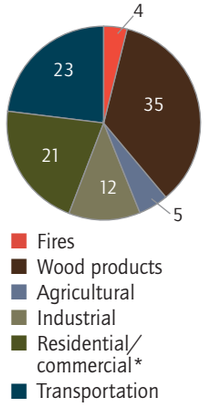
The study shows that extending the time between harvests on private forests to 80 years and halving the harvests in publicly owned forests would increase carbon storage in Oregon forests by 17 percent by 2100.

These shifts would come with a cost: Managing forests solely for their pollution-absorbing potential will mean even fewer jobs in an industry that has severely contracted over the last few decades. Reductions in federal harvests, the growing automation of timber felling and milling, and competition with international markets have taken chunks out of Oregon's timber economy. The industry accounted for fewer than 30,000 jobs statewide in 2016 and was responsible for about 2 percent of the state's GDP, according to a presentation by Josh Lerner with the Oregon Office of Economic Analysis. Still, in five rural counties timber accounts for more than 10 percent of private sector jobs, according to Lerner's report.

Law's research could have regional implications: She is working on a large-scale study of how land use affects carbon emissions across the West. Stanford forest carbon researcher Christa Anderson says studies like these are important to understand the impact of land use and forests in the atmosphere's carbon balance.

Anderson, whose research has informed California's climate policies, says that forests can play a part in slowing climate change but that growing them won't be enough. "There's definitely a role for forests to play in climate change mitigation," Anderson says. "But we also can't think of them as *the* heavy lifters." □

Carbon dioxide emissions by sector in Oregon, 2011-2015



* Note: Utility fuel use is subtracted from residential and commercial data reported by the Oregon Global Warming Commission.

SOURCES: OREGON GLOBAL WARMING COMMISSION AND OREGON STATE/UNIVERSITY OF IDAHO STUDY

Carl Segerstrom is an editorial intern at *High Country News*. @carlschirps

A new danger to the desert

In California, the Trump administration stymies a collaboration decades in the making

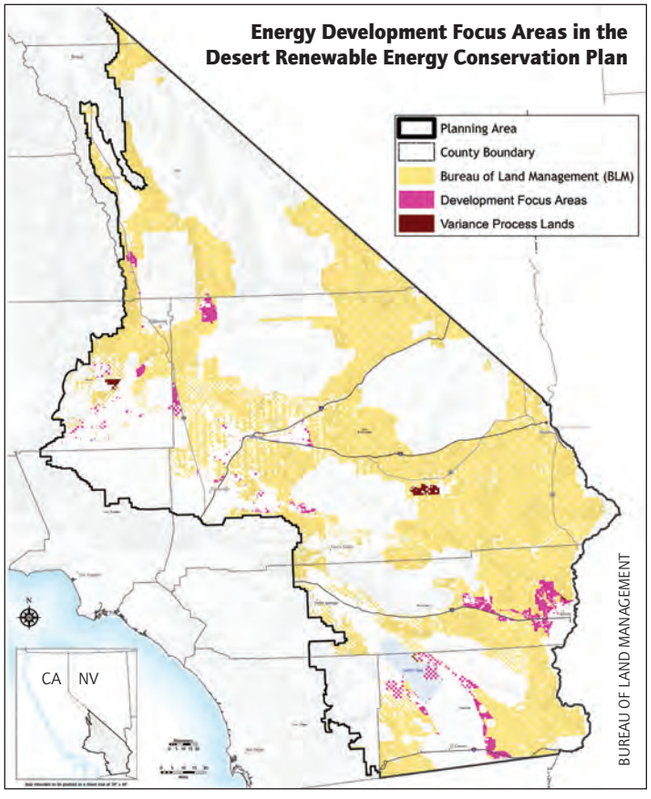
BY AMY MATHEWS AMOS

In 2002, Pat Flanagan, a 78-year-old conservation activist, fled the bright lights of the big city for outer San Bernardino County and the stark beauty of the Mojave Desert. "I'm a desert person," Flanagan said. "I have to live here."

Her home sits in a part of California that encompasses three deserts — the Mojave, the Colorado and the Sonoran — five national parks and monuments, and more than 10 million acres managed by the Bureau of Land Management for multiple uses, including conservation of threatened species such as the desert tortoise, desert bighorn sheep and Coachella Valley fringe-toed lizard.

People give up a lot to live in this remote region: "a social life, movies, concerts, shopping," Flanagan said. "They come here for the peace and quiet."

But soon after she arrived, that tranquility faced a new threat: a solar gold rush. The BLM's offices were flooded with applications to build large-scale solar facilities in the desert. In response, the agency began a comprehensive planning process to identify areas appropriate for development. After eight long years, the state of California and the U.S. government officially approved the plan in September 2016. Now, the Trump administration has proposed a review of the plan, which could result in a major overhaul and upset an uneasy truce between environmentalists, locals and the solar industry.



The Trump administration has proposed allowing more energy development on the 22.5 million acres covered by the plan.

The rush began soon after the state passed its first renewable energy standards in 2002. Then, in 2009, the federal government promoted renewable energy projects as part of its economic stimulus package. Suddenly, the state and feds agreed: Solar could help save the world from climate change while recharging a moribund economy battered by the 2008 recession.

Policymakers in D.C. and Sacramento may have seen the limitless solar resources of the desert as a panacea, but Flanagan and her neighbors dreaded the wholesale invasion of their wild, peaceful landscape. Large-scale solar facilities can blanket hundreds or even thousands of acres with massive panels. Depending on their size, siting and technology, solar facilities can destroy wildlife habitat, attract and kill unsuspecting birds, and trigger dust storms that race across disrupted desert soils. The construction of Ivanpah on BLM land near the Nevada border — one of the first and largest facilities approved at 3,500 acres — is estimated to have harmed dozens of adult desert tortoises and countless eggs and juveniles.

David Lamfrom, director of the National Parks Conservation Association's California Desert and National Wildlife Programs, arrived in the desert as a new staffer in 2008, just as the rush was accelerating. "There were no guidelines on how to do renewable energy on public lands," he said. And national environmental groups were willing to let a few bad projects slip through while waiting for the completion of a multi-state environmental assessment to address larger ecosystem issues. "(They) believed the only way to avoid a climate crisis was to move forward on renewable energy," he said. "And to do that, they said, 'You gotta break a few eggs.' The folks here in the desert, we were saying, 'Those are *our* eggs.' " Despite his newbie status, Lamfrom convinced his bosses back in D.C. that they couldn't sacrifice what he calls "an ecological gem" at the altar of quick renewable energy projects.

As local resistance grew, the BLM opened a collaborative process involving state and federal agencies, county and tribal governments, industry and conservation groups. In 2015, the BLM released a draft Desert Renewable Energy Conservation Plan (DRECP) encompassing all 22.5 million acres of public and private land in the desert region, including nonfederal land in the seven California desert counties. But counties raised serious concerns, such as who was authorized to permit projects, and how solar development worked on private lands exempted from property taxes by state law, as well as how to preserve rural residents' quality of life.

So the BLM divided the plan into two phases. Phase I encompassed the 10 million acres under federal jurisdiction, finalized in September 2016. Phase II includes renewable energy plans developed by each affected county for lands under its jurisdiction, many of which have been completed.

Now, despite all the local dialogue that went into creating the plan, the Trump administration is considering reopening it. In its February 2018 announcement, the BLM quoted President Donald Trump's executive order directing federal agencies to review actions that could "potentially burden the development or use of domestically produced energy resources." The BLM had withdrawn new mineral leases within the DRECP area, but soon after its announcement, it canceled that withdrawal, potentially opening up some areas to mining.

Renewable energy associations were concerned that the plan did not set aside enough public lands for development, the BLM said, and it solicited public comments to help set the parameters of a review.

A hiker in the Ivanpah Valley of the Mojave Desert, with the Ivanpah Solar Electric Generating System in the distance.
LARA KOBELT/BUREAU OF LAND MANAGEMENT

"The original vision was renewable energy and conservation (of lands)," said Shannon Eddy, executive director of the Large-Scale Solar Association. "Now it's a conservation plan." The vast majority of the acres covered by Phase I are set aside for conservation or recreation; only 388,000 acres are designated as appropriate for energy development.

Even in those areas, environmental requirements limit industry activities. "Instead of streamlining approval in appropriate areas, it's even harder to develop projects now than before the DRECP," Eddy, a former Sierra Club staffer, said. She believes solar power is critical for combatting climate change and is frustrated by the restrictions. "We need to get used to seeing these (facilities) on the landscape. We're at the point now with climate change where we don't have the luxury of not doing projects."

But Eddy's industry never requested that the DRECP be reopened. Instead, in combined comments to the BLM submitted in March, the Large-Scale Solar Association and the Solar Energy Industry Association reiterated their concerns and suggested adjusting the existing plan and working out issues during implementation. The California Wind Energy Association was less conciliatory: Executive Director Nancy Rader said she doesn't see how its concerns can be addressed without amending the plan. But, like Eddy, she said her group did not request that it be reopened.

The BLM's notice of the review also mentioned local opposition, specifically from California's Riverside County and the city of Blythe. BLM spokesperson Sarah Webster cited two letters written in 2016. In one, John Benoit — the now-deceased chairman of the Riverside County Board of Supervisors, a key player in the DRECP process — maintained that the plan hindered renewable energy development on BLM land, thereby driving solar development to private lands within the county. The city of Blythe's letter simply supported Benoit's letter.

