

High Country News

For people who care about the West



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After a stormy centennial year, a look at what lies ahead
for the National Park Service
An *HCN* special report

Patrick Gonzalez, principal climate change scientist of the National Park Service, measures a ponderosa pine in Yosemite National Park to help track the effects of climate change. AL GOLUB/
GOLUB PHOTOGRAPHY



100 SPECIAL REPORT ON THE NATIONAL PARKS

On the cover
At sunrise last October, a rainbow bridges the North and South rims of Black Canyon of the Gunnison National Park in western Colorado. HOWARD HILL/
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Editor's note

Birthdays and beyond

For most of us, birthdays are happy occasions, when friends and family pay fond attention, lavishing us with gifts to prove that we are loved and valued. For one day, at least, our foibles are accepted with a smile, or at least diplomatically ignored.

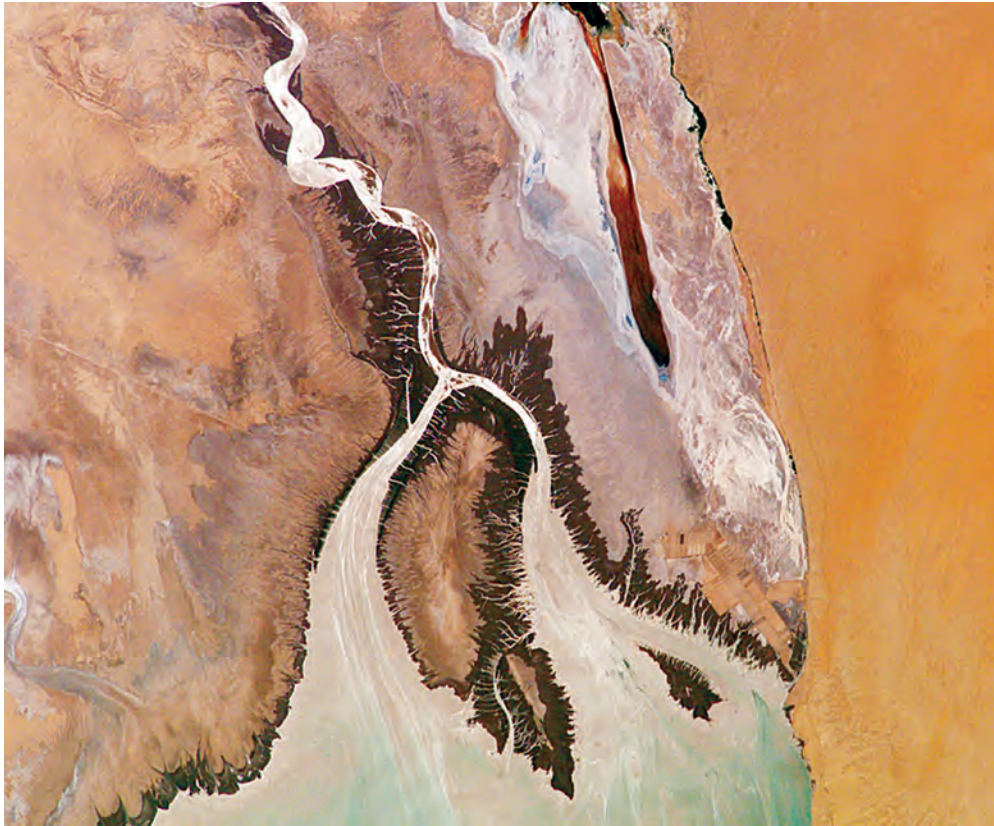


The National Park Service's 100th birthday has been less joyful, however. In fact, anyone paying attention to the news might think that the proud agency, which oversees 412 units across more than 80 million acres, has had its centennial celebration ruined by a series of uncomfortable revelations. In January, the Interior Department's Office of Inspector General released a report detailing two decades of sexual harassment by boatmen in the Grand Canyon's River District and the failure of senior officials to adequately respond. In March, the agency abolished the River District and announced that it would increase sexual harassment training and conduct an agency-wide survey to ascertain how widespread the problem is. Then, in February, Chief Jonathan Jarvis was reprimanded by his bosses at Interior for publishing a book on the parks through a private company without federal approval.

Meanwhile, as you can read in this issue, the Park Service remains hobbled by Byzantine bureaucratic policies that have contributed to its struggle to hire a workforce that reflects the nation's racial diversity, despite decades of "we're-on-it" rhetoric. The agency also lacks an adequate funding base, not only to maintain current operations, but to address the crumbling, neglected infrastructure at parks around the country. The funding crisis is so bad that it is considering corporate sponsorships, a move that has some worried that "America's Best Idea" will end up auctioned off to the highest bidder. It's enough bad news that some park officials probably wish that they'd planned a low-key event at some remote park in, say, South Dakota, rather than the yearlong, media-saturated, Subaru-sponsored celebration that is keeping the agency in the public eye.

But I'm glad the Park Service went big on its centennial, and I'm even glad that its dirty laundry is getting an airing. After all, birthdays are more than just celebrations; they're also a time for reflection and redirection. The fact that we are having such deep, passionate discussions about our national parks and their problems is proof that they are loved and that they matter. Besides, there are some bright spots: The agency continues to lead the way in helping us understand how climate change affects ecological systems; and it has expanded its vision beyond protecting gorgeous landscapes to embracing parks and monuments, some of them brand-new, that spotlight America's unique cultural heritage in all its remarkable, complex and occasionally ugly glory. We can all raise a glass to that.

—Paul Larmer, executive director/publisher



The Colorado River's carbon footprint

To reinvigorate the dry Colorado River Delta and restore native plant life, the U.S. and Mexico agreed to release over 100,000 acre-feet of water from the Morelos Dam in 2014, part of the Minute 319 pact. The flooding worked: The Delta is greener than it has been in decades. But a new study by research teams from Yale University and the universities of Florida, Washington and Arizona also reveals it had an unintended consequence: The rush of water caused the ground to rapidly emit methane and carbon dioxide stored beneath the riverbed for years. It's unclear how much carbon was released in total or whether the increased plant growth made up for the greenhouse gases released. In the future, the researchers hope to quantify that and also look at how flood pulses compare to a steady flow in rivers like the Colorado. As the U.S. and Mexico negotiate more Delta restoration efforts, their findings could help inform those water-planning decisions. **LYNDESEY GILPIN**
MORE: hcne.ws/COriver-footprint

A view of the Colorado River Delta where it meets the Sea of Cortez.

NASA

Trending

Overlooked horse-packers

In an opinion piece, Maddy Butcher argues that the outdoor recreation community ignores people who get out on horseback, as opposed to on foot or by bike. "We love and make use of our public lands, but we get no respect, either on the trail or in the trade," Butcher writes. The Back Country Horsemen of America spent over 300,000 volunteer hours on trail maintenance last year, but at major industry events, Butcher says, riders get little attention, despite being loyal, deep-pocketed consumers. On the trail, she argues, hikers and fast-moving mountain bikers often fail to slow for horses. **MADDY BUTCHER**

You say

CRAIG REPPE
"Considering that vast miles of wilderness trails are open to horseback travel, but closed to mountain bike use, I fail to understand your position."

CAROLYN HOPPER
"I'd rather watch the butterflies that sip the moisture from horse droppings than get run over by a bicycle. And I love to ride horseback."

NALA BEAR
"Rather than hate on one another, try recognizing we all have impact, rather than pointing fingers at everyone else and casting blame."

MORE: hcne.ws/ignoring-horses and [Facebook.com/highcountrysnews](https://www.facebook.com/highcountrysnews)

Batrachochytrium dendrobatidis

A fungus also known as chytrid that is responsible for the collapse or extinction of some 200 species of amphibians.

Janthinobacterium lividum

A type of bacteria that could save amphibians from the effects of chytrid.

Historically, boreal toads were abundant in high-altitude Rocky Mountain streams, but in the past several decades, populations have plummeted, thanks in large part to a fungal infection called chytrid. The toad could receive endangered species protection, but in the meantime, University of Colorado Boulder researcher Valerie McKenzie is testing out a potential fix: spraying toads with a distinctively purple bacterium that could help them ward off chytrid. She's running field tests this summer, in what she's calling Operation Purple Rain.

KRISTA LANGLOIS

MORE: hcne.ws/purple-bacteria

Floodplain fallout

A FEMA program that provides affordable insurance to homeowners and businesses in flood-prone areas is rolling out new regulations in Oregon, due to a lawsuit. The National Flood Insurance Program has been accused of encouraging development in flood-prone zones and imperiling endangered species. The new rules could temporarily stop floodplain development in many Oregon communities.

ANNA V. SMITH

MORE: hcne.ws/ORfloodplain



Development on floodplains can raise flood levels, especially when buildings and parking lots replace natural vegetation that used to absorb water. **FEMA**

18 Threatened and endangered species impacted by development on Oregon floodplains.

251 Communities within floodplain zones that would be severely impacted by a potential moratorium on development and redevelopment under new regulations.

85 Percent of the Willamette River's historic floodplain that has been drained and developed, just one of the many major floodplain zones that have been altered for urban and agricultural reasons.

Quoted

“ I facilitate astonishment. I didn't join the Park Service for money; I get paid in gasps. ”

—Shelton Johnson, the National Park Service's best-known African-American park ranger, on why he has resisted promotion in order to continue playing an active role in telling the story of the Buffalo Soldiers. Even after 33 years, his federal pay grade is equivalent to entry-level in a lot of other fields.

GLENN NELSON MORE: hcne.ws/shelton-johnson



GLENN NELSON

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DESERET RISING?

The map showing the counties in Western states that support the American Lands Council makes it look like a Mormon conspiracy to re-create the State of Deseret ("Land transfer support, county by county," *HCN*, 7/25/16). Add to this House Bill 4751 (the Local Enforcement for Local Lands Act, which would shift law enforcement functions from the Bureau of Land Management and Forest Service on public lands to local law enforcement), which was recently introduced by Utah's four Mormon representatives. Then add in Bundy family members (all Mormons of one stripe or another) who "by force of arms" want to manage or liberate public lands. What next? Legalize polygamy rather than just ignore it?

Utah was admitted to the Union in 1896. I think it is time for its Mormon politicians to start acting like they are still part of the United States of America.

*Al Herring
Sutherlin, Oregon*

IMMIGRANTS AND JOBS

In "Love and Death on the Border" in the July 25, 2016, issue, Jon M. Shumaker ends a paragraph about the risks immigrants take in illegally crossing the border with "All this in order to take dangerous, crappy jobs no one in this country wants." With this seemingly trivial comment, he perpetuates a false assumption that continually skews the illegal immigration issue. Americans all over this country would be delighted to have the jobs undocumented workers currently have. The distinction is that if they did take these jobs, their employment would be legal, and therefore minimum wage, workers' compensation insurance, overtime and safety regulations, etc., would apply. The "dangerous, crappy" qualities of these jobs become much more tolerable when such employment is governed by existing laws.

*Gwen Hoffnagle
Troy, Montana*

HCN AS TRAVEL GUIDE

Hillary Rosner's excellent article "When Water Turns to Dust" in the June 13, 2016, issue became a surprise travel guide of sorts on our recent trip across the Great Desert. On our return from Tahoe and Yosemite, we made a point to stop at Mono Lake, in part because in was mentioned in Hillary's article. Plus, it's a cool place.

We stopped at Lassen Volcanic Na-



PAT BAGLEY/CAGLECARTOONS.COM

tional Park, perhaps one of the National Park Service's best-kept secrets. Then we chose to meander north and rim the Great Desert before turning back to Denver, in part because we could then put a "face" to the places named in her article. At every point along the way north — Goose Lake (and its surprisingly pleasant campground), the endless miles of hay and alfalfa fields (the bales are "bigger than a man!"), then the Abert Rim — we were exclaiming, "Hey, that was in the *HCN* article!"

But not even the distant glisten of a receded Goose Lake could prepare us for the mile after dusty, salty mile of shoreline as we passed Lake Abert. But thanks to Rosner's detailed reporting, we understood the issues behind the lakes' dwindling water levels, and it added a surprising and enjoyable context to our trip home.

