COLORADO PLATEAU Advocate

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GRAND CANYON TRUST

Contents

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.

You can help the Grand Canyon Trust by taking action on any of the issues presented in this magazine by going to the ***"Take Action"*** section of our website at: www.grandcanyontrust.org; by writing a letter to the editor or an opinion-editorial piece for your local newspaper; by circulating a petition or writing a letter for presentation to your elected officials; or by organizing a forum and speaking out in your community.

Acoustics experts pay attention to things the rest of us have become numb to. Imagine your favorite vacation spot or quiet retreat…would you consider it a peaceful day if you could escape from the sounds of humans for an hour or so? Would you be surprised to learn that there isn't any place left in the Southwest (or most anywhere else) where you could experience such quiet? Our noise invades simply everywhere, even the remotest wild places, far more often than that. If you doubt it, the people who record natural sounds for the National Park Service suggest that next time you are in a quiet spot, pay attention to the sounds you hear and jot them down along with the time. It's surprising.

Activists who work to promote natural quiet quickly learn that most people consider loss of silence to be a negligible concern: a quibble of elitists compared with, say, the thrilling right to ride an off-road vehicle absolutely anywhere, or the utilitarian concerns of airline route planners. And yet, when many people actually encounter moments of deep silence in a wild place they find the experience overwhelming—transporting or frightening. We devalue silence only because we hardly know what it is in the modern world. And, it is the same thing with our lights obscuring the thick clot of the Milky Way across a dark night sky, or our pollution changing the atmosphere. Civilization's effluvia are gradually blocking our interactions with the rest of the creation and we are both much poorer and less secure as a result.

We need to find new ways to converse about these matters, to find words that cut through the fog so that we are spurred to individual and collective action. In these pages Carolyn Tanner Irish, Bishop of the Episcopal Diocese of Utah, talks in frankly moral and spiritual terms about the imperative to address the threat climate change poses to a "harmoniously intricate world we did not create but were given." And, since this is an extraordinary case

Bill Hedden

in which scientists are more worried than the general public, I take a different approach in a separate article by summarizing the grim scientific consensus about what we can expect the canyon country of a hotter earth to be like. It is a risk to be so blunt, but there is a greater danger that we will all be caught up in lionizing or vilifying climate change messengers, like Al Gore, rather than understanding why their hair is on fire in the first place. Critical decisions that will do much to determine the future are being made now and we all need to engage with knowledge and passion.

One area that is ripe for public participation is the planning for five million acres of national forest land in southern Utah. The Dixie, Fishlake and Manti La Sal forests are all preparing long-term management plans for alpine areas that will be among the habitats most dramatically affected by climate change. Since no part of this vulnerable landscape is more at risk than the streams, David Smuin, the Director of our Utah Watersheds Program, describes the plight of the resilient, beautiful species of cutthroat trout that nature has shaped for millennia to live in the drainages of prehistoric Lake Bonneville. The more you know about the tight linkages between forest health and living streams, the more important it seems that we plan for a future where these lovely natives can prosper.

Another place where change is underway is Grand Canyon National Park itself, where Steve Martin is the experienced and deeply energized new Superintendent. In laying out a draft of his agenda for the park, Steve explains that the Canyon can be read as a symbol of our national relationship to our treasured landscapes and to the global community. He points out that this park, like most of the rest, is suffering from drastic funding shortfalls, a casualty, perhaps, of priorities that have shifted elsewhere simply because we have so completely lost touch with nature. But nature hasn't lost touch with us, and there will likely be a steep bill to pay. Superintendent Martin wants us to treat the Grand Canyon with the respect it deserves, and in doing so, to rediscover a saner way of living.

Deep in the Canyon it is not news that the Colorado River is in trouble. Scientists recently catalogued the damage in a comprehensive report concluding that virtually every component of the natural river system is in steep decline. This is not really surprising since Glen Canyon Dam has changed the character of the river so completely. What is surprising is that for more than a decade the federal agencies managing the river have refused to try promising experiments with more natural flow releases from the dam, despite the facts that they have broad scientific support and are arguably required by law. Nikolai Lash and Rick Johnson explain here why the Trust has finally taken the matter to federal court. As I have said before, we will use any tool necessary on behalf of the canyon country.

It is our Obligation to Care for the Earth

by Carolyn Tanner Irish

The decision to award the Nobel Peace Prize to former Vice President Al Gore and the U.N. Intergovernmental Panel on Climate Change vindicates both a courageous political leader and the multitude of scientists who have been warning us about climate change for decades.

The fact that we haven't wanted to face "inconvenient truths" doesn't alter the realities they point to, nor does it mitigate the devastating consequences of our continuing denial.

It is interesting to reflect on what has fed our illusion that climate change is just a "maybe." For a time scientists published studies, and other scientists (as well as politicians and political appointees) challenged them. Many communities began recycling waste rather than reducing it, thinking that might fix the problem.

But probably the biggest factor in our denial is simply fear; we like our way of life, sustainable or not. Given our dependence on so many things we do not control, as well as the global scale of the problem, we naturally feel powerless to deal with what threatens it.

Nevertheless, the case has been made. It is now time for us to look honestly at the kinds of choices we will have to consider.

Never has the counsel to "think globally and act locally" been more to the point. Just days before the Nobel awards were announced, Gov. Jon Huntsman's Blue Ribbon Advisory Council on Climate Change issued its report indicating Utah is projected to warm more than the average for the entire Earth. For us this brings both the issues and our responses very close to home.

Obviously, no single action or policy on anyone's part will be sufficient to respond effectively over the long haul, but the advisory council did raise many possibilities for active response. As citizens, however, it may be necessary for us to rethink some of our most basic assumptions and attitudes before the policy recommendations and practical restrictions are put forward.

Chief among these is the recognition that in certain areas, the common good must take precedence over the personal preferences of individuals. Freedom, as well as security, is about much more than what each of us wants and can afford to claim.

We must also be willing to choose and support informed and courageous leaders at all levels of public life, who will not just promise what we prefer to hear, encouraging our illusion of safety in the context of global warming. We need radically new land, energy and water policies that offer long-range protection of the resources we are blessed to have, sharing them more equitably among all our people.

It is often said that competition is what makes America work. But America is not working; we are a major part of the problem, not the solution. Our overconsumption, incredible waste and inequitable distribution of benefits and sacrifices will challenge the well-being of all our people.

There is, finally, a spiritual dimension to all the problems we face and to the resolutions we may discover. When we use the term "global" we are referring to a harmoniously intricate world we did not create, but were given.

The gift of human life and human community on this Earth brings with it a vocation to steward and care for the great community of creatures that sustain life.

We ignore that vocation at great peril. Peace, "shalom," is the blessing of our constant fidelity to it. And only this shalom is worthy of our ultimate hope.

(Reprinted with permission)
The Rt. Rev. Carolyn Tanner Irish is the bishop of the Episcopal Diocese of Utah and a frequent commentator on issues of spirituality and the environment.

Straining for Silence

by Roger Clark

Helicopter rotors slapped air somewhere across the Canyon as I took in the view from Point Sublime. This hard-to-reach spot juts out from the North Rim, some two dozen miles west of Bright Angel Point. I stood there in solitude this fall, far away from bustling visitors and busses, reflecting on topography and time.

Twenty-one years earlier and a mile below where I stood, a deep staccato noise rose above the roar of Crystal Rapid. We shipped our oars and gazed upward as a giant chopper carried away wreckage. A helicopter and an airplane collided on the day we launched our river trip, six days before and ninety-eight miles upriver. There were no survivors. One of our guides was a close personal friend to one of the pilots.

Sadly it took a tragedy before the Federal Aviation Administration (FAA) felt compelled to regulate scenic air tours over the Grand Canyon. Until that day, FAA believed that "visual flight rules" were sufficient to ensure the safety of more than 100,000 people per year who took "the ride of a lifetime."

