

GRAND CANYON TRUST *COLORADO PLATEAU*

# Advocate

SPRING/SUMMER 2016

## THE CLIMATE ISSUE

CHASING FIRE

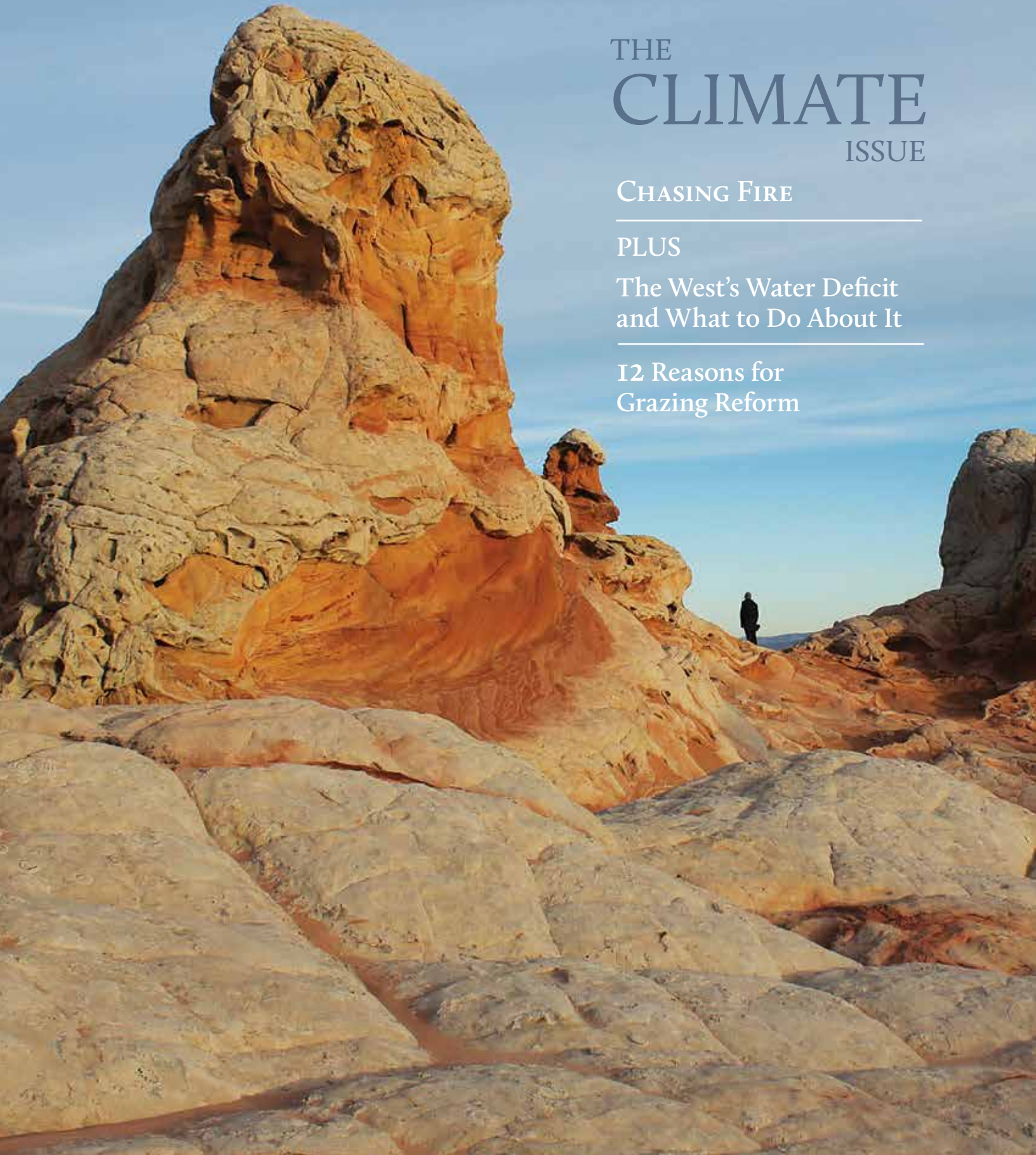
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PLUS

The West's Water Deficit  
and What to Do About It

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12 Reasons for  
Grazing Reform





**LETTER from the Executive Director**  
**BILL HEDDEN**

These are chaotic days in the development of a response to global warming. At the start of 2016, the Obama administration placed a moratorium on federal coal leasing, keeping more than 200 billion tons of greenhouse gases in the ground while the government tries to analyze the climate impacts of digging up all that carbon and burning it.

Running counter to this prudent step are ongoing Bureau of Land Management auctions at which leases to drill for oil and gas on our public lands are sold to the highest bidders. The fossil fuel industry already holds a glut of unused leases in the West and low oil prices have idled drill rigs everywhere, so the uncontested bidders at these inexplicable auctions pay virtually nothing for the right to drill. Motivated by climate science and economics, activists have already blocked these so-called "climate auctions" in Utah, Montana, Wyoming, and Washington, D.C.

Also in Washington, mere days before Justice Antonin Scalia's death threw the future temper of the Supreme Court into doubt, the high court stayed implementation of the EPA's Clean Power Plan while its merits are litigated in the lower courts. Since the plan would have reduced carbon emissions from our coal-fired power plants for the first time in history, and is key to making America's promises in the Paris accord real, the Supreme Court's unprecedented action could affect the global response to the climate crisis.

The Trust, of course, does not carry much weight in international affairs, but here we offer what we do best: a series of on-the-ground, scientific, and strategic responses to a changing climate on the Colorado Plateau. It feels like the right scale for making a difference.

Sincerely,

*Bill*



*Protecting the wild heart of the West since 1985*

**ON THE COVER**

White Pocket, Vermilion Cliffs National Monument. CLAIRE MARTINI

**EDITOR'S NOTE**

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# CHASING FIRE

By Ethan Aumack



The Wallow Fire. JAYSON COIL

**Wildfire** is an animating force. It can destroy, and it can renew. In can enrage and inspire.

It can fragment and unify. Humans have long used it as a tool to reshape natural landscapes. Over the last century, we have used it to reshape political ones. It was powerful enough that Teddy Roosevelt wielded the threat of wildfire—the Great Fire of 1910 to be exact—to solidify the nation's

acceptance of the then new national forest system. To this day, wildfire is used to argue for everything from increased logging on public lands to stricter global warming action. Wildfire is a powerful physical force to be reckoned with, and it occupies a powerful place in our nation's history, its political systems, and its psyche.

On a much more personal level, wildfire drew me toward conservation advocacy as a life path, fundamentally shaped my perspectives around

conservation and social change, and served as a crucible within which I've developed lifelong working relationships and friendships.

Fire took hold of me during my peripatetic post-college years. I wanted to test my book smarts in the real world and found my way to Santa Cruz Island, off the coast of California, to do so. There, working with a small team of biologists and a much larger team of volunteers, I helped prepare the island to see fire for the first time in decades.



After months of scratching fire control lines from ridgetop to ocean, carefully measuring the location and number of rare plant species, and setting up monitoring plots from one end of the burn area to the other, we lit the fire. It burned for days, scorching, singing, and skipping down to the ocean. After spending the next few months crisscrossing the burn area to study the fire's effects, I was sold. Once reintroduced, fire—which had been part of the island's natural functioning for centuries—could begin to restore health and vitality to a fragile ecosystem hit hard by a century of abuse.

Ready to help restorative fire play out across western public lands, I returned home to northern Arizona and began work at the Grand Canyon Trust. I spent my first day on the job, appropriately, tending to a prescribed burn on the outskirts of Flagstaff. Over the coming months, I began to understand the consequence and complexity of the wildfire and restoration challenge in the greater Grand Canyon region. I knew that family and friends didn't want any more towering infernos like the Horseshoe and Hochderffer fires that terrified Flagstaff residents during the summer of 1996, and they wanted something done about those fires. That something—thinning the forests and returning low-intensity fire to them—didn't turn out to be easy. It required a radical reversal for industry, which had to retool to thin small trees instead of large ones. It required environmental groups to shift from shutting down unsustainable logging to helping restart a different, restorative kind of work. It required the Forest Service to move from a command-and-control style of land management to a collaborative one. And, it required something different than the zero-sum politicking and finger-pointing that had become staples of each and every fire season.



ABOVE: Dogtown Lake, Kaibab National Forest. UNITED STATES FOREST SERVICE, SOUTHWESTERN REGION, KAIBAB NATIONAL FOREST

BELOW: On April 17, 2015, then Forest Supervisors Mike Williams (Kaibab National Forest) and Earl Steward (Coconino National Forest) signed the Final Record of Decision for the first Environmental Impact Statement of the Four Forest Restoration Initiative. 4FRI

### THE FOUR FOREST RESTORATION INITIATIVE

**1,000,000**

Acres analyzed within 4FRI's first Environmental Impact Statement

**430,261**

Acres to be mechanically thinned as part of the restoration process

**726**

Miles of roads to be decommissioned on the Coconino National Forest

**134**

Miles of roads to be decommissioned on the Kaibab National Forest

**82**

Miles of fencing to be constructed to protect newly sprouting aspen from elk

**74**

Springs to be restored

**39**

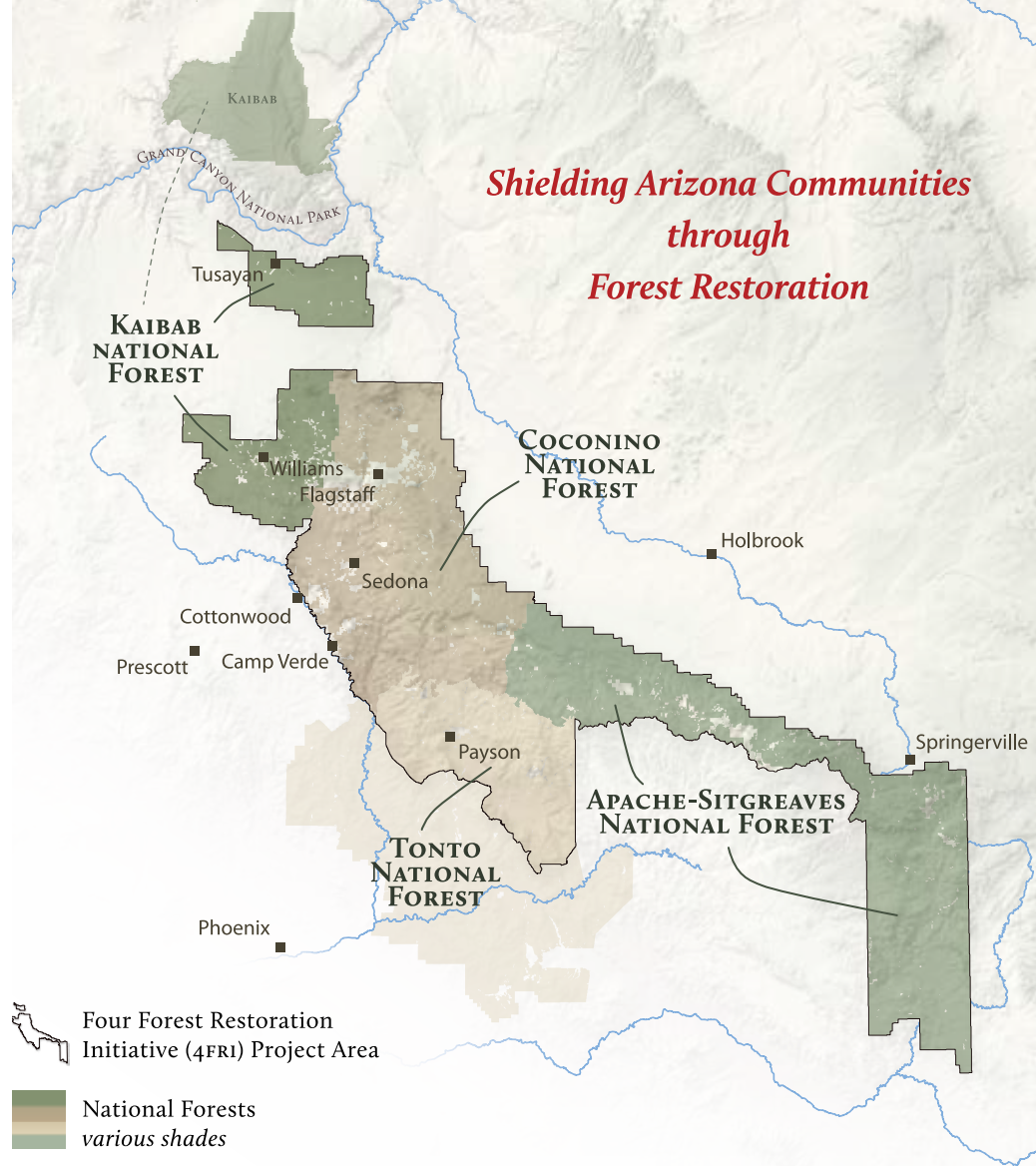
Miles of seasonal stream channels to be restored



Each of these represented a fundamental cultural shift, each a strand in a Gordian knot that I—and many others—have spent the last 15 years working to untangle.