So thank you, *High Country News*, for your excellent reporting of the West and this surprise "travel issue."

*Jim and Marsha Miller
Denver, Colorado*

COLLABORATION? NOT SO MUCH

I read your article on the Bureau of Land Management's new collaborative approach to planning with skepticism ("BLM rethinks land-use planning," *HCN*, 5/30/16). In this same region of western Montana, the U.S. Forest Service has been applying the word "collaborative" to its timber sales because the Healthy Forest Restoration Act (HFRA) requires "public collaboration." However, the HFRA does not define collaboration, and so anything counts. The Forest Service's usual tactic is to take a small

project recommended by a local restoration committee, greatly expand that project to include commercial timber harvest and new road building, and then apply the collaborative label. Bitterroot National Forest's recent approval of the Westside Collaborative Vegetation Management Project near Hamilton, Montana, is a good example. Here, BNF greatly enlarged a small Bitterroot Restoration Committee project to include more than 2 square miles of commercial logging and 7.6 miles of new logging roads. Despite a majority of public comments and objections opposing the new roads and commercial logging around a popular 9-mile hiking-biking-horseback trail, BNF approved the plan with no significant changes. Prior to reaching the final decision, agency officials had also marked all the trees, completed geotechnical work for the roads, and lined up workers for the project, suggesting that they never had any intent to compromise by considering public concerns. This behavior has only served to increase the public's distrust of the Forest Service.

I thought it interesting that you quoted a representative of Pyramid Mountain Timber as being "enthusiastic" about the BLM's new collaborative efforts. I'll bet he is: Pyramid might be the only real collaborator on the Forest Service timber projects. In contrast to the Forest Service, I hope the BLM will include the public as collaborators — after all, it is public land.

*Jeff Lonn
Hamilton, Montana*

High
Country
News



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recycled paper.



Spent nuclear fuel is stored in steel cylinders called dry casks at the Diablo Canyon nuclear power plant. There's still no long-term disposal method for the waste. NUCLEAR REGULATORY COMMISSION

Nuclear power divides environmentalists in California

Is the closure of the Diablo Canyon nuclear plant good or bad for the climate?

BY PAIGE BLANKENBUEHLER

At the end of June, nearly 100 environmentalists marched through the streets of Oakland, California, stopping to picket an unlikely foe: the Sierra Club. While most of their comrades waved signs outside the concrete building's expansive front windows, a small group took the elevators upstairs to the main office and began chanting: "We're on a mission to stop all emissions!"

"We love you, and we're behind you," declared Eric Meyer, organizer of the march. "But you're wrong about one thing: nuclear power."

The protest followed Pacific Gas & Electric's announcement that it would close the Diablo Canyon nuclear power plant in 2025. PG&E executives said it would be too expensive to install the new cooling towers and seismic upgrades needed to keep it open. Both the Sierra Club and the Natural Resources Defense Council pushed for the closure because they say that there's no long-term disposal method for nuclear waste, and the plants consume too much water.

But environmentalists like Meyer ar-

gue that Diablo Canyon is currently California's single largest producer of carbon-free power, and closing it will derail the state's ambitious efforts to phase out fossil fuels. California already leads the nation in renewable energy, with 22 percent of its electricity coming from geothermal, wind and solar. By 2030, it hopes to more than double that figure.

Diablo's closure won't impede progress toward that goal if PG&E can replace the plant's massive energy load entirely with renewables. The utility's executives say that's their plan. The question is whether it's actually feasible.

Michael Shellenberger, president of the Berkeley-based organization Environmental Progress, is one of the louder pro-nuke voices. He argues that California owes its progress in cutting emissions to its nuclear plant. Diablo Canyon, the state's largest generation facility, provides what's known as "base load" power. Unlike wind and solar, it can pump out electricity whenever it's needed, day or night. The cheapest, easiest replacement for base-load nuclear power is natural gas, Shellenberger says. But going that route would make it harder for the state to meet its climate goals.

If the past is any indication, he's right that losing Diablo could force California to depend more on natural gas. In 2013, the San Onofre nuclear plant south of Los Angeles shut down abruptly after an equipment failure. Natural gas, abundant and inexpensive, filled the hole that closure left in the electricity supply. "Wind and solar are intermittent and need to be backed up," Shellenberger says. "There is not enough power when people need it."

PG&E's plan is still under review, but its executives and some environmental groups believe that renewables can do the job. PG&E and its partners plan to lean heavily on homeowners and businesses installing rooftop solar arrays, but they have yet to specify just how they would deal with the sun's intermittent nature. Still, Peter Miller, senior scientist with the NRDC, which helped craft the proposal, says new battery technology to store excess wind and solar energy is on the horizon and would allow that power to be deployed on demand. Nuclear power, he adds, is a crutch that inhibits investments that could speed such advancements along. And solar power in California already costs less per kilowatt-hour than energy from Diablo. "Nuclear is making less and less sense in California," he says.

California's progressive politics have nurtured a renewable energy market that could be robust enough to fill the gap left by Diablo, says Alex Gilbert, an independent energy policy analyst based in Washington, D.C. Unlike San Onofre, PG&E will have nearly a decade to prepare for closure. "Over time, it's reasonable that renewables could take the place of nuclear," Gilbert says. And if PG&E can pull it off, the state could set a new standard for shifting away from large base-load power plants. "California is always about five to 10 years ahead of the rest of the country in its energy policy."

The American West has never been particularly fertile ground for nuclear energy. During the nation's nuclear boom, most plants were built in the East, near population centers and the large water sources needed to cool reactor cores and control waste. Today, there are only three nuclear plants in the West, including Diablo Canyon. If it closes, Arizona's Palo Verde Nuclear Generation Station and Washington's Columbia Generating Station will be the last remaining. A new plant has been proposed near Green River, Utah, and in July, it received the necessary water rights. But it still lacks enough investors to begin construction.

If California can meet its climate goals without nuclear, it will be an example to the nation. But Gilbert says the larger energy economy is not yet prepared to follow its lead on renewables. "If staving off climate change is the goal," he says, "getting rid of all nuclear power in this country would be irresponsible." □

THE LATEST

Backstory

On Aug. 5, 2015, as Environmental Protection Agency contractors excavated debris at the old Gold King Mine near Silverton, Colorado, **a blowout sent 3 million gallons of heavy metal-laden wastewater down the Animas and San Juan rivers, turning the water mustard-yellow.** The contamination left Navajo Nation farmers downstream without water, inspired dozens of lawsuits against the EPA and raised concerns about how to remediate the West's thousands of abandoned mines ("The Gold King Reckoning," *HCN*, 5/2/16).

Followup

This month, the EPA's Office of Inspector General confirmed it is conducting a criminal investigation into the agency's role in the spill, just after the EPA released a report implicating Colorado mining law. Sens. John McCain, R-Ariz., and John Barrasso, R-Wyo., have pushed the government to hold someone responsible for the damage. So far, the EPA has spent \$29 million on remediation. Should the site receive Superfund designation, it would be eligible for more federal dollars.

LYNDSY GILPIN

A worker adjusts the pH of a settling pond. ERIC VANCE/EPA



Paige Blankenbuehler is an *HCN* editorial fellow.

Twitter: @PaigeBlank

Andrew White steps from the 2015 Subaru Outback donated to Grand Teton National Park last year by the National Park Foundation and Subaru of America. NATIONAL PARK SERVICE



The Park Service's befuddled funding

A cash-strapped agency wrestles with corporate sponsorships

BY PHIL TAYLOR

As the Park Service celebrates its 100th anniversary, lack of funding threatens its ability to fulfill its basic mandate to preserve America's iconic scenic, historic and recreational sites for the public's enjoyment.

Congress has been tightening the agency's purse strings. Annual appropriations, which make up about 88 percent of its roughly \$3 billion budget, declined 8 percent between 2005 and 2014 after adjusting for inflation, according to a December report from the Government Accountability Office.

As a result, park superintendents are being forced to do more with less — particularly when it comes to staff. "What options do superintendents have?" says Denis Galvin, a Park Service retiree who served as deputy director under presidents Reagan, Clinton and George W. Bush. "You've got to pay the electric bill. You've got to pay your suppliers of materials. The only thing a park superintendent can really do is not hire people."

Phil Taylor is a *Greenwire* staff reporter. Copyright 2016, Environment and Energy Publishing LLC. Reprinted with permission.

Consider this fact: In 2010, the Park Service had the equivalent of 22,211 full-time employees managing 394 units, including national parks, preserves, recreation areas, historic sites, battlefields and parkways. By last year, the number of park units had risen to 409 — yet the workforce number had been trimmed to 19,539.

Galvin, who is now on the board of the National Parks Conservation Association (NPCA), blames Congress, too. In 2001, congressional funding for the Park Service represented 0.12 percent of overall federal spending, Galvin says. By 2014, it had declined to 0.069 percent. National parks "are a minuscule and declining part of the federal budget," Galvin told a panel of lawmakers in October 2013 during the 16-day government shutdown.

The funding crunch has forced the agency to rely more on non-appropriated sources of funding, including entrance fees and corporate donations. Fees, donations and other such funding sources grew 39 percent from 2005 to 2014, even after adjusting for inflation, the GAO found.

That has raised tough questions within the Park Service over the role of philanthropy in keeping parks afloat. To what extent

should private donations supplant congressional appropriations? And what's to stop parks from becoming overly commercialized and beholden to their sponsors?

"We have to hold a bake sale for everything," Interior Secretary Sally Jewell told a national parks conference in Berkeley, California, last year. "I didn't think I'd be jumping into fundraising — other than begging for money from Congress — when I got this job. But I learned early on that if we wanted to do what we aspired to do in terms of connecting the next generation, I was going to have to tap the private sector to see if they would help us. And they have been."

But philanthropy is no panacea for budget woes, warns Director Jonathan Jarvis. For one, donors aren't fighting to pick up the agency's \$11.9 billion deferred maintenance tab. That includes budget-busting projects like Yosemite National Park's sewer lines, which on "numerous occasions" have spilled untreated sewage into the watershed of the wild and scenic Merced River, according to agency budget documents.

Deep-pocketed donors are ponying up to save iconic park buildings; for example, billionaire history buff David Rubenstein gave \$7.5 million to shore up the earthquake-shaken Washington Monument and \$18.5 million to restore the Lincoln Memorial. But private philanthropists won't fix the agency's pothole-strewn roads, its crumbling bridges or its bathrooms, Jarvis says. "David Rubenstein is not gonna give me money to fix my roads, OK? Nor is anybody else in philanthropy." That's the responsibility of American taxpayers, he added.

The funding dilemma made headlines earlier this year, when the agency's new plans to roll out the welcome mat for donors became public. Media reports questioned whether the Park Service would sell naming rights, raising fears of corporate logos prominently displayed in celebrated landscapes.

In a shift from the Park Service's 2008 philanthropy policy, Jarvis has allowed donors' names to be posted on park benches and vehicles, and he suspended a ban against taking money or advertising support from alcohol companies in order to allow Anheuser-Busch InBev to be a "premier partner" in the parks' centennial campaign.

In March, Jarvis released a draft order that would codify those policies, promising to give "a new generation of Americans the opportunity to care for their national parks through the 21st century and beyond." The new order would allow park superintendents who receive the required training and certification to accept gifts of up to \$5 million. It would also allow the Park Service director and deputy director to solicit donations directly from private individuals or organizations. Corporations could temporarily name auditoriums and other rooms in visitor facilities that they helped renovate, with the director's approval. Benches, paving bricks and other fixtures could also be adorned with corporate names.

That sparked concern among the public and park advocates over the placement of corporate names and logos. "We support the order's intent to allow for additional opportunities to recognize donors, but that should not commercialize the park experience," says Theresa Pierno, chief executive officer of NPCA. "National parks are places where the public's eyes can take a rest from advertising and enjoy the scenery and history. They need to stay that way."