The National Park Service (NPS) had convinced Congress a decade earlier that aircraft noise was polluting "natural quiet" in the Canyon. In the months following the collision, former Trust president Ed Norton worked tirelessly with Senator McCain to pass the 1987 National Parks Overflights Act. The law gave NPS authority to develop rules for the "substantial restoration of natural quiet" to Grand Canyon, pending a safety review by the FAA.

Protecting national park values is the mission of NPS. However, skyrocketing numbers of scenic air tours meant that FAA was, in effect, doing the park's job. Because FAA's purpose included promoting commercial aviation, the two agencies (and their respective constituencies) have been at odds ever since.

After two decades of studies, reports, rules, definitions, and lawsuits, NPS and FAA have yet to adopt a final rule to regulate airspace over Grand Canyon. Interim rules prohibit aircraft from flying below the rim, establish flight-free zones and curfews at dawn and sunset, and set temporary limits on the number of air tours permitted to fly over the canyon.

Monitoring and modeling studies show that, despite a dramatic rise in the volume of air tours,

AIRCRAFT NOISE IS POLLUTING

"natural quiet" IN THE CANYON

interim measures may be holding noise pollution to a level needed to meet NPS' definition of "natural quiet." Their objective is to have at least 50% of the Park free from air tour noise at least 75% of the time. What remains to be decided is how to make a minimal restoration of natural quiet become a "substantial restoration."

GCT archive

Beginning in 2004, at the urging of Senator McCain, agencies and interest groups entered into an alternative dispute resolution process with a goal of adopting final rules by sometime in 2008. That process is nearly complete. Currently, it appears that two of the seven alternatives being considered would substantially restore natural quiet to the Grand Canyon.

One alternative would close two of the main flight corridors at different times during the year, allowing hikers to enjoy Hermit and Tanner trails for a few months free from air tour noise. Another, recommended by NPS in 1994, would permanently close the "Dragon Corridor." It is the route that extends out over the Tonto Trail, crosses the river above Crystal Rapid, and shoots a seemingly invisible conveyer belt of helicopters toward Point Sublime, where my ears strained to hear silence last fall.

Air tour owners claim such measures would put them out of business. They made similar claims in 1987 when opposing any regulation of scenic overflights.

A Renewed Vision for Grand Canyon National Park

by Steve Martin, Superintendent

RETURNING TO THE GRAND CANYON AFTER 26 YEARS, I am once again struck by the uniqueness of this incredible place. Reading the geologic story revealed in the strata of the canyon, seeing a condor soaring in the vast blue northern Arizona sky, walking a canyon trail and seeing a bighorn sheep perched on a cliff, or boating the rapids of the Colorado River awakens our imagination, rejuvenates our spirits, and provides opportunities for physical well-being. The Grand Canyon is one of the few places I have returned to after a long absence and felt it to be a more remarkable place than I remembered it. But the Canyon needs some help if it is to stay this way.

NPS

In the early days of the national parks, the job of National Park Service (NPS) staff and leadership was to protect the scenery and the large "wildlife." In addition, early records document that the NPS worked hard to build constituents resulting in the two periods where parks seemed to be on the forefront of the national conscience. In the 1930s some of the best work of the Civilian Conservation Corp era went into the national parks. And, in the 1950s, Mission 66 raised the national conscience again to repair and build facilities in the parks and allocated millions of dollars to improve park programs. The billion dollars spent during this era would require a five to six billion dollar investment today, with many hundreds of millions of dollars for operations.

National Parks and other public lands need the kind of investment done nearly 50 years ago—at Grand Canyon alone we estimate that there is over $250,000,000 in deferred maintenance, and tremendous shortfalls—as much as $14 million annually—in operational dollars. Secretary Kempthorne and Director Bomar are taking leadership roles in kicking off an initiative that will begin the steps to make our parks solvent. The NPS will need several years of this kind of support, as well as the support of the public and Congress, to achieve a reasonable level of park funding.

There is another missing piece to the future of public lands. Their contribution to state and regional economies is taken for granted, their educational value is often overlooked, their scientific value is largely untapped, and, in many cases, their resources are still threatened, or impaired resources are not restored. We know now that protecting the parks and allowing people to enjoy them and be inspired by them is far more complicated than was imagined in 1916—and also much more important.

If Grand Canyon is to remain a national treasure and international icon, we—the National Park Service, employees in the park, residents of northern Arizona, and visitors from the US and abroad—must work together to understand and protect the park's resources and values while we welcome everyone to experience, enjoy, and appreciate this remarkable place.

Grand Canyon National Park is one of the "must see" attractions for people throughout the world. We need to work with partners and neighbors to ensure that we welcome all who wish to discover its wonders. We also need to be sure that the park's ecosystem is protected and restored. We have much to teach the world on climate change, the effects of industrialization on parks, and the fascinating and fragile nature of the world's arid regions. We are more than just scenery, we are a window into the past, present, and future of the earth and peoples' relationship to it. The Grand Canyon Trust is a group that can be at the center of the protection and use of the Canyon. It has the credibility and resources to be a key partner of the National Park Service at Grand Canyon.

NPS

View from the patio of Grand Canyon Lodge on the north rim of Grand Canyon National Park.

One of the most important of these relationships is the government-to-government relationship that Grand Canyon National Park has with tribes in and around the park. This is a vital legacy of the national parks. The park is working to incorporate a tribal perspective into interpretation for visitors on the rim and the river. The park also works closely with the tribes to address their concerns about sacred sites, inadvertent discovery of human remains and funerary objects, and tribal access to the park. The park is more than archaeology and history—the contemporary needs and evolving collaboration of tribes and parks should be one of cooperation and mutual support.

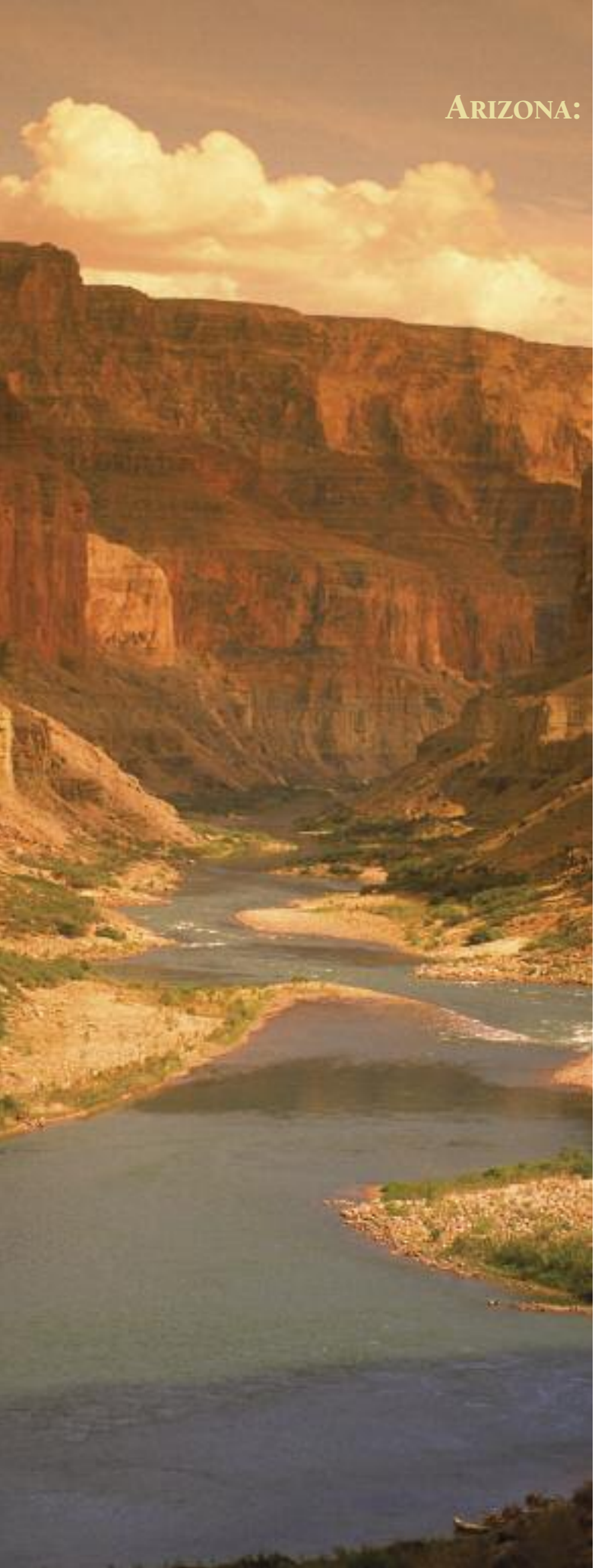
The resources of the park are extraordinary and demand our greatest attention. Grand Canyon does not exist as a solitary entity, however. To successfully manage the park's complex and interrelated natural and cultural environment—the park needs expertise in biology, geology, hydrology, archaeology, and anthropology. In addition, the park must combine forces with other agencies, tribes, and interests to cooperatively manage the interrelated web of issues that affect the park as one entity of the larger Colorado Plateau region. The National Park Service is working with the state and non-profits on the reintroduction of the California condor, with power and water interests to manage Glen Canyon Dam to mitigate the deleterious effects on the canyon, with universities in education programs, and with local communities in improving economic opportunities.