I got into conservation as a career because I wanted to do good for the land. Working to get fire back into fire-adapted ecosystems has been an incredibly rewarding opportunity to do so. The fraught world of fire and forest politics forced me to challenge existing paradigms and worldviews—both mine and others'. But it also gave

Overriding all, however, is my excitement that fire, given sufficient respect and handled with proper care, will allow our forests and their species to gradually transition into a brave new world.



The Four Forest Restoration Initiative (4FRI) will restore 2.4 million acres of northern Arizona's Kaibab, Coconino, Apache-Sitgreaves and Tonto national forests over the next 20 years. The largest forest restoration project in the nation, 4FRI will shield Arizona communities from wildfire, protect critical wildlife habitat, and make our forests more resilient in the face of climate change.

me one more thing that I hadn't quite bargained for: a soul-wrenching empathy for those who have had nothing to do with forests or fire or restoration politics, but whose families and livelihoods have still been affected, often dramatically. I have come to know, and develop close friendships with, some of the scores of individuals and families who were forced out of their homes during the 468,000-acre Rodeo-Chediski fire of 2002 that ultimately destroyed 400 homes. Following the 538,000-acre Wallow Fire of 2011, I stood in front of an auditorium packed

with angry and scared families, and apologized for our collective failure to move forward fast enough with restoration that could have prevented that fire. I've watched close friends stake their families' life savings on restoration-supporting start-ups—and lose them. I have also developed fast friendships with colleagues of all political persuasions who are committing their lives to see landscape-scale forest restoration through to success.

Looking back over the last nearly twenty years, the angst I have experienced amongst those who desperately

want to see their communities and forests made whole, the joy I have shared as we progress toward that point, and the friendships I have developed in the process, have been rich beyond belief. All have been fire-forged.

I belong to a community of scientists, advocates, and land managers that has set its gaze directly on the future of fire in northern Arizona. Everything we do is intended to ensure that fires—prescribed and wild—operate better than they do now. As we look out into the future though, the specter of global warming looms large. Maintaining the





Mogollon Rim Ranger District, Coconino National Forest. BRADY SMITH, USFS, SOUTHWESTERN REGION, COCONINO NATIONAL FOREST

status quo is simply not acceptable.

Part of my job is to ask whether my work—our work—will matter in the face of the most important environmental challenge of our era. Though I've come back to this question many a time (it often wakes me up in a cold sweat at 3 a.m.), I always come back to the same answer: an emphatic yes. Here's why:

As the plateau warms over the coming decades, some parts of it will shift gradually, allowing some degree of recalibration, some degree of adaptation. Not so with the plateau's fire-adapted forests. Under warming conditions, and without small tree thinning and prescribed burning, choked, dry forests will burn at scales of hundreds of thousands of acres. Habitat, homes, and lives will be lost. Massive amounts of carbon will also be released into the atmosphere, exacerbating the global warming challenge.

If, on the other hand, we are able to harness the power of fire as a restorative agent, these forests—our forests—will have a fighting chance to shift gradually, with warming temperatures, to their new normal, with less damage along the way. Global warming, in fact, dramatically

amplifies the need for fire management and forest restoration. Managing fire is one of the most important efforts we can take to simultaneously slow the Colorado Plateau's contribution to warming, and allow the region to gradually adapt to it as it occurs.

Twenty years ago, I first came to know fire on an island, in an environment almost entirely foreign to me. Over the last two decades, I have come to know fire in a much more familiar way as it has affected my home, my family and friends, and our communities. I continue to feel a sense of awe and respect for the power of fire as well as a residual fear that fire will undo much of what I have achieved thus far in my career. Overriding all, however, is my excitement that fire, given sufficient respect and handled with proper care, will allow our forests and their species to gradually transition into a brave new world. They surely deserve that opportunity. ©

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*Conservation Director Ethan Aumack has worked on forest restoration at the Trust since 1999.*



## Lend a Hand

### FOREST RESTORATION VOLUNTEER TRIPS

#### SEPTEMBER 5 – 9

Help bring fire back to northern Arizona's forests by volunteering to survey springs for the Four Forest Restoration Initiative (4FRI).

#### SEPTEMBER 19 – 23

Survey streams and get in on the ground floor of 4FRI Phase 1, which will restore nearly a million acres of ponderosa pine forest over 10 years.

More trips:

[grandcanyontrust.org/events](https://www.grandcanyontrust.org/events)



# Walking to Water

By Mark Udall

Election Day, November 2015. My wife Maggie and I paddled our pack raft from the historic gauging station on the east side of Lees Ferry to the boat ramp on the west. It was cloudy, cold, and windy, but we felt a quiet elation. We had just completed a 45-day, 400-mile walkabout from Upper Grand Gulch to Lees Ferry.



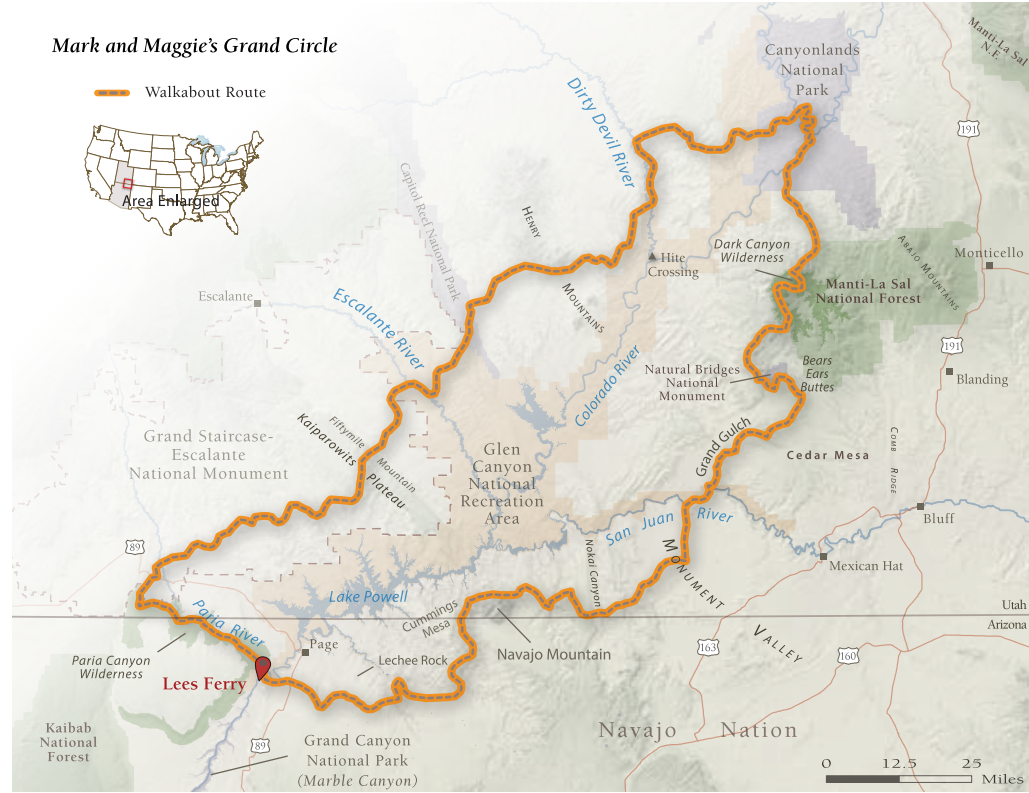


We'd started our initial walkabout in the early 1980s, traveling from Lees Ferry up the narrowing Paria, over the Kaiparowits Plateau down into the Escalante and circling the Henry Mountains. After 30 days and 300 miles, we stopped—temporarily—at Hite, at the top of Lake Powell. Three years later, we were back at Hite for a 300-mile traverse of the Dirty Devil and Maze Country, a swim across the Colorado River, and south to the natural bridges of White Canyon and cliff dwellings of Grand Gulch.

And now, 35 years, two children, and 16 years in Congress later, as we clambered out of our little raft at Lees Ferry, we'd completed our version of the Grand Circle in the most fascinating and mysterious landscape in the world.

I am a son of the Colorado Plateau. My father grew up on the Little Colorado and my mother in the high reaches of Rocky Mountain National Park. John D. Lee, Mormon explorer, founder of Lees Ferry and, yes, of Mountain Meadows Massacre notoriety, was my paternal great-great-grandfather. Jacob Hamblin, the Mormon leatherstocking and trusted friend of the Colorado Plateau's Native American tribes, was my maternal great-great-grandfather. From an early age, I was captivated by the natural, geologic, and human history of the Southwest. And, as we walked day-to-day in the wildest, most remote terrain in the Lower 48, I keenly felt the presence of my own family's history, and of the people who, for thousands of years, lived in and on these vast, arid lands.

I kept asking myself what linked us to those humans. Awe and respect for Mother Nature and for the scale and diversity of landforms: Navajo Mountain, Monument Valley, Lechee Rock, Nokai Canyon, Cummings Mesa. Intimacy and beauty in the turns of countless canyons, sculpture in every



We were always prepared to walk to water,  
but what if the water isn't there?



Mark and Maggie depended on potholes—pools of rainwater found in natural rock cisterns—for more than half the nights of their walkabout.



**Here's the good news: we know what to do. Carbon emissions must be significantly reduced, and soon.**



Rainwater will sit for days, weeks, or even years in potholes large and small.

rock, the whisper of running water. The order and rhythm of life present in the flora and fauna from the intricate patterns of microbiotic soil, to maiden-hair ferns hanging on a shaded wall, to the elusive but always present coyote. That order and rhythm ultimately depend on an element miraculous and scarce, both in the universe and on the Colorado Plateau: water.

Every morning, as we packed up our gear, we faced the question: Where is our next water? How much water must we carry? Having ample water in your pack is comforting and—at least initially—liberating, but those feelings come at a cost. More than two quarts on your back perversely becomes oppressive. You face a conundrum: water's weight slows you down and the more water you're hauling, the heavier your attitude becomes. But not having enough is also a burden. On a long, hot traverse of Navajo Mountain with only a half-quart each, our mouths dried up along with our mental fortitude. We hoped, and managed to convince ourselves, that there would be water in Horse Canyon. Alas, Horse Canyon was dry. A hot evening wind blew as we crawled under a juniper tree, husbanded our water and ate “wet” food (tuna, dried fruit, candy). We endured a restless night of unsettled dreams hoping the spring on the next day's map would be flowing.

A central challenge of our walkabout adventure was to learn to decipher the clues that lead to water. Decades of desert travel have taught us some skills. Luck also plays a role. As it turned out, over half our nights we depended on potholes—pools of water found in natural rock cisterns of all shapes and sizes carved by wind and water over eons—where rainwater will sit for days, weeks, or even years. We were literally on our hands and knees praying to water, whether clear or colored red, brown, or green. Its smell,



feel, our gratitude, our desire, even our unspoken fear of dry camps were all part of our daily existence. So it has always been for humans who live on the Colorado Plateau.

In all of our southwest cultural traditions, there is a reverence for water. Every drop must be respected and cherished. When you must daily carry water, irrigate by hand, dig irrigation ditches, count on spring runoff and endure drought, you are mindful. Our technological prowess has allowed us to let that mindfulness slip. But science shows we have over-appropriated the waters of our river basins and strategic campaigns are underway to reduce, conserve, and reuse our finite water (See Robert Glennon's article, "A Problem of Math" on page 12).