Jewell believes Jarvis is striking the right balance between recognition and preservation. "There's no way we're going to commercialize the parks and say, 'Brought to you by Coca-Cola,'" she told *Greenwire*. "But to recognize when people do step up as individual philanthropists, in a tasteful, appropriate way to a national park, is something we do believe we should do."

Yet as philanthropy's share of the agency's budget grows, so do concerns from park advocates. While the 2008 order specified that "donations are not to be used as offsets to appropriated funds or to meet recurring operational requirements," that phrase does not appear in Jarvis' new order.

"National parks for the first time will depend on outside gifts to support their base budgets," says Jeff Ruch, executive director of Public Employees for Environmental Responsibility. That raises the risk

that corporate donors will exert too much influence over decisions, compromising the agency's mandate to keep parks "unimpaired," Ruch says.

A case in point, he says, was Jarvis' decision in 2011 to temporarily halt Grand Canyon National Park's ban on the sale of disposable water bottles after complaints from Coca-Cola, which distributes water under the Dasani brand and had donated more than \$13 million to national parks, according to *The New York Times*. Ruch and other critics say Coca-Cola unduly influenced the decision, an accusation Jarvis has denied.

The Grand Canyon did ban bottled water by early 2012. "These are investments in a quid pro quo," Ruch says. "We are concerned that influence peddling will soon become a major recreational activity in our national parks."

Jarvis' order contains provisions intended to prevent that. When determining whether to accept or decline a gift, Park Service employees must verify that it is not designed to "influence the exercise of any NPS or Departmental regulatory or other authority" and that "the donor will not obtain or appear to obtain special treatment in dealing with the NPS," the draft order says.

When it comes to federal funding, most members of Congress want to help. The problem, according to Rick Healy, a former Democratic aide on the House Appropriations Committee, is that Congress never has enough money to start with. With a finite spending cap, a

major boost in park funding would require siphoning cash from other critical government programs, such as fighting wildfires or funding the Centers for Disease Control and Prevention, he says.

"It's a zero-sum game," says Healy, who is now with the firm McDermott Will & Emery LLP. Competition for discretionary funding is fierce, Healy says. The panel Healy worked on, the Interior, Environment and Related Agencies Appropriations Subcommittee, must compete with 11 other subcommittees for a piece of the non-defense discretionary spending pie, which last year was set at \$518 billion.

Once the panel receives its slice — last year it was \$32.159 billion — it must be shared with all the other Interior Department, Forest Service and EPA "must-do's" like wildfires, American Indian programs and money for rural counties, Healy noted. "We could give the National Park Service more money, but we need to deal with budgeting holistically."

For too long, Congress has tried to balance the federal budget by limiting non-defense discretionary spending, Healy says. The solution, according to Galvin, is to rein in long-term entitlement costs like Medicare while raising some new tax revenues. That would potentially free up more money for parks.

The Park Service achieved a minor victory last October when Congress struck a two-year, bipartisan budget deal that lifted the so-called sequester cuts and freed up \$80 billion in additional discretionary

Please see Cash-strapped, page 22

A campground in Joshua Tree National Park, where the maintenance backlog is \$60 million, according to a 2015 NPS report.

NATHAN ROTT/NPR



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WILLIAM HENRY JACKSON PHOTOS, Exhibit of rare, original photochromes and cabinet cards at FAD (Furniture, Art & Design) Gallery, 107 Grand Ave., Mancos, CO

On U.S. Geological Survey expeditions through the American West in the 1870s, William Henry Jackson took the first photographs of the Yellowstone region's thermal springs, craters and geysers. Those images helped persuade Congress to protect Yellowstone as a national park — America's first — in 1872. Jackson also took early pictures of Yosemite in California and Wyoming's Devils Tower, and was the first to photograph the ancient cliff dwellings at Colorado's Mesa Verde, decades before it became a national park. Long before color film was available, he used the photochromic process to colorize black-and-white photos, which he sold as postcards. To celebrate the National Park Service's 100th birthday this month and Jackson's role in its history, his rare photographs will be displayed at the FAD Gallery in Mancos, Colorado, until the end of September. The exhibit showcases 10 original black-and-white postcards of Mesa Verde and over a dozen vivid color photos of other Western landmarks. **LYNDESEY GILPIN**

Index Peak in Yellowstone, far left, and dogwood blossoms.
WILLIAM HENRY JACKSON

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Farewell to a senior editor — sort of

This issue we're saying good-bye, in a way, to longtime *High Country News* writer and old friend **Jonathan Thompson**, who is leaving his post as senior editor in Durango, Colorado, to move to Bulgaria with his family. There he'll be hard at work turning his extensive reporting on Colorado's Gold King Mine spill into his first book. He's not quite off the hook with us, however: He has agreed to continue working part-time for *High Country News* as a contributing editor. Good luck, Jonathan.

Closer to home, we're now calling for submissions for our annual reader photo contest. In honor of the 100th anniversary of the National Park Service, we're dedicating this year's competition to the parks you love, from the world-famous to the nearly unknown. Submit up to three images of people, wildlife, landscape, trees, wildflowers or landscapes in national parks or monuments in the American West. Submissions are accepted through Aug. 31. For details on prizes and more, go to **hcn.org/photos16**.

This summer has been filled with new and old friends who have dropped by the magazine here in Paonia, Colorado. **Jordan Roth**, a long-distance cyclist making his way around Colorado, rolled into our office after a storm in June, bedraggled and hungry from a night out in the rain. Jordan, who is from Fayetteville, Arkansas, had embarked on a monthlong tour of Colorado's highest passes. His biggest day included two

11,000-foot passes: Berthoud and Loveland. We fed and watered him and sent him on his way. Great to meet you, Jordan, and we look forward to hearing about your trip.

Reader **Bryan Johnson** stopped by after backpacking in the Sonoran Desert, which stretches across parts of California, New Mexico and Arizona. Prior to that, Bryan, who is from Portland, Oregon, worked with "No More Deaths," an organization that provides humanitarian aid to people crossing the U.S.-Mexico border. Thanks for coming by and sharing your story, Bryan.

Recent subscribers **Susan** and **Clark Duffy**, from Topeka, Kansas, popped into the office in August while they were in Colorado to visit family. They spent their college years in the West and started subscribing to *High Country News* because they want to stay connected to the region, its people and its issues. We also caught up with longtime subscriber **Jim Barron** this month, who stopped by the office after visiting his brother, author **T.A. Barron**, who writes about nature but is best known for his fantasy and children's books. Jim's mother, **Gloria**, donated to *High Country News* during the financial crisis in the 1970s, helping create what has become our Research Fund (see opposite page). We're thankful to all of you for your enduring support.

—Paige Blankenbuehler,
for the staff



HCN editor Jonathan Thompson took a trip in the proposed Bears Ears national monument in Utah before moving to Bulgaria. JONATHAN THOMPSON

Climate Change Scientist Walks the Walk

Patrick
Gonzalez
prepares the
national
parks for a
hotter
future

FEATURE BY
ELIZABETH
SHOGREN

100

THE FIRST UNMISTAKABLE SIGN of climate change Patrick Gonzalez ever saw in the field was in Senegal. It was a dead tree — *Prosopis Africana* or, as the locals call it, *yir* — normally a mid-sized tree with tiny bluish-green leaves and wood so dense that Wolof villagers use it to hold up the walls of their huts, passing the poles down through the generations. But this *yir* was nothing but a gray naked trunk, and Gonzalez knew that climate change had killed it.

Five years earlier, when he first came to Senegal as a Peace Corps forestry volunteer in 1988, village elders told him that many local trees were dying off — including *yir*, mango, cashew and jujube, whose berries are full of vitamin C. Their loss contributed to the people's obvious malnutrition — toddlers with hair of a dull reddish hue instead of shiny black, tragically skinny adults. Women were forced to walk much farther to gather firewood.

Gonzalez helped them revive forgotten traditional methods and re-grow some of their native trees. But he was also determined to figure out what was causing so many trees to die. So he returned to Senegal in the early 1990s and walked to 135 villages to count and measure trees and interview village elders. He wore out six pairs of tennis shoes walking nearly 1,200 miles — and earned his Ph.D. from the University of California, Berkeley as a forest ecologist, and his stripes as a climate change scientist.

His data showed that, since 1945, one out of three tree species in Senegal had disappeared, and one out of every five big trees had died. Over 50 years, tropical woodlands had shifted 15 to 18 miles toward the equator, giving way to grasslands. “Only a substantial change in climate can cause that,” says Gonzalez. The primary tree-killing factors were higher temperatures and lower rainfall, caused by global increases in greenhouse gases. He had unraveled the mystery of the dying trees of Senegal and documented one of the earliest cases of climate change altering the fundamental ecology of a region, causing a biome shift. “So here we have our pollution causing



A dead *yir* tree in Senegal, seen by Patrick Gonzalez in 1993 as an unmistakable indication of climate change.

COURTESY PATRICK GONZALEZ

climate change, causing drought, killing trees and hurting people's livelihoods half a world away,” he says. “And it's the thought of these people and the hardships of their lives that really drove me.”

A quarter-century later, Gonzalez is focusing his considerable passion for deciphering how climate change is altering the natural world on some of America's most cherished landscapes: the national parks. It's melting glaciers, hastening snowmelt, intensifying wildfires, warming streams, and pushing animals and plants out of their usual locations. In coming decades, climate change will magnify these impacts. To what degree depends on whether and how much people rein in greenhouse gas emissions.

As in Senegal, Gonzalez's mission is twofold: He's leading a massive effort to analyze and describe climate change impacts in every park and across the whole system, and with colleagues inside and outside the agency he's pioneering ways to use that science to preserve the landscapes that first inspired Americans to create national parks. Climate data

can help park supervisors make decisions about everything from how to manage wildfires and restore wetlands to how — and whether — to upgrade culverts or move roads.

This new thinking doesn't come easy to a 100-year-old bureaucracy. But the National Park Service acknowledges that, due to climate change, it needs to revolutionize the way it manages the landscapes in its care. The goal, Gonzalez says, is “to go from trying to re-create small pictures of a past to which we cannot return, to national parks that we manage for potential future conditions, so that they remain vibrant through this time of dramatic global change.”

THE MAGNITUDE OF THAT CHALLENGE

inspired National Park Service Chief Jonathan Jarvis, nearly six years ago, to create the job of principal climate change scientist. He hired Gonzalez, whom he calls a “brilliant” scientist with deep experience. A lead author of three reports of the Intergovernmental Panel on Climate Change, Gonzalez shares in the Nobel Peace Prize the group received in 2007. But more importantly, says Jarvis, he's got the heart of a field scientist: “Patrick is a field guy. He gets it, he understands. He has this sort of deep passion about the outdoors and about trees in particular.”

Gonzalez, a trim 51-year-old with short salt-and-pepper hair, regularly walks 10 miles a day. He literally bounces up steep trails in Yosemite, stopping periodically to admire new spring growth on pines or sniff their bark, talking all the while. There's a kind of quiet ferocity to the man, especially when it comes to climate change. An introvert by nature, he acquired the gift of gab from the Wolof villagers, who welcomed him when he showed up unannounced, wanting only his conversation. He owes to them his rare ability to communicate the truth about climate change.

He drives himself and his colleagues to combine the latest international climate data with contemporary field observations, as well as the national parks' rich trove of historical research. That has given the National Park Service a major



Patrick Gonzalez, principal climate change scientist of the National Park Service, uses a clinometer to measure tree height in his favorite national park, Yosemite, where he sees first-hand the effects of climate change.

AL GOLUB/
GOLUB PHOTOGRAPHY

Vital signs

Climate change has already brought irreversible changes to the national parks. And more are imminent, without major reductions in pollution from cars, power plants and deforestation. Here's a sampling. E.S.

