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GRAND CANYON TRUST



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ANNUAL REPORT

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JOHN ABER

Editor's Note: The views expressed by the guest writers in this issue are solely their own and do not necessarily represent the views of the Grand Canyon Trust.

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www.grandcanyontrust.org

In this issue of the *Advocate* our writers attempt to visualize the future of Colorado Plateau conservation as the Grand Canyon Trust enters its second quarter-century. This is a difficult trick, especially with the recent upheaval in Congress, but we are searching for the big patterns that will drive our society's relationship with the natural world regardless of the fluctuations of the electoral cycle.

I am afraid that the biggest pattern that will shape our future is the destabilization of global climate, with particularly acute effects in the American Southwest. If, as scientists predict, annual flows in the Colorado River decrease by 30 percent, the years ahead are likely to pose some old questions, such as: "Where will our water come from, and how will we share it?" with an urgency that will make them different from what we have dealt with in the past. Will there be wholesale abandonment of agriculture to free up water for the cities? Will our rivers be treated ever more like plumbing? It will be the thankless job of environmentalists to remind us that if we solve our immediate problems by destroying the river habitats and the creatures that depend on them, we will have taken another large step toward foreclosing our own future as well. Or, as Joseph Wood Krutch warned more poetically long ago, "If we do not permit the earth to produce beauty and joy, it will in the end not produce food, either."

All these downstream problems will originate in the headwaters, where snowpacks will be reduced and melted off earlier in the spring due to warmer winters and blankets of dust blowing in from dried-up lowlands. These factors will stress and change the forests that now perform extraordinary services as water purifiers and slow-release sponges. We will need to concentrate on restoring the forests and helping them, with all their wildlife, adapt to the changes so that the watersheds do not collapse. Come to think of it, the forests are not unique: we will need all of the remaining habitats to be as intact and functional as possible.

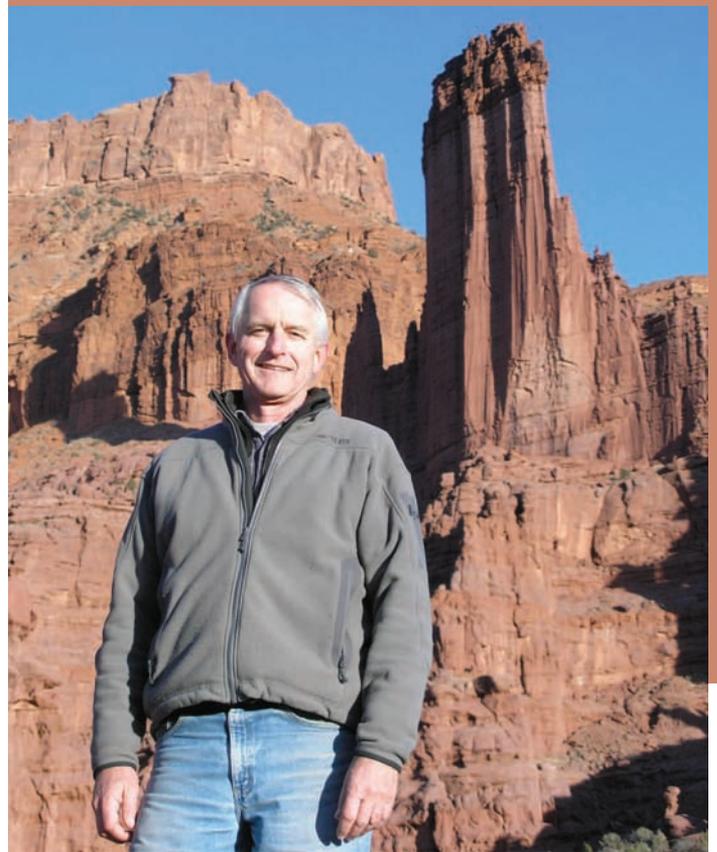
When millions of people might be worried about whether water will flow from their taps, things like the stewardship of soil surfaces, or the health of

mountain beaver populations, will seem like irrelevant issues. That is why I believe one of the prime tasks of conservationists going forward will be to explain the complex interactions between seemingly unrelated things. In a densely populated, hotter world many of our old understandings about how things work will need revision. For example, we will need to accurately understand how our choices about energy sources and energy efficiency affect our daily lives. We will need to know where our food comes from and why that matters. And we will need to blend the best of what modern science can teach us with the ancient knowledge of the indigenous people, who have experienced mega-drought in the past and come through the knot-hole alive, with deep respect for the limits imposed by the land and climate.

My thinking about the gap between the stories we tell ourselves and the external reality was enriched when I read David Owen's profile of Saul Griffith in the *New Yorker* this spring. Griffith is one of the most prolific inventors in the world and also an environmental activist who long dedicated his prodigious creativity to breakthroughs in energy technology. After making advances in things like solar roadways and airborne wind turbines, Griffith calculated that the energy embedded in the materials, construction, and operation of any of these renewable technologies exceeded what they could reasonably generate during their lifetimes. He understood the sobering fact that we cannot build a sustainable future, which is to say a future at all, on technological ingenuity alone. We will have to change our behavior to allow seven or eight billion people to live agreeably on this finite planet. As national science advisor John Holdren said, "We basically have three choices: mitigation, adaptation, and suffering. We're going to do some of each. The question is what the mix is going to be. The more mitigation we do, the less adaptation will be required and the less suffering there will be."

I am heartened reading the essays by the Trust staff in this magazine. They are the people who dedicate their lives to protecting and restoring the land and the

LETTER FROM THE EXECUTIVE DIRECTOR BILL HEDDEN



RICK MOORE

difficult challenges ahead have not daunted them. Notice how the twin themes of building a scientific understanding of the land and engaging a devoted population of citizens to advocate for the land run through all their plans for the future. They are going to solve enormous problems in the only way they ever get solved: by taking the first step and then the next. I hope you will consider a special 25th anniversary gift to the Trust to help us with this great work in the years ahead. Our children and the voiceless wildlife and wild places who will have to live in the world we create are depending on us. 🌀



WHAT TOMORROW HOLDS FOR ARIZONA'S PONDEROSA PINE FORESTS

by Ethan Aumack

I never think of the future – it comes soon enough.

Albert Einstein

When it comes to predicting the future as it relates to the environment—especially in the context of climate change—even the best prognosticators can and do appear foolish at times. While the overall outlook for the world as we know it is fairly grim without substantial course corrections, the specific type and rate of change we might expect to see in our environment is very difficult to predict. This being said, the future is upon us when it comes to northern Arizona's ponderosa pine forests, and the consequences of inaction (or small-scale restoration) vs. ambitious landscape-scale restoration are only too clear. Let's take a closer look at the choice in front of us.

THE FUTURE OF NORTHERN ARIZONA'S PONDEROSA PINE FORESTS UNDER A CONTINUED SMALL-SCALE RESTORATION PARADIGM

Currently, less than 10,000 acres of ponderosa pine forests managed by the U.S. Forest Service are being thinned each year in northern Arizona. Additional acres are being treated through prescribed burning and Wildland Fire Use—the management of naturally ignited fires. Put together, all of these treatments equal an infinitesimally small portion of the region's ponderosa pine forests (totaling more than 2.4 million acres across the Arizona portion of the Mogollon Rim alone).

While the amount of wildfire we see in this region varies year-to-year based on amount and timing of precipitation, our overall wildfire trendline is not too difficult to interpret. “Large” fires of the 1980s several thousand acres in size have been replaced by larger fires tens of thousands of acres in size in the 1990s, which have been replaced by much larger fires hundreds of thousands of acres in size in the first decade of the twenty-first century.