Now a greater existential challenge looms. Climate change is not a theory; it is a reality. It affects all we hold dear on the Colorado Plateau. Listen to Hopi and Navajo shepherders, ranchers, water engineers, and river runners. Like the Ancestral Puebloans, they see it and feel it.

Here's the good news: we know what to do. Carbon emissions must be significantly reduced, and soon. Historically, we have always taxed pollutants like mercury and acid rain. Carbon dioxide, by this definition, is a pollutant, and it is my long-held view that we should apply a fee to carbon emissions. American innovation will then meet the challenge and new clean technologies will emerge. The recent Paris Agreement is a huge step by the international community. Regionally, we in the Southwest can lead in deploying wind, solar, and biomass energy systems.

I will be presumptuous and suggest that Maggie's and my daily quest for water is a perfect metaphor for what our region faces. We were always prepared to walk to water, but what if the water isn't there?



Exploring a slot canyon.

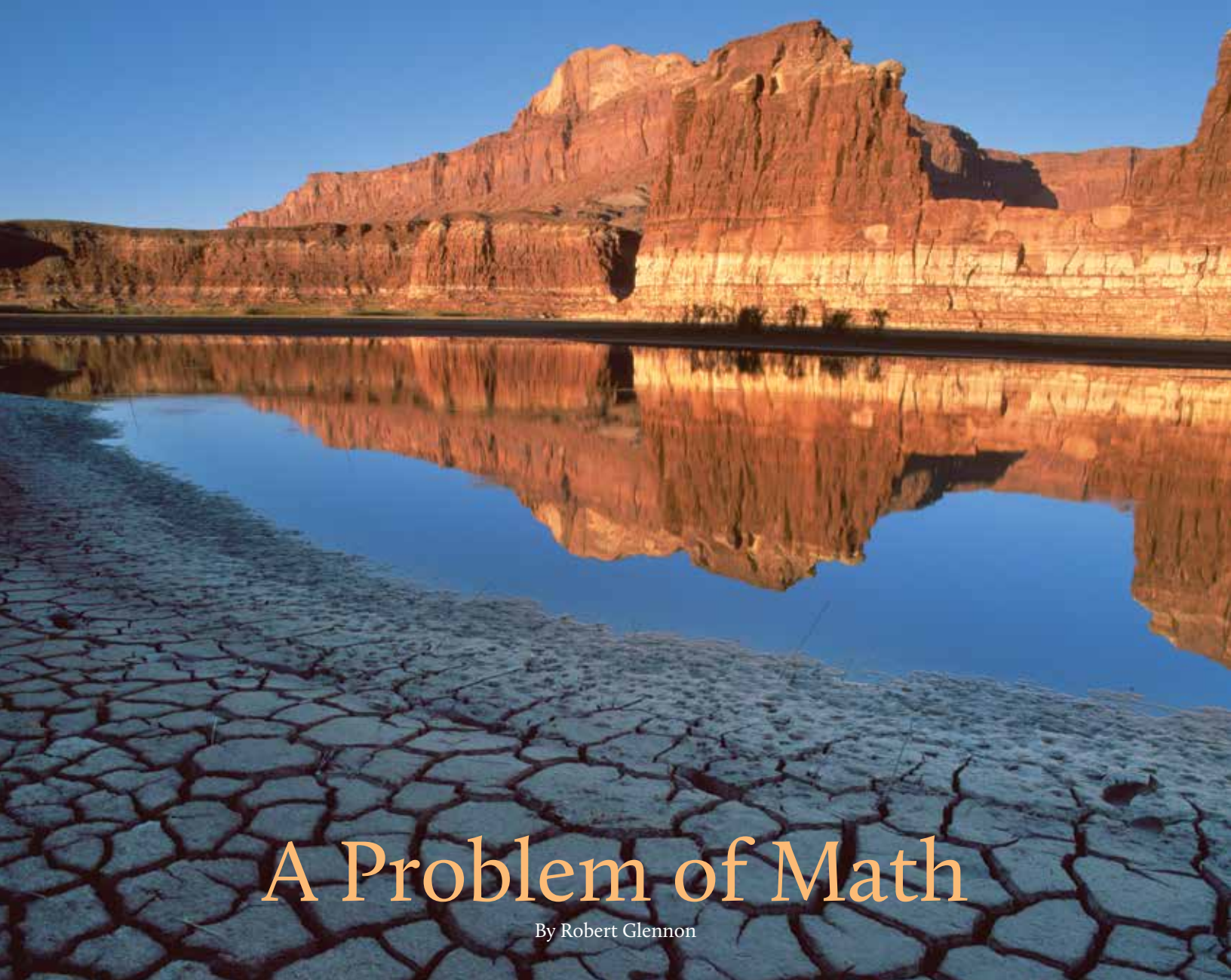
As I savor and relive our walk-about, I desperately want to know that someday, my grandchildren will be able to retrace our route. I want them to know the Colorado Plateau on foot. If they can walk to water as we did, I have to believe our generation will have met the challenge of climate change. The residents of our modern southwestern communities don't and can't walk to water. The biggest pothole of all, Lake Powell, if not replenished, will only hold water for a few years. But if water is present in the tanks and potholes, hidden

springs and crevices, and during the summer and winter monsoons as it has historically been, and as it was for Maggie and me, we will have kept faith with future generations.

But it will not be enough to hope, as we did on the flank of Navajo Mountain, that the Horse Canyons of the Colorado Plateau will hold water. It is up to us to act now. ©

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*A former U.S. senator from Colorado and an avid mountaineer, Mark Udall is a member of the Grand Canyon Trust's board of trustees.*



# A Problem of Math

By Robert Glennon

JAMES KAY

Simple addition and subtraction reveal the immense challenge facing the seven Colorado River Basin states.

In the 1920s, the Colorado River Compact divvied up the river's estimated flow, allocating 7.5 million acre-feet of water to the Upper Basin and another 7.5 million to the Lower Basin. [An acre-foot is enough water to flood one acre of land to the depth of one foot, or approximately 325,000 gallons.] The Boulder Canyon Project Act of 1928, as later interpreted by the U.S. Supreme Court, divided up the Lower Basin's share, giving California 4.4 million acre-feet, Arizona 2.8,

and Nevada 0.3. Then, in the 1940s, a treaty between the U.S. and Mexico granted the Republic of Mexico 1.5 million acre-feet of Colorado River water. All together, these allocations add up to 16.5 million acre-feet.

But in the latter part of the twentieth century, University of Arizona tree-ring scientists determined that the actual flow in the Colorado River at Lees Ferry over the past 500 years is only roughly 14 million acre-feet. Whoops. And things get worse.

The two enormous reservoirs on the Colorado River—lakes Mead and Powell—lose 1.6 million acre-feet per year to evaporation. So the available 14 million acre-feet are really only 12.4.

Now consider the impact of climate change. In a massive 2012 study, "Colorado River Basin Water Supply and Demand," the U.S. Bureau of Reclamation concluded that climate change will likely reduce Colorado River flows by nine percent. Other prominent scientists, including Brad Udall, think



## Rather than chasing a rainbow, it would be better to explore using existing water supplies more efficiently.

the actual reduction may approach 20 percent. Even assuming the bureau's numbers are correct, that reduces the available water in the river from 12.4 million acre-feet to a little over 11.

That's not all. The same study analyzed how much water farmers would need under warmer weather conditions to grow the same amount of crops. The numbers vary from state to state, but overall it's about a five percent increase for each one-degree rise in temperature. Because farmers consume more than 80 percent of the Colorado's water, a temperature rise of three degrees would require 1.5 million acre-feet more water simply to maintain the status quo. Finally, the bureau expects the population in the Colorado River Basin to climb from 40 million to between 49 and 76 million by 2060, depending on growth projection scenarios.

Where does this addition and subtraction leave us? On paper, there are allocated rights to 16.5 million acre-feet, but the reliable supply is roughly 11. We're one-third short.

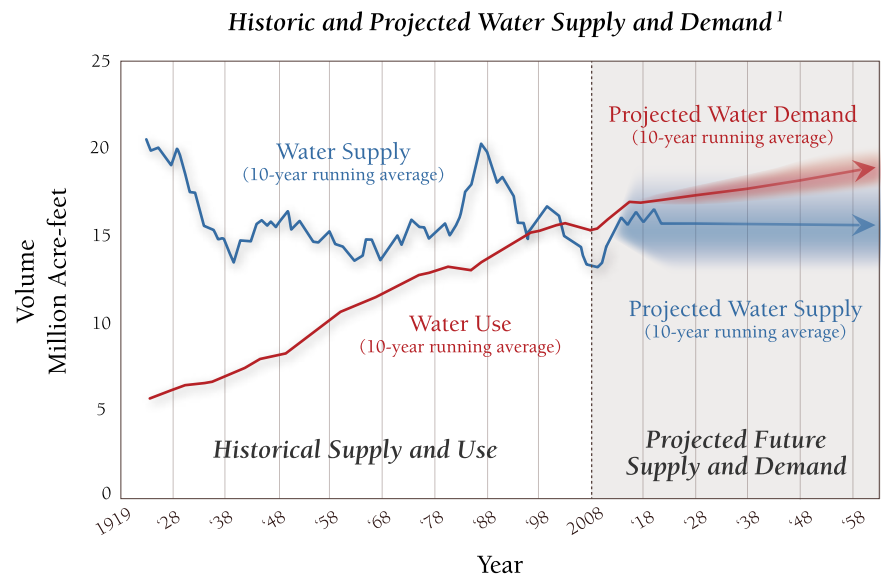
Why, you may be asking, haven't the wheels come off before now? For two main reasons. First, Upper Basin states have not yet used their full allocations. Second, when lakes Mead and Powell are full, they hold approximately 56 million acre-feet—or four years of average flow. But the Colorado River is now in its 15th year of drought, which has drawn down the levels in lakes Mead and Powell to less than 50 percent. Lower levels in Lake Powell directly correlate to lower flows through the Grand Canyon, which will impact habitat along the river corridor.

How long will the remaining water last? That depends on how much water the states use and how much precipitation Mother Nature delivers. What is unmistakably clear is that there is

a structural deficit. Every year since 2003, states have diverted more water than has come into the river. The 2012 Bureau of Reclamation study ominously concluded that this deficit could *average* 3.2 million acre-feet per year by 2060.

Who loses in this game of musical chairs? The Upper Basin states are obligated by the Colorado River Compact to release 75 million acre-feet over a 10-year rolling average. That's a heavy burden considering that the river's

actual flows are much lower than was believed in the 1920s, compounded by the effects of climate change. As for the Lower Basin, California cut itself a sweet deal in 1968 when it traded its congressional delegation's support for funding of Arizona's Central Arizona Project (CAP) in exchange for Arizona accepting the lowest priority for the CAP. Now that the implications of the tree-ring studies have become painfully evident, Arizona rues the day it agreed to this trade.



<sup>1</sup>U.S. Department of the Interior. Bureau of Reclamation. "Reclamation Managing Water in the West: Colorado River Basin Water Supply and Demand Study," (Executive Summary). Dec 2012.



When we turn on the tap, out comes as much water as we want for less than we pay for cell phone service or for cable television.



Lake Mead and Hoover Dam water intake towers, as seen from the Arizona side of Hoover Dam, October 2010. WIKIMEDIA COMMONS

More recently, Arizona managed to persuade Nevada and Mexico to share a small part of her pain if Lake Mead falls below precise elevation levels, which would trigger shortages shared by all three. Alas, the Bureau of Reclamation expects the first trigger could occur as soon as 2018. Without drought relief, the more substantial triggers may not be far off. The hardest hit users will be non-Indian farmers in Arizona who rely on the Central Arizona Project.

The seven basin states and Mexico have enjoyed harmonious collaboration over the last two decades, in sharp

contrast to the bitter litigation that characterized most of the twentieth century. Who knows how long this harmony will last.

Regardless, all states need to develop drought contingency and climate change plans to adapt to a future with increasing variability in water supplies. Water managers face a daunting task because, in light of climate change, the past is no longer a reliable guide to the future. With clear eyes and steady resolve, water managers should consider employing risk mitigation strategies developed in other spheres,

such as insurance, hedge funds, stock exchanges, and commodities markets, options I explore in a recent report, “Shopping for Water: How the Market Can Mitigate Water Shortages in the American West.”