Melting glaciers

The elevation of Muir Glacier in Alaska's Glacier Bay National Park and Preserve has dropped in places by 2,100 feet since 1948. This is one of many glaciers in southeast Alaska that have shrunk astoundingly in recent decades, dramatically changing what visitors see and contributing to sea-level rise. Scientists estimate that over the latter half of the 20th century, melting ice masses in Alaska and neighboring Canada have increased global sea level even more than the Greenland ice sheet has. Muir Glacier offers a great example of how the rich data from national parks has contributed to the global understanding of climate change. It's among 168,000 glaciers used by the Intergovernmental Panel on Climate Change to determine that human-created climate change is melting glaciers globally.

continued on next page



Yosemite toad.
PAUL MAIER/CC VIA WIKIPEDIA

Vital signs ... Shifting biomes

Since 1880, lodgepole and other pine trees have moved uphill into what once were subalpine meadows in Yosemite National Park. The thirsty trees have helped dry up a wetland ecosystem important for small mammals like marmots as well as high-elevation frogs and salamanders. Yosemite now is working on a restoration project to restore the meadows' hydrological functioning. "You want them to remain wetlands," says Linda Mazzu, Yosemite's resource manager. "When trees invade, it's like a biome shift." A biome is the community of plants and animals in a particular region, and this was one of 23 biome shifts worldwide documented by the Intergovernmental Panel on Climate Change. Other biome shifts are underway — boreal conifer forests moving into tundra and alpine biomes in the Kenai Mountains-Turnagain Arm Natural Heritage Area and in Noatak National Preserve.

Voracious beetles

Climate change is causing extensive bark beetle outbreaks across the West, because winters have been too mild to kill the insects and trees are stressed by drought. Rocky Mountain National Park has been hit especially hard, with 90 percent of the park's forested areas affected. Hundreds of thousands of lodgepole, ponderosa, Engelmann spruce and other evergreens have died. Park staff remove standing dead trees at campsites and other heavily visited areas so they don't fall on people or property. They also spray insecticide on thousands of tree trunks in non-wilderness areas. But 95 percent of the park is designated wilderness, and the beetles, which are native, have free rein there. The park has planted a small number of trees, but leaves most areas for natural regeneration.

head start over other federal agencies, says Kathy Jacobs, who worked in the Obama White House for four years producing the 2014 National Climate Assessment. The other dozen agencies involved in that report "were more reluctant to use this information or didn't know how to translate science in ways that are useful for decision making," says Jacobs, now a University of Arizona professor and director of its Center for Climate Adaptation Science and Solutions.

Gonzalez serves all the parks, but Yosemite has been his personal favorite since he woke up in a tent in the valley on a snowy morning, 29 years ago. This May, as he headed back there from his home in Berkeley, California, he was full of excitement. He was about to introduce managers from several West Coast and Pacific island parks to his strategy for better managing forests in the face of the increasingly frequent fires that climate change brings.

But before reaching Yosemite, Gonzalez was jolted by a sight reminiscent of his experiences in Africa. He knew that California's four-year-drought had killed trees, but was unprepared for the profusion of rust-colored dead trees on a landscape he loves so deeply. A wave of shock and sadness swept over him. "I was alarmed, actually," he recalls. "It's preventable," he says of the tree losses around the state. "Human climate change has caused a tenth to a quarter of the California drought." The Sierra Nevada's dead trees are part of a West-wide die-off. Climate change caused tree deaths to double between 1955 and 2007, research shows. Scientists haven't yet analyzed the role climate change played in the even larger die-offs of more recent years.

As in Senegal, that knowledge motivates Gonzalez to act. Now he and his colleagues are using careful, inventive science to prove that climate change is to blame, communicating that fact to the public and devising management changes that reflect the data. Gonzalez looks for

Patrick Gonzalez, right, and his best Wolof friend, Séex Ley, check the "sowing bags" that contain seeds that have yet to sprout. As a Peace Corps volunteer, Gonzalez innovated new ways to grow native trees in an environment that was becoming less hospitable to them. Far right, some of the trees today, grown by Senegalese farmer Modu Jóob with seeds Gonzalez gave him decades ago. COURTESY PATRICK GONZALEZ



ELIZABETH SHOGREN

"Human climate change has caused a tenth to a quarter of the California drought."

—Patrick Gonzalez, NPS chief climate change scientist, who says he's optimistic that people will do the right thing in the face of climate change

overarching patterns. For instance, his analysis shows that climate change is heating up national parks on average three times faster than the rest of the country. Parks tend to be located at higher elevations and farther north, where temperature increases are greater. The increases vary significantly, park by park. But national parks serve as crucial safe havens: As lynx, wolverines and other high-elevation mammals are pushed into ever-smaller areas, their remaining habitats, often in parks, become increasingly important to their survival.

He's also parsing the latest climate data and synthesizing studies to draw individual portraits of climate change in each park, now and in the future. So far, he's completed reports for 234 of the 412 national parks. They provide specific data tailored for each park about historic temperature increases and precipitation

changes, as well as a range of projections. For coastal parks, they also include historic data and projections for sea-level rise, erosion and storm surge. But the reports also provide much more intimate pictures, capturing the vulnerability of particular animals and plants, as well as impacts to glaciers and other natural wonders. "The Park Service should be applauded for really drilling down and trying to understand how each unit will be affected," says Jonathan Overpeck, professor of geosciences and atmospheric sciences at the University of Arizona.

The sea-level rise and storm surge data come from a major project by University of Colorado climate scientist Maria Caffrey, which examines all coastal and lakeside parks. Gonzalez, who oversees Caffrey, had her recalculate her data using a different measurement technique, to make it more useful for park managers. Despite the inordinate amount of work that caused her, Caffrey says she appreciates his high standards: "Patrick really is the only person at the Park Service I can think of who will dive into the numbers and think about things I haven't taken into account." So far, two parks have resisted Caffrey's projections because they didn't jibe with their own estimates. But Gonzalez stepped in, insisting they use her conclusions because she used more accurate, up-to-date science.

The Park Service sent a summary of Gonzalez's Yosemite report to President Barack Obama's speechwriters before his speech in Yosemite Valley in June. "The biggest challenge we're going to face in protecting this place and places like it is climate change," Obama said that day. "The idea that these places that sear themselves into your memory could be marred or lost to history — that's to be taken seriously."

WHILE THE PARK SERVICE has progressed light-years in terms of conducting climate change science, individual parks have

Please see Climate change, page 24





Researchers in the Jemez Mountains of New Mexico work to identify how best to protect cultural resources during fuel treatments that are increasingly part of forest management for the National Park Service and other agencies. At left, video and infrared cameras set up on tripods record the progression of fire during a prescribed burn. Following a burn, researchers uncover test artifacts, such as the potsherd above, and check for damage. U.S. FOREST SERVICE

Vital signs ...

Shrinking wildlife habitat

In Mount Rainier, North Cascades and Olympic national parks, scientists predict that climate change will dramatically shrink habitats for high-elevation mammals. As temperatures warm and snowpack decreases, hoary marmot, wolverine, mountain goat, American pika, American marten, snowshoe hare and Canada lynx will probably lose most of their current turf. Small patches of mountain-top habitat in national parks will become increasingly important for the conservation of these species, because other suitable homes for them are likely to be gone.



Saguro National Park in 1935, top, and 2010. NPS

Looming die-offs of desert plants

The exquisite desert plants of Arizona's Saguro National Park are adapted for dry conditions, but climate change may make their Sonoran Desert home too hot even for them. Scientists project major die-offs of saguaro, palo verde, ocotillo and creosote bush. And even if the planet's people manage to modestly reduce their greenhouse gas emissions, scientists project that 90 percent of Joshua Tree National Park could become too dry for Joshua trees by 2100.

A new vision for park stewardship

National parks tackle climate change despite meager help from Congress

Five years ago, just after archaeologist Marcy Rockman joined the National Park Service's new climate change response program, the GOP-controlled Congress slashed its budget by 70 percent. Republicans were determined to squash President Barack Obama's climate agenda, and many federal officials were deeply discouraged. So Park Service Director Jonathan Jarvis convened his top staff and climate team. Rockman says he pounded his fist on a table and bellowed: "Say the 'c' word!" It was a clear battle cry, she adds: "Jarvis was so forceful in saying, 'We are doing this!'"

With only \$2.8 million and a tiny staff, the program began a major research blitz, studying climate change impacts on national parks from Acadia in Maine to American Samoa in the Pacific. Meanwhile, Jarvis convened a panel of independent scientists, who, in 2012 produced a report titled *Revisiting Leopold*. They urged the agency to jettison its decades-old mandate to preserve each park as a "vignette of primitive America." Rather, parks should steward America's treasures through the continuous and unpredictable changes to come. Managers should "act immediately, boldly and decisively" to prepare for volatile conditions, including severe wet seasons and deep droughts, and unite with nearby public lands to address landscape-wide challenges, such as creating corridors for wildlife seeking new habitat. A permanent policy reflecting the panel's thinking is due out later this year.

"That's a huge paradigm shift; it's driven by recognition that climate change is making the former strategy impossible," says University of Arizona professor Jonathan Overpeck. "The shift in climatic extremes will affect just about anything in a park, other than the solid rock. The Park Service is taking climate science and climate change seriously, which is really important if we're going to manage these precious resources into the future."

Many changes are already evident. Yosemite's Lyell Glacier, which covered 1.2 square kilometers when John Muir first studied in 1872, was down to 0.27 square kilometers. At this rate, park geologist Greg Stock warns, it will vanish completely within 10 years. Glacier National Park's much larger glaciers have shrunk tremendously, too. Scientists project other dire consequences for Western parks if humans fail to kick the fossil fuels habit: rampant wildfires, rivers too hot for native trout, mountaintops too warm for snow-dependent mammals like snowshoe hare and Canada lynx.

The parks are working to slash their own emissions. The visitors' center at California's Pinnacles National Park, for

instance, was built with renewable power and runs on electricity from solar panels. Passenger vehicles are no longer welcome in Zion during the summer. And parks are educating the public about climate change.

But they've been slower to adapt management practices. There are good reasons, says Tom Olliff, division chief of landscape conservation and climate change for the Intermountain West Region. Science takes time, as does crafting good policy. And managers are rightfully conservative, says Olliff, because their mission is to leave these magnificent landscapes "unimpaired for the enjoyment of future generations."

Still, some parks are charging ahead. At Golden Gate National Recreation Area, several beach restoration projects are in the works due to erosion caused partly by sea-level rise. At Stinson Beach, the park recently removed its old sewage treatment system on the beach and installed a new one high in the bluffs. For the last three springs, Utah's Timpanogos Cave National Monument has attached pheromone packets to 100 Douglas firs along a steep paved trail to the cave, hoping to help them avoid joining a West-wide bark beetle outbreak exacerbated by climate change.

With the program's budget still stuck at \$2.8 million, Rockman finds it hard to do the job she was hired to do: assessing cultural treasures' vulnerability to climate change. Most available funding goes to protect historic coastal buildings from sea-level rise and storm surge; a 2015 analysis of 40 coastal parks determined that buildings worth \$40 billion are at high risk over the next century. But Rockman worries that the West's archaeological and historic treasures have as-yet-unidentified weaknesses. She wonders if climate change is responsible for crumbling adobe structures at some Southwestern parks. After major deluges uncommon around Tucson, cracks opened up underneath windows at Tumacácori Mission. And following another intense rain, an adobe wall collapsed at New Mexico's Fort Union, the region's largest 19th century fort. "If we don't catch those in time, those resources are just as gone as if they'd been taken away by a storm surge," she says.

Anne Carlson, climate adaptation specialist for The Wilderness Society, says the agency has accomplished much in a short time with little money. That it hasn't done more reflects the scale and nature of the challenge, she adds. "We've never been through climate change before. It is extremely difficult to figure out what to do to adapt to something we have never experienced as a species before." ELIZABETH SHOGREN

A Backup in the National Parks Jobs Pipeline

Young, diverse job candidates find it hard to make inroads in the overwhelmingly white agency

FEATURE BY
GLENN NELSON

100

It's a nasty, end-of-winter night in the coastal Washington town of Ilwaco, but the driving rain is the least of Nancy Fernandez's concerns. The inside of the Salt Pub is dry but jammed with soggy locals chomping burgers, sipping brews and waiting to check out the night's entertainment, which is Fernandez, 25. She's crossed the Columbia River, from Lewis and Clark National Historical Park in Oregon, to present her findings on plants and climate change.