Comparing our status quo restoration progression with rapidly growing wildfires, it doesn’t take a theoretical physicist to understand that we are behind the curve, and falling further behind by leaps and bounds every year.

What can we expect in the future from such a disparity between our small-scale, on-the-ground restoration actions, and wildfires of increasing severity and magnitude? Here’s a depressing sample:

Potentially irreversible loss of forested habitat

This will likely occur in large swaths—tens of thousands to hundreds of thousands of acres at a time. In a changing climate context, no one knows whether forests can recover.

Weed invasion Cheatgrass loves fire and has been shown to invade and dominate severely burned areas. Between large fires and warming associated with climate change, cheatgrass will likely expand its range into and become dominant across large portions of ponderosa pine forests in the region.

Wildlife habitat loss Key animal species can respond to smaller fires without too much difficulty. Increasingly large wildfires will pose a significant threat to many forest-dependant species.

Burned homes and threatened communities

We’ve seen it before, and we’re likely to see it with increasing frequency: Large wildfires will continue burning around and into communities—threatening homes, lives, and livelihoods.

THE FUTURE OF NORTHERN ARIZONA’S PONDEROSA PINE FORESTS UNDER A LANDSCAPE-SCALE RESTORATION PARADIGM

While restoring northern Arizona’s ponderosa pine forests in patches of hundreds of acres to thousands of acres at a time has some benefit, it is akin to giving a manicure to a patient in cardiac arrest. To truly address that which ails our ponderosa pine forests at a scale that will be meaningful 100 years from now, we need to be working at and beyond the scale at which wildfires occur—hundreds of thousands of acres.

For more than a decade, the Trust has been pushing with partners to plan and work at these scales. If that pushing had only resulted in more talking, we wouldn’t waste the ink on this page to re-cap the conversation. Fortunately, however, we are now helping lead efforts to implement landscape-scale restoration at unprecedented scales across northern Arizona. The largest of these efforts, the Four Forest Restoration Initiative, aims to substantially restore more than 2.4 million acres in northern Arizona over the next 20 years.

So, in the spirit of gazing into the crystal ball, let’s take a look at what we might expect with a very ambitious, very large-scale restoration initiative—the likes of which we have never seen before in this region.

Ecologically beneficial fire and controllable wildfires

If we do the job right thinning and burning in strategically important locations, we should be able to greatly reduce the chance of large fires burning across northern Arizona—buying critical time to finish the restoration job. If we do the job right, ecologically beneficial fire will once again play an important role in maintaining forest health across northern Arizona.

Forests and forest-dependent species given a fighting chance to respond to climate change

Losing hundreds of thousands of acres of forest at a time to wildfire guarantees that forests and forest-dependent species will have a harsh and destructive transition to new climate conditions. Reducing the size of wildfires, and bringing appropriate fire back into these fire-adapted forests will give all species a more gradual period of adjustment to the change that is coming.

continued on page 23





ENERGY CHOICES LOOM LARGE

by Roger Clark

If the past is any indication, tough energy choices will continue to threaten our region's entire economic and ecological well-being. Shrinking supplies of fossil fuels, increasing uranium prices, and other pressures are compelling us to repeat the pattern of boom-and-bust cycles that have plagued the Colorado Plateau for decades.

More landscapes marred by mining, contaminated air and water, and economically exploited people are among the many, well-known symptoms of our chronic shortsightedness. Will we keep indebting the next generation with a legacy of toxic liabilities or endow it with a commitment to cleaner alternatives?

NUCLEAR RENAISSANCE?

Permanently polluted land and water are a direct result of federal programs that encouraged uranium prospecting on public lands beginning in the 1950s. That mining and milling boom in the Four Corners area

Left: Havasupai Tribal Council member Colleen Kaska opposes uranium mining in Grand Canyon watersheds.

AMANDA VOISARD

Facing Page: Navajo Generating Station. MICHAEL COLLIER

lasted for about three decades before going bust. When the bottom dropped out of the uranium market, the industry went belly-up, leaving behind thousands of poisonous surface sites and deadly groundwater plumes.

Today, people living in these areas are dying and the public is stuck with the tab for bankrupt businesses. For Navajo elders, this means hauling water and driving long distances to be treated for cancer. Federal taxpayers are footing the billion dollar bill to remove millions of tons of uranium-mill tailings from the Colorado River's floodplain near Moab, Utah. A father who lost his 16-year-old son in 1966 to leukemia said "I blame the government. Their scientists knew the effects of radiation, and they knew the dangers. But they didn't say a word to anyone." In this case, swimming in a uranium mill pond was the likely cause of death. But for multitudes of others, their lives were cut short by breathing radon gas and radioactive dust or drinking radionuclide-tainted water.

Beginning in 2006, the price for uranium began to rise. Thousands of new claims have been filed in Utah, Colorado, New Mexico, and on Arizona watersheds that drain directly into Grand Canyon National Park and the Colorado River. A Canadian-owned company reopened its mill in Blanding, Utah and began processing uranium for powering nuclear reactors in South Korea and France. Without requiring any revisions to outdated environmental assessments, the Bureau of Land Management automatically allowed the same company to begin opening mines that were abandoned by previous owners in the 1980s.

Antiquated mining laws and federal policies favoring private businesses are once again failing to prevent permanent harm. For the foreseeable future, the Trust will continue to work with Havasupai and Kaibab-Paiute leaders in supporting a ban by the Secretary of Interior on new uranium claims around the Grand Canyon that threaten their water and sacred homeland.

Municipal water interests, the National Park Service, wildlife agencies and advocates, county supervisors and city councils, Navajo and Hopi governments, and national conservation organizations are also working with us to support a 20-year moratorium on mining as well as to enact a more permanent prohibition under the

BEGINNING IN 2006, THE PRICE FOR URANIUM BEGAN TO RISE. THOUSANDS OF NEW CLAIMS HAVE BEEN FILED IN UTAH, COLORADO, NEW MEXICO, AND ON ARIZONA WATERSHEDS THAT DRAIN DIRECTLY INTO GRAND CANYON NATIONAL PARK AND THE COLORADO RIVER.

Grand Canyon Watersheds Protection Act (HR 644). Time will tell whether we are successful in preempting powerful interests from continuing to turn Colorado Plateau public lands into industrial wastelands.

DEEPENING DEPENDENCE ON COAL?

Utilities are poised to retrofit coal-fired power plants with pollution controls and to renew expired land and water leases needed to operate well beyond mid-century. Federal officials are once again abetting unfettered access to resources belonging to the public and sovereign people.

A 1968 resolution by the Navajo Nation Council promised a 50-year delay in asserting tribal claims to Upper Colorado River Basin water rights, essential for running the coal-fired Navajo Generating Station (NGS). The U.S. Department of Interior and other plant owners are now negotiating a renewal of the plant's lease on tribal lands. And they are proposing a water settlement requiring that Navajos forego any future claim to water rights from Powell Reservoir, where 30,000 acre feet of water are siphoned each year for the plant's cooling system. In return, \$800 million in federal funding is being promised to build new water projects to benefit Native communities. If these deals proceed, our

region's dependence on coal and the toxic pollution it creates will persist for decades.