The Colorado River Management Plan released last year is the first in a number of plans that will guide the management of the park over the next decade or more. The South Rim Transportation, Visitor Experience, and Fire Management Plans will all be completed in the next few months, and work has begun on updating the Backcountry Management Plan. All of these plans need the input from everyone who cares for the Grand Canyon to ensure we do the right thing.

There are many ways for citizens to help the park. Grand Canyon has a volunteer program that gives people an opportunity to participate in the operation of the park. Volunteers contribute time and effort to many projects including trail work, exotic plant removal, interpretation, preventive search and rescue, and research library assistance. The Artist in Residence program offers a variety of artists an opportunity to spend several weeks on either the North or South Rim. The next time you attend a program at the Shrine of the Ages, look at the mural painted in the lobby by Juliana Greer, our Artist in Residence for November, 2007. We have recently hired a volunteer program coordinator to improve the management of the volunteer program.

The National Park Service employees at Grand Canyon deserve many thanks for making all these programs possible. I am committed to enhancing the opportunities of park employees so that they are happy, engaged, and fulfilled in their professional lives, and are trained and ready to become the NPS leaders of tomorrow.

The awesome spiritual resources of Grand Canyon encourage contemplation—what direction are we, as a nation, going? Where are we, as global residents, headed? Parks can be touchstones for exploring personal and national identity, and for making us better stewards of our world. Sharing the benefits from them— and the responsibility for protecting them—with neighbors, communities, tribes and other groups, will enrich us all and ensure that these great places remain wellsprings of peace, culture, nature and inspiration for the American people and for all of our neighbors around the world. Let us stand up and work together to make sure that we do not rest on memories of the good old days—we must protect and improve our parks for today and the years and generations to come.



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Arizona: Not the Glen Canyon Dam State

by Nikolai Lash

Having worked as a conservationist for the last ten years, I've learned that patience and persistence are priority work requirements. In order to accomplish worthwhile goals, conservation advocates, as part of their jobs, move through irritation and frustration. I can't imagine a more worthy conservation goal than restoring to its native beauty the international icon, Grand Canyon National Park. And yet no other project has been so trying, frustrated from its goal of a restored, healthy Grand Canyon.

Fifteen years ago, Grand Canyon Trust successfully lobbied Congress for passage of the Grand Canyon Protection Act, a law written to reverse the destruction of native fish, beaches, streamside vegetation, and archaeological sites in Grand Canyon, all caused by destructive flows from Glen Canyon Dam. Fifteen years later, we continue to be witness to destructive flows from the dam and the ongoing unraveling of our most beloved park.

The Grand Canyon Protection Act resolved a long-running debate over whether dam operations should favor cheap peaking power or protection of the Park resources downstream. Although Congress gave clear precedence to park resources, politics favor cheap peaking power, a kind of varying power generation that sends daily floods out of the dam when air conditioners turn on, and turns off the dam spigot when demand drops. The Bureau of Reclamation, charged with operating the dam, follows the politics of power, creating an artificial river that is destroying the vestiges of the real one.

No doubt, compelling reasons exist for generating as much hydropower as possible from Glen Canyon Dam. The dam generates more power than any other Colorado River dam, enough electricity to supply thousands of people in the region with household power. And to optimize power generation, flows from the dam must fluctuate in accordance with human use. Because of summer air conditioning and winter heating during the day, power optimization requires a peaking-power, 24-hour fluctuating cycle that releases more water during the day and less at night.

But river scientists have learned that fluctuating flows are harmful to the resources in Grand Canyon. Fluctuating flows erode beaches and export sediment

more quickly than steady flows, eliminating camping areas alongside the river. Fluctuating flows destabilize shoreline habitat and thus degrade spawning and rearing habitat for native fish. They also eliminate much of the sediment needed to counteract erosion of centuries-old Native American sites along the river. *To reverse these negative trends, scientists have learned that more natural, daily, steady flows from Glen Canyon Dam are essential for the health of Grand Canyon.*

However necessary steady flows are to Grand Canyon resources, they are costly to hydropower interests. Further, because hydropower revenue is used to subsidize additional diversion projects from the Colorado River, the seven basin states and power entities typically vote as a block within the Glen Canyon Dam Adaptive Management Program. The result is gridlocked majority support for a fluctuating flow regime beneficial to power and detrimental to Grand Canyon.

The Glen Canyon Dam Adaptive Management Program is the 25-stakeholder committee that makes recommendations to the Secretary of the Interior on Glen Canyon Dam operations that will improve resource conditions in Grand Canyon. But in spite of the US Geological Survey's recent SCORE report documenting the decline of Grand Canyon resources over the past 10 years, conservation interests continue to get outvoted by water and power interests. The effort to change from a fluctuating flow regime to a steady flow regime has been continually rejected.

The USGS SCORE Report found that between 1998 and 2003, the total campsite areas in Grand Canyon decreased by 55 percent. Four of the eight native fish historically found in Grand Canyon have vanished. The endangered humpback chub, found only in the Colorado River, has dropped in population to 6,000, down from 9,300 in 1989.

Fortunately, Grand Canyon's native fish have legal protection. The 1994 Biological Opinion for Glen Canyon Dam operations, written by US Fish and Wildlife Service, requires steady flows for the benefit of humpback chub and other native fish. It states: *"A program of experimental flows will be carried out to include high steady flows in the spring and low steady flows in summer and fall [called "Seasonally Adjusted Steady Flows"] during low water years (releases of approximately 8.23 million-acre-feet per year) to verify an effective flow regime and to quantify, to the extent possible, effects on endangered and native fish."*

And although the last seven years have been low water years, the Bureau of Reclamation continues to violate the Endangered Species Act (ESA) and 1994 Biological Opinion by not testing Seasonally Adjusted Steady Flows. To put it bluntly, ***current flows from Glen Canyon Dam are in violation of federal law.***

Because of the violation of ESA law, Grand Canyon Trust filed a lawsuit against the federal government December 6, 2007. We are suing the Department of Interior over three legal claims:

(1) violation of the Biological Opinion, and the ESA section 7 prohibition against jeopardy and adverse modification;
(2) unlawful ESA section 9 "take" of chub and sucker due to the Bureau's non-compliance with the Biological Opinion, and
(3) failure to consult under ESA section 7 on the Annual Operating Plans, which are Reclamation decisions on monthly flow releases and a subset of the larger Dam "operations."