When asked before the talk if she is nervous, Fernandez replies, "Very."

But as slides of field mustard and skunk cabbage appear on the screen behind her, the crowd is drawn in, and her confidence grows. She is wearing a bright red shirt and flashing an even more dazzling smile.

Relaxing on a lobby sofa afterward, Fernandez contemplates the months she's spent at Lewis and Clark as an intern. One of her first triumphs there was using her Spanish to convince migrant parents to leave their son for an overnight campout. Since then, she's picked up frogs with summer camp kids, paddle-boarded the Lewis and Clark River, and hiked a lava tube near Mount St. Helens.

"I never imagined myself doing anything like this before," Fernandez says. She left her central California home after college, against the wishes of her Mexican immigrant parents, and eventually

completed three consecutive internships through the Student Conservation Association, which partners with the National Park Service and other agencies to develop the next generation of public-lands stewards. Fernandez is determined to be part of that generation.

She is just about everything the National Park Service could wish for when it blows out its 100 candles later this month: young, brown, bilingual and bright. She has clocked enough conservation project hours during her internships to earn noncompetitive employment status, which in the arcane federal hiring system is tantamount to obtaining a hire-this-diverse-candidate-free card.

A lot is riding on Fernandez and people like her. For years, the agency has been waging a pitched but mostly losing battle for its future. It is a sprawling institution with 23,000 employees who manage and protect this nation's most cherished public lands and its cultural history. But it also is a perennially underfunded agency with a gender problem (63 percent of its workforce is male), an age problem (nearly 50 percent is at least 46 years old), and a race problem (83 percent white). All this flies in the face of the changes seizing this country, but none more pronounced than race.

The demographics of today's park visitors nearly mirror those of the agency's workforce, cementing longstanding suggestions that the park system lacks relevance to communities of color. This is a sobering realization for an agency that, under Director Jonathan Jarvis, pivoted to a belief that diversity and inclusiveness in workforce and visitation will flow from a focus on relevancy.

Its current racial composition encourages cultural isolation, making it difficult for the agency to retain employees of color. The National Park Service relies on a labyrinthine federal hiring system that favors military veterans and makes it nearly impossible to improve diversity by targeting hires by race. Even if it could, the agency doesn't have enough jobs to offer anyway. With all the challenges at hand, from infrastructure to wildlife preservation to mitigating climate change impacts, the agency can have a myopic view of issues like diversity, which can

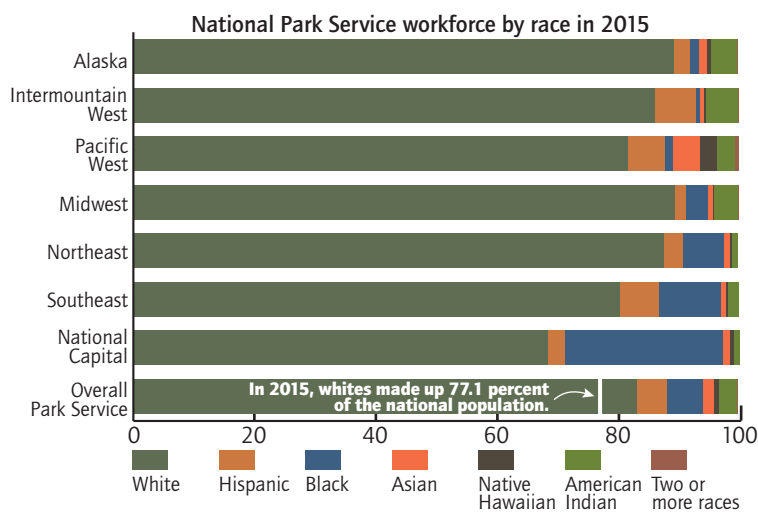
seem "nice to have."

"Everybody commits to diversity intellectually, and they commit to it in their hearts, but they don't have any idea what kind of work it takes to really get this done," says Mickey Fearn, who was the highest-ranking person of color in the agency under Jarvis. He likens it to the wine-making process. "When you first bottle it, it's kind of rigorous and raw. Then it goes through what is called a 'dumb period,' when in the bottle it doesn't really taste like anything. Later on, all those flavors come back somehow. The National Park Service is in what you'd call a dumb period. And the reason it's in a dumb period is because it's initiated something. It's trying to do something, even if it doesn't know exactly how to do it."

THE PARK SERVICE HAS BEGUN building bridges into communities of color by telling more of their stories. It's had an enthusiastic partner in President Barack Obama, who not only has protected more land and sea under the Antiquities Act than any other president, but also established more national park units significant to nonwhites, such as Maryland's Harriet Tubman Underground Railroad National Historic Park and the César Chávez National Monument in California (see sidebar at right).

Yet workplace diversity in the agency not only has failed to improve during the Obama administration, it has worsened, suggesting major, institutionalized impediments. One former intern calls it "the Mississippi of federal agencies," and others say it struggles to see solutions through the fog of its own overwhelming whiteness. It has a long-ingrained culture that one former employee described as "paramilitary, male-dominated, paternalistically thinking." Employees have a markedly split view of their calling: About 90 percent believe that what they do is important, according to a 2015 survey conducted by the Office of Personnel Management, but only 50 percent say they're satisfied with the organization.

The Park Service's response to inquiries about workforce diversity has been awkward at an official level. The agency invited *High Country News* to a meeting





National Park Service Director Jonathan Jarvis tells 10-year-old Tigran Nahabedian, a Korean-Armenian-German American and Park Service Junior Ranger with 32 badges, that he could be the agency's director one day, at the El Pueblo de Los Angeles Historic Monument last April. The National Park Service continues to struggle to broaden diversity in both staffing and visitors. AL SEIB/LOS ANGELES TIMES VIA GETTY IMAGES

in Washington, D.C., to explain its challenges and efforts. But the meeting time was scheduled over by its four participants, reducing what originally was a four-hour block to about 90 minutes. Half the group did not speak or make eye contact, and the atmosphere seemed tense. No direct contact followed, and further requests for resources, such as partner data and workforce demographics, were referred to the agency's public affairs office.

Dozens of Park Service rangers and hiring managers throughout the West agreed to be interviewed during the year we followed Fernandez through the system, but only if they were not identified. Several checked back, in fact, to ensure their names wouldn't be linked to information or opinions. Fearn, a former deputy director, says their fears are justified.

"It would be suicidal for them to criticize the agency in public," he says. "If nothing else, it's a very proud agency. ... People who become rebels or naysayers can get stuck in place. I don't think

there's any question about that."

Now a professor at North Carolina State University, Fearn left the National Park Service in 2013, in large part, he says, because of the "Mickey fatigue" that developed in the agency due to his continually pushing for relevancy, diversity and inclusiveness. Before his three and a half years at the national parks, he led groundbreaking work on race and diversity, including the Race and Social Justice Initiative in Seattle. Cultural isolation also played a part in his leaving, Fearn says: During his tenure, he was the only African-American in the top three levels of the Park Service.

NANCY FERNANDEZ IS JUST ONE OF MANY RECRUITS summoned to address the kind of change facing Lewis and Clark — a shift that is occurring all over the country, which is projected to be majority non-white within three decades. When she arrived at the park just before the summer of 2015, a traditionally migrant Latino

population had begun settling in Clatsop County, where most of Lewis and Clark is located. The Latino population is about 10 percent, and growing fast, in nearby Astoria.

Eager to introduce this burgeoning community to his park, then-Superintendent Scott Tucker dispatched two rangers for an entire week to invite the migrant communities to a free picnic. He says he had a "light-bulb moment" when no Latinos showed up. Latino community leaders later applauded his sending rangers, but asked him, "Were they in uniform?" Tucker, who is white, immediately got the point. Most communities of color have a negative association with men in uniform, and National Park Service uniforms are from the same provider as those for *La Migra*, the U.S. Border Patrol. A Latino staffer might have flagged and prevented the cultural blunder.

Lesson learned, Tucker applied for two bilingual summer interns and felt he hit the jackpot with Fernandez and Sal

New, diverse parks

President Obama has designated or expanded 24 national park units under the Antiquities Act, more than any president. Among those units are seven especially significant to communities of color:

- Port Chicago Naval Magazine National Memorial (IL)
- Martin Luther King, Jr. Memorial (DC)
- César Chávez National Monument (CA)
- Charles Young Buffalo Soldiers National Monument (OH)
- Harriet Tubman Underground Railroad National Historic Park* (MD)
- Pullman National Monument (IL)
- Honouliuli National Monument (HI)

*Originally designated a national monument in 2013.



"I never heard of people hiking. What is that? I'd heard of long walks."

—Nancy Fernandez, remembering a visit to Yosemite National Park, one of her first experiences with outdoor recreation

Ornelas, who also is from California. He supplemented the pair with three Latino seasonal employees, and last year, Lewis and Clark had Latino kids in its summer camp programs for the first time ever. With her teaching background, Fernandez was a natural with children and deft at creating trust with Spanish-speaking parents. Tucker helped her land another SCA internship, shared with San Juan Island National Historic Park.

Before last summer, Fernandez's attachment to the outdoors had been minimal. She once volunteered for an archaeological survey in Stanislaus National Forest, where she had to camp but had no idea how to pitch a tent. On a visit to Yosemite National Park, near her home in California's Central Valley, she observed people doing something called "hiking." The activity, however, drew a blank.

"I never heard of people hiking," she says. "What is that? I'd heard of long walks."

Her parents, from Michoacán on the southwest coast of Mexico, were field workers, mostly, and a tough sell, Fernandez says: The concept of outdoor recreation is so removed from Mexican immigrant culture, there aren't even words in Spanish for basic terms such as hiking, camping and tent. It was bad enough that their daughter had switched majors from nursing to anthropology at California State University, Stanislaus.

But after spending the summer in Lewis and Clark, with its coastal forests, meandering rivers and abundant wildlife, she wanted to do the kind of things they'd worked to protect her from — like taking a job outdoors and sleeping on the ground.

"It was a very difficult discussion," Fernandez recalls. "It doesn't click in their minds that the outdoors are something to enjoy. Since they were little, they were working outdoors. To them, it's not a place to have fun. It's a place for hard work. They wanted me to work in an office, with air conditioning."

Tucker introduced Fernandez to the first of her "fun outdoors" jobs. His previous career had nurtured a sensitivity to diversity and inclusion. When he was at the National Mall, he encountered a young African-American boy on a field trip with his school. The boy returned that evening with his father and excitedly pointed out everything he'd seen and learned earlier. That image stuck.

"That's how we get underserved people to the parks," says Tucker, 42, who recently became superintendent at Sleeping Bear Dunes National Lakeshore in Michigan. "Get them early, and keep them involved for life."

To that end, the Park Service has committed considerable resources to creating a pipeline for diverse young people like Fernandez. Its programs are driven

by agreements with 52 partner organizations, which last year employed 4,248 youth interns in national parks. An additional 11,372 were employed in parks last year by commercial services organizations, mostly concessionaires. They have been gateways into the Park Service for the likes of Shelton Johnson, an African-American at Yosemite National Park who may be the agency's most recognized ranger.

The third-party youth programs help the National Park Service circumvent prohibitions against targeted recruitment of diverse young job candidates, but they are not without their challenges. The Student Conservation Association has been one of the agency's biggest and longest-standing partners. It founded the NPS Academy, one of the Park Service's most significant and innovative programs for targeting diverse youth; Fernandez attended it, as both a participant and a mentor. But the SCA also has been criticized in the past for its lack of internal diversity and, more recently, for its higher-than-average overhead ratio, which sources say is about 26 percent. That means SCA interns aren't paid much and have to play chicken against financial pressures while they await permanent job opportunities. One Forest Service official, for example, mentored a young SCA intern who had to spend a Colorado summer living in her car. Such conditions



Nancy Fernandez, facing page, surges ahead in a race against Lylianna Allala (purple coat) and Michelle Piñon (red) during a snowshoeing trip with Latino Outdoors at Snoqualmie Pass near Seattle. Fernandez went snowshoeing for the first time during a Student Conservation Association internship last year. Like Fernandez, Sal Ornelas, left, is a bilingual Californian and was an intern last summer at Lewis and Clark National Historical Park in Oregon. As park superintendent, Scott Tucker, below, made changes to attract Clatsop County's growing Latino community to the Lewis and Clark.