Perhaps another approach is worth considering. NGS owners estimate that significantly reducing nitrogen pollution alone could cost as much as a billion dollars and that requiring expensive new emission controls could force the plant to close. Alternative investments in solar, wind, and efficiency might make more sense, particularly if they included a commitment to ratchet down and eventually retire plant operations and thus its pollution. An enforceable timetable with opportunities for tribal ownership and employment would be essential to mitigate the eventual loss of coal-derived revenues. It is time to begin planning the transition to a cleaner energy economy.

In Stewart Udall's final letter to his grandchildren, he admitted being haunted by misjudgments about cheap and abundant energy that he made as Secretary of Interior. "Now, the paramount task of your generation will be to correct those mistakes with an efficient infrastructure that respects the limitations of our environment to keep up with damages we are causing." Looking ahead, much of the Trust's Air & Energy Program will be following Udall's advice by preventing new liabilities caused by coal and uranium and by helping to create more sensible energy choices. 🌱



ECONOMIC DIVERSIFICATION DRIVES NATIVE AMERICA PROGRAM

by Tony Skrelunas



The initial impetus for the Native America Program was the paramount need to work with Hopi and Navajo communities and governments on diversification of economies that had grown overly dependent on resource extractive industry. Over the past five years, we have made major strides in this endeavor including helping the Navajo Nation develop a joint venture for utility-scale renewable energy and helping the Shonto community initiate a diversified set of sustainable economic plans. We also worked with the Nation to create the first Green Economy Commission and established the environmentally friendly North Leupp Family Farms. These are but a few highlights of our portfolio of work, some of which have already transpired into jobs and development.

We have built a strong network of partners and organizations, most of which is led by young Native Americans, to help us carry out the mandate of diversification. We thus are blessed to be at a place where, with our experience and credibility, we can continue to guide green economy and renewable energy efforts on tribal lands. We are also at a place where we can begin to design a program that builds on our years of lessons about how to work most effectively in tribal communities.

The future of the work with the First Nations of the Colorado Plateau will be guided by the cultural and community elders. They will help us identify the most meaningful methodologies that will best inspire their peoples to initiate the protection of the lands with which they have been blessed.

The late Stewart Udall, former Secretary of Interior and Grand Canyon Trust board member, in his introduction to the book *Navajo Portrait of a Nation*, eloquently summarizes where we are in our work building an effective Native America Program.

I would like to give you a sense of the powerful words of this great man and what it means to our work as we move forward.

“Even today, the old traditions hold a powerful tug for many Diné, particularly the elderly. But many young Navajo, too, seem to realize the folly of trading their ancient inheritance for the meaningless pursuit of consumerism. But why should we care whether the Navajo succumb to the incessant, often vapid drumbeat of Anglo culture? The Navajo do possess sophisticated insights about the natural world and the role of humans in it, insights which can benefit all of us. Perhaps because the

Navajo have always lived close to the land, in their belief system there exists no rift between man and naturetheir elders teach that trees and other living things are manifested gods. The Navajo also understand that the earth should not be injured, for if the earth becomes ill, its sickness will inevitably be transferred to man. Contemplating such ideas leaves me wondering if the Navajo don't have as much to teach us as we have to teach them. After all, it is "the white men's ways" that have led to ozone depletion, climate change, nuclear weapons, acid rain, and toxic waste. To date, the Navajo have survived Western civilization. Now the question is whether Western civilization can survive its mistakes. Restoring the harmony between humankind and the environment—the central thrust of Navajo spiritual tradition—may be the most critical task of the upcoming century. Might not their wisdom guide us in this endeavor?"

Each of the Plateau tribes has teachings that serve as a guide for living a good life in harmony with the land. These teachings have served them well for thousands of years to protect their lands, use resources wisely, and grow with consideration.

Three important lessons learned over our program's short history include that effective work with tribal communities requires that the work and its goals be identified and driven by the affected community. There are champions in every community, elder and young, educated and traditional, who are ready to guide and work. Second, tribal values and teachings carry much significance and can create long term adherence by community members. Third, those working to create effective partnerships must utilize patience and be prepared to work for the long term.

Based on this foundation, utilizing tested, age-old processes, we have assembled a group of tribal advisors from eleven Tribal Nations. This group includes elders and young who are in charge of their own tribe's key dances, songmakers, artists, storytellers, farmers, runners; all passionate about finding the right equilibrium where they can grow as a commu-

nity utilizing the story of their ancient experience. With this group's direction and wisdom, we have commenced research and work in four key areas: protecting sacred sites, building healthy communities, preserving the beautiful waters, and protecting culture and language.

This work will lead to several important initiatives for us over the next five years.

We will think through how to best support the work that tribes, communities, and organizations are undertaking in the four key areas. This support could be in the form of organizing intertribal networking, technical assistance, and hopefully, financial assistance. We will also incorporate honorable, intertribal sharing of culture, teachings, issues, and effective approaches. We will look to other First Nations across the globe to learn from and share our common efforts. We will also work to effectively organize this intertribal group with the utmost consideration given to keeping the processes traditional. We have initiated work in some of the areas already. The "sacred sites" work will likely aim to share effective tools and drive new long-range, out-of-the-box strategies from which tribes will greatly benefit. Another important outgrowth is the recording of selected sacred teachings that few elders still retain; rich teachings that must be captured now because some tribes have only a few elders left. We will determine the best ways to engage youth in this work as they will be the torchbearers for retaining culture, values, and teachings in the future.

Some of the elders in our past two gatherings have discussed the fact that it seems the Creator is guiding our work on this truly honorable project. We agree.

Utilizing our knowledge and expertise in the green economy and renewable energy sectors, we will be drivers of regional and national tribal work. For example, we are beginning to work with western Navajo community leaders on plans to maximize the benefits of renewable energy projects where business opportunities abound in system design, manufacturing, sales, installation and maintenance. We will work to create industry clusters around these opportunities to ensure that tribal communities and people truly benefit from the green economy. 🌀

UTAH'S BIG GAMBLE

by Laura Kamala

Along with the right to own, manage, and use natural resources comes the duty to prevent environmental harm and to protect the rights of people.

—The Earth Charter

As if conjuring disaster, shortly before a Chevron oil pipeline was found leaking into Red Butte Creek in Salt Lake City, Utah's Governor Gary Herbert posed the question, "Why are we drilling in the middle of the ocean where there is extreme environmental risk when we could be meeting these same production needs from our land-based wells in areas of minimal environmental risk such as Utah?"

Red Butte Creek ran black for days, winding through Salt Lake neighborhoods and killing aquatic wildlife in the creek's corridor. Toxic fumes from the spill, which was estimated at over 30,000 gallons or in excess of 700 barrels of oil, sickened area residents.

This was not an isolated incident for Utah. Regrettably, oil and gas industry spills, violations, and catastrophes are customary these days. State regulating agencies such as the Division of Air Quality and the Division of Water Quality are overwhelmed and underfunded, lacking capacity for adequate oversight of existing developments even as Governor Herbert expedites more polluting energy industry projects. Grand Canyon Trust, private citizens, and local non-profit organizations are forced to monitor industry developments to report violations to the regulatory authorities and ensure compliance with the state's lenient environmental rules.

Utah should compel industry developers to abide by rules and evolve even higher standards to safeguard citizens' basic rights to clean air, water, and soils. However, elected officials evidently believe that if the

state strongly enforced existing environmental regulations or if rules were strengthened to protect private property rights and human health and welfare, then economic doom would follow as the industry flees Utah. This same kind of reasoning is shared by opponents of the Clean Air Act. The economic health of corporations continues to take priority over the economic and physical well-being of citizens.