What do we want to see happen as a result of our lawsuit? One possible and favorable result would be the court ordering the Bureau of Reclamation to run steady flows in compliance with the ESA and the 1994 Biological Opinion. Another possible outcome would be the court ordering Reclamation to reconsult with US Fish & Wildlife Service to develop a new Biological Opinion. Because steady flows are recognized by nearly every river scientist as being essential to improving humpback chub habitat, we expect a new Biological Opinion, like the 1994 Biological Opinion, to require steady flows from Glen Canyon Dam at least part of the time.

Arizona has never been called the Glen Canyon Dam state. Power can be replaced, but not the Grand Canyon. Alternative power options for Glen Canyon Dam exist today, and more will exist in the future, including renewable energy sources such as solar and wind power. But no replacement options exist for Grand Canyon. Notwithstanding additional power costs, isn't the Grand Canyon deserving of the best care and protection possible?

Dam Flows Threaten Grand Canyon

by Rick Johnson

The damage is revealed as I hop from rock to rock while looking at old aerial photos of Badger Rapid and the adjacent beaches. All the statistics and scientific reports that usually absorb my time have not impressed upon me the enormity of the changes like being on the beach with the photos and the din of the Colorado River. A huge boulder that barely protruded from the sand in the year I was born now stands seven feet above the surface.

For most of us fortunate enough to see the Grand Canyon at river level, the damage is obscured by the immense beauty of the canyon. To the river runners, I suspect that the cold spray from the rapids is much more bone chilling than the severe environmental damage surrounding them. However, to me, the damage is not hidden, and the scary part of Grand Canyon is to witness the continued collapse of a remarkable ecosystem. The extensive sand beaches once emblematic of the Colorado River through Grand Canyon are not just convenient places to set up tents, contemplate life, or play Frisbee. The sediment is the foundation for a unique ecosystem.

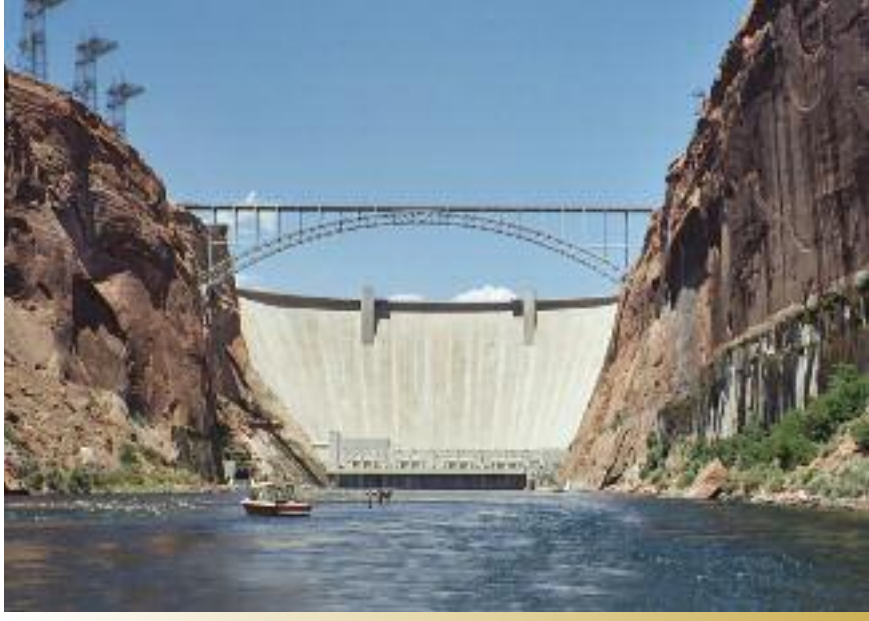
The wild Colorado River is best characterized by its variability. Flows in Grand Canyon ranged from being so low in the winter that the river could be forded in places, to spectacular raging torrents during snowmelt run-off. Every spring the river accumulated massive amounts of sediment from the Colorado Plateau and dumped it on the beaches in Grand Canyon. These extremes of flow and sediment produced a distinctive community of fishes with, to put it kindly, uncharacteristic sizes and shapes.

Today, the Colorado River is largely tamed and is widely known as the most intensely controlled river in the world. The Rube Goldberg-like contraption of dams, reservoirs, canals, lift stations, and tunnels produce obvious societal benefits in terms of drinking water, irrigation, hydropower, and flatwater recreation. But, there are also enormous societal costs in terms of the impacts to species and ecosystems throughout the watershed (and far into the Gulf of California), as well as the degradation of archaeological sites, and the loss of the recreational opportunities afforded by a wild river.

The impacts to the natural, cultural and recreational resources in Grand Canyon National Park were expressed not long after Glen Canyon Dam became operational in 1963. At that time, water releases were dependent strictly upon considerations for meeting water delivery obligations to the lower basin and generating hydropower revenues. The natural annual flow cycle was exchanged for daily fluctuations. The sediment once delivered by the mainstem became trapped in the reservoir. Not only is the clear, sediment-free water released by the dam highly erosive, the erosiveness is compounded by high daily fluctuations. Consequently, the beaches began a downward spiral that continues to this day. Of course, there is a myriad of other ecosystem changes that result from placing a huge concrete barrier across a river.

Although the downstream ecosystem changes were obvious, the remedy was not. The impacted resources are within National Park Service units: Glen Canyon National Recreational Area and Grand Canyon National Park. However, the threats to these resources are generated mainly by Glen Canyon Dam, which is operated by the Bureau of Reclamation. Although both the National Park Service and the Bureau of Reclamation are in the Department of Interior, the two agencies could not untie the huge Gordian Knot of multiple conflicting laws regulating water, hydropower and National Park resources. Unfortunately, in the absence of a solution, the dam continued to be operated to benefit hydropower interests, and park resources continued to decline.

Beginning in the late 1980s, the Grand Canyon Trust and other environmental and recreation groups lobbied hard to change the operation of Glen Canyon Dam and restore the river ecosystem below the dam. The result of this advocacy was impressive. Congress,


John Aber

under the leadership of Senators John McCain and Bill Bradley, Representative George Miller, and many others passed the landmark Grand Canyon Protection Act (GCPA). The Act clearly reordered the priorities for dam operations—the Secretary of Interior was required to operate the dam in a manner that will protect and restore National Park resources and values, while not affecting the annual volume of water needed to meet the delivery requirements of the "Law of the River." The trade-off that Congress made was to increase the protection for Grand Canyon at the expense of cheap "peaking power" (i.e., power produced during periods of high demand) from the dam.

The second result of this advocacy was to revise the operating criteria for Glen Canyon Dam so it would be consistent with the Grand Canyon Protection Act. Although the revised operating criteria took a step in the right direction, subsequent research and monitoring has shown that it was a small step—too small to meet the intent of the GCPA. Under the revised operating criteria, sediment continues to be lost from the ecosystem faster than it is replenished. The endangered humpback chub is at a lower abundance today than when the GCPA was passed in 1992, and the population continues to be vulnerable to extirpation due to its small size and reliance solely on reproduction in the Little Colorado River. In addition, archaeological resources continue to be degraded and lost in the absence of a continuously renewed blanket of protective wind-blown sediment.

Some argue that the impacts of the dam are too great and, despite the values the American public holds for Grand Canyon National Park, we should let go of any ideas for protecting a semblance of the natural ecosystem. After all, we only have a fraction of the sediment supply (mainly from the Paria and Little Colorado rivers) that once entered the canyon, the physical constraints of the dam minimize the options to mimic the natural hydrograph, the dam releases cold water year-round rather than the natural annual cycle, and non-native fish like trout and catfish are prevalent and prey on and compete with native fish for food and other resources. The task is daunting, but I believe it is possible.

So how should the operating criteria be changed—what is the next step? When the Secretary of Interior chose the current operating criteria, the US Fish and Wildlife Service issued a jeopardy opinion under the Endangered Species Act (ESA). This opinion outlines an alternative dam operating scenario called Seasonally-Adjusted Steady Flows. These flows call for mimicking the natural hydrograph to the extent possible while maintaining sediment in the canyon. In addition to these flows, the Service called for testing a modification of the dam's intake structures to provide warmer releases to stimulate successful spawning and rearing of native fish in the mainstem. After more than 10 years of research and monitoring, it looks like the Service was spot-on, not only for meeting the requirements of the ESA, but also the GCPA.