Some states have developed careful water plans to adapt to unreliable water supplies. The Colorado Water Plan, finalized in December 2015, is one good example. The culmination of a 10-year process, the plan used local river basin roundtables to establish supply and demand, project future demand, and craft realistic options for meeting it.



Plans in other states, such as Arizona's 2014 plan, are stuck in an old way of thinking: there must be some oasis out there that Arizona can tap into to augment its supplies. Even the Bureau of Reclamation, the agency that created most of the West's massive infrastructure for moving water great distances, has rejected this approach. The bureau is playing a critical role in prodding the seven basin states to work toward realistic policy options.

Yet, prominent western water managers are considering massive programs of cloud seeding, which attempt to induce rainfall by dispersing silver iodide from planes or cannons, even though the scientific community is skeptical of the capacity of cloud seeding to augment precipitation. In 2003, a National Research Council report concluded that "there still is no convincing scientific proof of the efficacy of intentional weather modification efforts."

Rather than chasing a rainbow, it would be better to explore using existing water supplies more efficiently. Stronger conservation programs and increased reuse offer two viable tools for confronting a drier future. For reuse, consider that the City of Los Angeles' Hyperion Treatment Plant processes a volume of water equal to the seventh largest river in the United States. Yet, almost all of that water is dumped into the Pacific Ocean. In 2015, prodded by the extreme drought, the city began to consider ways to reuse more water.

Another way to encourage conservation is by pricing water appropriately. Most of us take water for granted. When we turn on the tap, out comes as much water as we want for less than we pay for cell phone service or for cable television.

Another option involves reallocating water from one user to another through voluntary leases or sales of water rights. In 2016, flood irrigation,



TOP: A scarlet monkeyflower growing near a spring in Saddle Canyon, Grand Canyon National Park. CENTER: Rafters on the Colorado River, north of the confluence, near the site of the proposed Escalade tramway development. BELOW: Vasey's Paradise, one of the many springs that feed the Colorado River inside the Grand Canyon. PHOTOS BY ELLEN HEYIN

which is woefully inefficient, is used on more than half the irrigated acres in the West. Farmers could install center pivots, micro-irrigation systems, or sub-surface drip irrigation. But these highly efficient systems are costly, beyond the means of many farmers.

Because it's the cities (and their people and businesses) that need more water, municipal interests should finance the modernization of farm infrastructure in exchange for the water conserved. It's a win-win. Farmers grow the same crops but with less water, and cities and businesses get a much-needed boost in their supply.

The specter of water markets alarms farmers and rural communities, as they fear that selling water rights will put an end to their way of life. What, after all, can they do without water? But cities only need a small portion of agricultural water. A four percent decrease in agricultural water consumption translates into almost a 50 percent increase in the water available for municipal use.

From an environmental perspective, it's important to remember that a water transfer simply changes one current use to another. If new growth can't secure water through transfers, it will get water the old fashioned way: by making new diversions from rivers, building new dams, or drilling new wells. Few environmentalists want that to occur. Yet it may. A proposal for massive new development in Tusayan could sink new wells into an already overtapped aquifer that nourishes springs and creeks in the Grand Canyon.

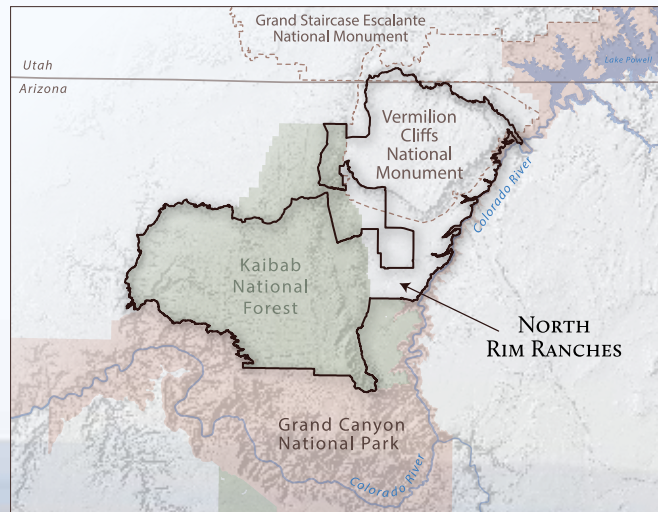
These are scary times for the West, the Colorado River Basin, and the Grand Canyon. But we need not despair. We have available, viable tools to provide water to our farms, cities, and industry—even as we protect our environment. What we really need is the moral courage and the political will to act. ©

*Robert Glennon is a Regents' Professor and Morris K. Udall Professor of Law and Public Policy at the University of Arizona. He is co-author of "Shopping for Water: How the Market Can Mitigate Water Shortages in the American West" and author of "Unquenchable: America's Water Crisis and What To Do About It."*

# A GOOD KIND OF TROUBLE

Getting Ahead of the Climate Change Curve on the North Rim Ranches

By Ed Grumbine





**Before** coming to work at the Grand Canyon Trust as manager of our conservation and grazing activities on the North Rim Ranches—850,000 acres of public lands north of the Grand Canyon—I was certain of three things about climate change and ranching. First, since I had been living in Asia and studying how pastoralists across the Himalaya adapt to climate change, I knew: yaks are grazing animals too. Second, I understood that no matter how big the landscape—a huge swath of the North Rim or the world’s tallest mountains—the people you partner with determine success or failure. And third, while a strong vision sets the stage for change, on-the-ground leadership makes it happen.

Working here in northern Arizona, I don’t see many yaks anymore. But when it comes to our partners, from the Jones family, who runs a small herd of cattle on these public lands, to the Forest Service and the Bureau of Land Management, who oversee the grazing permits, to the scientists studying everything from the movements of mountain lions and mule deer to ways to stop the spread of cheatgrass and the devastating wildfires it feeds, I know I want to rely on folks who are willing to think ahead of the curve. And because the Trust decided years ago to advocate for the health of the land using our unique position as a conservation organization *and* a grazing permittee, I am acutely aware that when it comes to our future climate and how people will adapt to change, our leadership remains essential.

Virtually all climate models show the Southwest headed toward some of the greatest temperature increases in the United States. Average temperatures are projected to rise by one to four degrees Fahrenheit by 2050, with even greater increases after that. If you’ve been following international climate

change discussions, you will remember the current consensus that an average temperature increase of much more than three degrees Fahrenheit will trigger significant disruptions to Earth’s natural systems.

On the Colorado Plateau, these higher temperatures will increase evaporation and reduce snowpack, making droughts worse. Projections of future regional rainfall are less certain. But as people working on the land know, precipitation is about timing, not just total amount. Declines in snowmelt and runoff will reduce river flows and soil moisture, leading to more stresses on humans and the land.

**With both partners  
in the mix, we’ve  
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a constructive way.**

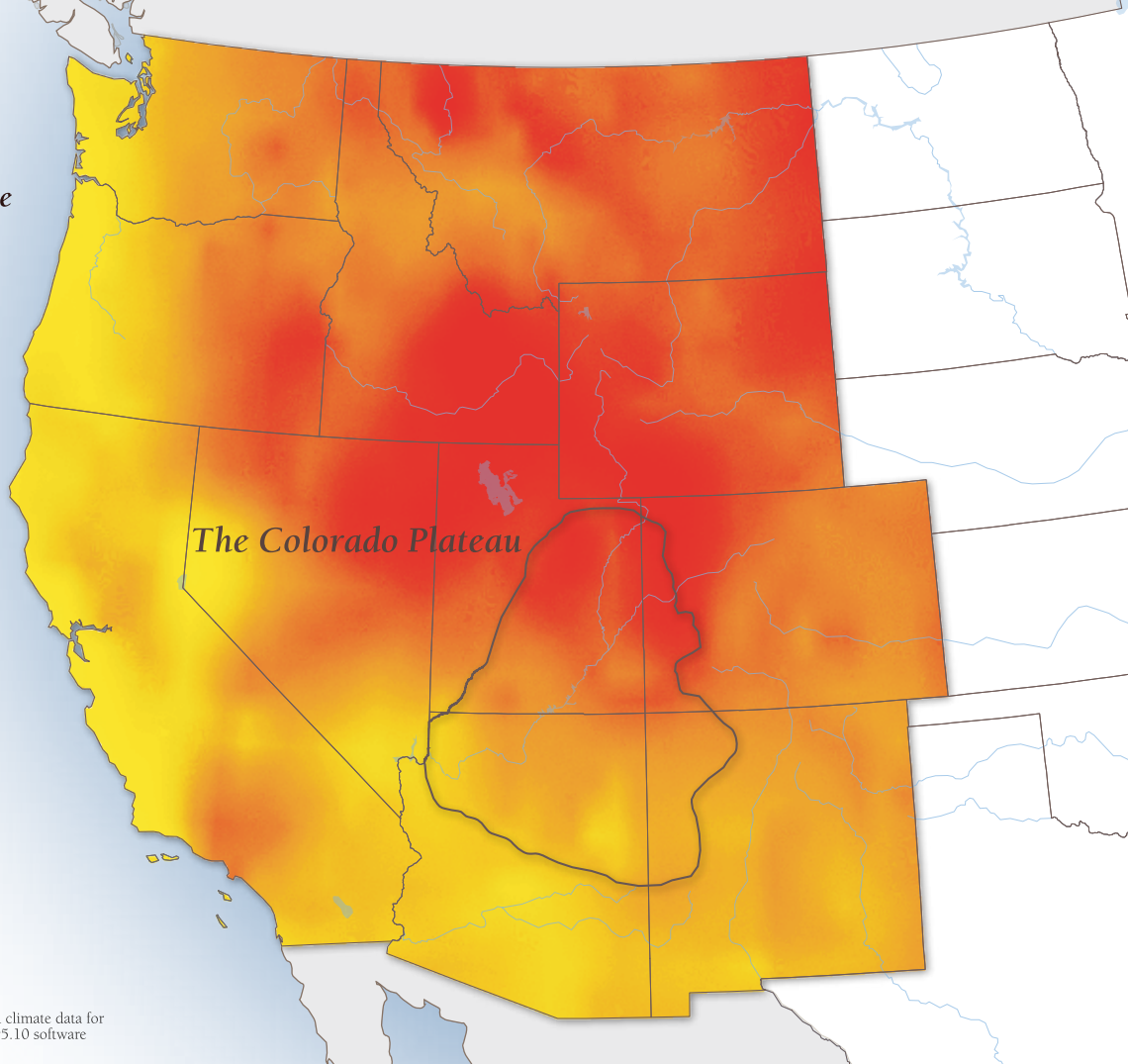
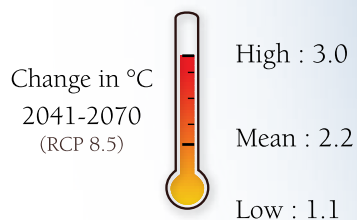


And as temperature, precipitation, and hydrology head toward some new normal, plants and animals will move on to find the habitat they need. By mid-century and beyond, this will likely lead to wholesale shifts in plant communities we have come to take for granted: pinyon-juniper woodlands are projected to become shrublands and ponderosa pine and spruce-fir communities may be replaced by drier forests. And the fire season, already

LEFT: COURTESY OF JUSTIN JONES

ABOVE: A wildlife camera trap snapped this shot of a bobcat on the North Rim Ranches in winter 2015 as part of an ongoing research project to understand the effects of our volunteer-powered habitat restoration work.

## Western United States Mid-century Projected Temperature Change in Degrees Celsius



ANALYSIS: Cerissa Hoglander  
DATA SOURCE: AdaptWest Project, 2015. Gridded current and projected climate data for North America at 1km resolution, interpolated using the ClimateNA v5.10 software (T. Wang et al., 2015). Available at [adaptwest.databasin.org](http://adaptwest.databasin.org).

lengthened by several weeks, will grow even longer, leading to more fires and larger burned areas.

As our longer fire season shows, the climate is already changing across the Southwest. What can we do? People often talk about reducing the amount of carbon humans emit, but on the lands where we ranch, our carbon footprint is small. Our best hope is to adapt: to plan for and then act to minimize the negative consequences of changing conditions by staying ahead of the curve of change and being flexible when “normal” climatic conditions evolve into something new.

The good news is that since the Trust purchased the grazing permits for the North Rim Ranches 10 years ago, we have successfully used our position as both a conservation advocacy organization and a livestock grazing permittee to promote climate-friendly management.