GLENN NELSON

are why internships often are viewed as “the playground of rich white kids,” whose family support makes the low pay tolerable.

Fernandez lacks that luxury. Her parents work several back-breaking jobs to make ends meet. Even after attending the NPS Academy as a mentor, she still made just \$320 every two weeks. At Lewis and Clark, she lucked out on a hostel room when the ranger using it went on leave. But even with park housing, she struggled during her last internship at Chattahoochee River National Recreation Area, just outside Atlanta. She was “adopted” by an older couple, who also worked in the park and, she says, “kept feeding me cookies.” It was bitter sweetness.

“For now, I find myself at a crossroads,” Fernandez mused during her final month at Chattahoochee. “On one side, I am tired of living on pennies as if I were still in college. It’s a struggle having to constantly be proving my worth to others. On the other side, I don’t know if I am ready to leave the park life entirely. I am not a quitter. I want to prove to people in my community and my family that it is possible to do the work you love.”

NANCY FERNANDEZ MIGHT BE ONE OF THE LUCKY ONES. At least she’s in the system — even if it’s a complicated and daunting one.

The usual way to apply for a Park

Service opening, or any federal position, is through the government jobs website, USAJobs.gov. The basic instructions for finding and applying for openings run 20 pages, and none of them offer suggestions on how to appeal to specific agencies, including the National Park Service and its unique culture and needs.

Even if park superintendents decided today to fill all their openings with candidates of color, they technically could not do so. The federal process of job creation, application and hiring is mostly blind, to encourage equal and open competition. Candidates are rated and ranked according to their responses to questions about their qualifications and skill levels, a method that doesn’t always reward the honest and humble. Military veterans get hiring priority. Only certain hiring authorities (exceptions and noncompetitive status, based on experience such as Peace Corps service, or participation in student programs) can trump a veteran’s place in line. This, one source said flatly, “is killing diversity efforts in the National Park Service.” It’s a sentiment echoed by many interviewed for this story, who point out that military service doesn’t change non-whites’ lack of interest in Park Service employment.

Depending on your point of view, some or much of the recent backslide in Park Service diversity efforts can be blamed on the changes the Obama administration



made in the federal hiring process, which inadvertently neutralized the agency’s not-inconsiderable efforts to recruit candidates of color. Two programs used to target diverse young hires were replaced by one called Pathways, which opened up competition and inserted a preference for veterans — a preference amplified throughout the hiring process.



Ranger Kya-Marina Le of the Santa Monica Mountains National Recreation Area hands out wildflower seed packets at *La Ranger Troca*'s debut in February. The truck will rove city streets to reach the next generation of park goers.

NATIONAL PARK SERVICE

WEB EXTRA

Read profiles of diverse National Park Service employees at hcn.org.



Glenn Nelson is the founder of Trail Posse, which documents and encourages diversity and inclusion in the outdoors. He is a member of Green 2.0 and The Next 100 Coalition, which advocate for increased racial diversity in federal land agencies and the environmental movement.

Congress presently is clashing in conference committee over a Senate provision limiting hiring preference to a veteran's first job and not subsequent employment, as is currently the case. Congress also is discussing extending the Public Lands Corps' noncompetitive status from 120 days to two years. That would give someone like Fernandez significantly more time to find an opening.

If the federal hiring process already is clogging the agency's recruitment pipeline, it turns into a full-fledged backup when one factors in the lack of openings, especially at entry-level positions. The agency makes 400-500 new full-time hires per year, hardly enough to make a dent in workforce demographics, even if it could fill every single one with diverse candidates for four or five straight years. But the picture will change dramatically, though not completely, if during the next five years, the projected 25 percent of the Park Service eligible for retirement — the so-called "silver tsunami" — is replaced by a significant number of nonwhites.

DESPITE EVERYTHING, A BREEZE OF CHANGE is wafting through the agency, generated not by mandate but by a combination of commitment, innovation, leadership, and, to a certain extent, location. Smaller park units are more successful at hiring diverse candidates because they're more nimble and experimental, less encumbered by daily infrastructure and personnel demands.

The Santa Monica Mountains National Recreation Area, near Los Angeles, seized opportunities forged by its proximity to a growing urban community of color. Santa Monica took its park to the people through innovative outreach programs, such as its mobile visitor center,

La Ranger Troca, and it expanded its thinking about youth recruitment beyond employee placement to developing ambassadors and advocates in diverse populations. Saguaro National Park, near Tucson, which is 42 percent Latino, recently hired Cam Juárez, a local activist and politician, as a public information officer and community engagement coordinator. It also started a program in 2015 called Next Generation Rangers, which allows the selection of diverse workers, who are paid through an independent contractor agreement with a supporting nonprofit. The nonprofit — Friends of Saguaro National Park — is not subject to federal mandates regarding open competition or the preference for veterans, so it has more leeway in hiring. The staff at Lowell National Historic Park in Massachusetts prompted itself to reflect the dramatic shift in its surrounding community, which now has the second-largest Cambodian population in the country, as well as significant African-American and Latino populations. Lowell helped fuel the demographic transformation of its staff by making an intergovernmental personnel agreement with the local community health center. This enabled the park to hire Linda Sopheap Sou, the well-connected daughter of Cambodian refugees, as its chief of interpretation and education.

At Lewis and Clark, the seeds that Scott Tucker sowed more than a year ago are beginning to flourish. Half of the park's summer camp slots are filled by Latino children, the result of a cooperative program with Astoria Public Schools. This summer, the youth program has seven diverse staff members, three of whom are bilingual. Last year, the park also hired a permanent bilingual ranger.

It just wasn't Nancy Fernandez.

Fernandez believes she got a lot out of her SCA internships. "I feel like a more confident and independent person than before," she says. She's traveled to eight different states in little more than a year, lived alone, seen the Milky Way in the Grand Tetons, and gone berry picking, canoeing, cross-country skiing, kayaking, mushroom hunting and snowshoeing for the first time. These experiences sparked what is now a raging romance with the outdoors.

But Fernandez still lacks what she wants more than anything — a permanent, full-time job in the National Park Service.

The final weeks during her last SCA internship at Chattahoochee River this summer were anxious, discouraging, and sometimes depressing, she says. She was thousands of miles from her family and her dog, Misty, and the geographic dislocation that discourages many young people of color from a Park Service career was very real to her. She struggled financially and worried about her future.

During orientation at the NPS Academy in March 2015, Fernandez was told that the National Park Service's workforce was older, white, male and ready to retire. She was hopeful, because she represented the very opposite. Yet when she applied for an education post at Lewis and Clark, she received an automated message stating that she wasn't qualified. It likely was the result of a misunderstanding about her experience. But Fernandez is part of a community that has come to assume the system is rigged against it, and it did not even occur to her to question the decision. Shortly afterward, her first noncompetitive status lapsed.

Somewhat to her surprise, Fernandez qualified for another 120 days of noncompetitive status at Chattahoochee. She is trying to use that status for the few openings she knows about and for which she feels qualified. She also began applying for other low-paying internships that would keep her in the Park Service or at least the outdoors, as well as for professional development training she could not easily afford. She recently was accepted into the Outdoor Educators Institute in Oakland. It's not the National Park Service, not permanent or even a job, but it allows her to stay in the game until an opportunity presents itself.

Still, Fernandez no longer is certain about her endgame, or what her tenure in the National Park Service actually represented. Sometimes she wonders if she was just a token intern. She dreads having to return, tail between her legs, to parents who were skeptical about her outdoor career choices from the beginning, as well as to an immigrant community that looks askance at single young women who leave the fold for anything but marriage.

"Either I failed," Fernandez says, "or the system failed me." □

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Cash-strapped, continued from page 7

spending. It gave Healy's panel \$1.7 billion in additional funding, much of which trickled down to the Park Service.

Congress' fiscal 2016 spending package provided \$2.9 billion for the agency — an increase of \$237 million above the 2015 enacted level, with major boosts for park operations and construction to chip away at the agency's maintenance backlog. But Congress still has some catch-up to do, Galvin says. Overall agency funding grew 19 percent from 2001 to 2014, even as the consumer price index increased 34 percent and the cost of a full-time Park Service employee jumped 52 percent, Galvin says.

That puts major stress on the agency's budget, more than three-fourths of which goes to personnel costs, he says. That means superintendents must hire fewer seasonal employees — like lifeguards at Cape Cod National Seashore — or leave permanent positions vacant.

Jim Northup, superintendent of Shenandoah National Park in Virginia, says budgets got so tight a decade ago that he had to consolidate his three maintenance crews — each consisting of road workers, plumbers and carpenters — into one. With 105 miles of Skyline Drive, 70 overlooks, two major lodges, four campgrounds, 27 different water systems, four wastewater treatment plants and a vehicle fleet to maintain, the crew is stretched thin, he says. The park, which runs on a \$12 million base budget from Congress, has become increasingly dependent on entrance and recreation fees, which raise roughly \$6 million annually, Northup says. It recently raised entrance fees from \$15 to \$25.



A sign in Yellowstone National Park in 2009. Today, the park has a maintenance backlog of more than \$603 million.

PAUL SOUDERS /
ALAMY STOCK PHOTO

The National Park Service has been in a similar predicament before. In the 1950s, parks were ill-prepared to accommodate the flood of new visitors that followed World War II. A 1953 article in *Harper's Magazine* warned that the parks' roads, campgrounds and other facilities were increasingly dilapidated. It carried a provocative headline: "Let's close the national parks."

"The author, Bernard DeVoto, hoped the shock of suggesting that Yellowstone, Yosemite and the Grand Canyon should be shut down until they were worthy of visitors would push Congress to properly fund the nation's crown jewels," Jewell said at a speech in April at the National Geographic Society in Washington, D.C. "That could have been the end of the story, the tombstone reading: 'Here lies the national parks. Loved to death.'"

Instead, it spurred a massive \$1 billion gov-

ernment investment in park infrastructure known as Mission 66. Jewell credits it with inspiring her generation, the baby boomers, "to love and visit and support the great outdoors."

"You don't need to look too hard to see the parallels to today," Jewell says. "Budget crunches have left our national parks and public lands understaffed and struggling to keep up with day-to-day operations."

Critics say Congress brought today's funding dilemma upon itself by creating too many parks. "Congress would rather create new parks or acquire more land than fund mundane maintenance projects," says a report released in February by the Property and Environment Research Center, a free-market think tank in Bozeman, Montana. "As one former congressman put it, 'It's not very sexy to fix a sewer system or maintain a trail. You



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Since 2000, 26 new park units have been added to the National Park System, the report noted. But discretionary appropriations remained essentially flat. “With more parks but little or no additional funding, our national parks are stretched thin,” the report says.

In 2013, then-Sen. Tom Coburn, R-Okla., issued a report calling for a moratorium on new parks until a plan is in place to halt the \$256 million in annual growth of the deferred maintenance backlog. No such plan has emerged. “No one would purchase a new car while ignoring a leaking ceiling or broken pipes in their own home, but that is essentially what Washington is doing with our national parks,” Coburn’s report says.

But park advocates have called the Coburn report shortsighted. Newly designated parks — such as the Charles Young Buffalo Soldiers National Monument in Ohio or the César E. Chávez National Monument in California — are typically small and inexpensive to operate compared with larger, more popular parks, advocates say.