"We were somewhat surprised to see Riverside County referred to (in the notice) for reopening the plan," said Juan Perez, director of Riverside County's Transportation and Land Management Agency. He confirmed that the county submitted comments in 2016. But in his official response to the BLM's 2018 solicitation for comments, Perez suggested gathering a working group to explore possible modifications of environmental requirements, within the framework of the existing plan. "It's not the right time to jump to a reopening of the plan," he said.

Frazier Haney, director of Land Conservation for the Mojave Desert Trust, believes that the DRECP review is just an excuse by the administration to open the desert to extraction. "If you look at the *Federal Register* notice soliciting comments," he said, "they throw in grazing, off-road vehicles, and mining," as factors to consider. Haney thinks that by stirring up those old issues, the administration will find an excuse to overhaul the plan.

It just might work. Although almost none of the plan's participants call for reopening it in their recent comments to the BLM, many did reiterate their lingering concerns. And though some opposed reopening the plan, others — such as San Bernardino County, which includes half of all the acreage addressed in it — chose not to take a position.

Moreover, collaborative processes are inherently fragile, said Alison Gash, associate professor of Political Science at the University of Oregon. Gash has studied what makes some successful. "These things are based on relationships," she said. "If any single relationship changes, the collaborative will change as well." Effective collaboration requires equality among stakeholders. "If the government wants to reassert its power, it can do that," she said. "But that's essentially a member of the collaborative reneging on its commitment to the effort."

The comment period ended in late March, and the BLM said that, by late spring, it will release a scoping report based on the 25,000 comments it received, most of which, according to conservation groups, supported keeping the plan in place. The agency has yet to announce its next steps, and the report had not been released as of press time.

It's not the first time the Trump administration has undone years of collaborative natural resource planning. Interior Secretary Ryan Zinke has reopened the multistate sage grouse conservation plan hammered out over a decade, to facilitate fossil fuel development. And the Interior Department reduced the size of national monuments in Utah in 2017, over the objections of tribal nations and some local communities.

If the BLM scraps the DRECP, some fear a return to the uncertainty and lawsuits of more than a decade ago. Back then, with few guidelines and an open desert, energy companies often proposed facilities on environmentally sensitive sites. Local and tribal groups fought proposals case by case, ultimately slowing development. Now, environmental groups might legally contest any revised plan that ultimately emerges.

Neither Flanagan nor those who have championed the desert along with her will concede ground easily. "The people here are extraordinary," she said. "They are motivated and smart and they do their work. They're not taking this quietly." □

Amy Mathews Amos is a writer and science communication coach in New Mexico.
@AmyMatAm

THE LATEST

Backstory

After the coalbed methane boom ended in the mid-2000s, Wyoming saw a big jump in the number of abandoned gas wells, including many on federal and tribal land, where the Bureau of Land Management oversees cleanup. The agency charges a small $25,000 bond to cover all of a company's wells in a given state, though reclaiming a single one may cost up to $30,000. On state and private land, meanwhile, bonds are at least $75,000 ("Coalbed methane bust leaves thousands of orphaned gas wells in Wyoming," *HCN*, 1/1/14).

Followup

A new report from the Government Accountability Office lays out the BLM's difficulties in managing abandoned oil and gas wells, noting that it lacks consistent procedures for reviewing wells and bonds, and has not systematically tracked data on cleanup expenses and potential liability. Today, **with an estimated 219 orphan wells and more sure to come, the BLM may face at least $46.2 million in reclamation costs**. For comparison, the agency spent $3.8 million on cleanups between 1988 and 2009.

JODI PETERSON

An abandoned coalbed methane well sits in a pool of water near Gillette, Wyoming.
STEPHANIE JOYCE / WYOMING PUBLIC RADIO

THE LATEST

Backstory

Sagebrush once covered more than 500,000 square miles of the West. Today, it's about half that, thanks to development, wildfire, invasive species and poorly managed grazing. The greater sage grouse has been vanishing along with its habitat, which supports some 350 other species, from sage thrashers and pygmy rabbits to sandhill cranes and elk. In response, federal, state and local agencies, tribes and private landowners have collaborated on plans to conserve sagebrush habitat and keep the grouse off the endangered species list ("Little Big Bird," *HCN*, 8/17/15).

Followup

Now, a new report from the Western Association of Fish and Wildlife Agencies says that **sagebrush is rapidly losing ground to invasive plants and wildfire**. More than 157,000 square miles are infested with exotics such as cheatgrass and medusahead, which crowd out native species and increase fire danger, and lack of funding hinders effective management and post-fire restoration. Meanwhile, the Trump administration is rewriting the collaborative plans meant to protect the grouse.

JODI PETERSON

A cheatgrass-infested sagebrush stand near Boise.
MATT LAVIN CC VIA FLICKR

The Kanab North Uranium Mine — a breccia-pipe mine now in reclamation — sits just above Kanab Creek in northern Arizona. ECOFLIGHT

Uranium mining reopened?

Republicans want to lift a ban on Grand Canyon mineral exploration

BY MAYA L. KAPOOR

In the ponderosa pine forests and deserts of northern Arizona, the Colorado River undulates for 277 miles through the red-banded rocks of the Grand Canyon. Millions of people visit the canyon each year, but few know about the region's other geologic rarity: uranium-rich columns of rubble. Some 200 million years before the Grand Canyon existed, subterranean water hollowed out pockets in the Colorado Plateau. Over time, the rock layers above collapsed into these empty spaces, creating underground shafts, called breccia, or "broken," pipes, approximately 300 feet in diameter and up to 1,000 feet deep. Their rubble pulled uranium from groundwater — meaning that the pipes hold some of the nation's richest and most accessible uranium deposits.

"(A breccia pipe) is like this plug of uranium," U.S. Geological Survey hydrologist Fred Tillman said. "(Mining companies) can get in there, and get it all in five years, and be gone, whereas other mines, they're there for decades. ... It's about as perfect a mining opportunity as you could want if you're a mining company."

Since 2012, a moratorium has blocked any new effort to mine this uranium near the Grand Canyon. Now, the Trump administration and some Western members of Congress are pushing to lift that moratorium. This worries federal scientists, who have made slow progress toward understanding the dangers that uranium mining poses to the region's water and wildlife, and it frustrates local communities, who have long opposed mining here.

Between 1956 and 2009, mining companies pulled 23.3 million pounds of uranium from the Grand Canyon region, creating a legacy of polluted water, contaminated soil and toxic mine sites. More than 800 active claims already dot the landscape that the moratorium covers, and many more could. Not all breccia pipes hold uranium, but the USGS estimates that 205 million pounds of the heavy metal remain to be claimed in the moratorium area.

The moratorium resulted from a mid-2000s uranium rush, when companies staked thousands of claims on the Colorado Plateau. In response, then-Secretary of the Interior Ken Salazar froze new uranium mining claims on approximately 1 million acres of land for two years, while researchers investigated possible dangers. In 2012, citing concerns about the "natural, cultural and social resources" in the park and beyond, Salazar established a 20-year moratorium.

Mining companies and Republicans pushed back. In 2012, the National Mining Association and others sued unsuccessfully to overturn the ban on new mining claims. Arizona Rep. Paul Gosar, R, who coauthored legislation in 2011 to prevent the moratorium, is also championing the current efforts to lift it. In May, he led Republican members of the Congressional Western Caucus in penning a letter requesting the moratorium's end, calling restrictions on minerals such as uranium dangerous for national security. Gosar has not responded to requests for comment.

Now, the Trump administration is moving to make mining uranium easier. In an executive order last year, President Donald Trump exhorted agencies to review all federal regulations that might lessen or delay domestic energy production, including nuclear energy. The administration has also expressed interest in developing more nuclear weapons to add to the country's current stockpile of an estimated 4,000 nuclear warheads. In May, the administration listed uranium as a critical mineral, even though only nonfuel minerals may be listed. The next week, Nevada Rep. Mark Amodei, R, added a rider to the 2019 defense spending bill that

Maya L. Kapoor is an associate editor with *High Country News*. @Kapoor_ML

would weaken the environmental review process for critical minerals extraction.

For several years, uranium prices have been too meager for mining to be profitable. In January, mining company Energy Fuels Resources, whose parent company is Canadian, and others petitioned the administration to impose a quota on uranium imports and require utilities and agencies to purchase uranium from domestic sources. And they continue pushing for more mines. Speaking before the House Committee on Natural Resources last December, Katie Sweeney, senior vice president and general counsel for the National Mining Association, said, "The scientific, technological and socioeconomic facts have not supported the need" for the million-acre withdrawal.

More than a decade ago, as Salazar considered creating the moratorium, he tasked a team of USGS scientists, including Tillman, with providing information on uranium mining's risks to the region. It quickly became apparent that important information was missing: how uranium mining affected wildlife, whether regional aquifers — and the Colorado River — might become contaminated, and whether local water supplies would vanish. The moratorium gave researchers time to tackle these questions, though funding for the studies had to be approved by Congress each year. The research has been underfunded, leading to large gaps in knowledge. "From the scientific perspective, there's just so much we don't know," Tillman said. If an accident occurred at Canyon Mine, on 17 acres of barren red dirt in deep green forest, nobody knows whether that contaminated water would flow toward the Grand Canyon and the tribes that rely on local water sources, or harm the town of Tusayan, six miles away. And the Redwall-Muav aquifer, below the Grand Canyon, is one of the state's largest. It connects to the Colorado River, and if mining contamination reached it, that could affect the water supply of some 30 million people, according to the nonprofit American Rivers.