The Secretary of Interior is required to implement the provisions of the Biological Opinion, but has not done so. Despite Congress requiring the Secretary to operate the dam to protect park resources, the Secretary is reluctant to implement the Seasonally-Adjusted Steady Flows, presumably because it reduces the production of cheap peaking power (Note that the total amount of energy produced is basically the same). The Trust is exploring all of its options to encourage the needed experimentation and implementation of flows, and other management actions, that are needed to meet the intent of the ESA and the GCPA.

Meeting the intent of these Acts will not be easy, especially since there is no silver bullet—several actions will need to be implemented in concert. But the Grand Canyon is worth fighting for. And I plan to eventually hop up on that boulder at Badger Creek and tell my kids and grandkids, and all the passing river rafters, just how deeply buried it is.

Southern Utah watersheds are

Watersheds are more than just drainage areas in and around our communities.
As rain falls, snow melts, or irrigation runs down the hill into the soil, they carry sediment, nutrients, or other materials. They are necessary to support habitat for plants and animals, and they provide drinking water for people and wildlife. They also provide the opportunity for recreation and enjoyment of nature.

David Smuin

Shawn Saunders

Shawn Saunders

David Smuin

CRITICAL TO OUR FUTURE WELL-BEING

Ray Wheeler

Utah receives an average of 13 inches of precipitation annually. Only Nevada, its neighbor to the west, receives less. Just a small portion of this precipitation makes its way through watersheds and into Utah's waterways and aquifers resulting in a limited supply for the people, plants and animals that rely on it.

In addition, climatological factors vary significantly from year to year making the water supply unpredictable. Protecting watersheds is essential to maintain the health and well-being of all living things, both now and in the future. The Trust's new Utah watershed program will help accomplish that.

David Smuin

Bonneville Cutthroat Trout and Utah Watersheds

by David Smuin

When Bill Hedden, the Grand Canyon Trust's Executive Director, first got the call from a southern Utah rancher urging him to come over and go fishing, he wasn't too excited by the description that the "trout are jumping right at the mouth of the culvert." Bill prefers wild, lonely streams, but he was nagged by memories of wonderful outings on the nearby Fremont and Sevier rivers and tributary creeks, and this particular ranch harbored a great diversity of wildlife, so he eventually scheduled a trip.

The fishing was weird, with the advertised culverts and pools dammed up by fences and irrigation diversions, but the country was beautiful with big brown trout in the lower meadows and rainbows higher upstream. In a deeper, more natural pool Bill caught a large and surprising cutthroat trout, which is the only trout native to this region. It was at least 18 inches long, yet its sides were covered with the striking parr markings that normally color immature fish and then fade away as they grow up. Though unsure, he suspected it was an extremely rare Bonneville cutthroat, and gingerly returned it to the stream.

Bill knew that the Bonneville, once thought to be extinct, were still found in a few headwater streams of the Sevier River drainage of south-central Utah, but he never expected to find them just off I-70 in such an unlikely looking stream. The Bonneville cutthroat trout (*Oncorhynchus clarki utah*) evolved as a separate species in the Great Basin's isolated inland watersheds. They look a lot like other cutthroat trout except that the parr markings (a red blush of oblong rosettes across the sides of the fish), which usually only appear on immature fish of other cutthroat species are persistent in the Bonneville, so that mature fish of 12 – 18 inches length often still show obvious parr markings. Biologists later confirmed that the stream holds an unusually pure strain of these rare fish.

Reflecting on his amazing catch, Bill sensed the possibilities of doing watershed conservation and fish habitat work to restore more native trout to their home waters. He and other Trust staff formulated a plan for a watershed restoration program in southern Utah and got approval from the Trust's Board to hire a manager.

Shawn Saunders

Fremont River through Red River Ranch.

The Utah Watersheds program is now underway and, as the new program manager, I'm running the project from my Teasdale, Utah home. My wife Maureen is my part-time, volunteer field assistant and our initial program focus area is the Fremont and Upper Sevier watersheds. The area encompasses about 4,000 square miles in southern Utah south of I-70, west of Capitol Reef National Park, east of I-15 and north of Bryce Canyon National Park. It was chosen because it seems to present the best opportunity for integrating public and private conservation and will provide local socioeconomic benefits and nationwide ecological benefits including protection of blue-ribbon fisheries, wildlife habitat, clean water flows, and sustainable recreation. Conservation of native fish including the Bonneville is a part of the program.

The Bonneville is the only native trout found in southern Utah's Sevier River basin and has persisted in the Sevier's headwaters for 8,000 years...

The Bonneville is the only native trout found in southern Utah's Sevier River basin and has persisted in the Sevier's headwaters for 8,000 years since the desiccation of prehistoric Lake Bonneville. They have adapted to survive in relatively warm water and marginal habitat. The migratory forms once grew to be quite large in lakes and large rivers. As with other subspecies of cutthroat trout throughout the Intermountain West, habitat alterations and introductions of nonnative trout from the late 1800s until the 1970s caused large-scale losses of this native fish. Active management of the Bonneville began in southern Utah after the Endangered Species Act was passed in 1973. By the 1990s, interagency management to conserve, protect, and expand Bonneville populations led to a formal fish recovery strategy.

Under the interagency program, all known populations of Bonneville cutthroat trout in the Sevier, Beaver, and Virgin Rivers were surveyed in 1994-1995, and again in 2001-2002. It was found that the stream habitat occupied by Bonnevilles increased from only 10.1 km in 1977 to 56.0 km in 1994-1995, and to 119.1 km by 2002. Part of this increase was due to the discovery of remnant populations of Bonnevilles and part was from the restoration efforts of the Utah Division of Wildlife Resources (UDWR). Then came the 2002 summer wildfires, which devastated large areas in southern Utah and caused the loss of some key habitats and populations. This trend has been worsened by the prolonged drought, and now the Bonneville is being considered for listing by the US Fish and Wildlife Service under the Endangered Species Act, a move that could have far reaching consequences for southern Utah watersheds. If listing occurs, then agencies must consider the impacts of all public land activities on the remaining Bonneville populations and a new recovery plan must be formulated and implemented.

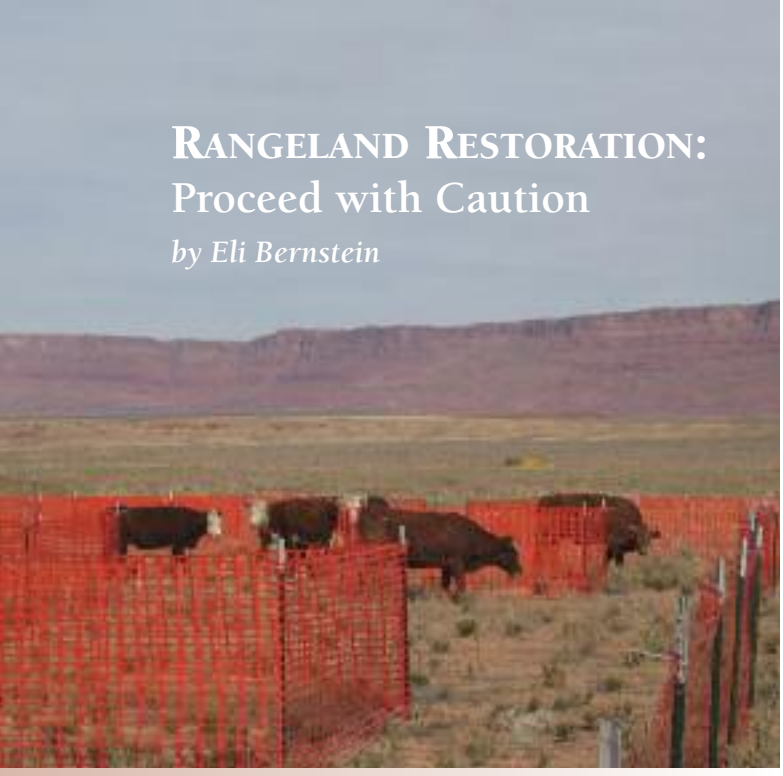
Current threats to the Bonneville include global climate change, accompanied by warming stream water, diminishing stream flows, competition with and hybridization with other trout species, degradation of habitat due to livestock overgrazing, and runaway all-terrain-vehicle use. To their credit, the UDWR has been working hard to expand the range of the Bonneville and improve stream conditions for existing populations. The reality is however, that the Bonneville's former range in southern Utah once included several hundred miles of mountain streams and lowland rivers and is now only about 75 miles of mountain streams. They are tough little fish hanging on by a thread. The UDWR has plans to restore the Bonneville to several more miles of streams in the Sevier River watershed, but that will still total only a tiny fraction of the original range.