The 15 park units designated since 2010 that require new funding had a combined annual budget this year of \$9 million, according to John Garder, a budget specialist at the National Parks Conservation Association. The amount of additional money the Park Service said it needed in 2015 just to keep the deferred maintenance backlog from rising was \$347 million — 39 times the cost to run the new parks, Garder says.

“They’re million-dollar parks,” Galvin says of the newly designated units. The 12 largest park units by budget, he says, were all established before 1972. A moratorium on new designations

would be “like finding a nickel when you’re looking for a dollar.”

For better or worse, donors are taking on an expanded role in park funding. Earlier this year, the National Park Foundation, the agency’s fundraising arm, announced plans to raise \$350 million to commemorate the Park Service centennial, marking the largest fundraising effort in the foundation’s history. It has already raised more than \$200 million through gifts from individuals, foundations, corporations and other donors during the campaign’s “quiet phase,” which began in October 2013. The campaign continues through September 2018. It will fund tangible projects like electric vehicle charging stations, the purchase of private inholdings, refurbishing the Lincoln Memorial and improving trail access.

But much of the money will be spent on introducing a younger and more diverse generation of visitors to the national parks, says foundation president Will Shafroth. The aim is to expand the agency’s constituency. “If you look at the current visitor base, they tend to be older and whiter — they’ve been supporters for a long time,” he says. “They’re not as diverse as they need to be. This is an attempt to make sure we’re creating the future we want for the parks.”

Donations to parks have soared in the years leading to the centennial. They hovered around \$37 million annually between 2007 and 2013, but shot up to \$95 million in 2014 and \$159 million in 2015. The agency anticipates receiving \$170 million this fiscal year.

But Shafroth says private philanthropy will never replace the core funding provided by Con-

gress. There’s a “reasonable chance” that the National Park Foundation will raise \$100 million this year and that other friends groups will raise an additional \$150 million, he says. “Let’s just say we got to \$250 million or \$300 million. It’s still 10 percent of what the federal government provides for parks,” he says. “The federal government will continue to provide the lion’s share.”

Yet the growing role of philanthropy cannot be ignored, says Galvin. The Grand Teton National Park Foundation has raised \$13 million — to be matched by \$3 million in agency funds — to build trails, bridges and interpretive facilities around Jenny Lake, a project that aims to create “safer pathways for recreation.”

In northern Maine, the Elliotsville Plantation Inc., a private foundation, is proposing to donate about 87,500 acres of land along the east branch of the Penobscot River to be designated as a new national monument. The gift would come with a \$40 million private endowment to support the national park site, says NPCA, which is backing the proposal.

Yet less glamorous park projects — roads, sewage and other infrastructure — will continue to fall by the wayside, Galvin warned. “Nobody wants to cut the ribbon of the sewage treatment plant,” he says. Jarvis is optimistic that Congress will intervene eventually — even if it takes a crisis to make that happen.

“If the water line at the Grand Canyon fails, there is no water on the South Rim of the Grand Canyon. OK?” he says. “That means you can’t have a hotel, you can’t have visitors. I don’t have the money to fix it. So at some point, Congress is going to have to step up to this responsibility and fund the Park Service appropriately to deal with the backlog.” □

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Yosemite Fire Chief Kelly Martin inspects a ponderosa pine in Yosemite Valley, burned in a prescribed fire. ELIZABETH SHOGREN

Vital signs ...

Snow and snowmobiles

Across the West, snow-packs have plummeted because of human-caused climate change. That trend is likely to continue, disrupting Yellowstone's \$60 million winter tourism industry, among other things, according to a paper published this month in *PLOS One* by Michael Tercek and Anne Rodman, the park's acting branch chief for physical science. By the end of this century, they predict that, during 70 percent of the winter season, there won't be enough snow for snowmobiles and snow coaches to drive into Yellowstone from its West entrance. The agency might eventually have to plow its roads for cars, they say, if it wants to maintain high levels of year-round tourism.



NPS

Climate change *continued from page 12*

moved much more slowly to incorporate that science into management. Agency veterans say the pace is intentional and reflects past experience, when hasty management changes backfired.

For Gonzalez, though, the speed

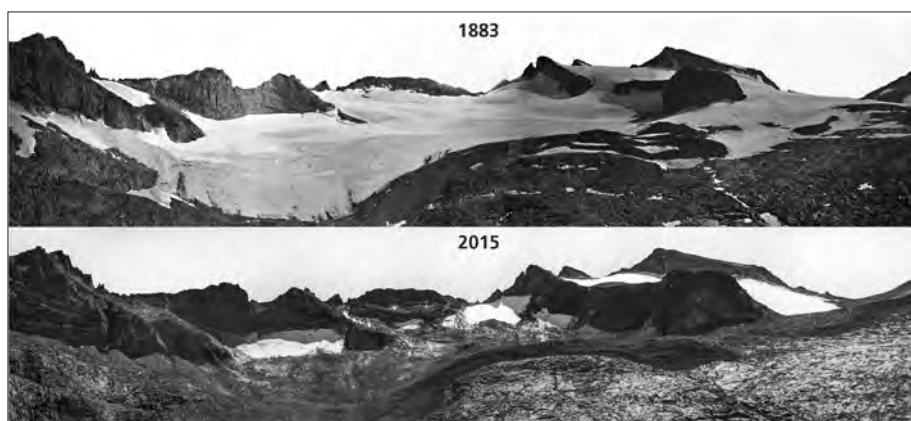
sometimes feels frustratingly slow. He remembers how, in just two years, he was able to devise ways to help remote villages in Senegal regrow the trees people needed for their health and livelihoods. To protect young trees from livestock, he resurrected a traditional practice of surrounding them with hedges intertwined

Historical climate change trends

(based on data collected 1950-2013*). All of these are statistically significant.

Park	State	Change (°C) per century
Denali National Park	Alaska	3.9 ± 1.1 °C
Grand Canyon National Park	Arizona	0.9 ± 0.4 °C
Mount Rainier National Park	Washington	0.9 ± 0.4 °C
Rocky Mountain National Park	Colorado	1.9 ± 0.4 °C
Yellowstone National Park	Wyoming, Montana, Idaho	1.4 ± 0.4 °C
Yosemite National Park	California	1.8 ± 0.4 °C
Zion National Park	Utah	2.0 ± 0.4 °C

DATA: DALY ET AL. 2008 *INTERNATIONAL JOURNAL OF CLIMATOLOGY*; HARRIS ET AL. 2014 *INTERNATIONAL JOURNAL OF CLIMATOLOGY*; ANALYSIS: P. GONZALEZ.
* DENALI DATA COLLECTED 1950-2009



Lyell Glacier, in Yosemite National Park, has retreated about 70 percent since John Muir discovered it in 1871. NATIONAL PARK SERVICE

with thorny branches. One of Gonzalez's proudest moments came when he returned to his Senegalese village this March: A happy farmer showed him 314 trees, jujube and others, planted with seeds that Gonzalez had given him.

But getting the Park Service to adopt such innovative ideas isn't always successful. Several years ago, Gonzalez was part of an effort to incorporate climate science into an update of fire-management policy at Sequoia and Kings Canyon national parks. That project fizzled. Last year, working with Bureau of Land Management and Forest Service officials, Gonzalez used climate change data to create a proposal to use Land and Water Conservation Fund dollars to buy private land adjacent to Redwood National Park and Whiskeytown National Recreation Area and other protected lands in Northern California. The parcels were important safe havens for animals and plants, home to trees that store a lot of carbon or vulnerable due to climate change. But the proposal wasn't selected for funding.

That makes him all the more pleased that managers at Yosemite, Grand Canyon and some other parks are now eager to integrate climate science into their decisions about when to treat landscapes with controlled fires and when to let natural fires burn.

Scientists project that, by 2085, climate change may double or triple the area that burns each year in Yosemite. It's already altering the three main factors that determine how often and with what intensity wildfires burn: climate, ignitions and fuels.

Temperatures in Yosemite are increasing at a rate of 1.8 degrees Celsius (about 3 degrees Fahrenheit) per century, with the highest increases in the spring. That translates into longer fire seasons as the snow melts earlier. Lightning strikes that would have been snuffed out by snow now spark fires more frequently and at higher elevations. With hotter temperatures, fire-resistant red fir forests are moving farther upslope and being replaced by more fire-prone trees, such as ponderosa pine. That all adds up to more frequent, more intense fires.

Other parks face even more daunting challenges. Steeper temperature rises in Yellowstone set the stage for "potentially astounding" increases in the frequency of fires, Gonzalez says; some scientists project that fires could become three to 10 times more common there by 2100.

In Joshua Tree, invasive plants have brought fire to a landscape that did not evolve with it. The double whammy of fire and hotter temperatures could push the gorgeous, goofy trees out of the park named for them.

Gonzalez wants to help park managers adapt to this new reality. The prescription

would vary: Forests projected to get wetter might need less fire, for example. This variability translates into tremendous amounts of data-crunching for Gonzalez, but he says: “The potential to help this special place and other places survive into the future really motivates me.”

Several factors make him optimistic that Yosemite and other parks will embrace his new approach. The climate data, which were coarse several years ago, are now so detailed that Gonzalez can plot projected temperatures and precipitation for quarter-mile-square parcels of Yosemite. That’s fine-grained enough to guide a fire chief’s decisions about whether to set controlled fires or let natural fires burn. Key people are ready, too.

Fire Chief Kelly Martin can barely contain her enthusiasm when she bumps into Gonzalez at Yosemite’s visitor center in June. “I really appreciate your work; I really want to know what I can do from my perspective.”

Later, she strides across a stretch of ponderosa forest that her crew had burned a few years before. The trees are widely spaced, with blackened trunks and green canopies. “These larger trees won’t be destroyed by fire because there is nothing now to let a fire into the canopy of these trees,” says Martin.

She wants to use low-intensity fires to clean out underbrush and small trees in large swaths of forests, thus preparing

them to withstand hotter, drier conditions and wildfire. Gonzalez’s data will help her target prescribed burns and decide where to let natural fires burn.

Her one worry is politics. It’s hard to get support to set fires when so many people view fire as always harmful.

So when she learned that President Obama was coming to Yosemite, Martin hoped to light a controlled burn in the Mariposa Grove, the park’s largest collection of giant sequoias. Maybe Obama would watch it and use his bully pulpit to burnish fire’s image. “Think how powerful that would be,” she says. That particular burn didn’t happen, but Martin plans to keep working with Gonzalez to prepare Yosemite for the wildfires of the future.

THE EVIDENCE OF CLIMATE CHANGE that Gonzalez has seen from Senegal to Yellowstone inspires him to encourage people to jettison fossil fuel-dependent lifestyles. He hasn’t owned a car since he returned from Senegal and avoids using elevators, even in skyscrapers.

To get to Yosemite in June to give a lecture, Gonzalez took the Bay Area Rapid Transit from his home in Berkeley to an Amtrak train, and then rode a bus to the park. “Every gram of carbon that I save is not going up in the atmosphere and melting that snow and shifting those trees or those mammals up higher,” he says. “It’s helping to avoid these impacts on the

most special places, our national parks.”

Walking the walk gives also him moral authority when he asks people to follow his example. Unlike many climate scientists, he’s extremely optimistic that people will do the right thing to slow climate change.

Gonzalez imagines visitors learning about the parks’ vulnerability to climate change and deciding to make a difference by walking and taking public transit, not just in the park but when they get home, too.

When Gonzalez was wrapping up his time at Yosemite, a family waiting for the same shuttle bus approached him. They had listened to his speech a couple of days earlier, and wished all visitors to national parks could be so lucky.

“I would love it if we could just fill up the rooms every single day with the likes of Dr. Gonzalez, so he and people like him could say we need to change,” said the father, Franz Limonta. His 12-year-old son, Ansel, named after the photographer, chimed in, saying the family could drive less.