Scientists also have very little data on uranium mining's threats to wildlife. Uranium dissolves quickly in water, so mines create fenced-off drainage ponds to store contaminated groundwater and runoff. In the region's high desert, those ponds attract thirsty wildlife. "You can imagine, any bird, critter, anything that can get into there, wants to get into that pond," Tillman said. And piles of waste rock attract animals burrowing out of the heat. There is also potential for uranium-tainted dust to blow offsite, creating windborne "blooms of radiation," which have been detected near North Rim mines. But scientists haven't yet traced the wider effects of that exposure on wildlife or humans. If the moratorium were lifted, funding for that work could disappear, too.

Regional tribes, including the Havasupai, Navajo, Hualapai and Kaibab-Paiute, have long opposed the uranium mining. Last October, the National Congress of American Indians passed a resolution against ending the moratorium.

Tribal opposition stems partly from the industry's history in Indian Country. On the Navajo Nation, more than 500 abandoned uranium mines await remediation, and research has found increased cancer rates among Navajos who worked in mines or live near contaminated sites. In Laguna Pueblo in New Mexico and elsewhere, residents live beside tailings piles.

The Havasupai want more research on whether they are exposed to dangerous uranium levels. The tribe lives at the bottom of the Grand Canyon, relying on springs and streams for water, and breccia pipes penetrate the aquifer that supplies that water. The Havasupai fear new mines could contaminate the water, if it hasn't been contaminated already. The national security argument for rescinding the moratorium galls Carletta Tilousi, a Havasupai tribal councilmember, because it overlooks the threats to local health. "It's for the protection of all of us," Tilousi said, "but how are we really protected? Are we protected in our own communities? Our own state?"

Religiously significant places are threatened, too. As a child, Tilousi watched elders fight the construction of Canyon Mine near Red Butte, a hill of red rock rising from the surrounding mesa. Havasupai oral tradition describes the butte and surrounding land as the umbilical cord of Mother Earth. Though the mine was built in the 1980s, tribal members still travel to Red Butte on pilgrimages.

On the canyon's South Rim, residents of the majority-white town of Tusayan, who use well water, share apprehensions about uranium mining, though they have no plans to fight the moratorium's lifting. "We get our water from the aquifer about 3,000 feet down," Mayor Craig Sanderson said. "The mining activity, they would tell you, is nowhere near that — but somehow, the water does find its way down."

Sanderson doubts Tusayan would benefit economically from increased mining. "(Miners) may come up and frequent our restaurants, things like that, but they don't buy gas or groceries or stay in our hotels," he said. Instead, the town, which visitors pass through on the drive to the park's South Rim entrance, relies on tourism. In 2011, the town council released a statement opposing uranium mining, and Sanderson said most residents still endorse the statement. "I very much oppose uranium mining, even though they claim it's very safe," he said. "I personally don't think it's worth the risk."

Havasupai council member Carletta Tilousi testifies in favor of permanently banning uranium mining in Grand Canyon watersheds.
AMANDA VOISARD

The mining industry says the risks are low. "When people talk about (Canyon Mine) harming the Havasupai, harming the Grand Canyon — (uranium is) being mined today by the river," Mark Chalmers, the president and CEO of Energy Fuels Resources, which owns Canyon Mine, told a group of reporters in February. Uranium does occur naturally in some Grand Canyon springs and streams but tends to be below dangerous levels.

Still, the region's mining past offers a cautionary tale. The Orphan uranium mine, started in the 1950s, closed more than 40 years ago and has still not been cleaned up. Now located within the boundaries of Grand Canyon National Park, the contaminated area spills over the canyon's rim and into a lower mining site. Today, visitors to the canyon's South Rim trail skirt the site, passing a warning not to enter the flattened and denuded area. The mine's obvious visible infrastructure, including a tram that hauled uranium up from below, has been removed, but its traces will linger on the landscape and in the water for many more decades. □

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Autumn and Soaptree Yucca Blooms and Dune, Spring.
CRAIG VARJABEDIAN

INTO THE GREAT WHITE SANDS
Photography by Craig Varjabedian
Hardcover: $39.95, 136 pages. University of New Mexico Press, 2018

For years, photographer Craig Varjabedian has documented New Mexico's White Sands National Monument and its waves of white gypsum sand. That work is collected in his new book, *Into the Great White Sands*. From shots of sunsets that set the sky ablaze to close-ups of fossilized animal tracks and hardy desert plants, each picture adds another piece to Varjabedian's portrait of an extraordinary natural wonder.

Essays by poet Jeanetta Calhoun Mish and monument employees like former White Sands Superintendent Dennis Ditmanson trace the park's history as a tourist attraction and its unique relationship with its neighbor, the White Sands Missile Range. Varjabedian describes his experiences as a photographer in the national monument, noting how "confluences of light, shadow (and) atmosphere" can lead to unexpected "magic." Varjabedian likes visiting the White Sands to recharge between photography projects, and his pictures will help those who see them recharge as well. **JESSICA KUTZ**

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Spring panels and river flotsam

Here in Colorado, the drought is becoming more pronounced with each passing day. As we go to press, fire restrictions are in place in most of the state, and thousands have been evacuated from a major wildfire outside Durango, 150 miles south of us, where the San Juan National Forest has been closed for the first time ever. In Paonia, where *High Country News* headquarters is located, we're desperately waiting for the summer rains.

Luckily, we're all multitaskers, so while we ponder the future of the West's water, we've also been working. At the beginning of June, Editor-in-Chief **Brian Calvert** traveled to Denver to participate in a panel organized by the U.S. Forest Service to discuss the role of media and its relationship to federal agencies and their work. Also in June, *HCN* correspondent **Joshua Zaffos** met with 16 students from Concordia College in Minnesota, who were traveling through Colorado while visiting eight national parks on a nature and culture program. Josh was one of several writers and artists who met with the students to explain how the American West's landscape plays a role in today's culture.

The warm spring days have brought visitors, including longtime subscriber **Dan Aiken**. Dan, a retired geologist, teaches at the Tohono O'odham Community College in southern Arizona. Some of his students traveled to North Dakota to support the Standing Rock Sioux last year, and he was happy to see *HCN*'s coverage of the protests.

At the end of May, faithful reader **Bill Mulvey** came all the way from Apex, North Carolina. Bill, a just-retired high school teacher and librarian, was three weeks into a four-week road trip when he dropped by. He says *HCN* is a good way to keep up with what's happening in the West. Thanks, Bill!

When our readers aren't saying hello in person, they send us emails and letters. This month we got one that made us all smile. **David Schaller** wrote to let us know that on a recent rafting trip down the San Juan River, he found an *HCN* photo caption taped to a plastic disc, from our coverage of the shrunken Bears Ears National Monument. "Thanks for printing that Bears Ears story that someone read, brought to the river, shared with colleagues, and then lost for us to find," he wrote, adding that he'd like for us to find out where it came from. So, a challenge for our friends: Look at the picture below, and write in if you know more!

Meanwhile, just a reminder that we are taking our summer print break after this issue. Look for issue 50.12 on July 23. In the meantime, you can find new stories online at hcn.org.

On a final note, one correction: In "Who can adopt a Native child?" (*HCN*, 4/30/18), we incorrectly state that the adoptive parents in the Baby Veronica case are from California; they are from South Carolina.

—Jessica Kutz, for the staff

Help solve the mystery of the *HCN* photo caption. COURTESY OF DAVID SCHALLER

Little Weed, Big Problem

A genetically modified grass is loose in Oregon. It could have been much worse.

FEATURE BY JULIA ROSEN
PHOTOS BY OTTO KITSINGER

In the failing light of an unusually warm January day, Jerry Erstrom and I race along a dirt track behind Rod Frahm's white pickup. Here, near Ontario, Oregon, a stone's throw from the Idaho border, Frahm grows onions, squash and corn. But today, he wants to show us something he's growing against his will: a genetically engineered turfgrass designed for golf courses.

Frahm slams on the brakes next to a dry irrigation ditch, jumps out and yanks up a clump, winter-brown but laced with new green shoots. Beneath his gray fedora, his dark eyes glint with anger as he holds out the scraggly specimen. "I have it in a lot of my ditches," he says.

Just to be sure, Erstrom produces a plastic vial the size and shape of a .22 caliber bullet. He stuffs a few blades into it, adds water, and mashes the mixture with a wooden rod, like a bartender muddling mint. Then he inserts a plastic strip and hands it to me. It's like a pregnancy test: One line confirms it's working, while the other detects a gene that unmasks the intruder.

We wait, batting away gnats and breathing in the aroma of onions, whose colorful skins litter the county roads. Then the results appear: This is indeed the variety of creeping bentgrass that agribusiness giants Scotts Miracle-Gro and Monsanto engineered to tolerate the herbicide Roundup.

The grass arrived here uninvited, after crossing the Snake River from old seed fields in Idaho. The U.S. Department of Agriculture, which vets most new genetically engineered products, had not approved the plant's release. But in 2010, landowners discovered it growing in great mats throughout the irrigation system that stretches like a spider web across Malheur County.

Creeping bentgrass has not created a catastrophe, as some anti-GMO groups warned it would. But it thrives in canals and ditches, where it collects sediment and impedes water flow, and it has proved difficult to control. That makes it a headache for Frahm and other growers — like the heavy snows that crushed their onion sheds last year, and the host of other weeds they already battle.