In February 2010, the Utah House passed a resolution that implied climate change was a "conspiracy" and urged the EPA to abandon all carbon reduction programs and policies; an action emblematic of the Utah legislature's disbelief in global climate destabilization and the science that backs it up. One reason stated for the resolution is that actions meant to reduce carbon emissions would result in "significantly higher energy costs to American consumers, businesses, and industry." The president of the Utah Mining Association and the executive director of the Utah Rural Electric Association spoke in favor of the bill. But proponents of the financial bottom line never factor in the direct costs of health care associated with serious illness caused by air and water pollution or the cost of cleaning up toxic spills, which run into billions of dollars. Until there is a realistic accounting of the cost of doing energy development business, we can't take Utah politicians' arguments seriously. And as long as Utah gets 90 percent of its electricity from coal-fired power plants, political and business leaders will protect the industry from cleaning up carbon emissions.



THE EARTH CHARTER IS A DECLARATION OF FUNDAMENTAL ETHICAL PRINCIPALS FOR BUILDING A JUST, SUSTAINABLE AND PEACEFUL GLOBAL SOCIETY IN THE TWENTY-FIRST CENTURY. IT SEEKS TO INSPIRE IN ALL PEOPLE A NEW SENSE OF GLOBAL INTERDEPENDENCE AND SHARED RESPONSIBILITY FOR THE WELL-BEING OF THE WHOLE HUMAN FAMILY, THE GREATER COMMUNITY OF LIFE, AND FUTURE GENERATIONS. IT IS A VISION OF HOPE AND A CALL TO ACTION. THE EARTH CHARTER IS A PRODUCT OF A DECADE-LONG, WORLDWIDE, CROSS-CULTURAL DIALOGUE ON COMMON GOALS AND SHARED VALUES. THE EARTH CHARTER RECOGNIZES THAT THE GOALS OF ECOLOGICAL PROTECTION, THE ERADICATION OF POVERTY, EQUITABLE ECONOMIC DEVELOPMENT, AND RESPECT FOR HUMAN RIGHTS, DEMOCRACY, AND PEACE ARE INTER-DEPENDENT AND INDIVISIBLE. OVER 4,500 ORGANIZATIONS WORLDWIDE, REPRESENTING MILLIONS OF PEOPLE, HAVE FORMALLY ENDORSED THE EARTH CHARTER.

The state of Utah has an opportunity to be a leader in renewable energy development in the West. Instead, the governor and legislature prefer a legacy of discouraging renewable development while clinging to the familiar carbon intensive, traditional extractive energy development including so called “alternative” energy sources; oil shale, tar sands, and nuclear power.

In the rural community where I live, brownouts are a common occurrence because the power lines coming into the valley can no longer accommodate the demand. The power company says it cannot justify the cost of upgrading the lines. At the same time our electric provider is pushing back against my hometown’s initiative to become more energy independent by creating its own solar power. The state won’t intervene so I’m stocking up on candles for the coming winter and planning to join my neighbors for a just resolution for our power needs.

Utah should adopt a precept from The Earth Charter, which recommends that we “transmit to future

generations values, traditions, and institutions that support the long term flourishing of Earth’s human and ecological communities.” The governor and the Utah legislature are disinclined to accept their responsibility to future generations to develop energy resources wisely. This is counterintuitive in a state that prides itself in pioneer heritage, family values, and generations connected to place. Meaningful change must come from people working persistently in their own communities from the ground up; we can no longer hope for elected officials to lead the way to sane energy policy here.

In September, Governor Herbert initiated public hearings to take input on a new ten year energy plan his administration is crafting and Grand Canyon Trust made an appeal to the state to create incentives and encourage renewable energy development now. One gentleman testifying before the governor’s Energy Initiative Task Force hearings made the succinct point, “We don’t like to gamble in Utah...except with climate change.” 🍀



UTAH FORESTS Hope for the Future

by Mary O'Brien



Shiril and Mary Ellen are teetering on a beaver dam in the rain to measure the height of the dam down to the creek bed. Mindy is identifying the species of a grass plant that has been bitten off within one inch of the ground. Val is hiking rapidly with me to one last beaver site late in the day so we won't keep the other six volunteers waiting back at the vehicles. Eleven Whitman College students are making a photo essay of the Pando Clone, renowned as potentially the world's largest known aspen stand, but one that is in deep trouble health-wise. I am in the field with a Forest Supervisor and her Range Management Specialist, visiting a stunning slope of sagebrush with native grass, a waterfall on the far slope, a streambank with diverse, healthy willow species, and a wet meadow with tall sedges.

This is the Utah Forests Program on ground, and five years from now we'll still be witnesses on ground to the "Good, Bad, and Recovering" in the three Colorado Plateau national forests of southern and central Utah: Dixie, Fishlake, and Manti-La Sal. Our field data and photos; our collaborative discussions in the field, in Forest Service offices and on the phone; our reports and our numerous proposals are all strategically undertaken to bring change to these three national forests. These particular forests have been referred to by the Forest Service as "working forests" because they have been largely dedicated and subjected to logging, drilling, mining, grazing, water diversions, and off-road recreation. The changes Grand Canyon Trust is working for are significantly increased attention to and care for these forests' native fish, wildlife, water, plants, and watershed functioning. The stakes are high, because the

Trust keeps active communication with colleague organizations and scientists throughout the West, and change that happens here can reverberate elsewhere.

These three national forests are not the iconic Grand Canyon. In the words of author Timothy Egan, such national forests are "rumpled." But national forests are also, in the words of former Forest Chief Jack Thomas, the only land most Americans will ever own. On top of it, these three Colorado Plateau forests are heading into the bull's eye that is climate change in the Southwest: they're going to get hotter and drier, and will experience more intense storms on drought-depleted slopes.

The Utah Forests Program was created in late 2003 to change the management of these forests and we've accomplished much. Several Forest Service proposed projects have been dropped in response to our evidence that the projects were not mindful of the forest; more have been significantly improved. The staff of all three forests know we're going to suggest alternatives for nearly every project they propose, and for the most part they now plan on that.

At Trust urging, the state of Utah has adopted its first-ever beaver management plan (the only state so far to do so in the West) and, of the 120 streams the plan finds potentially desirable for beaver reintroduction, 87 are on these three national forests.

Based on our Utah Forests Program's quantitative and photographic data showing excessive browse of willow, cottonwood, and aspen near streams, the Supervisors of all three forests have agreed they need to revise their forest plans' management approach for land near lakes and streams in order to assure





Above: New beaver dam on Tasha Creek opens up Fishlake NF and provides wildlife habitat. MARY O'BRIEN
Below: GCT is working with the Forest Service and others to restore world-famous Pando Aspen Clone. THEODORE BARNHART



continued presence of these fundamentally essential woody riparian species.

The three forests have accepted our proposal to recognize certain areas that are in good ecological condition as reference areas and have established a Memorandum of Understanding with the Trust to use the first of these areas as a “gold standard” against which to judge condition and recovery of similar forest habitats that are currently in less good condition. Within the next five years, we plan on completing Memoranda of Understanding to establish and use more than a dozen reference areas to provide insight into the potential for restoration of currently impacted sites elsewhere on the forests.

The revision of riparian management will be a multi-year undertaking, because willow, cottonwood,

and aspen near streams that have been grazed down to short shrubs for many years will not be restored by continued annual grazing and every creek cannot simply be fenced to keep livestock out. But annual grazing is the basic means of current livestock management, and so the Forest Service will need to analyze our very different proposal to provide rest for multiple years in many natural areas near water.