In order to learn more about the Bonneville, I accompanied UDWR personnel on several trips to various streams with remnant populations of Bonnevilles. We conducted fish population surveys using electro-shock techniques as part of the UDWR's ongoing monitoring program. I was amazed to see just how resilient and beautiful the fish in these little streams are and what marginal conditions they have to survive in. The lively little fish with their flashing silver and red sides and deep orange throat markings recovered quickly from the electro-shocking. After being weighed and measured they were returned to the water apparently no worse for the experience. Coming from Colorado, where there are much bigger streams and rivers than in most of southern Utah, it is still hard for me to believe that streams only 18 inches wide and a few inches deep can support a self-sustaining trout population, but it appears to be true. Yet faced with global climate change and the likelihood of continued drought, it seems that more effort will be needed in order to conserve these fish.

According to a Trout Unlimited (TU) assessment, perhaps the greatest future threat to the survival of the Bonneville is climate change, as the species is isolated in a desert basin and will have limited access to higher elevation refuges if lower elevation habitats continue to warm up and dry out. TU believes that restoration and conservation of Bonnevilles in the southern range should be accomplished by restoring habitat connectivity and reintroducing Bonnevilles in all habitats throughout southern Utah. As a start towards this end, the Trust will be assisting the UDWR with a stream restoration project on the Upper Sevier River in 2008, thanks in part to a Hemingway Foundation grant. The initial phase of this restoration targets 5 miles of the Upper Sevier River in the vicinity of Hatch, Utah. Future plans are to expand restoration to several other key areas of the Sevier and Fremont watersheds.

Rangeland Restoration: Proceed with Caution

by Eli Bernstein



Eli Bernstein

Sitting on the front porch of the Kane Ranch headquarters, with the cool shadow of the Kaibab's East Monocline at my back, I let my eyes drift east over 20 linear miles of tawny desert, across the House Rock Valley to the red ramparts of the Vermilion Cliffs, then south to a sinuous cleft in the plain where the Colorado winds through Marble Canyon. Gazing south to my mountain home in Flagstaff, I realize that the entire San Francisco Peaks could fit in this valley, with room to spare. While House Rock Valley represents only 15 percent of the entire Kane and Two-Mile ranches it has stories to tell that are relevant to much of the West.

If you think the Kane and Two-Mile (K2M) ranches are big at 850,000 acres, consider that there are 753 million acres of land in the 11 western states, and that nearly two-thirds of the "West" is federal land owned by the American people and managed for us by the United States Forest Service (USFS) and the Bureau of Land Management (BLM). Of those public lands, approximately 70 percent are rangelands used for grazing livestock, which private corporations like the Trust's North Rim Ranch can lease from the government under 10 year grazing permits, as established by the Taylor Grazing Act of 1934. This means that nearly half of the West is public rangeland.

The House Rock Valley, mostly BLM land, is typical of the western public rangelands. It is an arid place, meeting the ecological definition of desert with less than 10 inches of annual precipitation. Like much of the Southwest, it is projected to get significantly drier in the coming century. It has been impacted by livestock grazing over the past century, as evidenced in places where invasive weeds, eroded washes, and grazing-tolerant plants have replaced native plant communities. It is part of the rarely visited Arizona Strip, which has been referred to as "America's Tibet" because of its remoteness. One thing that sets the valley apart is the research taking place here on how to reconcile public rangeland grazing with the overarching goal of ecological restoration.

The United States Department of Agriculture (USDA) admits that "over half of public rangelands are in unsatisfactory condition, and about two-thirds of these rangelands are not responding to current management practices." Without taking sides over how much of this trend is due to historic or current grazing regimes, we can all agree that there is a clear need for ecological restoration of degraded rangelands. However, for much of this century restoration meant "range improvement," essentially seeding non-native plant species to boost forage for livestock. Ecological restoration for the sake of wildlife, native plant and soil communities, and healthy, functioning ecosystems, is a relatively new concept for public lands management. This mandate emerged as a logical extension of policies such as the National Environmental Policy Act (1969), the Endangered Species Act (1973), and the Federal Lands Management Policy Act (1976), which brought America's budding conservation values to bear on lands that had originally been valued primarily for livestock, timber and minerals. Today the BLM and USFS are in the difficult position of managing lands for sustained yield (as represented by livestock grazing in the case of House Rock Valley) while simultaneously trying to

"One means of sanity is to retain a hold on the natural world ... Americans still have that chance, more than many peoples."

–Wallace Stegner

protect and improve ecosystem health as measured in soils, watersheds, wildlife populations and native plant communities.

But deserts are difficult places to do restoration work. Rest from grazing alone has proven insufficient for achieving significant restoration in many situations. Active restoration, including subsoil "drill" seeding of native species, may be necessary, but a harsh and variable climate is a formidable foe to a germinating seedling. Moreover, ecologists are learning that highly variable climates, and the propensity of ecosystems to settle into alternate stable states, make restoring degraded lands to historical conditions highly unpredictable and difficult. Global climate change may make a true reconstruction of past ecosystems impossible. In short, there is a web of complex conditions that determine restoration success, and these are not the sorts of problems with simple solutions that can be sketched out on the back of a napkin. These problems require a learn-as-you-go adaptive management framework that is hard to keep alive, whether you work at a non-profit conservation organization, for a university, or in a BLM or USFS field office.

Over the past year and a half, I have partnered with the Grand Canyon Trust to conduct research on why current restoration treatments are often failing to improve arid rangelands. Given that federal agencies are overworked and under-funded, the alternative of partnering with a private conservation group helped bring together local knowledge, management flexibility, and scientific resources.

Over 2006-2007 I implemented a series of restoration experiments in House Rock Valley, combining different methods for reseeding native grasses under two climate scenarios (modeling the average and historically wettest year over the past three decades) both with and without cattle impacts. Using germination of seeded species as my indicator of success, I addressed multiple research questions: (1) which seeding methods are the best; (2) what is the extent to which climate determines success; and (3) can cattle trampling be used as a "restoration tool" for driving seeds into the soil and thus improving the chance of germination.

To summarize a long field season, my results were surprising and sobering. Only one treatment led to successful germination of seeded native grasses, and only when combined with irrigation that mimicked a historically wet year; meaning that in the absence of irrigation, opportunities to re-establish native grasses weren't likely to occur more often than one or two times every 50 years. But that wasn't really the surprising part: It was some negative repercussions of the "successful" treatment that have caught my attention.

In the seeding treatment where native grass germination was successful I also saw a proliferation of exotic weeds and a decrease in soil stability—a measure of resistance to erosion. Examining these apparent side effects in detail is a focus of my ongoing graduate research. However, it seems that while

Ethan Aumack

ABOVE: Eli Bernstein and volunteers survey restoration plots.
PREVIOUS PAGE: Trampling and seeding restoration experiment.

disturbing the soil to "drill" seeds below the surface was essential for their germination, it also had the nasty consequence of worsening the weed problem and increasing the risk of soil erosion, key indicators of the degraded condition I was trying to remedy.