No one believes the bentgrass can be fully eradicated, either. And as long as it's around, some fear it could contaminate non-GMO crops and invade natural areas. "It just scares the bejeezus out of me," says Erstrom, a retired Bureau of Land Management natural resource specialist who chairs the Malheur County Weed Advisory Board.

So far, Scotts has led the battle to rein in its escapee, with some recent success. But in a series of decisions over the last several years, the USDA has relieved Scotts of future responsibility in return for the company's promise not to market the grass. Scotts has pledged not to turn its back on the problem, but after this summer, it no longer has to bankroll cleanup efforts. Now, Erstrom and others say there are no legal safeguards to keep the task — with its reported $250,000 annual price tag — from becoming the burden of local growers and the state and county governments.

To critics, the case laid bare glaring weaknesses in the country's oversight of genetically engineered, or GE, crops. While biotechnology's defenders say the process is already overly rigorous, others have long argued that regulations, which haven't changed significantly since 1987, don't do enough to protect agriculture and the environment. Neither the USDA nor any government agency must weigh the full social, economic and ecological impacts of GE products, says Jennifer Kuzma, co-director of the Genetic Engineering and Society Center at North Carolina State University. "There's really no place that's looking at this broadly from a risk-benefit perspective."

In Malheur County, landowners must reckon with the consequences. Erstrom says the USDA's handling of bentgrass has forced a polarized community to grapple with a problem it didn't create. "They took it out of Scotts' hands and dumped it into the laps of the irrigation district and the farmers."

Jerry Erstrom looks for genetically engineered creeping bentgrass along an irrigation ditch in Ontario, Oregon.

CREEPING BENTGRASS is nothing special to behold. You've probably stepped on its delicate emerald blades without noticing. The plant may be native to North America, or it may have crossed the Atlantic hundreds of years ago in animal feed. Today, it grows in every state of the Union and on many golf courses. Groundskeepers prize its fine texture and its ability — as its name suggests — to creep, sending out stems that root into the soil and sprout new plants, forming a dense, even cover.

Scotts and Monsanto started working on the Roundup-resistant version in the 1990s. It was to be the first commercial GE grass. As scientists had done with corn and soy, they used bacteria to insert a segment of DNA into the bentgrass genome, which allowed the plant to survive a dose of the herbicide even as neighboring weeds withered.

Keeping golf courses weed-free is important, especially for professional tournaments with big money at stake, says Virgil Meier, a plant geneticist who worked on the grass at Scotts. "Anything other than 100 percent bentgrass makes any kind of putt on a green unreliable," he says. But what started as a straightforward idea quickly grew messy, as Scotts — and some say the USDA — fumbled the plant's rollout. (Scotts declined to comment for this story.)

Things went well at first. Scotts conducted dozens of field trials, marshaling evidence that its bentgrass was safe and differed from regular bentgrass only in its Roundup resistance. The USDA's Animal and Plant Health Inspection Service, or APHIS, considers these questions when deciding whether to release new genetically engineered organisms from regulatory oversight — a necessary step for wide commercial sale. In 2003, with results in hand, Scotts and Monsanto petitioned the agency to deregulate the grass.

At the same time, Scotts got permission from the USDA to plant larger fields for seed production. Farmers sowed 80 acres of bentgrass in Canyon County, Idaho, and 420 acres in Jefferson County, Oregon, north of Bend. The Oregon Department of Agriculture picked the site — an irrigated island in the sagebrush sea — to keep the plant far from the Willamette Valley. There, on the western side of the mountains, farmers grow forage and turf grass for a $1 billion-a-year seed industry.

Then two windstorms swept through the eastern Oregon fields in August of 2013, scattering flea-sized seeds well beyond the designated control area. Roundup-resistant pollen fertilized conventional bentgrass plants as far as 13 miles away. There was no calling it back.

The escape didn't surprise anyone, says Carol Mallory-Smith, a weed scientist at Oregon State University. She says she warned APHIS that permitting the seed fields was tantamount to deregulation; even without the storms, the grass' biology practically guaranteed its spread. The decision to move ahead anyway reflected the agency's somewhat cavalier approach to field trials at the time. A 2005 USDA audit found that it did not, for instance, keep track of field locations or review companies' plans for containing their products. The audit warned that APHIS' procedures did "not go far enough to ensure the safe introduction of agricultural biotechnology."

In 2007, APHIS fined Scotts $500,000 — the largest amount allowable — for losing control of the bentgrass. "There was no doubt they violated the agreement," says Meier, who had left Scotts to work for the agency by then. But he didn't think the bentgrass' escape in Oregon, or from future plantings, was cause for concern. It has never been a weed in crops like corn, soy or wheat, he says.

However, APHIS soon discovered that not everyone shared Meier's view. In particular, federal land management agencies already struggled to manage creeping bentgrass and its relatives in natural areas, and objected to the prospect of losing one of their best tools: Roundup. "The deregulation of this organism," the U.S. Forest Service wrote bluntly, "has the potential to adversely impact all 175 national forests and grasslands."

When the petition got mired in concerns that the grass could threaten two endangered plants and a butterfly, many assumed that APHIS had shelved it. "We all thought that the bentgrass was dead and buried," says George Kimbrell, legal director for the Center for Food Safety, which had sued to stop the grass' production. But the situation in Malheur County brought it roaring back to life.

AT AN EMPTY CAFÉ IN NYSSA, 12 miles south of Ontario, Jerry Erstrom hunches over his chicken salad. At 69, he's tall and energetic, with silver-white hair and pale blue eyes. Erstrom has lived among Malheur County's sundried hills all his life, working as a fire manager for the BLM, and later, leading the agency's regional weed program. His unofficial title, according to the nameplate above his desk at home, was "Weed Czar."

When Erstrom retired in 2003, he decided to farm full-time, partly because a friend said he couldn't do it. "I'm a little bit hard-headed," he says. Now Erstrom grows close to 1,000 acres of alfalfa and unusual crops like yarrow and sagebrush, selling the seeds for fire restoration. Erstrom also chaired the local watershed council and serves on the State Weed Board.

Over the last few years, bentgrass has consumed more and more of his energy. And there is one thing he wants understood: "This is not about GMOs," he says, stabbing the table with his finger. It's about accountability. "Scotts had an 'oh-shit,' " he says, "and my feeling is — and I live by this — you play, you pay."

Of course, Scotts did pay a fine. But then Malheur County landowners noticed that Roundup no longer worked on what they thought were regular bentgrass plants in their ditches. They brought samples to OSU's local experiment station, which sent them to Mallory-Smith in Corvallis. She soon confirmed the fugitive plant's identity.

Scotts hired contractors to help the irrigation district fight the grass, but it kept getting ahead of them, says Gary Page, the Malheur County weed inspector. Workers sprayed other herbicides every spring and fall. But they struggled to keep up in summer, when the grass grew long and flowered. The ditches were full and the only herbicide approved for use near water was Roundup.

Erstrom watched with increasing worry. He feared that bentgrass might creep into alfalfa or carrot seed bound for anti-GE export markets like Japan, causing crops to get rejected. It could also hitch a ride to the Willamette Valley in the hay Malheur County supplies to many dairies, he says, and infiltrate the grass seed industry.

Contamination is a frequent source of friction over GE crops. A 2014 survey by Food and Water Watch, an opponent of biotechnology, reported that a third of all organic grain producers had found unwanted GE products on their farms. The majority had taken preventive measures to reduce the risk — which cost individual farmers thousands of dollars. A USDA survey, published the same year, found that economic losses due to contaminated organic crops were relatively small — $6 million in total since 2011. But it did not track impacts on non-organic, non-GE growers, who make up a much larger share of the agricultural industry.

In most cases, the offending plant is a commercial crop. But there are exceptions, as when an eastern Oregon farmer found Roundup Ready wheat growing in a field in 2013. Mallory-Smith identified it as a variety Monsanto had field-tested in the state before it abandoned its bid for deregulation. In the wake of the discovery, Japan and South Korea temporarily stopped buying wheat from the Pacific Northwest.

So far, bentgrass hasn't caused any other export problems. It's mainly a nuisance that refuses to go away. Feral plants still grow in all three counties, despite years of management, making it one of dozens of herbicide-resistant weeds whose proliferation has shadowed the adoption of GE crops. And in central Oregon, Mallory-Smith and her colleagues have documented cases where the grass has blended with two different species to

"There's really no place that's looking at this broadly from a risk-benefit perspective."

–Jennifer Kuzma, co-director of the Genetic Engineering and Society Center at North Carolina State University, who says that neither the USDA nor any government agency is responsible for weighing the full social, economic and ecological impacts of genetically engineered organisms

Genetically engineered creeping bentgrass, which made its way to eastern Oregon from across the Snake River in Idaho.

"We're going to be stuck fighting this for the rest of our lives. All so somebody could have green grass on a golf course."

—Warren Chamberlain, chair of the Vale Irrigation District, west of Ontario, where the genetically engineered bentgrass has not yet spread

form Roundup-resistant hybrids. These bear no resemblance to bentgrass and will likely evade control efforts, she says. The grass — a perennial — could spread, too; it can't survive in the dry desert, but it could migrate through waterways and invade bare riverbanks. Scotts has already treated the grass on an island in the Snake River.

Warren Chamberlain, who chairs the irrigation district west of Ontario, thinks the birds will bring bentgrass to him. The day after our lunch in Nyssa, Erstrom and I visit Chamberlain's dairy farm near the two-stop-sign community of Willowcreek. "We're going to be stuck fighting this for the rest of our lives," he laments. "All so somebody could have green grass on a golf course."