Likewise, the Utah Division of Wildlife Resources has long depended on ever-growing herds of elk for funds from hunting permits. The combination of too many elk and too many livestock needs to be revisited, and the Trust will be working with both state and federal agencies to address this issue.

Beaver, historically abundant throughout many watersheds on the three forests, are currently absent from most. Restoring them will take work. The process, which includes introducing flow control devices to transform some “beaver-are-nuisance” sites to “beaver-are-welcome-here sites;” locating creeks on private and forest lands that have the potential for successful reintroduction of beaver; working with the Utah Division of Wildlife Resources to livetrapped beaver from sites where flow control devices can’t help; tracking the fate of translocated beaver; and communicating with skeptical and enthusiastic community members alike will consume much of the next five years.

Both revision of riparian management and restoration of beaver in these three forests will result in markedly improved resilience of the forests’ watersheds in the face of climate change.

The newly-minted (as of 2010) and hugely successful Utah Volunteer Program will help us provide the assessments and monitoring that the managers of the three forests have come to expect from the Trust, and which they respect.

In 2011, the National Forest System will be 100 years old, and Grand Canyon Trust will be helping the U.S. Forest Service, Colorado Plateau communities, and our nation embrace ever more informed, generous, and wiser care for one of our country’s greatest legacies to the world: national public lands, managed with public participation, for the health and well-being of this and future generations. 🌀





THE KANE AND TWO MILE RANCHES

An Investment in Public Lands

by Christine Albano
and Ethan Aumack



Kane Ranch Headquarters. RICK MOORE

The remote 850,000 acre landscape north of the Grand Canyon known as the Kane and Two Mile ranches remains a place that is largely devoid of development, contains some of the most spectacular scenery in the region, and accommodates important habitats for the California condor, the world-renowned Kaibab mule deer herd, desert bighorn sheep, and American pronghorn. Despite its relatively unspoiled nature, the fate of the Kane and Two Mile ranches landscape has

to conservation-based land management and helping to restore and maintain the cultural, scenic, and ecological values that are intrinsic to this place. The Trust's purchase of the ranches signifies a concerted investment in the future of this landscape; one that places substantial value on learning, emphasizes ecological restoration and conservation, and involves significantly increased public participation in the management of these public lands.

The Grand Canyon Trust purchased the Kane and Two Mile ranches in 2005 with the goal of assisting land managers in their pursuit of modern approaches to conservation-based land management and helping to restore and maintain the cultural, scenic, and ecological values that are intrinsic to this place.

been inextricably tied to perspectives on land use and management that existed over a century ago. In many cases, management priorities valued extraction of commodities over conservation, and resulted in unsustainable timber harvest, widespread predator eradication, and livestock overgrazing. While these practices have diminished dramatically, their legacy remains in the form of forests that exhibit potential for large and unnaturally severe wildfires, imbalances in predator and prey populations, and degraded grasslands dominated by grazing tolerant plants and invasive, nonnative weeds.

The Grand Canyon Trust purchased the Kane and Two Mile ranches in 2005 with the goal of assisting land managers in their pursuit of modern approaches

Over the past five years, our work has emphasized building a strong scientific foundation upon which management decisions can be made through research, monitoring, and assessment projects completed in partnership with students and researchers from Northern Arizona University and other academic institutions across the country. Strong public involvement also has been necessary to support and implement conservation priorities, and this has been accomplished by our now 1000 member strong volunteer network. Perhaps most importantly, we've demonstrated the incredible amount of work that can be achieved through cooperative partnerships between public land management agencies and conservation organizations in a time of constricted agency budgets.



Our vision for the future of the Kane and Two Mile ranches centers upon a landscape that is open, wild, and intact. It is a landscape that will sustain fundamental ecological processes, such as plant and animal dispersal, and natural fire. It is a landscape that will support the persistence of native plant and animal populations, and is resilient to natural and human-caused disturbances. It is where potential threats to ecosystem health, such as unnaturally severe wildfire, cheatgrass invasion, excessive soil erosion, and climate change, will have been minimized.

Building a knowledge base through research, monitoring, active restoration, and adaptive management will be fundamental to reaching our ecological goals. In forested ecosystems we will focus our work toward understanding, developing, testing, and demonstrating landscape-scale forest restoration and fire management strategies that can effectively reduce the threat of unnaturally severe wildfire. Concurrently, we will attempt to identify and implement effective strategies for controlling spread of invasive species, such as cheatgrass, within the contexts of fire management, wildlife habitat restoration or enhancement, livestock management, and ongoing climate change. In arid rangelands our work will center on actively restoring native plant species and understanding the potential for natural recovery and its relationship to pervasive land uses, such as livestock grazing. Through the process of building out this scientific foundation, we expect to generate a new commodity that is both transferrable and relevant to public lands management across the West: knowledge.

Achieving our ambitious ecological goals will require a coming together of entities that have often worked at cross-purposes. While we have already firmly established working relationships with many partners, including agencies, academics, and non-profits, we must continue to increase the depth and breadth of these partnerships and engage those who can provide diverse perspectives, resources, and expertise. Doing so will serve to increase both the management relevance and social viability of our work, while providing opportunities to more efficiently devise and implement novel conservation strategies.

We must continue to cultivate a community of land stewards who are deeply vested in both the present and future of this place. We can achieve this by providing more opportunities for place-based education in partnership with local and national academic or teaching institutions. In addition, our growing volunteer community has been and will continue to be essential to getting important on-the-ground conservation work done. Perhaps even more critical is the connection to the land that grows from their involvement, as it provides them with the knowledge and the standing to play a vital role as advocates for future conservation solutions.

Finally, we must ensure that land uses such as tree thinning and livestock grazing are managed to align with conservation objectives across large landscapes. For example, by engaging with industry and directing timber harvest toward small-diameter trees, which contribute significantly to the threat of unnaturally severe fire, both conservation and economic objectives can be met. In a similar vein, we will need to explore creative ways to manage livestock sustainably, which must include finding ways to minimize impacts to sensitive arid ecosystems and incorporating measures such as grass banks or grass reserves that can create the flexibility needed by land managers to allow them to respond to wildfire, drought, and restoration activities in a manner that facilitates the long-term protection and sustainability of rangeland resources. In all cases, we must be fastidious in documenting the successes and failures of these endeavors in a manner that can inform future management.

Fulfilling our vision for the future of the Kane and Two Mile landscape will require a recognition that funding and maintaining a project of this scope and scale will be challenging, and will necessitate a deepened commitment to conservation, stewardship, research, and learning on the part of all of our partners. While there is a long road ahead, and we must carry with us the expectation to work hard, we believe that this project can and will succeed given the unparalleled opportunity we have to influence the future of this place. 🌀



PRESERVING FOREST WILDERNESS FOR THE NEXT GENERATION

by Tim Peterson

The clearest way into the universe is through a forest wilderness.