Interestingly, weedy species seem to germinate most readily in drill-seeded plots that received an

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Finding Hozho:
The Natural Balance

by Tony Skrelunas and Claudia Jackson

Geri Hongeva

Volunteers work on overlook cleanup.

On Saturday morning November 17, 2007, I awoke with some apprehension as the Native America Program embarked on its first volunteer project. Having never been involved in such an effort, and with much of the organizing responsibility falling on Volunteer Coordinator intern Claudia Jackson, I didn't quite know what to expect.

To my great surprise, twenty-one volunteers and three Trust staff members along with employees from the Navajo Nation Parks and Recreation Department came out to the Little Colorado River 2nd Overlook Gorge, located along the Grand Canyon scenic route, to lend a helping hand in our first volunteer project. Volunteers from Northern Arizona University's American Indian Science and Engineering Society and Grand Canyon Trust eagerly went to work removing rocks and debris, painting picnic tables and railings, and cleaning up trash. At the end of a long day, an overwhelming 54 bags of assorted debris sat on our flatbed truck near restored trails, signage and picnic areas.

Claudia and Helen Webster, from Navajo Nation Tribal Parks, collaborated to create a project that would benefit both the Tribal Parks and Grand Canyon Trust. The work project was designed to help us achieve our vision of working toward a region where generations of people and all of nature can thrive in *Hozho*—the harmonious balance between man and nature. Our goal was to facilitate a symbiotic relationship between local communities and the natural environment, and to create educated, enthusiastic, stewards of the land.

With six different tasks scheduled from 8 am to 4 pm, volunteers built hearty appetites. Breakfast goodies and refreshments were provided to kick off the day and the Navajo Nation Tribal Parks wrapped it up with a magnificent, traditional lunch of mutton stew, ribs, chili beans and fry bread. The evening ended with a cook-out dinner celebration that was provided by tribal park staff from the Visitors Center in Cameron, Arizona. Everyone had a grand time.

Future projects at the Little Colorado River 2nd Overlook Gorge include installing signage in both Navajo and English along the restored area to identify plants and describe their medicinal use. Markers identifying the newly restored half-mile trail will be located along the path that winds around a knoll and leads back to the parking area, creating an enticing short hike for visitors

Trail restoration is also planned in Monument Valley Tribal Park. If you would like to join us for this project, please look for more information on our special volunteer website: www.gcvolunteers.org

With all the good food and fun, one long-time volunteer was ready to sign up for the next event before he had washed off the dust from this project. We hope you will join him and the rest of us at our next event.

Gift Annuities
Beneficial to You and Grand Canyon Trust

by Phil Pearl

There are now are a number of creative ways to give, and to keep on giving—some that will even pay you an annual income while supporting the work you believe in. The following example will focus on a "Gift Annuity", which is a financial contract between you and a non-profit organization like the Grand Canyon Trust. The intent is to generally illustrate how you and the Trust can mutually benefit from such an arrangement. This being said, each person's financial circumstances are different, so it is critical that you seek advice from your personal financial advisor.

How a Gift Annuity Works

Let's say you own financial assets such as stocks, bonds, mutual funds or real estate that have appreciated in value over the years. Selling an asset at its appreciated value will result in capital gain and a substantial income tax liability. An alternative to paying these taxes is to create a Gift Annuity. A Gift Annuity allows you to take a federal income tax deduction equal to the value of your gift, earn an annual income for the remainder of your life (and, if desirable, the life of your spouse) and, at the same time, invest in the work of the Grand Canyon Trust. A Gift Annuity also reduces the overall size of your estate and consequently, reduces overall estate tax liability.

For example, let's assume you own 500 shares of XYZ stock that you purchased in 1985 for $50 per share. Today the stock is worth four times what you paid for it. If you sold this you would pay capital gain on the difference between what you originally paid for the stock ($25,000) and the amount you sold it for ($100,000). As a result, your gain would result in a tax liability of close to $15,000 (assuming federal and state income tax and transaction fees) and you would only net approximately $85,000 from the sale.

An alternative to the sale is to create a Gift Annuity. With a Gift Annuity the stock is donated to the Trust in exchange for a contractual agreement to pay you a mutually agreeable annual return based on your age. In addition to the annual return, you avoid the capital gain you would have otherwise paid on the stock sale ***and*** receive a charitable tax deduction for the gift of stock.

Let's take the example one step further. Assume that by mutual agreement the Gift Annuity pays you an annual return of 6%. You've also avoided approximately $15,000 in capital gain tax and you've realized a substantial charitable tax deduction based on the value of the gift. Taking the avoidance of capital gain taxes and charitable tax deduction into consideration, the effective annual return on the Gift Annuity might be closer to 7 – 8% per year. Meanwhile, and perhaps most importantly, the Gift Annuity may generate modest income for the Grand Canyon Trust and, over the longer term, provides the Trust with $100,000 in support.

The older you are, the higher the rate of return a Gift Annuity will pay. You can also elect to defer receiving the annual payments for some period of time and receive a higher rate of return in the future. Additionally, some of the annual return may be tax exempt.

A Gift Annuity isn't right for everybody. However, if you have a financial asset that you look to for income (and not capital appreciation), a Gift Annuity is an excellent way to receive an ongoing return on your investment while supporting the Grand Canyon Trust.

If you are interested in learning more about Gift Annuities or other creative ways to support the Grand Canyon Trust, please contact Phil Pearl, the Grand Canyon Trust's Associate Director, at 928.774.7488 x237.

Tom Till

Climate Change Bull's-Eye on the Colorado Plateau

by Bill Hedden

Scientists have recently been combining the predictions of many climate change models to arrive at a broadly supported view of what is in store for us. While the picture is not pretty for the southwestern US, it does give us clear guidance regarding actions we should be taking now and what may happen if we continue business as usual.

A map of trends in annual maximum temperatures over the coming century shows a red hot bull's-eye directly over the states of Utah, Arizona, Colorado and New Mexico. Temperatures here may rise by 11 degrees Fahrenheit, far beyond the global average; and there is a corresponding dry zone slicing diagonally across half of the U.S. from Oregon to Florida, with the Southwest again hardest hit. We can expect annual precipitation to decline by 20 percent and for the precipitation we do get to arrive in less useful forms, like destructive summer downpours rather than winter snowpack.

Combined heat and dryness reduce the soil moisture so that average conditions will be akin to historic drought levels. The first casualties of this will be shallow-rooted grasses, cacti, lichens and mosses, affecting rodents and their predators and livestock. Fires are expected to increase in frequency and severity, and the stressed plants will be more vulnerable to insect outbreaks. The loss of vegetative cover from these and other causes increases the albedo, or reflectivity, of the land causing a local effect of fewer clouds and as much as a 30 percent decline in rainfall, setting off a negative feedback that reduces vegetation further.

The increased atmospheric carbon dioxide, coupled with surface disturbing activities and water tables lowered from pumping, will encourage invasions of exotic species, like cheat grass, that provide poor forage for wildlife and livestock, decrease soil carbon and nutrients, and make the land prone to frequent fires that favor further invasion by exotics, starting the cycle anew.

At the base of all these changes is the soil, which takes 5,000 -10,000 years to form in arid lands. Currently, erosion primarily due to human activities is carrying off our soils at rates ranging from ten to one thousand times faster than they are being replenished. Their fertility is being depleted at a comparably fast rate. On site this affects the quantity and quality of vegetation and offsite the soil fouls waterways with sediment and pollutants.

It seems counterintuitive that most desert soils are quite stable until vegetation is removed or the surface is disturbed. But once they are exposed they are highly vulnerable, resulting in the terrible dust storms seen in recent years in Phoenix and elsewhere. Mountain lakes across the region hold a layer of lowland sediment airlifted during the grazing heyday of the late nineteenth century, and today dust is being dumped on mountain snows at a rate 3-6 times higher than before 1850. By darkening the snow so that it absorbs more sunlight,

the dust makes the snowpack melt off a month earlier, resulting in far less late season water for agriculture and cities. Again, the Southwest is action central for decreased future water supplies, with expected declines in Nevada pegged at over 40 percent.