AT SOME POINT AFTER THE GRASS INVADED Malheur County, Scotts and Monsanto quietly decided to reapply for deregulation. The companies gave up on commercializing the grass and limited their petition to existing populations — raising questions about their motivation. "They saw it as a way out of their current and future liability," speculates Kimbrell, of the Center for Food Safety. (Scotts declined to comment.) But Kimbrell and others found the USDA's response even more perplexing.

In 2015, after learning of Scotts' intentions, the agency proposed a deal: If the company promised not to sell the grass for the life of the patent and continued control efforts for three more years, APHIS would absolve Scotts of responsibility for controlling the plants. The company would have to maintain an educational website and provide technical support for managing the grass until 2023, including if it cropped up in a new location or in someone's harvest. But it would not have to pay for cleanup.

Sid Abel, the assistant deputy administrator for APHIS' Biotechnology Regulatory Services, saw the agreement as a preemptive measure to protect farmers and secure Scotts' cooperation. "We wanted that written out," he says. That's because, under current regulations, APHIS would likely have to approve the grass this time around. Understanding why gets at the heart of what many see as a fundamental flaw in the nation's regulatory system.

When lawmakers first confronted GE crops in the 1980s, they decided not to create new laws to regulate them. Instead, agencies used existing laws and split the authority. The Food and Drug Administration would oversee edible crops and the Environmental Protection Agency would manage pesticides and plants engineered to produce biopesticides. The USDA already had the power to guard against plant pests, a category that includes parasites, microbes, bugs and other critters that physically harm plants or plant products. And because most GE organisms were initially modified using DNA from bacteria or viruses — both pests — they came under the purview of APHIS' Biotechnology Regulatory Services.

But if a company petitioned to have a GE product deregulated, APHIS could only deny it if it concluded that the product itself was a pest, or if it could somehow boost pests. Few plants met this criteria; simply being weedy or troublesome was not enough. As a result, APHIS has not denied any of the 127 petitions it's received for deregulation, although there

have been a few cases where companies withdrew them, Abel says. "Our entire decision-making process relies solely on whether this product is a plant pest."

People across the spectrum dislike the current system, which focuses more on how a product is made than on how it behaves. Wayne Parrott, a biotechnology expert at the University of Georgia, says that existing regulations create unnecessary barriers for many GE crops while ignoring the potential health and environmental risks of others.

When it came to bentgrass, Parrott says, the USDA didn't have the authority to deny the companies' petition. Even though the grass had a proven record of causing problems for landowners, and even though the USDA itself acknowledged that bentgrass was weedy, it did not qualify as a pest. The agency argued that it was merely a management issue, and that landowners could use other means to control the grass — although it recognized the challenges of treating the grass around water. Scotts' promise not to sell the product also meant that it wouldn't be planted anywhere else, relieving many of the environmental concerns that had stymied deregulation before, like those involving endangered species.

In 2000, Congress passed a law that provided the first real opportunity to rethink GE regulation. It allows APHIS to extend its authority over noxious weeds to GE products, theoretically granting the agency greater discretion over potentially weedy crops, Kuzma says. (Notably, conventionally bred crops are far less regulated, and have also led to weed issues.) However, regulations have yet to change. APHIS has tried twice to revamp the rules to reflect the new law, and to address issues raised in the 2005 audit, but failed when new presidential administrations scrapped the proposals before they could be finalized. Today, Biotechnology Regulatory Services still operates under regulations written last century. "We'd like to change that," Abel says.

It's unclear whether the updates would have changed the outcome for bentgrass, but there's growing urgency to do something, Kuzma says. Current regulations don't allow APHIS to regulate the increasing number of products engineered with synthetic tools like gene guns. Roughly 60 GE organisms now fall outside the agency's authority because they weren't made with a plant pest, and all can be released into the environment without review. A soybean has already been commercialized, and an anti-browning button mushroom has drawn media attention. But the list also includes four grasses developed by Scotts. "There is no check to see whether the ecological implications are being thought through," Kuzma says.

Mallory-Smith fears something worse than bentgrass could creep through this gap. While Roundup resistance is a pain for growers and land managers, it's a relatively benign trait in the wild; it offers a competitive edge only when plants get sprayed with herbicide. But what about a potentially weedy plant that's been modified to tolerate drought or salt or heat? That would give the species a major advantage, she says. "All of a sudden, you are looking at something that could have very different environmental impacts."

AT 5 P.M. ON MARCH 1, 2016, Scotts and the USDA held a meeting at the extension office in downtown Ontario. A few dozen people, including Erstrom, packed the conference room, taking seats at rows of tables. Others leaned against the counter along the back wall. The mood, Erstrom recalls, was tense.

In January, APHIS had announced it would consider Scotts' revised petition for deregulation, but news of its 2015 agreement with the company broke much later. The head of the Oregon Department of Agriculture first called attention to it in mid-February, in a letter rebuking the USDA for thrusting the bentgrass problem on the state's residents. Sitting in the front row, Erstrom put it more bluntly, according to a newspaper account. He called the deal "nothing more than a plan for Scotts to get off the economic hook of fixing what they broke."

At the meeting, Bob Harriman, Scotts' vice president of biotechnology, assured everyone that the company had no intention of walking away. "We have a history of being an honorable company," Harriman said. "Judge us on the actions we're taking (and) the progress we're making."

But Harriman's assurances didn't assuage locals' feeling that a bargain had been struck behind their backs. "We were never given the opportunity to give much input from our area," says Les Ito, who grows onions, beans and other crops outside Ontario. "That's been a sore spot." Erstrom and others didn't fully trust Scotts, either. The company refused to reveal where it had treated bentgrass, even to the weed board. "They keep saying they want to be open and transparent about it, but they are not willing to share the data," says Page, the county weed inspector.

So that May, at the weed board's request, the county commission unanimously voted to classify the bentgrass as a noxious weed in Malheur County. The designation requires landowners to remove it from their property, providing a backstop if Scotts ramped down its efforts.

Erstrom also hatched a plan to sue. He reached out to the Farm Bureau, an agricultural advocacy group, and to U.S. Rep. Greg Walden, a Republican whom Erstrom had supported for decades. When he called, he mentioned that he had also contacted the Center for Food Safety and the nonprofit Center for Biological Diversity, a Portland-based environmental group. Both wanted to help and had the resources to fight Scotts and the USDA. That's when the ground shifted.

Walden's office never responded, and instead of offering support, the Farm Bureau alerted Dan Andersen, a local rancher who serves as its regional director. Andersen appeared before the county commission on June 1 to say that the Farm Bureau could not support collaborating with the environmental groups. He warned that they wanted to do away with all GE crops, including the corn and sugar beets that form mainstays of the local economy.

Around the same time, Paulette Pyle, a longtime agribusiness lobbyist who now worked in PR, met with locals on behalf of Scotts. Lori Ann Burd, an attorney at the Center for Biological Diversity, says that Pyle spread false rumors that her organization planned to use bentgrass as an opening to push for designation of the nearby Owyhee Canyonlands as a national monument — a contentious proposal that many locals opposed. (Pyle did not respond to requests for comment.)

◀ Jerry Erstrom, right, and Terry Oft discuss genetically engineered creeping bentgrass growing along a gated irrigation pipe in a field of hay and orchardgrass in Ontario, Oregon.
▲ Erstrom tests a grass sample to determine whether it's genetically engineered creeping bentgrass. Some of the grass he tested at the Oft property was.

A rift opened in the community. The county commission — once receptive to the idea of a lawsuit — turned against it, as did some local growers. Erstrom tried other avenues, contacting Oregon's two Democratic senators, and proposing a plan to force Scotts to put $4 million in an escrow account that the weed board could use to fight the grass. But APHIS' regulatory process had already lurched back into motion.

In August 2016, the agency released a preliminary assessment concluding that Roundup-resistant creeping bentgrass did not constitute a pest. And in November, APHIS completed its final environmental analysis — now much narrower in scope — indicating its intent to deregulate.

Each stage saw waves of protest. The majority of the nearly 6,000 public comments on the petition opposed deregulation, and more negative feedback rolled in over the new year. On Jan. 9, 2017, Bruce MacBryde, a retired botanist who worked on bentgrass at APHIS from 2002 to 2006, wrote that "the decision

should be no — there is still more to do that requires good regulatory oversight." The same day, the Oregon Department of Agriculture sent a final letter to the USDA, rejecting the agency's conclusion that bentgrass wasn't a pest. It also noted that no herbicide had yet been approved to control the grass around water.

But on Jan. 12, as expected, the USDA relinquished control over Roundup-resistant creeping bentgrass once and for all.

Parrott says APHIS had no choice. But Mallory-Smith says the move sets a dangerous precedent for other companies that let their products get away. "I think it was a total whitewash," she says. "I have a real problem with that."

ON MY LAST DAY IN MALHEUR COUNTY, Erstrom takes me to visit the cavernous, clanking plant where he cleans and processes his seeds. We hurtle through the blanched countryside under a robin's-egg-blue sky, following the Snake River south, until we arrive at a cluster of buildings.

A rooster and two hens scratch around some empty seed bins while a black cat supervises from a pile of pallets. Erstrom, wearing a royal blue kerchief around his neck, leads me inside where antiquated machines shake, sift and sort seeds. In one corner, a contraption with belts and chutes separates tiny sagebrush seeds from their husks, filling the air with fragrant haze. Someday, these plants might be used to restore the landscape Erstrom wants to protect from threats like bentgrass.