—John Muir

Clean water, clean air, free flowing streams of snowmelt, lush fields of grass, craggy peaks and dark, damp forests—these are wilderness in the primal sense. Where natural processes dominate, where man is but a visitor, where the views stretch as far as one's imagination, and where there is space to think, to walk, and be renewed—these are wilderness. Thankfully, generations before us allowed nature to continue the work of the eons upon the landscape—they had the wisdom to leave some things alone. These are the places we escape to—reminders of the great wild continent our ancestors knew. Truly stunning places, rich in game and fish—places we can still save for our children. Places where freedom means more than an afternoon at the movies; where responsibility means

more than paying the bills on time. Here we can live as those before us lived, free from e-mail and voice-mail and text messages—places where alerts are the chattering of squirrels, the chirps of pikas, and the call of songbirds. Here we depend upon our own skills, and we rely on our own decisions to keep us safe. We are blessed in America—our birthright is public land, and we are exalted in its magnificence. The primeval still exists, and it can still be experienced. The place we came from is still here, and that place deserves our reverence. Wildernesses with a capital W are lands which Congress—representing every corner of our nation—acknowledges as primitive in perpetuity. Forever. To let a place alone, to the extent that we can, to measure against our buildings and cities the great paved roads of our built civilization. These are places to walk, to camp, to hunt and fish, to turn back the clock to a simpler time. This Wilderness—setting aside some land for future generations—is a uniquely

American idea. The concept was born here, and because public lands belong to all Americans, the entire nation has a voice in matters related to our Western commons—no King’s Forest for us—and for that we can be grateful.

These thoughts come to mind as I contemplate why wilderness matters. Recent research tells us that the general public doesn’t understand what we are working toward when we advocate for wilderness protection. They don’t comprehend why wilderness moves us, and they don’t connect our work with their own lives. We have told plenty about *how* and *where* we do what we do, but we have yet to communicate *why* we value wilderness, and *for whom* we do what we do.

Leave it as it is. You can not improve on it. The ages have been at work on it, and man can only mar it.

– Teddy Roosevelt

We value wilderness for its own sake, for the flora and fauna’s right to exist unaltered by man’s intrusion. We value wilderness for what it does for our spirits—for how it can renew us. We value our heritage and we value that it is still possible to save a piece of what our ancestors saw when they settled here—what First Nations knew millennia before.

Wilderness is even more important in the face of climate change. Species need room to adapt; the most protected ecosystems are the most diverse and they stand the best chance to cope with a changing climate. Our work on wilderness isn’t a question of recreation, it isn’t about “locking up the land,” it’s about preserving the old ways for many generations to come. The skilled rhetoricians in the wilderness debate belie the true meaning of the quiet reverence of the woods. The elk that bugles at dawn, the fish that spawn in the streams—the rhetoric never reaches their consciousness. They live only for the hunt, to drink and to reproduce. They’ve earned the right to these things through the generations—it is *their* natural heritage. Wilderness is our natural heritage too, and to separate humanity from nature is folly.

Something will have gone out of us as a people if we ever let the remaining wilderness be destroyed... We simply need that wild country available to us, even if we never do more than drive to its edge and look in.

– Wallace Stegner

In my many years in the woods, driving, riding, walking out to the edges of wilderness, I often wonder if those who oppose designating wilderness know just how much opportunity there is to drive. It’s staggering. If all the wilderness still left in early twenty-first century America were protected tomorrow, it would take *several* lifetimes to jeep the fringes, ATV along the trails, and dirt bike down the paths that separate the expanses of wilderness we still have left. That is the great secret. One could drive somewhere new every day for the rest of one’s life and not even scratch the surface. There are more than enough roads to satisfy the masses, there are more than enough trees to cut for lumber and paper, and there is more than enough room for mines and gas wells on our public lands. We are not asking for it all, we are just asking that the places that are still wild be kept wild. Stegner’s drive to the edge will always be possible.

As members and supporters of the Trust I know you understand and value these things, but I’m afraid you’re unique among your neighbors. The future of the Utah Forest Wilderness Program will be about how to better make our values understood by decision-makers, by members of Congress, and by the great majority of people that know that nature is valuable for its own sake, but don’t understand that they have as much right to speak up for it as the miner, the off-roader, the rancher, and the logger. The debate will continue, and places will continue to face threats. We have suffered delay over the past year in this new program as the winds of politics shift, but nobody told us Utah wilderness would be quick and easy. It is my hope the Trust’s presence in the wilderness debate can help bring folks together to do great things—to set aside some of our superb national forest wildlands. We can mute the naysayers, rise above the rhetoric, and achieve real protections so our children’s children can still glimpse the primeval. We, as a people, deserve nothing less. 🌲



A LOOK AHEAD AT IMPROVING GRAND CANYON

by Nikolai Lash

Let us look ahead at what might be in store for Grand Canyon. But first, let us acknowledge that Grand Canyon has suffered dramatically from downstream flows from Glen Canyon Dam. The fluctuating flows that have been a regular part of dam operations since blocking the river in 1963 have eroded beaches, reduced native fish populations and habitat, and undermined sediment support for cultural sites. Grand Canyon's declining state has been well-documented. The 2005 U.S. Geological Survey's Colorado River report concluded that every resource of concern in Grand Canyon has declined over the past decade. Scientists recently reported that fluctuating flows immediately following the 2008 high-flow release quickly destroyed the beach-building benefits originally conferred by the high flow.

Scientists continue to warn that different flows from Glen Canyon Dam are needed to improve conditions: specifically, periodic high flows followed by months of steady flows. Periodic high flows under sediment-enriched conditions rebuild beaches and backwater channels, and steady flows preserve beaches and provide stable habitat for native fish, including the endangered humpback chub. USGS scientist Scott Wright concluded in his recent paper on sediment health in Grand Canyon that, "a steady flow will transport less sand than an equivalent-volume fluctuating flow." This conclusion was backed up by Grand Canyon Monitoring Research Center's (GCMRC) latest modeling efforts on sediment, which concluded that the most sediment-conserving annual flow regime would be twelve months of steady flows, called Year-Round Steady Flows.

Given that Grand Canyon has suffered diminishment from Glen Canyon Dam for forty years, let us look ahead, use our imagination, and see what improvements we can foresee for the coming years.



YEAR 2011 – BAD YEAR

Next year will likely be a bad one for Grand Canyon. Even though the Grand Canyon Protection Act requires the Secretary of the Interior to implement the best flows for Grand Canyon—basically well-timed high flows and year-round steady flows—the Department of Interior has put forward a dam protocol for next year that is predicted to destroy beaches and other sediment-related resources in Grand Canyon. Unfortunately, water and power interests dominate politics at Interior, and water and power want to see fluctuating flows because they increase power revenue at the dam.

Interior's proposed 2011 water releases are based on the existing flow regime, called Modified Low Fluctuating Flows (MLFF), and are likely to produce similar effects. Under the 11.5 million-acre-feet forecasted to be released next year, science modeling predicts that implementation of MLFF would result in the loss of over 500,000 metric tons of sediment in Marble Canyon and eastern Grand Canyon. This large reduction in sediment means that beaches and native fish habitat will be significantly eroded or wiped out. GCMRC has concluded that only Year-Round Steady Flows will result in a positive mass balance of sediment in Marble Canyon and eastern Grand Canyon. Unless Interior changes course, it will be another year of diminishment for Grand Canyon.



YEAR 2012 – STEADY FLOWS!

After the previous year's bevy of resource declines caused by fluctuating flows, it is time for a change. Let us be optimistic and predict that Interior will finally implement Year-Round Steady Flows. It is a good bet. Science supports this flow regime as being the best for conserving sediment in Grand Canyon. Because sediment is fundamental to building beaches, creating

native fish habitat, and shoring up vulnerable cultural sites, this flow regime is a compelling choice for Grand Canyon.