Afterwards, they wrote Gonzalez to tell him that his lecture was the highlight of their vacation. They’re moving to San Diego and have already begun searching the internet for carpools, so Crystal Limonta, an ER nurse, can limit the greenhouse gas emissions from her new commute. □



Correspondent Elizabeth Shogren (shown on assignment in Yosemite National Park), writes from Washington, D.C. @ShogrenE

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THE GRAND, without handrails

ESSAY BY

GEOFFREY O'GARA

100

I'd like to be able to say, for the gravitas of this essay, that as I drifted into Deubendorff Rapid in the Grand Canyon last April, I was thinking deep thoughts about *Mountains Without Handrails*, Joseph Sax's treatise on allowing visitors to risk unfettered nature in national parks.

But evidence from the GoPro camera strapped to my forehead suggests otherwise. As John Metcalfe (at the oars of his Grand Canyon dory) and I (crouched in the bow ready to high-side against waves) start into the rapid, you can hear me shouting weighty things like "Dooby-dooby-doobendorff!" and my friend responding, profoundly, "Big waaaa-ter, baby!" About midway, there is a slapping liquid sound and a frothy brown view of the boat's underside. Then you can hear me talking to the fishes.

Without handrails, indeed.

Other boaters in our group waited at the bottom of the rapid for us, which was a good thing, because the water flowing out of the bottom of Glen Canyon Dam is COLD — less than 55 degrees Fahrenheit — and even the adrenaline released by a swim in the rapids can't rebuff hypothermia for long. Anders Johnson pulled me aboard the 14-foot cat raft he manned with Jerry Longabardi; another boat picked up John; and another dragged the overturned dory to a beach, where a small group of picnicking commercial rafters applauded our little drama. It was the dory, not our flailing, that drew the audience: a reminder of the primitive wooden boats Maj. John Wesley Powell skippered on his pioneering expedition in 1869. The rubber rafters can't resist pausing to watch the little buckaroo ride the big bull.

John has rowed his handmade dory for over two decades, and he's a skilled boatman. Over countless miles of dangerous water, he's never had a swim — never before, I should say. He let me row some of the gentler water, but mostly I was ballast in the bow. That turned out to be a real job. A dory is a Poohstick on the river, cupping its passengers like an edge-curved leaf, and while the boatman carves a route through chaos, the passenger up front crouches and grips the gunwales, throwing weight right and left, forward and back, tilting the boat into the swells like a mo-

torcycle in a cyclorama. Whitewater can transform in an instant, though, and we never saw the lateral wave that blindsided us.

Just over a year earlier, I had hiked off the North Rim with my daughter, Rosaleen, my first trip into the canyon. We took a weary dip in the Colorado, and as I felt the muscle of its current, I regretted that I would likely never float it. People wait years for a permit for a private trip down the canyon. I'd be an old gimp — well, an older gimp — before I got the chance. And I refused to pay big bucks to sit in a crowd on one of those big commercial boats.

Then Mark Bruscano, a retired Wyoming Game and Fish Department biologist, called and said he had a private permit. Would I like to go? He gently asked about my health — *evacuation is a big deal, involving helicopters* — my experience — *if big water intimidates you, your anxiety affects the whole crew* — and my banjo — *if you bring yours, I'll bring mine*. Seventeen days in seven boats on 225 miles of sometimes-whitewater, cut off from the world outside the canyon, with 14 other people I mostly didn't know.

Count me in: I would show up at Lees Ferry with my personal flotation device, a new cot for my aging bones, and some water bottles filled with gin. Oh, and a banjo.

The sight of a dory evokes thoughts of earlier expeditions, but the river looks nothing like it did when Powell, the one-armed Civil War veteran, strapped himself to a chair and floated through. Glen Canyon Dam, erected in the 1950s, provides clear, cold water rather than the silty opaque runoff of Powell's time.

Nor were we as isolated as earlier explorers. Today, about 23,000 people go down the river each year, about 6,000 of us in private, non-motorized crafts. Our group featured six inflatable rafts and cataracts, including a couple of rented 18-footers to carry the kitchen (our moveable feast) and the "groover" (our moveable waste), as well as the dory.

At almost any stop, there is a hike worth taking. Anasazi



granaries hide in the cliffs high above the river. Steep ridges reach thousands of feet skyward, on some afternoons pointing their peaks at lightning-laced clouds. Tight, beautiful side canyons like Havasu run with water the color of frozen sky.

Cliff swallows swooped down at the water, and condors wheeled unhurriedly high above; a rattlesnake reposed in the rocks, while some bighorn sheep tiptoed to the water's edge. The compressed tilt of billions of years of earth history lay exposed: limestones, shales, sandstones, lava flows and granite, a Georgia O'Keeffe color wheel. Columbine and cacti bloomed, lizards darted, and scorpions looked for a comfy bed. Reputedly, there are fish — though our lone angler, Anders, argued otherwise.

Too many parks are infested with hotels, video screens, soft ice cream and crowds — automobiles circulate in the heart of the Yellowstone Plateau. The Grand Canyon is not immune, but the crowds and ice cream are on the South Rim, where 5.5 million people stop annually for a glimpse over the edge. A mile below, on the river, there are no modern amenities. No trail signs or posted warnings of danger; no recycling bins. After a ranger briefed us before we launched at Lees Ferry, we never saw a uniform. Except for Phantom Ranch, a historic facility about 88 miles down the river serviced by mule strings, there are no stores or beds or restaurants for 225 miles. And no handrails, Mr. Sax, on the narrow, exposed trails that climb the side canyons and cliffs.

As for the rangers, they are absent in part because the so-called River Unit — five rangers who regularly rafted the canyon to monitor use, handle emergencies, and ferry scientists and politicians — has been suspended after a sexual harassment investigation. An “operational review” will determine whether its removal will be permanent.

Permanent seems like a good idea, and not just to curtail inappropriate touching. The less we see of the Park Service in the canyon, the better the agency is doing its job.

The less we see of industrial tourism, too, the better. About 185 miles in, you'll hear the *whomp-whomp* of a helicopter,

swooping into the canyon to the Whitmore Helipad to pick up and drop off passengers from big, engine-driven pontoon boats. Fitfully, since 1980, the Grand Canyon has tried to phase out motors, then lost its nerve. The commercial rigs quiet their engines when they pass folks like us, but nevertheless bathe us in the modern world's mechanical hum. There's a proposal, too, to construct a tramway into the canyon where the Little Colorado flows into the big river, on Navajo Nation lands.

No, thanks. Rather, we should enlarge the canyon's solitude, make it easier to believe, lying on a granite ledge above that whispering river, that it's just you, the lizards, and the Milky Way. “Nature, taken on its own terms, has something to say that you will be glad to hear.” Which may sound preachy and selfish to those who feel excluded without mechanized horsepower — the disabled, the elderly, the time-constrained — but at least it proves that I've been reading Joseph Sax.

Our intimate experience last April testifies to the exemplary job boatmen and -women are doing to minimize their footprints in the canyon. They have guidance from Park Service regulations, but this community of strangers takes it further. The only litterer I encountered there was me — I misplaced a water bottle during a solar shower — and at the end of our journey, we learned that another group retrieved it.

I don't find it ironic that in this discussion of wildness and how much we must “manage” to experience it today, we end up talking about civilized behavior. It seems the small cadre of canyon boaters has internalized rules that keep the river experience wild and uncluttered and revelatory — without supervision, or handrails.

Edward Abbey, reflecting on his own days floating the Colorado, put it simply: A wild river is “a necessity of the human spirit.” He didn't mean a world of comforts and safety — he meant rock, heat, silt and water that can spill and pound you. □

Geoffrey O'Gara is a writer and documentary producer based in Lander, Wyoming.

Jeff Streeter and Geoffrey O'Gara take in a view of the Colorado River from ancient granaries on a 17-day rafting trip down the Grand Canyon. CRAIG BROMLEY



HEARD AROUND THE WEST | BY BETSY MARSTON

THE WEST

A wit once wisely observed that “anyone who represents himself has a fool for a client.” Now there’s proof: Representing himself before a federal judge in Portland, Oregon, one of the occupiers of the Malheur National Wildlife Refuge declared himself an “idiot,” adding that he is “incompetent and am not required by any law to be competent.” Ryan Bundy’s statement was one of several decidedly odd declarations sent to U.S. District Court Judge Anna Brown, who, after reading his motions, called them not “legally cognizable.” All along, Bundy has insisted that he is not a U.S. citizen because he is a sovereign citizen of the “Bundy society.” He also says he cannot be legally defined as a “person” because he was created by God and is therefore not subject to laws created by people. Unmoved, Judge Brown reminded Bundy at his most recent hearing that if he keeps denying the federal court’s jurisdiction, he risks forfeiting his right to self-representation. The conspiracy trial of Ryan and Ammon, the Bundy brothers, who led the 41-day refuge occupation, is set for Sept. 7, reports *Oregon Public Broadcasting*.

THE WEST

In an upscale resort town like Sun Valley, Idaho, where’s a teacher, cop or restaurant worker supposed to live? An estimated 12,500 homes and condos are available for working people as well as tourists, reports the *Idaho Mountain Express*, but these days, just try to get a landlord to sign a long-term lease. Not likely. Homeowners who once rented out places for a year or more are now making much more money by renting to short-termers through Airbnb, VRBO and other internet rental sites. In the Wood River Valley, for example, a large house close to the ski area now rents for \$1,400 per night. Even the low end can be lucrative: A treehouse with a path to the bath (and a zipline) rents for \$60-\$70 per night. Before the internet turned so many into opportunistic landlords, the average three-bedroom, down-valley house rented for \$1,600 a month. In



COLORADO Keeps the hoi polloi out. JUDY WROUGHT

just 20 days, however, that same house can produce \$6,500. It’s much the same story in the resort town of Crested Butte, in western Colorado. Bartender Alex Shelley told the *Crested Butte News* that he’s moved five times in two years. Now, just before he was supposed to renew his current lease, he lost his rental. Something has got to give.

SOUTH DAKOTA

In the small town of Freeman, South Dakota, recently, 150 people gathered at a nursing home to fete a woman who just retired from a nursing career that spanned 72 years. Older than many of the home’s residents at 93, Alice Graber was delighted to reunite with former patients and some of the nurses she’d trained since she started out in nursing during World War II. “I was just flabbergasted,” she told *The Week* magazine. Given her lifelong vocation, her retirement plans aren’t surprising: She intends to volunteer at the nursing home where she’s worked for the last 20 years.

OREGON

When a regional girls’ softball team started selling raffle tickets, with an AR-15 assault rifle as a prize, a pastor in Lake Oswego, Oregon,

decided he definitely wanted to win that weapon. He used \$3,000 from a church “discretionary fund” and a bunch of member donations to buy 150 raffle tickets, and as luck would have it, the Rev. Jeremy Lucas of Christ Church Episcopal Parish bought the winning ticket. Lucas said he had two reasons for wanting to win the rifle: to help the girls’ team get to a tournament in California “and to take the weapon out of circulation.” But he had no desire to fire or even house the AR-15, a semi-automatic weapon often used by mass murderers. So he asked a parishioner “to keep the rifle locked up in a gun safe until the pastor was ready to destroy it,” reports the *Portland Tribune*. The minister, however, may

have violated a tricky state law: In order for that transfer of possession to be legal, the parishioner “should have undergone a background check at a licensed gun dealer” while Lucas, as the gun’s owner, was present. One commenter suggested that Lucas would not be charged for “political” reasons, while another called the state law “stupid” and designed to “harass lawful gun owners.” If the minister gets that now-confiscated gun back, he hopes to transform it into a work of art.

MONTANA

Self-incrimination is turning out to be a wonderful feature of the internet. In Helena, Montana, a ranch hand was so proud of himself for chasing a grizzly bear in his pickup truck, he posted a video on social media. Federal wildlife officials noticed, and Lawrence Kennedy of Browning was fined \$400 for unlawfully harassing a threatened species.

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

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



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“The word ‘reconcile’ comes from the Latin for ‘to bring back together.’ That’s a good metaphor for what we need in Salida and this nation: to rejoin our splintered communities.”

Susan J. Tweit, in her essay, “Partisan politics are pulling my town apart,” from *Writers on the Range*, hcn.org/wotr