For now, he's still recovering from the sting of defeat. "It really put a needle in my balloon," he says. He's lost friends over the issue, and acknowledges that his association with environmental groups may have polarized the issue. "I almost drew a line in the sand," he told me during a moment of introspection earlier in the week. But later, when he recovered his usual confidence, he reconsidered. "What would have happened in World War II if Churchill hadn't reached out to the Russians?" he asked me, exasperated.

Erstrom's gamble didn't work out the way he hoped, but it may still have made a difference. Andersen, the Farm Bureau representative, always favored a cooperative approach to the problem, and he now sits on a local working group that manages the bentgrass cleanup with Scotts. But he concedes that the threat of a lawsuit may have pressured the company to step up. "They've been working at it diligently for probably four to five years," he says, but got even more serious when they realized that "there was a bigger problem here than they had anticipated."

The biggest victory came last spring, a few months after deregulation, when Scotts helped win approval for the herbicide Reckon to be used on the grass all summer long. The results look promising, Andersen says. Scotts has been handing out free vouchers to landowners, and he is cautiously optimistic they can keep the grass at bay. But he acknowledges that it will never go away. Any plants that escape control will provide a seed source, and if people ever get lax, there's little doubt the grass will surge back. Abel says APHIS will keep an eye on it, and if landowners start losing ground, the agency will "encourage Scotts to do the right thing." But there is no legal force behind that.

Driving back into town after the tour, Erstrom turns onto a side road and peers out his window. "I've found bentgrass right over here," he says, pulling over to collect another sample. This time, however, it's just a run-of-the-mill ditch inhabitant. Erstrom somewhat grudgingly admits that's good news.

Even if the bentgrass retreats, it still bothers him that the Farm Bureau sided with Scotts and that the community fractured when it should have united. It bothers him that his elected officials kept silent. Most of all, it bothers him that the USDA seemed to protect industry over local growers. The regulatory system "failed miserably," Erstrom says, upending his faith in the government he served for decades. It's been a hard lesson to learn. "That really disillusioned me about what's going on in the world." □

Julia Rosen is a freelance journalist based in Portland, Oregon. Her work has appeared in *Nature*, *Orion*, the *Los Angeles Times* and many other places.

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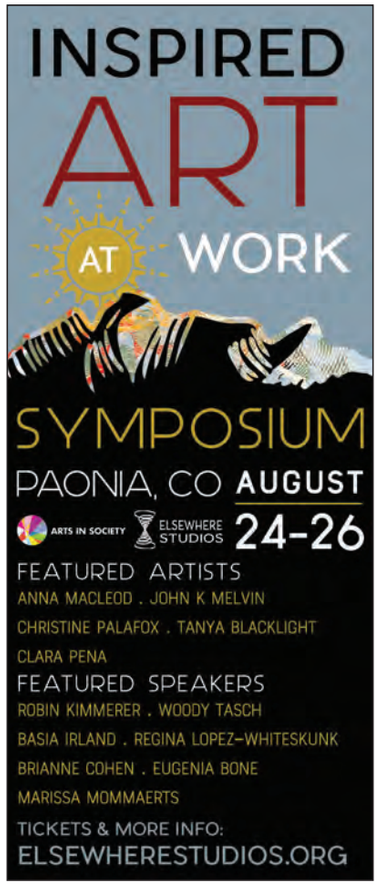

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The big history behind *Little House*

Laura Ingalls Wilder's *Little House* books form some of my earliest literary memories. Reading them — first with my mom and then on my own — sparked my fascination with stories of the past, memories of true-life history fueling my imagination more than fantasy or science fiction.

But history can be hard to pin down, especially when it comes to memories. The personal truths Wilder shared in her bestselling books had a huge influence on our collective cultural memory of the Western frontier, one I never questioned until I dove into *Prairie Fires: The American Dreams of Laura Ingalls Wilder*, Caroline Fraser's meticulously researched biography. By exposing the gritty reality behind the cozy, optimistic picture of frontier life Wilder's books present, Fraser makes a compelling case that in their very contradictions, their nostalgic gloss on the pioneer struggle, the *Little House* books capture the ambiguity of Western identity.

The myth of the self-made pioneer, an archetype that still reigns supreme in the West, is a recurring theme in Fraser's study of Wilder's life, which was often a direct rebuttal to the frontier illusion of self-sufficiency. Wilder's beloved father, Charles Ingalls, never lived up to that ideal; constantly in debt, he shuffled the family from one parched homestead to another, chasing a prosperity always one good harvest out of reach. (Once, while living in Burr Oak, Iowa — a dark interlude not chronicled in Wilder's books — the entire family split town in the middle of the night, unable to pay their rent.) Like many farmers, the Ingallses made ends meet by taking odd jobs in town; from the age of 9, the child Laura worked to support her family.

Their poverty was not unique. Countless settlers lured to the Great Plains after the Civil War by promises of free land and fertile soil found nothing but struggle and starvation. *Prairie Fires* offers a lively chronicle of the history of westward expansion, grounded in the experiences of small farmers. The book links the land booms of the 1870s and 1880s to the Dust Bowl crisis a half-century later, drawing parallels between modern-day climate denial and 19th century refusals to heed warnings that the Plains were unsuitable for farming.

Prairie Fires wrestles with the meaning of self-reliance as it traces the evolution of rural political consciousness in the West. As a middle-aged woman, Wilder, like many of her peers, detested FDR's New Deal relief programs, insisting that her family endured hardship without handouts. "Not starving, though, was hardly the same thing as succeeding," Fraser points out — and, in fact, the Ingallses nearly starved, several times. They'd also expected and accepted government help. Charles Ingalls' Kansas homestead, the setting for *Little House on the Prairie*, constituted an illegal squat in what was at that time still Indigenous land:

His dealings with Indians and implicit reliance on the government — to protect settlers from the consequences of their provocative actions and remove Indians from land he wanted — were self-serving. He was willing … to take something that did not belong to him if he thought he could get away with it.

Even the family's legitimate land claims in South Dakota cast a shadow of hypocrisy over Wilder's later disdain for federal assistance. For the hundreds of thousands of people pouring into Dakota Territory, taking advantage of the Homestead Act — which offered free land to anyone who could work it — meant capitalizing on what could be seen as the most large-scale, reckless government program of all time, one that triggered a half-century of violent conflict and brutal struggle for Indians and settlers alike.

Prairie Fires explores the narrative liberties Wilder took with her own story without denigrating the series. Even as it points out the omissions and — shall we say — "alternative facts" deployed to keep *Little House* in line with the wholesome pioneer values Wilder hoped to promote, *Prairie Fires* acknowledges the simple beauty and raw emotional power of the books, at their best when they tap into the timeless draw of wild spaces. Wilder's love of nature — the native grasses and flowers of the virgin prairie, the endless takeoff and landing of geese on the shores of Silver Lake — sustained her through a lifetime of privation, and speaks to a paradox Westerners still wrestle with today. Our cultural identity is rooted in that yearning for wild spaces, despite the fact that our very presence makes them less wild. Fraser writes:

The genius of (Little House on the Prairie) *lay in that tension between its ostensible pioneer subject — celebrating a destiny made manifest in claiming virgin land … clearing fields, establishing a farm — and its unmistakable appetite for the very opposite.*

How do we live on the land we love without changing what we love about it? When does our worship of self-reliance become self-destructive? Deftly weaving together literary criticism and historical analysis, *Prairie Fires* makes a rich, engaging contribution to our effort to understand our complex history.

BY CLAIRE THOMPSON

Our cultural identity is rooted in that yearning for wild spaces, despite the fact that our very presence makes them less wild.

Children work in a Kansas beet field, c. 1922. KANSAS STATE HISTORICAL SOCIETY

Prairie Fires: The American Dreams of Laura Ingalls Wilder
By Caroline Fraser
640 pages, hardcover: $35.
Metropolitan Books, 2017.

OAKENROAD, CC VIA FLICKR

Monument Valley

ESSAY BY THOMAS MIRA Y LOPEZ

With the invention of the daguerreotype in the mid-19th century, Americans adopted a strange tradition. They took family photographs of their dead.

Families dressed the bodies of children or parents in their finest clothes, then sat them in a rocking chair or laid them out on a divan. Sometimes, they stood the body up, and relatives gathered around the corpse, Christmas card-like. Often, given the rates of infant mortality and the relative novelty of the medium, this was the only family photo that existed.

It's a morbid habit, but not a new one. Pliny writes famously that painting "originated in tracing lines round the human shadow," just as early daguerreotype advertisements claimed the technology would "catch the substance ere the shadow fades." Right at the onset of a new technology, one whose future iterations would so display the muscles and ripples of movement — of what it means to be alive — people used it to do what they've always done: capture their dead.

For many years I owned a flip phone. When I finally bought an iPhone, I decided to download a game. This was a big step for me; I'm not an iPhone sort of guy. But *Monument Valley*, its creators promised, was a game full of "illusory adventure, impossible architecture, and forgiveness." That sounded good. Ida, a young girl in a white dress and conical hat, navigates different levels, each with its own fantastic structure: ruins of cities, mazes, a jeweler's box of mirrored rooms, waterfalls falling out of empty buildings.

The game plays with perspective. Ida begins a level at one spot and through a reshuffling of architectural and geographical elements, she M.C. Eschers herself to a point far distant. For much of the game, you manipulate angles, tapping and swiping until the physically impossible occurs. Columns appear different sizes, or a stairway seems to end in midair, but then the structure is twisted round, and a path beckons towards a place previously inaccessible.