Three accomplishments stand out. In partnership with the Jones family, who has grazed cattle on the north rim of the Grand Canyon for three generations, and the agencies, we have managed livestock to support healthy ecosystems. Since 2005, we have reduced the herd grazing on these public lands from several thousand to some 600 animals today, about half the number of cows our Forest Service permit allows and a quarter of our Bureau of Land Management permit maximum. We have embraced grazing rotations that, in addition to fewer cattle, have altered the times and locations where livestock can graze in certain pastures to give grasses time to recover and reduce erosion. And, where the land needs a rest, we have negotiated closures on nearly 200,000 acres.

Supported by agency and research partners and powered by dedicated

volunteers, we have identified and restored sensitive areas including springs, streamides along the Paria River, and the remains of native grasslands that once covered large swaths of the rim before cattle were introduced. Much of this on-the-ground work has been done through the Trust’s Volunteer Program. In 2015 alone, volunteers donated nearly 4,000 hours to stewardship projects on the ranches. As a result, these important ecosystems are more resilient to future changes on the land.

Beyond grazing and restoration work, the Trust has convinced our partners of the benefits of inclusive, science-based management. With our leadership of the North Rim Ranches Research and Stewardship Partnership, a working group of major federal, state, and academic players, if we don’t know the answer to a management question, we use science to find





The barn at Kane Ranch headquarters (one of two historic ranches that make up the current North Rim Ranches) lies in shadow as sunlight falls across the Vermilion Cliffs. BRENDON POTTS

one. This partnership has sponsored a wealth of cheatgrass research to understand how to control its spread. We have delved deeply into the best ways to use native perennial grasses to restore arid lands in the House Rock Valley. We have also completed many wildlife studies, from baseline surveys to determine how many bird and bat species call these lands home, to mapping travel corridors which must be maintained for wide-ranging species like deer and mountain lions. Current research projects include restoring springs in Vermilion Cliffs National Monument, using camera trapping to better understand wildlife diversity,

**...we will be evaluating  
waters all across the  
ranches to determine  
what we can do to  
keep them flowing for  
wildlife and livestock in  
drier years to come.**

densities, and movements across the Kaibab Plateau, and discovering which kinds of trees might be better adapted to new climate conditions.

Building a coalition of partners has not always been easy, but 10 years of hard work has produced healthier lands, a stronger commitment to science, and greater trust in working together. And a decade of light-on-the-land grazing, successful restoration, and collaborative science have bought us time to prepare for what comes next.

How much time do we have to adapt to climate change? No one knows. But conservation-first management has given us experience in how to boost land health on the North Rim, and our partners have seen this too. The Forest Service has added climate change concerns into the North Rim Ranches' new allotment management plan, using our successes to set grazing rules for the next 10 years. And Justun Jones, who has worked on this land since he was seven years old, is willing to run a close-to-the-bone ranching operation because it allows him to live in the place he loves while he partners with us to help the land heal and adapt for the future. As he told me recently over coffee, "we have a life-long operation, not a five-year operation."

Taking the long-term view is a good place to begin tackling the impacts of climate change. To discover more about where our potential vulnerabilities lie across the North Rim lands,



University of Wisconsin volunteers plant a native, drought-resistant garden on North Rim Ranches. KATE WATTERS



The view from Fence Point, on the North Rim Ranches. VOLUNTEER PROGRAM

the Trust has just completed a climate adaptation plan that will guide us into an uncertain future.

In arid lands, the place to start is water. No one knows how much rainfall is in store for the Colorado Plateau. But on the ranches, one potential pinch point for water is in the low elevation winter grasslands of the House Rock Valley. The House Rock Valley is famous for its expansive views of red-rock cliffs, but there are few springs and no surface waters. In House Rock, our adaptation plan prioritizes restoring and monitoring springs. In fact, we will be evaluating waters all across the ranches to determine what we can do to keep them flowing for wildlife and livestock in drier years to come.

The new climate adaptation plan also spotlights the risk of unnaturally severe wildfires and the spread of invasive species. After a fire, the Forest Service closes grazing across the burn for three years. If cheatgrass moves in, grazing might be halted for much longer. Our ranching partner, Justun, is

particularly concerned about this. “If climate change ramps up the fire cycle, we’ll be impacted a lot on the Kaibab,” he says. “But we don’t do ranching from a truck. We get out on the land where we can see what’s going on and that should allow us to adapt.”

On-the-ground flexibility based on paying attention to what works and what doesn’t work on the land is a key outcome of the Trust’s long-term investment in partnerships. But partners don’t always see eye-to-eye. Despite recent dry conditions on the ranches, Justun believes we should run more cows, because, in his view, “our small numbers across a large landscape mean that we’ve never hit any threshold that tells us ‘okay, stop, that’s too many cows for these conditions.’” A partner who knows the land can provide essential information about weather, springs, fences, and Forest Service permitting requirements, but may overlook conservation goals that extend beyond ranching.

One afternoon when we were out

in the forest inspecting a broken water valve on the Little Mountain stock tank, Justun reminded me that if the Trust worked alone, things would have gone differently. “With both partners in the mix, we’ve been able to give each other trouble in a constructive way,” he said, laughing. This good kind of trouble—challenging every partner to think smarter and more creatively—is what adaptive behavior is all about.

Right now, we have maybe five years to prepare for whatever comes next on the North Rim lands. We have a fresh set of ideas from the climate adaptation plan. We have access to the best science. Our agency partners are ready to get on board. And, we have Justun, a rancher who wants to solve problems collaboratively for the well-being of his family and the health of the land.

I haven’t seen yaks on the North Rim, but I know good partners when I see them. ©

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*Ed Grumbine directs the Trust’s Land Programs.*



RIGHT: Artist Heidi Snyder examines a single Last Chance Townsendia. MARY O'BRIEN  
BELOW: Last Chance Townsendia, with a pinyon cone for scale. The entire plant is only half an inch in diameter. ARTWORK BY HEIDI SNYDER



# 12 Reasons for Grazing Reform

By Mary O'Brien

Heidi Snyder and I had been walking for two hours, hunting for a dime-sized plant—the rare Last Chance Townsendia—in an isolated stretch of pinyon-juniper woodland.

Listed as threatened under the Endangered Species Act, Last Chance Townsendia's only known home on earth is in southern Utah, where oil and gas development, off-road vehicles, and grazing threaten the plant's three known populations.







Was Heidi getting hungry? Annoyed? What if we couldn't find it? And then, suddenly, there it was. We recognized it instantly from a photo and description.

While Heidi, a superb botanical and wildlife artist, sat down with her camera and colored pencils to capture its faintly yellow-apricot petals and minute features, I searched for others of its kind for over an hour. We never found another.

This type of adventure has been par for the course as Heidi has assembled twelve magnificent drawings for a series called "Twelve Reasons." Each drawing tells the story of a species or ecosystem—sage grouse, springs,

boreal toads—that is directly or indirectly affected by poorly-managed livestock grazing. And each one is a powerful reason for grazing reform.

It's hard to choose favorites on this year-long journey, but Heidi particularly loved a site high in the Tushar Mountains that hasn't been grazed by livestock for 40 years. Here she prepared her bunchgrasses drawing—the largest, hardest drawing of all. One day we poked around a diversity of biological soil crusts as colorful as coral near Castle Valley, Utah. "I'm blaming the biocrust piece," Heidi says, "for a renewed interest in [drawing] lichens."

Born in Germany, Heidi came to the U.S. with her husband in 1975. A life-long aficionado of plants, gardening, herbs, and wildlife, she took up art as a profession in 2006. "So much comes into perspective outdoors," she says. "So much is calming and healing."

In February, Heidi completed the last of her Twelve Reasons drawings, and now it's time for the Trust to get to work using Heidi's drawings and their stories to help educate citizens and land managers about the impacts of grazing on nearly every habitat, plant community, food web, soil type, and species in southern Utah.

It is the Colorado Plateau's gain that Heidi has undertaken Twelve Reasons. No doubt her art will continue to enrich our sense of the wild world around us for many years to come. ©

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*Mary O'Brien directs the Trust's Utah Forests Program. Heidi Snyder's book, "Wild in the City," co-authored and illustrated with Dorothy DePaulo, features dozens of Heidi's drawings of plants and wildlife in urban Colorado spaces. See the rest of Heidi's "Twelve Reasons" drawings at [grandcanyontrust.org/grazing-utahs-public-forests](http://grandcanyontrust.org/grazing-utahs-public-forests)*

**Each drawing tells the story of a species or ecosystem that is directly or indirectly affected by poorly-managed livestock grazing.**



TOP: Cutthroat trout. ARTWORK BY HEIDI SNYDER

ABOVE: Bunchgrasses, the largest and most challenging drawing in the series. ARTWORK BY HEIDI SNYDER



## Tough Guys We Want on Our Side

By Mary O'Brien



TOP: Cyanobacteria creating a crust. COLLIN SMITH  
CENTER: A riot of old growth biocrust near  
Castle Valley, Utah. ARTWORK BY HEIDI SNYDER  
BELOW: Old growth white and dark lichens  
with moss leaves in the foreground.  
ELLEN MORRIS BISHOP

In January 2016, European scientists reported that most fungi cells taken from Antarctic rocks had survived 18 months on the International Space Station in conditions similar to those on Mars. These tough little fungi are friends of ours, because fungi shelter food-making algae to create lichens. And lichens are considered the old growth stage of the biological soil crusts (“biocrusts”) that hold soil in place and help soil absorb water in arid areas of the Colorado Plateau.

But old growth biocrusts, like old growth forests, are the late stages of a long process. In the case of biocrusts on the Colorado Plateau, it all starts with light-colored filaments of cyanobacteria (pronounced “sigh-anno-bacteria”) winding their way through desert soils, wrapping around soil particles or adhering particles onto their sticky sheaths.

After light cyanobacteria have colonized the soil, darker-pigmented cyanobacteria can build the blackish lumps we easily recognize as biocrusts. Then, mosses and tough-guy lichens, which come in a whole range of colors and forms, can build and hold the soil in place through high winds and rainstorms.

But if we want the tough guys, we need to protect their predecessors, the light cyanobacterial biocrusts. In 2014 and 2015, when the Trust remeasured 176 sites in Grand Staircase-Escalante National Monument where the Bureau of Land Management (BLM) had recorded biocrusts in 2000-2003,

we added light cyanobacteria to our data sheets. The BLM had limited their inventory to dark cyanobacteria, moss, and lichen. Our survey found that there are much more light cyanobacteria present than dark cyanobacteria, mosses, and lichens.

The dark cyanobacteria, mosses, and lichens are superior to light cyanobacteria at protecting the desert soils and retaining scarce rainwater, but they’re also more vulnerable to being destroyed by trampling by cows, vehicles, or hikers.

The good news is that, over time, much more old growth crust can develop on these light cyanobacteria in the monument. The bad news is that current monument management is suppressing biocrusts early in their lifecycle as light cyanobacteria. More bad news came in late 2015, with the publication of a 10-year

study showing that the higher temperatures and altered rain patterns predicted for the Colorado Plateau with global warming will also suppress the lichens, moss, and dark cyanobacteria, leaving the pioneering, but weaker, light cyanobacteria to take care of our lands.

What’s the best help we can give biocrusts right now? Limit the trampling. That means watching where we’re putting our feet and our tires, and protecting these tough guys from heavyweights like cattle.

*Mary O'Brien directs the Trust's Utah Forests Program. Read more in the Trust's 2015 report: "Grand Staircase-Escalante National Monument Biocrust Survey: 2014-2015" available in the resources section of our website.*

# A TIME TO ACT



## Opportunities for Climate Leadership

By Rick Moore and Anne Mariah Tapp

The Colorado Plateau is full of quiet refuges. You'll find alcoves in canyons hewn out of Navajo Sandstone where maidenhair ferns cling to the walls, water seeps to the surface, and the repetitive sound of drips falling into small pools reverberates in the silence. And don't forget shady groves of fir and spruce, high on the sides of volcanic sky islands punched through the horizontal red-rock country that makes up most of the plateau. Meanwhile, in the high country, shaded snowbanks melt slowly, soaking into the ground to nourish springs far below, water trickling downslope to nurture vegetation lining sinuous sandstone canyons.