Fortunately, this alternative is not burdened by overly large financial costs to hydropower. In 2008, if twelve months of steady flows had been done instead of the actual hydrograph dominated by fluctuating flows, the cost to hydropower would have been under \$9 million. That is just pennies per month for utility users receiving power from the dam. Additionally, this alternative would not change a drop of water allocated among the seven basin states and Mexico.



YEAR 2019 – SEDIMENT AUGMENTATION AND TEMPERATURE CONTROL DEVICE

Perhaps it can be envisioned that sediment augmentation will be implemented at Glen Canyon Dam by the year 2019. Sediment augmentation refers to mechanical means of dredging and delivering sediment around or through the dam, so that the clear water released from the dam will be mixed with added sediment to create a healthy, pre-dam-like muddy flow. Sediment augmentation would make the time of high releases less critical and would afford the possibility of doing one (or even two) high flow releases a year, thus creating larger sandbars and better sediment conditions throughout Grand Canyon.

Year 2019 might also see a Temperature Control Device (TCD) implemented at the dam. A TCD would allow for water from different lake levels to be released through the dam. Because water near the lake surface is warmer, a TCD would allow for the possibility of varying the river water's temperature. Because the endangered humpback chub need temperatures above sixty degrees to successfully reproduce, being able to warm the river water is important for creating suitable mainstem habitat for the humpback chub.



YEAR 2027 – RUN OF THE RIVER

A few years from now, climate change will have taken its toll on the river, with several more drought years *continued on page 23*

VOLUNTEER STEWARDSHIP AND THE FUTURE OF PUBLIC LANDS

by Kate Watters



This is the time of our becoming. As a community of people who care about the land and about our relationship to it, this is a moment of opportunity. — Peter Forbes

KATE WATTERS

What does the future hold for the captivating Colorado Plateau? Over half of this land is publicly owned and Native American tribes hold another 30 percent, resulting in a patchwork of management jurisdictions. Yet land management agencies lack the resources necessary to address the rapidly degrading condition of public lands. With dwindling public funding, agencies will continue to seek ways to get important conservation, restoration, and monitoring work done. The Grand Canyon Trust Volunteer Program is honored to be a part of the ongoing work to build a community of people committed to preserving the Plateau's unmatched biodiversity and we'll continue to create experiences that connect people with the land and leverage GCT's conservation values.

People are disconnected from nature and lack the knowledge and commitment necessary to help protect and restore these iconic landscapes for future generations. Nearly half of Americans now believe the threat of global warming has been exaggerated; the highest level since polling began thirteen years ago. Today, most Americans can recognize one thousand corpo-

rate logos, but can't identify ten plants and animals native to their region. The future of conservation depends on young people. In this struggling economy, our youth are hungry for hands-on education that will help them gain experience and knowledge and build their resumes.

In the coming years the volunteer program will endeavor to create opportunities for young people to experience the outdoors, develop science skills and explore natural resource careers; shaping the next generation of conservation advocates. We will partner with national youth programs such as AmeriCorps National Civilian Community Corps, a full-time, team-based residential program that strengthens communities by building leadership skills for men and women age 18–24 through direct community service. By helping to direct meaningful projects with national service programs, we will not only add capacity and increase the profile of unique areas of the Colorado Plateau, we will also provide an educational context for the work and promote the pursuit of conservation careers and increased environmental literacy.

We will also continue to develop “master volunteer” opportunities; trainings where people learn skills to do such things as documenting springs and regional plant diversity. These volunteers, capable of basic archeology, botany and hydrology inventory and monitoring work, have demonstrated their value to agencies with diminished budgets.

Besides preserving and restoring these lands, it is also critical to maintain our human connection to these places. Our volunteer community represents people of myriad ages and backgrounds, all hungry to experience the land at a deeper level. They want to learn the stories of these places, and we want to help them tell their own stories—ones that will outlast them.

Although it is critically important, science alone is not the answer to conserving land in peril or to restoring the wild places we love. The conservation movement needs an active, knowledgeable constituency in order to advance policy changes needed to protect our environment. We also need a groundswell of public support for conservation that is rooted in the Colorado Plateau, but is powered by the entire nation. 🌀

GETTING OUT

by Phil Pearl

In early September several friends and I paddled the Meander Canyon reach of the Colorado River. This trip served as a good reminder of how proud I am to be a Trust employee and why I feel so comfortable asking our members to invest in our work.

On the drive out of Moab to the put-in point, we crossed the now defunct Atlas uranium mill site that for more than a decade was home to thirty million tons of toxic uranium tailings. My friends asked me “what is going on here?” I was able to tell them that the Trust was instrumental in securing the federal appropriation to begin the cleanup and move the tailings to a place safely away from the Colorado River.

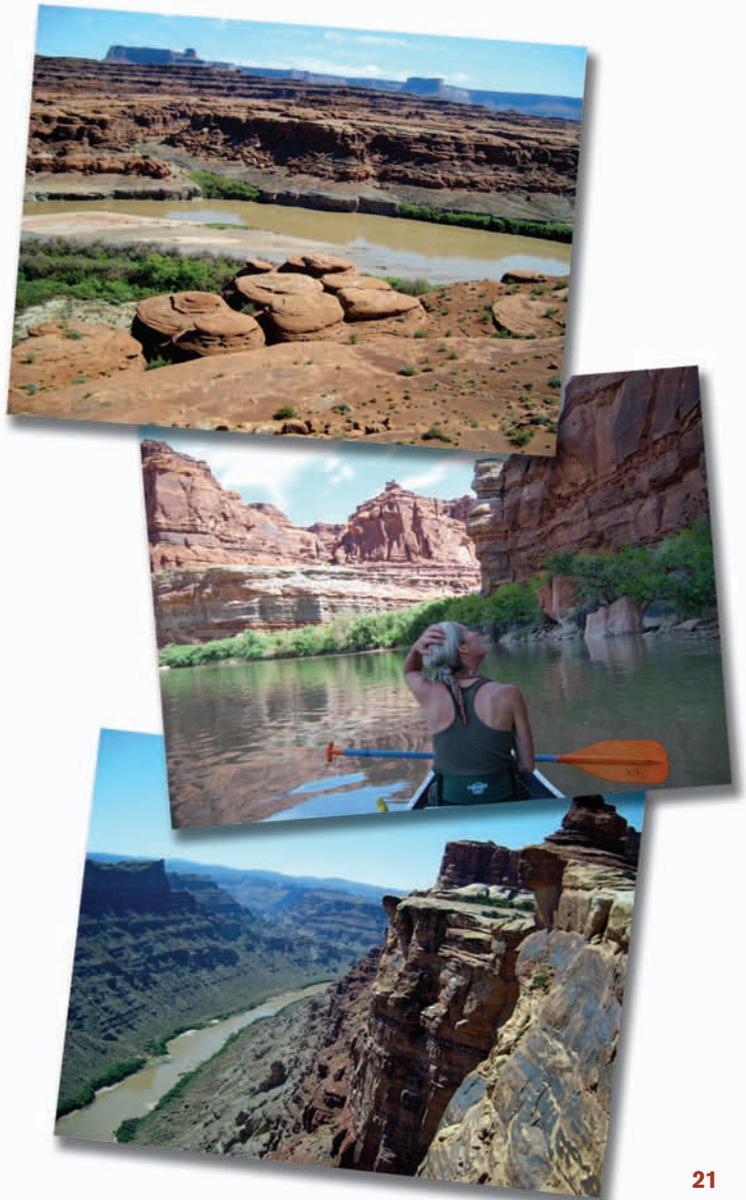
A few miles down the road we saw an area where the Trust facilitated the withdrawal of an oil and gas leasing site near Canyonlands and Arches National Park—one of seventy-seven proposed sites we were successful in shutting down. And, to the east, on the north shoulder of the La Sal Mountains and along several miles of the Colorado River, I could make out the configuration of the 48,000 acre area that the Trust successfully protected through last year’s passage of the Utah Recreational Land Exchange Act.