Sometimes, crows pester the landscape, blocking Ida's path, cawing at her with big, loud beaks. A holographic figure called the Ghost, the game's storyteller and cliché old wise man, floats around and offers equal parts wisdom and scolding. Mostly, though, *Monument Valley* is a solitary game. You and Ida figure a problem out. I played in bed in the morning or before I turned out the lights at night. When Ida reaches the end of a level, she takes off her hat and sets loose a spinning geometric shape. It floats in the air and lands on an altar. This is her offering, her ritual, her monument. The game hinges on its mystery: What does she offer and whom does she offer it to? What does she seek "forgiveness" for?

Something uncanny happens in these photographs of the dead. Daguerreotype exposures took notoriously long to develop, and living subjects needed to sit still for prolonged stretches, minutes sometimes, with their heads braced and bodies propped perfectly still. Often, since the dead died at all ages and the family dressed identically and assumed monochromatically placid expressions, it becomes difficult to determine, when looking at a photo, just who is the corpse. It's only when you study two pairs of hands under their cuffs — one a shade darker than the other — or notice how one family member sags a bit against a cushion, that you find the detail that separates living from dead.

These photos must have confused a sense of order. We say the living and the dead should not mix. The dead live in the land of the unknown and, if someone shuffles that seemingly impossible path back to the living, then something has gone wrong. Orpheus and Eurydice. The night watchman and the ringing of the corpse's bell. A ghost is a manifestation of guilt, a forgiveness demanded, a memory contested. Our way of dealing with the uncomfortable truth: The dead do not return to life, but they do return to the living.

Like a daguerreotype, an iPhone is an intimate object. You hold one in your hand. You cradle it sometimes. There, relatively cheap and available, hovers the past.

About three-quarters of the way through *Monument Valley* comes the twist. The Ghost upbraids Ida — "Shameful Ida, why do you come back here?" — and she lowers her head. When she does, we realize her hat forms an inverted beak and that she and the crows are one and the same. Like the game's architecture, we have only witnessed her from one perspective. Ida is in mourning and each sacred shape she returns is also one she stole. Her monuments disguise her thefts, her paths through these ruins her penance.

Once I stood in a cherry orchard on a hill overlooking Prague. I had just turned 20 and, although I did not know it, my father was about to die. It was Halloween and I would dress up that night as one of the seven deadly sins. I seemed to be both myself and not myself at the same time.

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It's only when you study two pairs of hands under their cuffs — one a shade darker than the other — or notice how one family member sags a bit against a cushion, that you find the detail that separates living from dead.

The cherry orchard still had its leaves. They were yellow and magnificent and carpeted the ground. There were rows and rows of cherry trees, so many that wherever I stopped there were four directions to choose from. It seemed these paths were multiplying, that they formed all possible paths one could take in a life.

When I stopped walking the orchard, I climbed a tree. The fruit still hung from the branches, and I ate too many cherries and spat the pits out on the ground. Sitting up in that tree, I wondered: When are you most yourself? Is it when you do what you do every day, or is it when you do something for the first time? Like, say, when you dress up as "Greed" for Halloween — are you more yourself then, or less yourself? Like, say, when you find out someone you love will die. Are you more yourself or less yourself? Like, say, when you're gone, and someone tries to capture your ghost.

I climbed down from the tree. I wiped my jeans off and picked one last cherry from the ground. I walked back along the same path. The rows and rows of cherry trees merged, and it no longer felt as if I could walk down all possible paths, as if they held all potential sums and endings. I figured it didn't matter one way or the other.

For a long time after that, I thought memory worked like an encyclopedia. In order to remember someone, I would need all our experiences alphabetized and annotated. I must not forget anything.

Then I thought, since the person I knew was only one aspect of the person who lived, I'd also need the memories of all the people close to him. We'd layer them one around the other, like a tree with its rings, so that the form of the whole was dependent upon the advancement of each part.

But if I needed all the memories of those who knew this man, I'd also need the memories of those who didn't: the woman who brushed his hand on a subway pole, the stranger who didn't talk to him on a plane. The flowerbed he weeded, the family pet, his favorite tree — I would need to give these language and add them to the book as well.

Yet even this wasn't enough. Because what I really needed was the experience of the person himself, the person lost. And for this, he would have needed to have kept his own encyclopedic account. Still, this record would only exist of that one person at one specific time, and so unless he recorded every single thing that happened at every single moment (every passing thought, every urge, every decision or indecision he did or did not make), the book would be incomplete. And if he did record everything that happened, he would do this and only this for all of his life and thus have no real life to live.

I didn't know what to do. I grew angry for a long time. And, of course, the person I most wanted to talk to about this was the very person I was trying to remember.

Though I did not know it, I was thinking of Monument Valley. The place, I mean. When viewers first saw its footage in John Ford's *Stagecoach* in 1939, they assumed this site, one of the most photographed on earth, stood in for all of the American West. The land of the unknown — its myth, its grandeur, its memory — rendered in 5 square Cinemascope miles.

If all that unknown land is out there, I thought, how do we choose just one path to stand in for all the rest? What is the right memory in the face of all we'll forget? I began to suspect that the mind that haunts its past is not the shadow but its captor. That a ghost — the being that seeks forgiveness, the being that returns when something has gone wrong — isn't necessarily the one who's dead.

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OAKENROAD, CC VIA FLICKR

Displaced / Erased

PHOTOGRAPHS AND ESSAY BY ROBERTO (BEAR) GUERRA

In the early 20th century, the unruly Los Angeles River supported a diverse ecosystem. But as the city grew, the river became problematic, prone to destructive winter flooding. After particularly devastating floods in the 1930s, a plan was set in motion to channelize the river, and by 1960 its verdant habitat had been transformed into a massive concrete ditch. This was the final blow for many species that once swam, soared and roamed in abundance along the river. After the concrete set, few would be seen here again.

These images, then, represent the erasure of incredible diversity and beauty from the collective memory of Angelenos. But they also hint at a possible future for the city, which is currently debating a river revitalization effort. Though the river will never again flow in its natural state, some habitat restoration may allow for the return of animals that have sought refuge elsewhere. Given the city's history of putting development before preservation, it remains to be seen what direction revitalization will take. But if we can remember what was lost, then certainly we can imagine what might be again.

▶ **American ribbed fluke snail** *(Pseudosuccinea columella)* A study of the freshwater mollusks of the LA River from 1984 to 1992, by C. Clifton Coney of the Natural History Museum of Los Angeles County, describes finding "overwhelming evidence that paints a picture of near extinction of an entire freshwater species," compared to studies from the early and mid-1900s. At the time of Coney's work, the American ribbed fluke snail was still present in small numbers, but today it is believed to be extirpated.

▶ **Yellow-billed cuckoo** *(Coccyzus americanus)* In the early 1900s, the western yellow-billed cuckoo was a common sight in the lower LA River Basin, where it nested during the summer among dense cottonwood and willow groves. But by the 1950s, its habitat was gone. Today, the cuckoo is a federally listed threatened species, and studies are underway to determine if habitat restoration could encourage the bird's return.

▶ **Arroyo chub** *(Gila orcuttii)* Though none of its seven native species of fish can still be found in the channelized stretches of the LA River, the tiny arroyo chub has managed to survive in greatly reduced and fragmented populations in some of the river's lowland tributaries. Today, it is listed as a California Department of Fish and Wildlife species of special concern, but because it seems to be the most tolerant to the drastic changes wrought by channelization, the fish is often mentioned as a candidate for reintroduction in the river, if the habitat to support it can be restored.

◄◄ **Side-blotched lizard** *(Uta stansburiana)*
The side-blotched lizard was once widespread in some of the dry habitats around and across the basin. In a recent study, herpetologists from the LA County Natural History Museum determined that habitat fragmentation due to urbanization has left only a few remaining populations on the floor of the LA Basin and these are physically, and therefore also genetically, isolated from each other.

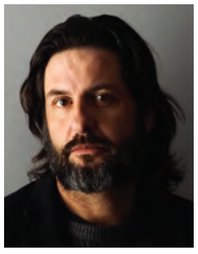
◄ **Gray fox** *(Urocyon cinereoargenteus)*
Before the massive urbanization of the LA River Basin over the last century, diverse populations of mammals, including a number of predators, wandered freely along the banks of the river. Though there were reports of a small population of gray foxes near the LA River at Griffith Park several years ago, the animal is now primarily limited to undeveloped areas in the nearby San Gabriel and Santa Monica mountains, where it can still find the native rodents that it preys upon.

◄ **Blue grosbeak** *(Passerina caerulea)*
Though the blue grosbeak is not generally a species of concern due to its relatively stable numbers and wide range in the United States and down into South America, it is declining in Southern California. Currently on the conservation group California Partners in Flight's watch list, it is only occasionally seen in the LA area during the summer breeding season, and only where it can still find woodlands and brush near the few remaining soft-bottom stretches of the river.

▲ **Western toad** *(Anaxyrus boreas)*
Perhaps no animal is as emblematic of the decline of native species in the decades following channelization as the western toad. One of the neighborhoods adjacent to the soft-bottom Glendale Narrows section of the river is still known as "Frogtown," for the swarms of young toads and Pacific treefrogs that hopped through the streets each year until the 1970s. Today, toads and frogs are rarely found there.

What's behind Trump's bailout for coal and nuclear?