But none of these refuges is safe from the carbon dioxide we're pumping into our atmosphere. Recently, an Arizona

Game and Fish Department manager spoke of watching a quarter-mile strip of lush green vegetation sustained by a spring on the Kane Ranch shrink to less than a hundred feet. Catastrophic wildfires are on the rise. In the Southwest, the total area burned from 1987 to 2003 increased more than 300 percent compared to the 1970s and early 1980s. Snow in Colorado's San Juan Mountains is melting earlier, affecting not only springs, but irrigation and how dams, reservoirs, and hydroelectric power are managed.

A 2002 "Colorado Plateau Advocate" article warned of frighteningly high levels of carbon dioxide in the atmosphere, pegged at 370 parts per million (ppm). Fourteen years later, carbon dioxide levels have climbed even higher—to

400 ppm—and the need for action in the face of the climate crisis is even more urgent. Unfortunately, in February 2016, the Supreme Court halted progress on the Obama administration's signature climate change program, the Clean Power Plan, which will reduce carbon dioxide emissions from existing power plants by 32 percent.

Despite this setback, we see tremendous potential in the leadership of tribal nations and cities across the United States who are acting on climate. The tribal nations and local governments of the Colorado Plateau are perfectly positioned to join this movement and lead the plateau to a new energy future—one defined by the choices of leaders who act, rather than waiting for the Supreme Court,



federal government, or recalcitrant states to take action.

Tribes across the West are emerging as the visionary leaders in local action

2008, the city council adopted a goal of cutting community-wide carbon emissions by 20 percent below 2005 emission levels by 2020 and 80 percent

## Tribes across the West are emerging as the visionary leaders in local action on climate.

on climate. Take the Tonto Apache Tribe whose reservation is located 95 miles northeast of Phoenix. The tribe recently completed an \$800,000 solar energy project to provide electricity for the tribal administration building and community gym and pool. In the first five months of operation, the project generated 100,000 kilowatt hours of electricity, saving the tribe \$14,000. The project is part of a longer-term goal to promote tribal sovereignty and self-determination while becoming a renewable energy leader in Indian country and upholding traditional ways of life.

The Blue Lake Rancheria, located near Arcata, California, is another groundbreaking example of tribal leadership. The tribe began its climate action planning in 2008 and since then has reduced energy consumption by an awe-inspiring 35 percent. Beginning in 2011, the tribe completed numerous energy efficiency projects, held a community forum on climate change mitigation and adaptation, added solar arrays to low-income homes, and installed two electric car charging stations. The most innovative renewable energy project the tribe has completed to date is the construction of a 175 kW fuel cell powered by hydrogen derived from sawdust. The tribe partnered with the Redwood Coast Energy Authority and Humboldt State University to develop and build the fuel cell.

When it comes to western cities, Fort Collins, Colorado has emerged as the shining example of a city forging a new path on climate action. In

by 2050. In March 2015, after nine months of work with a citizen advisory committee, multiple public forums, and participation from Colorado State University, the council tightened those goals, aiming to reduce emissions by 80 percent in 2030 and achieve carbon neutrality by 2050. Unlike many cities that set goals, but don't track progress, Fort Collins publishes an annual report on the community's greenhouse gas emissions. The 2014 report found that emissions were down 2.5 percent compared to 2005, even though the population increased 19 percent and the economy continued to grow at a robust rate, evidenced by the 41 percent increase in the city's sales and use tax revenues.

Fifty years ago, the Colorado Plateau emerged as an energy colony that supplied both the energy and the water for the buildup of the desert Southwest and California. Using the plateau's resources, we transformed the arid landscape of the American West and enshrined a fossil fuel-based economy. Charles Wilkinson—long-time Trust board member and former board chair—called this effort “one of the most prodigious peacetime exercises of industrial might in the history of the world.”

Now we stand in a moment when leaders on the plateau—particularly tribal nations and local governments—may again shape history by transitioning from fossil fuels to clean energy and energy efficiency alternatives. And these energy choices will dictate whether we will be able to continue listening to the mesmerizing



LEFT: Designed to bring power to those in need, a solar trailer belonging to the Shonto Community Development Corporation has mounted panels on the roof and a battery and control console inside. ROGER CLARK  
ABOVE: An 80KW solar photovoltaic system being installed at Leupp High School, Leupp, Arizona. DANIEL SNYDER

sound of water dripping from lush alcove walls in the plateau's canyons and finding solace in its high mountain forests. This crossroad—and the consequences of choosing the wrong way—call for another prodigious peacetime exercise on the Colorado Plateau. This time, let us all work together to restructure our energy future and finally begin to live on the Colorado Plateau in a sustainable way. ©

*Rick Moore is the Trust's clean energy and efficiency director. Anne Mariah Tapp directs the Trust's Energy Program.*

# MEDIATING LAND MANAGEMENT

## A Synthesis of Science and Tradition

By Jim Enote



The Bears Ears Buttes. TIM PETERSON

*The effort by five tribes to establish a national monument west of the Four Corners region is worthy of our attention.*



The Bears Ears National Monument proposal asserts that tribes and the federal government will collaboratively co-manage the monument as partners. Upper-level policy and decision-making for the monument would be conducted through a monument commission comprised of both tribal and federal representatives. The Bears Ears monument concept will address the asymmetry between federal land managers and tribal authorities and give local indigenous traditional knowledge and science equal treatment and application.

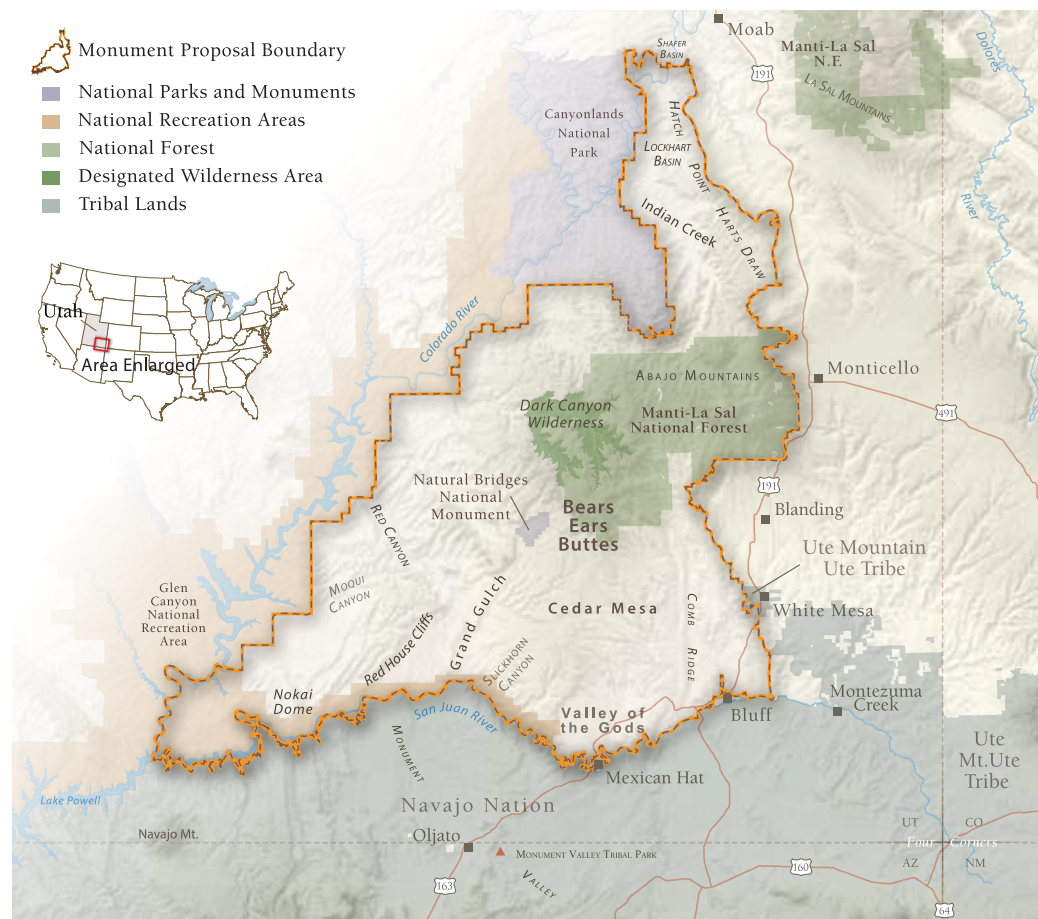
The vision put forward by the five tribes, if accepted and implemented, would initiate groundbreaking policy. While the current system of science-based natural resource management stems from good and responsible intentions, the search for best practices has not satisfactorily included Native American knowledge and values. The path toward forming a more appropriate resource management strategy must necessarily include input from tribal and cultural leaders. With a true co-management model, tribal authority would *not* be limited to an advisory committee and involvement in decision-making would *not* be limited to occasional tribal consultations.

With the Bears Ears region, this is particularly important since the area is dense with Native American cultural resources and is still an operative cultural landscape for several regional tribes. Thousands of years of cultural and environmental knowledge is contained in the cultural practices and languages of Native peoples in the area. The landscape is sacred. Once consecrated, the ancient springs, shelters, shrines, petroglyphs, pictographs, and plant and mineral gathering places of the Bears Ears area are blessed in perpetuity and must be protected.

Sadly, the proposed Bears Ears monument area is ground zero for looters



Native people from across the Colorado Plateau meet regularly at Bears Ears Inter-Tribal Coalition gatherings.





Imagine a national monument where human presence is essential to maintain a cosmological process and to complete a coexisting relationship between people and place.



TOP: Riders return to a Bears Ears Inter-Tribal Coalition gathering after watering their horses in a pond below the Bears Ears Buttes. ABOVE: A curious deer eyes Bears Ears Inter-Tribal Coalition members meeting near the Bears Ears.

of cultural resources, while mining and development throughout the area further threaten sensitive sites. As tribal peoples have become increasingly mobile and able to visit the Bears Ears area more frequently, what they find is not always pleasant.

Young Native people are completing university studies, eager to apply a new kind of stewardship to natural and cultural resources. We need not simulate or replicate conventional land management planning processes or strategies. Instead, there will be an opportunity to make the Bears Ears monument a place for mediation among science and traditional knowledge, experience, and sensibilities, to create original meaning from a complicated history and with a new relevance, to negotiate innovative plans based on new environmental criteria, lexicons, and visions. A Bears Ears

monument would signify restoration.

Imagine a national monument where human presence is essential to maintain a cosmological process and to complete a coexisting relationship between people and place. How this sense of home and place is interpreted would be a special task for the monument's tribal and federal staff. The Bears Ears landscape is a complex of notes and memorials, hand-made testaments of hope and resilience in the American Southwest. Even without the ability to speak for itself, the place called Bears Ears reminds me: I am of this place. ©

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*Jim Enote directs the A:shiwi A:wan Museum and Heritage Center at Zuni, New Mexico and the Colorado Plateau Foundation. He also serves as vice-chair of the Grand Canyon Trust's board of trustees.*





The Bears Ears Inter-Tribal Coalition press conference in Washington D.C. GAVIN NOYES, UTAH DINÉ BIKÉYAH

Since Alastair Bitsóí’s cover story, “This Land is What I’m Here For,” in the fall/winter 2015 issue of the *Advocate*, the people’s movement for Bears Ears continues to grow. The Bears Ears Inter-Tribal Coalition has prepared a practical proposal to protect and collaboratively manage 1.9 million acres of transcendent public lands surrounding the Bears Ears in southeastern Utah.

Their proposal calls on history and law while laying out a bold vision for a future in which the five core coalition tribes—Hopi, Navajo, Ute, Ute Mountain Ute, and Zuni—work together to manage this vibrant cultural landscape as equals with federal land managers. A world-class center that integrates Native American traditional knowledge and western science is envisioned for this place. More than just management, their proposal offers to preserve Bears Ears while sharing the Native worldview with all Americans lucky enough to visit.