Once on the river I was reminded of the Trust’s efforts to keep the Colorado River healthy and how, just a short distance downstream, are Lake Powell and Glen Canyon Dam, stopping this huge river and all the nutrient rich sediment and life it transports. I thought about how three of the four fish native only to this region are now extinct, and what the Trust is doing to change dam operations and flows so they begin to mimic what nature has done for millennia.

Further downriver we came upon an exposed Chinle formation and I was able to point out that this is the rock layer where all the uranium in the region is found. My friends were surprised to learn that thousands of new claims have been filed around the Grand Canyon and that the Trust is leading the effort to permanently withdraw new uranium mining from close to one million acres surrounding the Grand Canyon. One friend asked the question: “Why on earth would they mine uranium adjacent to one of the natural wonders of the world and run the risk of contaminating a water supply serving over twenty-five million people?”

On the drive home to Flagstaff we passed the south entrance of Canyonlands National Park, where the Trust successfully fought to protect one of the region’s largest concentrations of cultural resources from being decimated by oil and gas development, and further south an archaeology site from 450 AD that the Trust helped a small town acquire and protect as an interpretive site.

Every so often, it is good for me to get out and remind myself of what is at stake and all the Trust is doing to protect this remarkable landscape. When I do, I am prompted once again to thank our membership—the people who make all of this important work possible. 🌀



ANNUAL REPORT 2009

STATEMENTS OF FINANCIAL POSITION

for the twelve months ended December 31, 2009

ASSETS	2009
Current Assets:	
Cash and cash equivalents	\$3,122,223
Cash - restricted	422,179
Contributions receivable	555,797
Other receivables	3,396
Livestock inventory	30,488
Prepaid expenses	22,001
Total current assets	4,156,084
Breeding Herd	115,473
Property and Equipment, net	3,071,739
Investments	2,070,739
Conservation Easement	1,295,000
Beneficial Interest in Remainder Trust	44,738
Total Assets	<u>\$10,753,712</u>
LIABILITIES AND NET ASSETS	
Current Liabilities:	
Account payable	\$57,162
Accrued expenses	<u>60,850</u>
Total current liabilities	118,012
Note Payable:	474,474
Total liabilities	592,486
Net Assets:	
Unrestricted	7,106,132
Temporarily restricted	1,260,094
Permanently restricted	<u>1,795,000</u>
Total net assets	<u>10,161,226</u>
Total liabilities and net assets	<u>\$10,753,712</u>



STATEMENTS OF ACTIVITY

for the twelve months ended December 31, 2009

CHANGES IN NET ASSETS	2009
Revenues:	
Grants	\$2,818,559
Contributions	1,911,356
Membership income	260,599
Donated materials and services	286,525
Investment income	183,495
Change in value of beneficial interest in remainder trust	5,244
Other income	67,958
Total revenues	<u>5,533,736</u>
Expenses:	
Program services	2,377,497
Education	166,213
Development and membership	338,483
General and administrative	<u>335,942</u>
Total expenses	<u>3,218,135</u>
Net increase in unrestricted net assets	<u>2,315,601</u>
Net assets at beginning of year	<u>7,845,625</u>
Net assets at end of year	<u>\$10,161,226</u>

continued from page 5

Fire-adapted communities Even under the most ambitious restoration scenarios, living in fire-adapted forests will never be risk-free. Nevertheless, risks can be dramatically reduced and communities can begin to manage themselves to thrive in forests where fire plays a natural role.

Bolstered restoration economies We have removed so much natural capital from our forests, it is unlikely the process of restoration will ever be a significant money-maker. It is possible, however, for appropriately-scaled industries to make a go of restoration at the landscape-scale, dramatically offsetting per-acre treatment costs, creating jobs, and bolstering sustainable restoration economies in rural communities where jobs are desperately needed.

We have two starkly different futures awaiting us as we test our mettle initiating landscape-scale forest restoration across northern Arizona. Let's hope we are up to the test. 🌀

continued from page 19

dropping Lake Powell to the point where hydropower generation has been significantly reduced. A recent study published in the *Journal of the American Water Resources Association* describes a rare alignment of La Nina, the Pacific Decadal Oscillation, and the Atlantic Multidecadal Oscillation, which is forecasted to deepen and extend the existing eleven year drought. "If I were concocting a recipe for a perfect drought, this would be it," said Glen MacDonald, co-author of the study and director of UCLA's Institute of the Environment and Sustainability.

Because the cost of water has gone up significantly, every drop of water has become precious. It has been estimated that Lake Powell loses over 400,000 acre-feet of water per year from evaporation. Because of Glen Canyon Dam's compromised hydropower generation from lower lake levels and evaporation losses from Powell, Interior—following the urging of the basin states—will have opened the dam up to a run-of-the-river operation. Water and sediment will no longer be kept behind the concrete walls of the dam. Evaporation water losses will be greatly reduced and Grand Canyon will receive a huge replenishment of resource-nurturing sediment. 🌀

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Marcus Selig, *Arizona Forest Conservation Program Associate*

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.....

Tom Sisk, PhD, *Senior Science Advisor, Kane & Two Mile Ranches*

Brett Dickson, PhD, *David H. Smith, Fellow in Conservation Biology*

Moab, Utah Office

Eleanor Bliss, *Executive Assistant*

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Grand Canyon Trust
2601 N. Fort Valley Road
Flagstaff, Arizona 86001
(928) 774-7488

www.grandcanyontrust.org

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Advocate Staff

Editor: *Richard Mayol*
Design: *Joan Carstensen Design*
Printing: *Arizona Lithographers*

Headquarters
2601 N. Fort Valley Road
Flagstaff, AZ 86001
(928) 774-7488 ph (928) 774-7570 fax

Moab, Utah Office
HC 64, Box 1801, Moab, Utah 84532
(435) 259-5284

THE PAINTING DEPICTED ON THE COVER IS “LAST FALL LEAVES” BY SCOTTY MITCHELL, A SOUTHERN UTAH PLEIN AIR ARTIST.

Statement from Scotty: “From the very first visit, my husband and I were so captivated by southern Utah that after a few summer trips we decided to pick up and move from the island of Crete to the town of Boulder, Utah. The landscape, which offers different marvels in each direction, has been my subject matter for pastel drawings which I’ve executed in the past five years since moving here. Having previously been painting Greek gardens, interiors, and the small cultivated island of Crete in oils, this is a big and exciting change for me. The incredible variety of form and color and the immense scale which Utah offers have been a joyous inspiration.

These works are a celebration of visual delights, all of which have been drawn on site. To me, working on site provides that edge of immediacy which breathes vitality into the work. There is a bonding of the artist to the subject which I hope will bring these landscapes alive to the viewer.”

Scotty’s work ranges in price from \$250 to \$3500. If you’re interested in seeing more of her work please visit www.scottymitchell.com.



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The **Mission** of the Grand Canyon Trust is to protect and restore the Colorado Plateau—its spectacular landscapes, flowing rivers, clean air, diversity of plants and animals, and areas of beauty and solitude.