In a nonsensical directive, the Department of Energy caters to industry barons



ANALYSIS
BY JONATHAN
THOMPSON

President Donald Trump digs coal, apparently more than he likes clean air or a healthy climate. And, as a recent document leaked by his administration indicates, he also favors coal industry profits over a free market.

Last month, *Bloomberg* published a draft Department of Energy directive that would employ Cold War-era laws to force utilities to purchase enough power from coal and nuclear power plants over the next two years to keep them running, thereby throwing a lifeline to the drowning industries.

This is a repeat of Trump and Energy Secretary Rick Perry's attempt last year to make the Federal Energy Regulatory Commission give preference to coal and nuclear. FERC refused, saying that there was no evidence to suggest that any past or imminent power plant retirements would affect grid resilience. A study by Perry's own department reached a similar conclusion. Trump's new directive, which has been endorsed by Perry, appears to provide a way around the Energy Department's own regulatory body.

The draft document argues that the government must step in and prop up coal and nuclear because the rash of plant retirements threatens the reliability and resilience of the electrical grid, and that, in turn, is a threat to national security, to the economy, and — ironically enough — the environment. The document provides a case study in logical contortionism, a tortured attempt to rationalize irrational meddling with markets.

Over the last half decade, a glut of cheap natural gas and burgeoning wind and solar power-generating capacity have driven wholesale electricity prices down, nudging nuclear and coal power plants into the red and forcing dozens of them to shut down altogether. The result has been an overall decrease in the electricity sector's greenhouse gas emissions and other pollutants.

Yet according to Trump's directive, the mass shutdown has also meant a loss of "fuel assurance," or the ability of power plants to stockpile extra fuel on-site so that they can continue to crank out the juice if supply lines are disrupted. Coal and nuclear plants have fuel assurance. Natural gas plants, not so much. If the pipelines feeding a plant are blown up or shut down by a terrorist attack, they typically have little to no on-site backup. So an electrical grid that relies too heavily on natural gas is going to be at the mercy of the pipeline network. According to Perry's directive, that leaves the nation vulnerable to mass blackouts.

What the directive fails to grasp, however, is that when it comes to the grid's reliability and resilience, fuel assurance is relatively insignificant. Most outages are the result of problems within the intricate electrical transmission or distribution systems: Extreme heat can cause power lines to sag and rub against tree branches, wildfires can take out power poles, squirrels and birds commonly get caught up in substation apparatus, and sudden spikes in demand can wreak havoc on the grid. Only rarely do power-plant shutdowns result in major outages, and fuel supply is almost never the cause. In October, the independent research firm Rhodium Group found that "fuel supply issues were responsible for 0.00007 percent of lost customer electric service hours" between 2012 and 2016.

Furthermore, replacing large, centralized coal and nuclear plants with smaller, more nimble and more distributed wind, solar and natural gas plants diversifies the grid, contrary to what the directive claims, thus making it less vulnerable to catastrophic outages.

Bizarrely, the directive contends that it will result in *less* pollution by reducing the number of blackouts, thereby decreasing the use of dirty backup diesel generators. The logic behind this is so twisted it needs no response. That said, nuclear power generation is carbon-free, while natural gas — though cleaner than coal — is not. So keeping existing nuclear plants running could theoretically result in reduced greenhouse gas emissions (though the directive never once mentions climate, carbon or greenhouse gases). Yet this ignores the thousands of tons of excess greenhouse gases and other pollutants coal power plants will emit as a result of the directive.

Replacing large, centralized coal and nuclear plants with smaller, more nimble and more distributed wind, solar, and natural gas plants diversifies the grid, contrary to what the directive claims, thus making it less vulnerable to catastrophic outages.

Assuming the order moves beyond draft form, it likely will face a rash of legal challenges and protests. While the nuclear and coal industries like it, almost no one else does, including grid operators, utilities and even the American Petroleum Institute.

If Perry really wanted to diversify the grid and enhance reliability and resilience, he'd be putting federal dollars and energy toward developing power storage technology, both centralized and distributed, to give solar and wind a sort of fuel assurance of their own. He'd be pushing energy efficiency, rooftop solar and demand response — shifting customers' electricity use away from times of peak demand. The draft directive seems primarily aimed at helping the coal industry, with nuclear thrown in — perhaps because the fuel-assurance argument used to back up coal also applies to nuclear. But Perry's not really interested in any of that. He's merely interested in creating the illusion that he and his boss are doing something to save that American icon, the coal miner. And most of all, he's cynically using reliability and national security claims to help out Trump's big-dollar, fossil fuel industry donors, for whom this directive seems tailor-made. □

Jonathan Thompson is a contributing editor at *High Country News*. He is the author of *River of Lost Souls: The Science, Politics and Greed Behind the Gold King Mine Disaster.*
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WEB EXTRA
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Michael O'Casey of the Oregon Natural Desert Association removes old barbed wire fencing in the Steens Mountain Cooperative Management and Protection Area, allowing native wildlife to move freely through the landscape once more. **SAGE BROWN**

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HEARD AROUND THE WEST | BY BETSY MARSTON

THE WEST

Like a scourge, increasing aridity is hurtling eastward across the land. According to a report from John Wesley Powell that was submitted to Congress 140 years ago, the vertical 100th meridian divided the humid Eastern United States from the dry Western plains. Powell called the boundary stark: Toward the east, "a luxuriant growth of grass," but westward, "the ground becomes naked." But now, that line is shifting 140 miles east to the 98th meridian, say scientists in a report issued by Columbia University's Lamont-Doherty Earth Observatory. Rising temperatures that increase soil evaporation are partly to blame, and shifts in wind patterns are causing less rain to fall. One result is that some farmers in the Midwest will no longer be able to grow moisture-loving corn. Climate scientist Richard Seager of Columbia University said only one other straight-line climate divide can be found on the globe — the one separating the Sahara Desert from the rest of Africa.

WYOMING

Forget *oohing* and *ahhing* at Old Faithful; the most exciting geyser in Yellowstone National Park is now Steamboat Geyser, its steamy plume the tallest in the world at up to 300 feet high. Steamboat is back on the job after waking up with a bang this spring, thrilling geophysicists who hope to learn more about what triggers its erratic eruptions. Dormant since 2014, Steamboat has surprised park watchers by erupting six times since mid-March, reports *East Idaho News*, and by the time the most recent blowup occurred June 4, winter snow had melted and some tourists were on hand to cheer the sudden spouting. Known as the hottest geyser in the park's Norris Geyser Basin, Steamboat's last three eruptions — just seven days apart — were the closest together on record, according to a log maintained by *GeyserTimes*.

At the same time Steamboat erupted June 4, a political storm blew through park headquarters, reports *Mountain Journal*: The superintendent of Yellowstone National Park, Dan Wenk, was demoted and forcibly reassigned to Washington, D.C. "It's a hell of a way to be treated at the end of four decades spent trying to do my best for the Park Service and places like Yellowstone, but that's how these guys are," Wenk said, referring to the Interior Department under the leadership of Secretary Ryan Zinke. "Throughout my career, I've not encountered anything like this — ever." Reporter Todd Wilkinson said the park superintendent's difficulties with Zinke apparently involved Wenk's understanding of the agency's mission: Wenk, 66, believes that the core of the Park Service is "environmental protection." Wenk will retire from his job at the end of August, never having "imagined leaving Yellowstone as an exile."

UTAH **Signs of the times.** GREG WOODALL

Moriah Engdahl may only be 12, but after the 17 deaths at Parkland High School in Florida, she became fiercely determined to help stop gun violence, including combatting the high rate of suicides that account for almost two-thirds of gun deaths. She has (politely) taken on the school board of Campbell County, Wyoming, arguing against arming teachers, while at home she stands her ground against her gun-loving dad, Alan, an oil field worker who mocks his daughter's politics at every opportunity. He told the *Washington Post* that he thought about grounding Moriah after she and nine other students walked out of school to march through downtown Gillette, demanding tighter gun laws, but then realized that "the rest of Wyoming is going to punish her for me." Moriah's advocacy of gun control in the Cowboy State definitely puts her in the minority: Wyoming has more guns per capita than any other state, and more than 80 percent of adults in Campbell County have firearms in their home. The feisty pre-teen, though, knows her own mind. Before ending gun violence became her passion, she'd begun questioning her divorced parents' Christianity, decided to favor abortion rights, stopped eating meat, and also declared that she was a feminist. With some pride, her dad says, "(She's) the mouthy, hard-headed one."

COLORADO

On the other end of the activist age spectrum, there's Joe Doak, 96, who spends much of his free time — and often overnight — as a "vigil volunteer" at HopeWest Care Center in Grand Junction, Colorado. Doak said he realized that when it came to dying, he'd had a lot of experience, reports the Grand Junction *Daily Sentinel*. He took care of his wife, Phyllis, for seven years until she died of Alzheimer's disease in 2011. As a volunteer now for those who have outlived spouses or lack nearby relatives or friends, Doak's job is to make sure that no one in hospice care dies alone. He sits by their bedside where he sings, prays and gently holds their hand, and when the end arrives, Doak said he finds himself "overwhelmed by the emotions that come with witnessing another person's last breath on Earth." He's not sure at times if the dying person even knows that he's there, but his aim is always to communicate love and offer comfort and hope: "I tell them the best is yet to come."

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.

"The large sign at the mouth of the gulch made it clear. **How could they have missed it?** No shooting, no chopping down trees, no food left out to attract bears."

Jane Parnell, in her essay, "Caught in the crossfire at a Colorado campground," from Writers on the Range, hcn.org/wotr