**The intertribal coalition’s proposal was delivered to the Obama administration on October 15th, 2015, in Washington D.C. A stirring press conference followed, with tribal leaders speaking from the heart about what Bears Ears means to their people. A normally stoic Washington press corps broke into applause.**

Shortly afterward, at the 2015 Native Nations Conference, President Barack Obama himself said: “Moving forward, we’ll review tribal proposals to permanently protect sacred lands for future generations.” As momentum builds, more and more supporters are lining up behind the cause. The National Congress of American Indians, representing over 250 tribes nationwide, passed a resolution endorsing protection and collaborative management for Bears Ears.

Bears Ears has garnered media attention worldwide as people are inspired by a truly historic convergence of events. For the first time in the 110-year history of the Antiquities Act, Native American tribes are using the Act to request that *their* ancestral lands be protected. Until now, the Antiquities Act has been used to protect Native American artifacts, but Bears Ears would be America’s first national monument to honor not just objects, but the vibrant modern-day people and cultures connected to them. 2016 holds great things for Bears Ears.

Please join us in supporting the intertribal coalition by reading the proposal and signing the petition at [www.bearscoalition.org](http://www.bearscoalition.org).

*Tim Peterson serves as the Trust’s Utah Wildlands Program director.*

## People and Place Inspire Action for Bear Ears

By Tim Peterson



Calf Creek Falls.



# A PLACE TO REMEMBER

By Anne Mariah Tapp

## My dad is eighty years old, about two decades too old than I'd like.

Over the last two years, an essentially ageless father has finally gotten older. I didn't think it was coming because his seventies were an extension of his sixties and that decade inseparable from his fifties. As a late-in-life child born when my dad was fifty, I thought he'd managed to escape the aches, pains, memory lapses, and general malaise that seemed to visit his peers throughout my teens and early twenties.

Now, hikes are harder, reflections are more intense, and our time together is interwoven with a growing realization that there's a dwindling amount of time left for him to share his experiences and for us to create new memories.

My dad loves the Colorado Plateau. He's as new to this region as I am; his visits started when I began working here. He comes to visit from his home in Houston, Texas and together we try to explore places that are new to both of us. My memories and experiences on the plateau are inseparable from memories of my dad. Now when I go to Zion to climb, I remember driving through the tunnel in a convertible we rented in Vegas five years before, on my first visit to southwestern Utah, both of us craning our necks at the glowing red walls rising to the clouds. It's a gift that I never expected, and one I'll never stop being thankful for.

Getting old is hard. Reflecting on the ending curve of your life is hard, no matter how well you lived it, and my dad has lived his life as well as anyone I've ever met. The last few years



The author and her father.

have been darker, with conversations touching on failures, a fear of no new beginnings, and the struggle to find real meaning in the long days of retirement. It's much like the dark and anxious conversations that we all have about the future of the plateau—about our future—if we do not avert the climate crisis.

My dad came to visit last fall, rising out of a depression perhaps borne out of these reflections or perhaps just a product of being human in this sometimes dark world. I wasn't sure how the trip would go, but I knew

that southern Utah in October never hurt anyone.

We drove from Flagstaff to Escalante, where we hiked to Calf Creek Falls. It's a six-mile roundtrip hike in the Grand Staircase-Escalante that I wasn't sure he could finish, and that I'd never done. The air was cool, the trail friendly, and we reached the falls cascading into a round green pool in one of Utah red-rock desert country's most perfect fall days.

Driving the next day across a vast stretch of the plateau, my dad commented on a sense of renewal, of faith in our society's ability to do the right things, and the gift that our leaders give us when we protect these places. I remembered that all across the plateau, the West, and the world, we are working—out of love for place and community, in ways small and grand, creative and conventional—to solve our climate crisis. And I could feel Stegner's "surge of inextinguishable western hope" rising like the Kaiparowits Plateau in the distance.

As our parents and grandparents age, they need the Colorado Plateau protected as much as anyone, maybe more. A place to remember, reflect, heal, experience joy, create memories, and hold space for the questions that come later in life. What greater gift can we give to those we love than our work to protect this landscape capable of restoring spirits weary after long years? ©

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*Anne Mariah Tapp directs the Trust's Energy Program.*

# RISING TO MEET CLIMATE CHANGE

By Claire Martini



*No place has enticed me to ponder more than the front porch of Kane Ranch.*

This vista never fails to inspire, particularly in optimistic company. For two years now, I've spent early November here with fellow young idealists, dreaming up Uplift, an independent



TOP: The author soaks in the morning sun on the front porch of Kane Ranch. WILLIAM MARTINI  
ABOVE: In 2015, Uplifters traveled from across the Colorado Plateau to participate in the inaugural Uplift Climate Conference. BLAKE MCCORD

for-youth-by-youth conservation movement that meets twentysomethings where they are and sets its own priorities.

From the porch of Kane Ranch, it's clear that wherever we're going has to do with where we've been. The human heritage of the Colorado Plateau plays in miniature across the House Rock

Valley. Look beyond the Navajo sandstone bricks of the 1870s headquarters and you'll find a shrinking cattle operation forced to adapt to a hammered ecosystem. If you know how to look, the washes and plains sloping toward Marble Canyon are adorned with traces of ancient farmers who moved on when the water did. And most precious of all: the Colorado River. The río persists and still sometimes flows red (dams be damned), permitting life and lore in this valley.

But rising above the Echo Cliffs, the triple smokestacks of our current indulgence—Navajo Generating Station, one of the West's dirtiest coal plants—remind us that our inheritance is tied to a legacy of exploitation. Climate change, water woes included, is the largest threat facing my generation. But the deep power of these western landscapes is not yet lost. Wallace Stegner called this arid land “the native home of hope.” To look into the expanse today is still to ask “what if?” What if young people united to confront climate change on a scale only possible in the digital era? What if we prioritized ecology over

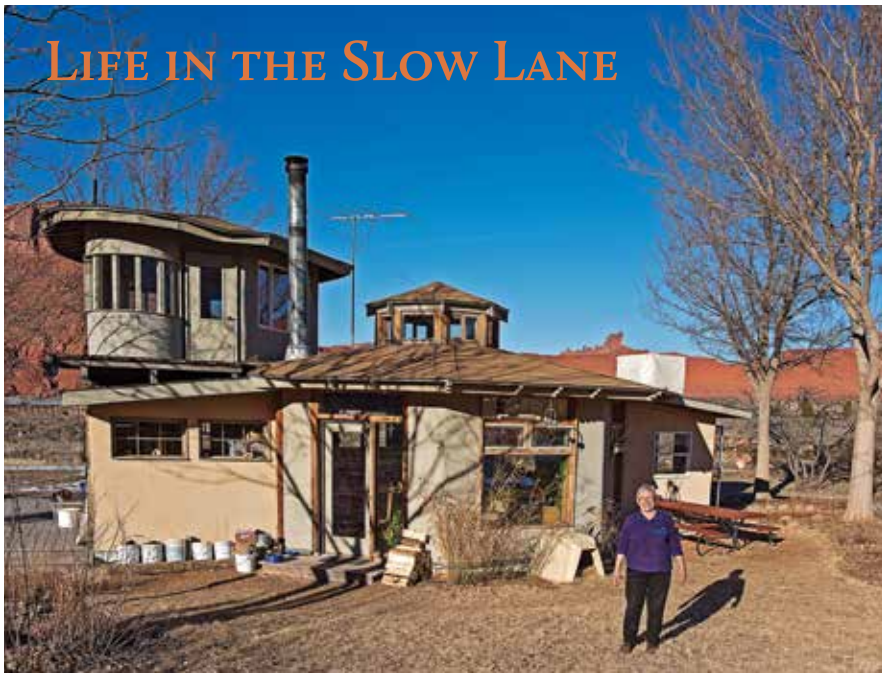
economy? When science increasingly points to drought, creating a Stegnerian “society to match the scenery” becomes more than aesthetic. It's existential.

Uplift is rooted in red rock, dry soils, and hope. We simply don't know if these red-rock mesas, aspen-clad mountains, and ponderosa forests will be habitable in a warmer world, so we're organizing now to protect the places we love. Our savvy team of volunteer organizers is gearing up for the second annual Uplift Climate Conference, August 18–20, 2016, with support from the Grand Canyon Trust and Northern Arizona University's Landscape Conservation Initiative.

Whether you're young or young at heart, Uplift welcomes you this August. Someday, we hope, our descendants—and yours—will sit on the front porch of Kane Ranch, look out over the House Rock Valley toward Marble Canyon, and instead of exploitation, see a subtle legacy preserved. They too will find wonder in the vast, wild landscape. ©

*Claire Martini is the Trust's Uplift and youth engagement coordinator.*





## LIFE IN THE SLOW LANE

Sue deVall outside her home in Castle Valley, Utah. TIM PETERSON

Longtime member Sue deVall respects the work that the Grand Canyon Trust does. “I’m a fan of Mary O’Brien and Bill Hedden’s work in the Utah forests. They do a phenomenal job,” she says.

In fact, Sue is so impressed that she bequeathed her house and land in Utah’s dramatically beautiful Castle Valley to the Trust. “I chose the Trust to gift my home to because I want to do something good for the environment,” Sue says.

An attorney set up a life estate for her, with the Grand Canyon Trust as beneficiary. Sue will live in her house for as long as she is able, but knows things are taken care of when that changes. It gives her great satisfaction to know everything is settled. “And the Trust now knows a gift will come its way,” she says.

The Trust’s executive director, Bill Hedden, is grateful. “It’s wonderful to have a vote of confidence like this. And it helps us a great deal with our financial planning to know about a gift in advance. We are deeply appreciative of what Sue has done.”

Sue came to Castle Valley in 1997 by way of the Bay Area and Salt Lake City. Her home, now retrofitted, was built to function off the grid in the ’80s. Sue

jokes, “People are always surprised to hear I only have 60-amp service. But it runs everything I need quite well.” Out back, there’s a barn converted to a workshop where she runs an outdoor equipment repair business. She mainly does sewing repairs for individuals and Moab outfitters.

“I care about preserving the land,” Sue says. “I know the Trust is committed to that. I like their efforts to limit grazing as much as possible. I want exotic goats off the La Sal Mountains, and I know Mary [the Trust’s Utah Forests Program director] shares that wish.” Sue also supports reintroducing beaver for land restoration and the Trust’s outreach to educate the wider community. In particular, she appreciates the Trust’s collaborative approach in working with such diverse groups as ranchers, industry, and government officials.

For fun, Sue floats rivers, hikes the mountains and desert, and camps out. “I’m a homebody,” she claims. “A neighbor and I share a big vegetable garden. It’s life in the slow lane. My home is very important to me. I know that the Grand Canyon Trust will put it to good use to benefit the land and the critters.”©

*“A man has made at least a start on discovering the meaning of human life when he plants shade trees under which he knows full well he will never sit.”*

*–D. Elton Trueblood*



TIM PETERSON

### LEGACY MATTERS.

Consider a gift by will to the Grand Canyon Trust. Call our legacy team at 928-774-7488 to discuss your needs and options.

# NOTES FROM THE FIELD

## **North Rim Lands**

On the 850,000-acre North Rim lands, we're working with volunteers to restore rare ecosystems around springs, monitor wildlife habitat, and research native plants. In 2015, volunteer citizen scientists contributed over 2,200 hours restoring springs, planting and measuring native grass and pine seedlings, and surveying the initial results of the "greenstrips" project, which studies how islands of native grasses interrupt the spread of invasive cheatgrass and the severe wildfires it feeds. Through these projects, we are identifying native grasses that can beat out cheatgrass and improving natural water access for wildlife such as desert bighorn sheep, bobcats, and sharp-shinned hawks.





## Arizona Forests

The Four Forest Restoration Initiative (4FRI) has successfully secured necessary environmental clearances for a restoration plan covering nearly 1 million acres spanning the western Mogollon Rim. As restoration activities ramp up in this area, planning will also continue to expand across another nearly 800,000 acres covering the central and eastern portions of Rim Country. Volunteers will be busy this summer helping to restore critical habitat, including springs, and collecting monitoring data to help us understand the effects of restoration across this vast area. Recognizing the critical importance of 4FRI, in January 2016, the Forest Service committed an additional \$10 million per year to the effort, an unmistakable sign of the agency's commitment to this flagship effort.

## Energy

Solutions to the climate crisis come in all shapes and sizes: small and large, creative and more conventional. Here at the Trust, we're focusing on an exciting new campaign to pass innovative legislation called PACE. What is this new legislation with a funny name and how does it relate to the Colorado Plateau's climate crisis? PACE legislation allows commercial and industrial property owners to obtain low-cost, long-term financing for energy efficiency, water conservation, and renewable energy projects—projects that reduce carbon and water footprints. PACE has passed in 32 states across the country, including Utah, New Mexico, and Colorado. Now, we're working to get PACE passed in Arizona, and then use it to move the plateau's future toward clean energy solutions.



## Grand Canyon

Storm clouds are still swirling around Grand Canyon Escalade, the scheme to build a 10,000-person-per-day tramway into the heart of the canyon. Promoters continue to lobby Navajo Nation lawmakers for approval to develop the 420-acre tourist resort on the Grand Canyon's east rim, where a gondola would drape more than a mile down to the confluence of the Colorado and Little Colorado rivers. At the local level, Chapter President Perry Slim recently wrote a letter to the *Navajo Times* calling for immediate approval, noting that "Escalade will create 3,500 jobs for Western Navajo families and build a new paved road along with water and power infrastructure for our community." Navajo President Russell Begaye remains opposed to the project. His administration is creating a land-use plan with local communities and Navajo Parks and Recreation to guide conservation and use within the two western Navajo parks where Escalade is proposed.



TOP: A wind/solar hybrid system installed at Dilkon Community School, on the Navajo Nation.  
ABOVE: A citizen scientist helps perform a transect. ANDREW MOUNT

## Volunteer

Our 2016 field season is in full swing, with volunteers hard at work to prevent the spread of invasive cheatgrass, restore springs, support climate change research on the North Rim Ranches, and collect data to make the case for grazing reform in southern Utah. We are especially excited about new projects with the Four Forest Restoration Initiative. Our citizen science volunteers will assess springs and inventory streams to support the nation's largest forest restoration project as it makes Arizona forests healthier, safer, and more resilient to wildfire. We look forward to seeing the new and familiar faces of volunteers, young and old, from across the country, getting their hands dirty and advocating for the places we cherish. See you in the field!



MICHAEL REMKE



Utah Forests Director Mary O'Brien walks through a sagebrush meadow in Cottonwood Creek Allotment, the Fishlake National Forest's only livestock-free allotment. CHRISTOPHER MARIN

## Utah Forests

In southern Utah, we're busy completing reports on 2015 field work, including beaver dam assessments, biocrust surveys, and painstaking plant biodiversity counts, to inform a host of big grazing actions on the docket this year. In 2016, 20-year-old Grand Staircase-Escalante National Monument will continue its methodical crawl toward a first-ever grazing plan; Canyons of the Ancients National Monument—loaded with archaeological artifacts—will consider reintroducing cattle on two allotments that have not been grazed by livestock in 10 years; and the 1.3 million acre Manti-La Sal National Forest will begin a multi-year process to revise its 31-year-old forest plan. So much to do before we head out to spend time with our Colorado Plateau plants and wildlife in another season of field work with interns, volunteers, and staff.



ELLEN MORRIS BISHOP

## Utah Wildlands

A discussion draft of the Public Lands Initiative (PLI) introduced in January fell far short of the goal set forth by Congressman Rob Bishop (R, UT) to “build consensus among stakeholders” around land protection in eastern Utah. In fact, the PLI would actually *weaken* protections for eastern Utah's best wilderness-quality lands. Unacceptable provisions found in the draft include: locking in or increasing livestock grazing, giving away 12,000 miles of “road” claims to the state of Utah, enabling a “hydrocarbon highway” through Utah's wild Book Cliffs, and making fossil fuel development the number one priority on 2.6 million acres of public lands. Despite our best efforts toward durable compromise over the last three years, the Trust cannot support the PLI. It does, however, reaffirm our unreserved support for the Bears Ears Inter-Tribal Coalition in their push for a new presidentially-proclaimed national monument. We're excited about Bears Ears, and we hope you are too!



## Native America

Diné Hózhó L3C, the Navajo Nation's first limited-profit company, which pairs investors directly with entrepreneurs to support ventures that benefit local Navajo communities, is gaining steam. The company is driving an important partnership between the Navajo Nation Parks and Recreation Department, local chapters of

the Navajo Nation, and Arizona State University to help create a world-class Navajo Nation Grand Canyon tribal park that would encompass Navajo land on the canyon's east rim. Diné Hózhó is also opening the door to new types of funding and investment on tribal lands.



Representatives of the Diné Hózhó L3C met with State Department Leadership Fellows participating in the Obama administration's Young Southeast Asian Leaders Initiative, which seeks to build the leadership capabilities of youth and strengthen ties between the United States and Southeast Asia. The initiative focuses on critical topics identified by youth in the region: civic engagement, environmental and natural resources management, entrepreneurship, and economic development.

## VOLUNTEER TRIPS

### AUGUST 8-12

Grab a shovel and a pair of work gloves and get hands-on experience supporting projects on the Kaibab Plateau that study how plants respond to climate change.

### AUGUST 12-14

Become a spring steward. Learn how to recognize and scientifically document the health of springs by taking water samples and identifying plants and animals.

### SEPTEMBER 5-9

Put your spring steward training to immediate use and support the Four Forest Restoration Initiative (4FRI). Join this adventure to survey springs within the project area.

### SEPTEMBER 19-23

Come along for our final 4FRI trip of the year. Survey streams and get in on the ground floor of 4FRI Phase 1, which will restore nearly a million acres of ponderosa pine forest over 10 years.

Find more trips:

[grandcanyontrust.org/events](http://grandcanyontrust.org/events)

## VOLUNTEER SPOTLIGHT

Current profession: Peace Corps volunteer

Hometown: Prescott, AZ

Volunteer and member since: 2010

**Total hours donated: 240**

### WHY I VOLUNTEER

The issues that confront our world, from climate change to social injustice, seem insurmountable. However, when I meet the individuals working to solve these problems, I can't help but be optimistic. The Trust's conservation successes demonstrate the ability of a collective of individuals to make a difference. I hope to continue to cross paths with the Trust throughout my career and life.



**Brian Andersen**

### HOW I STARTED

I got to know the Grand Canyon Trust as a student volunteer with Prescott College, restoring springs in the House Rock Valley. Most recently, I helped organize the inaugural Uplift Conference. The idea of engaging young people to reimagine the conservation conversation is beautiful, and desperately needed. Organizing Uplift gave me space to be an activist by empowering other young people, an influential step in my career path. I'm excited for my next move in the conservation field as an environmental educator in Panama through the Peace Corps.



# Beyond the Pelt

**GLOBAL WARMING IS MAKING FUR HATS PASSÉ. BUT BEAVERS THEMSELVES ARE MAKING A COMEBACK.**

Washington-based filmmaker Sarah Koenigsberg was getting tired of all the apocalyptic doom-and-gloom climate change stories floating around the media circuit when she happened upon an unlikely glimmer of hope: beavers. After filming these ecosystem engineers for her own feature-length documentary, “The Beaver Believers,” she helped the Trust produce a short film showcasing three success stories of how the return of beavers has transformed public lands across the West. Here, we talk to Sarah about beavers, activism, and catching the slippery critters on camera.



TOP: Baby beaver. SARAH KOENIGSBERG  
ABOVE: Sarah filming. TYSON KOPFER

## **What was it about beavers that caught your attention?**

It’s exhausting to think about a life of environmental activism as a perpetually depressing uphill battle. That’s why the story of beaver was instantly appealing: everyone working with them seemed genuinely happy in their work! They’d be out in the field, hiking in the hot sun plotting GPS coordinates, or on their hands and knees counting willows—I mean, how boring is that?—yet they were all having a great time—laughing, loving being outside, and celebrating the amazing transformation beavers make across the landscape.

## **Most people know beavers build dams, but how do they help address climate change?**

Beaver dams create ponds and wetlands that collect precipitation, letting it sink slowly into the ground instead

of rushing straight out to the ocean. In the arid Southwest, this water storage is incredibly valuable, as it recharges the aquifer and holds water underground until it can slowly trickle back into our streams. Local wildlife, spawning fish, and migrating birds also thrive in the pockets of diverse habitat that beavers help build. The list goes on!

## **How are people using beavers to restore ecosystems?**

Our western landscapes evolved with beaver in them, but since we nearly exterminated them in the heyday of trapping, it’s never been in our collective consciousness that they’re supposed to be here. In some places, land managers are sharing the story of beaver with the public, hoping to foster appreciation for the benefits they provide. In other areas, land managers are live-trapping “nuisance” beavers—those that may be blocking culverts



or felling ornamental trees on private land—and relocating them high up into the mountains on public land, to reestablish in our headwaters.

**Some of the footage looked pretty remote—what was involved with getting to the shoot locations?**

I am amazed we never dropped the camera in the water! At one point, I was actually chest deep, about to top my waders, holding the camera up above my head while trying to keep up with the fisheries biologist. Filming always involved a lot of hiking through swampy, slippery areas—a lot of balancing precariously on fallen logs and slurp-slurp-slurping through the muck. But it was fun, in a masochistic way.

**How do you turn footage into a film?**

I guess it's kind of like a huge jigsaw puzzle, except there's not one right way to put it together. I sit at a big table and lay out my content in front of me. I write quotes, concepts, and shots on index cards—I have to see it in physical space to make sense of it—and I start shuffling them around, looking for themes or things people say that connect together. The endless possibilities

can be maddening, but it's also one of the most fun things I do.

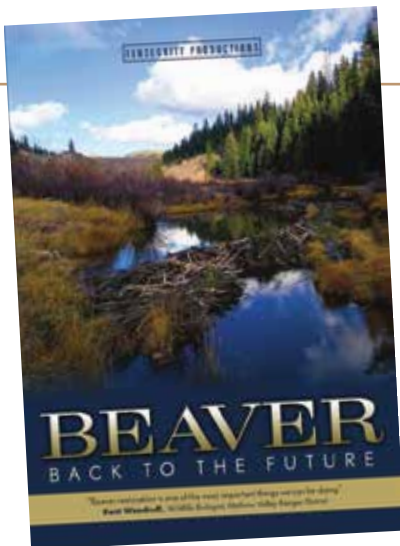
**What's your favorite thing about filming nature?**

Our modern-day lives are so hyper-scheduled and hyper-managed. We're supposed to have everything perfectly planned out—chop, chop, chop! But when your task is to film a wild animal, you simply can't control it, and I love that. It's humbling—I get reminded (and forced) to slow down, to remember the bigger picture. And it's just the best feeling when you've been trying to get a shot for days, and then finally, as if on cue, a beaver comes gliding out of its lodge and you're lucky enough to capture the shot.

**What is next in the queue?**

I'm in the final stages of post-production on my film "The Beaver Believers," which is really exciting. I had something like 70 hours of footage shot over two years for this 50-minute film. You can learn more about that project and watch our trailer at [www.thebeaverbelievers.com](http://www.thebeaverbelievers.com). We'll begin entering it into film festivals this spring!

*Interview by Ellen Heyn.*



**ASK YOUR FOREST TO BRING BEAVERS BACK.**

For a free copy of Sarah's 12-minute DVD, "Beaver: Back to the Future,"

email us:

[info@grandcanyontrust.org](mailto:info@grandcanyontrust.org)

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## MEET SUSIE AND RICK KNEZEVICH

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Knowing we can count on your gift every month helps us plan our work and is critically important to the Trust's ability to achieve its mission. Please make the commitment today.

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## Members Make Our Work Possible

**FROM:** Aspen, CO

**MEMBERS SINCE:** 2014

### **FAVORITE PLACE ON THE COLORADO PLATEAU:**

Our property at Johnson Lakes, an inholding on the southern edge of Grand Staircase-Escalante National Monument. It's a microcosm of the entire plateau.

### **WHY WE GIVE:**

There are a lot of reasons. As individuals, we can only do so much. The Trust will be around for generations and has a long-term institutional life that most of us don't—this is important when studying damage that will take generations to heal.

### **GETTING OUT ON THE LAND:**

We purchased our land because it is beautiful. Since becoming involved with the Trust, our property has taken on a broader purpose and given us a personal direction: to leave the land better than we found it. Our goal is to restore the land and use it as a reference area, with boots on the ground and hands in the dirt through the Trust's Volunteer Program. Each volunteer's gift of time is so much more valuable than our gift of money.

*Thank you, Susie and Rick!*