One take home message from all this disturbing news is that we should strive to minimize our heavy hand on the land, since disturbance sets off so many destructive feedback loops. I urge readers to get involved in large-scale planning efforts for the federal lands you care about. In a ready instance, the Bureau of Land Management is now finalizing plans for 11 million acres of public lands in Utah, and the proposals could really benefit from citizen intervention. The agency has rushed through the public comment phase and taken no account whatsoever of all this new climate science.

For example, the Richfield, Utah BLM plan for 5.4 million acres proposes to manage not a single acre for its Wilderness quality, despite the fact that BLM recognizes that 682,000 acres in the planning area qualify for such special treatment. On the flip side, the agency has identified 4,315 miles of potential off-road vehicle routes and proposes to close just 3 percent of them. Every acre outside of congressionally designated Wilderness Study Areas remains open to oil and gas leasing, and virtually the entire planning unit will continue grazing as usual. Unfortunately, the scientists are telling us where business as usual will take us. We must convince the BLM to revise these bad plans as soon as possible.

P.S. The information here is largely derived from a presentation made by USGS scientist Jayne Belnap, who summarized predictions from multiple climate models. Mistakes are mine.

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average year's precipitation, suggesting that if we seed natives in average years we may be shooting ourselves in the foot: We don't get natives established and instead germinate great numbers of exotic weeds. To offset this effect, perhaps seeding should be restricted to wet years, when natives are more successful and, presumably, might out-compete the weeds.

El Niño years (when Arizona sees increased rainfall) can be predicted fairly well, with enough lead time to synchronize restoration activities with these windows of opportunity. Unfortunately, the majority of public rangeland restoration taking place today is not making use of these opportunities, instead timing restoration actions around budgetary and personnel issues. Metaphorically speaking, I see three elephants in the room for arid rangeland restoration today. First, mechanical re-seeding seems to be critical to successful germination of native grasses, but causes soil disturbance. This disturbance can lead to the establishment of invasive weeds and reduced soil stability. Such initial results necessitate an informed and cautious pursuit of active restoration. Second, global climate change will be drying up the windows of opportunity in which to carry out successful re-seeding projects. Warming and drying trends may make active restoration of native species impossible on a growing proportion of arid rangelands across the West, in which case we may have to plan for unique plant communities comprised of native species from other locations. Lastly, ecological "windows of opportunity" for restoration and management decisions within the existing policy environment are temporally out of synchronization. To restore arid rangelands, managers must think long-term and act spontaneously when windows of opportunity present themselves. They must also fully realize the importance of preventing damage in the first place.

Ecological restoration is a buzzword that everyone wants to support, and for good reason. There are a lot of ecological wounds that need healing. However, if we don't use a critical scientific approach, which includes self-examination and questioning within an adaptive management framework, we may end up making things worse. It is my belief that the kind of public-private partnerships exemplified by the Kane and Two-Mile Ranches project are essential to finding real, workable solutions for these twenty-first century management conundrums.

ARRIVALS

Phil Pearl

Associate Director: Development

Phil came to the Trust in October 2007 with a thirty year history in conservation programs and will focus on strategic development, donor cultivation and fundraising for Trust programs. Phil was formerly the principal in Open Space Resources, a land conservation consulting firm; Northwest Regional Director for the National Parks and Conservation Association; Senior Project Manager for the Trust for Public Land; Program Director for the Lila Acheson and Dewitt Wallace Fund for the Hudson Highlands and Land Preservation Director for Scenic Hudson.

Phil earned his B.A. degree at Pennsylvania State University and Evergreen State College and his M.S. from Columbia University. In his spare time, Phil is an avid Nordic skier, and Masters and open water swimmer. Phil is married to Liza vonRosenstiel, a well-known Seattle area artist, and has a very free spirited 21 year old daughter named Sasha.

Dave Gowdey

Grand Canyon Program Director

Dave became Trust team member in November 2007. A Prescott native, Dave grew up in northern Arizona and earned a BS in Political Science from NAU in 1983, and a Masters degree in International Relations from the University of Aberdeen in Scotland in 1987. He joined the US Foreign Service in 1988 and served in US Embassies in Dublin, Ireland and Quito, Ecuador.

In 1993 Gowdey moved to the United Nations where he served as the Office Director of the Mine Clearance and Policy Unit, and as a United Nations Representative. In 2002 he served as Executive Director of the Arizona Wildlife Federation, and in 2004 he accepted the position of Executive Director of the Wyoming Wildlife Federation. While in Wyoming he helped spearhead the creation of the Wildlife and Natural Resources Trust Fund—a $200 million endowment established by the state to fund wildlife habitat restoration and improvement projects. He also worked extensively on energy development issues, and issues affecting Yellowstone and Grand Teton National Parks. Dave is an avid fly fisher and bird hunter and has been a passionate conservationist for most of his life.

Kate Watters

Volunteer Program Manager

Kate Watters joined the Trust in December 2007 as the Volunteer Program Manager. She plans to apply her knowledge of protecting and restoring natural areas, and her experience leading volunteers, to continue building the Trust's thriving community of citizen stewards working to preserve the remarkable Colorado Plateau region.

Her past experience includes 10 years as a trail crew member and field biologist with Grand Canyon National Park, and work for the Ecological Restoration Institute, the Arboretum, and the Museum of Northern Arizona, participating in a variety of restoration, plant survey, and native plant gardening projects.

Kate earned a M.A. in Botany, Conservation Biology and Creative Writing in the Liberal Studies Program from Northern Arizona University, and a B.A. in Sociology from Wheaton College. She is co-author of the book, River and Desert Plants of the Grand Canyon. Spare moments are devoted to her small textile design business as well as outdoor pursuits, traveling and playing guitar around the campfire.

Travis Wiggins

Volunteer Program Coordinator

Travis' interest in environmental conservation began in the Southwest as a volunteer in the Grand Canyon. He started working at the Trust as a Volunteer Program intern in April 2007 and happily accepted a promotion to Volunteer Program Coordinator in November 2007. Travis enjoys the excitement of working with scientists, policy-makers, and land managers to address environmental challenges. However, most of all he enjoys sharing the landscapes of the Southwest with hardworking volunteers because he believes that the more time people spend experiencing wild places, the more they will be committed to protecting them.

Travis earned a BS in Business Management from the University of Georgia. He now spends his spare time hiking in beautiful country, rock climbing, sliding down snowy hills, and finding new places to explore with his partner Sonya and their dog Grey.

Christine Albano

Restoration Program Coordinator

Christine came on board in April 2007 and is primarily responsible for coordinating research and restoration projects on the Kane and Two-Mile Ranches. Christine brings seven years of graduate research and professional experience in ecological assessment and monitoring of stream and riparian systems in the Great Basin, Rocky Mountains and on the Colorado Plateau. Prior to joining the Trust, she was a biologist for the US Geological Survey in Utah, where her work focused on water quality assessment and biomonitoring. Most recently, she helped to develop and test biomonitoring field techniques specifically for Colorado Plateau streams for the National Park Service Inventory and Monitoring program. Christine received her B.S. in Biology from Westminster College in her home town of Salt Lake City, UT. She earned her M.S. in Ecology from Colorado State University in 2006.

Shannon Baker

Finance Manager, North Rim Ranches LLC

Shannon joined the Trust in December 2007 after more than 20 years living and working on a cattle ranch in the Nebraska Sandhills and managing a feed store. She lived in Boulder, Colorado for a few years before settling in Flagstaff in 2006. Ms. Baker earned her MBA at Regis University in Denver. Shannon is thrilled to combine her love of the land with her business experience.

DEPARTURES

Kari Malen left her Volunteer Coordinator position in October to take the opportunity to do conservation work in China.

Maria Clementi, formerly Volunteer Assistant, moved to Oregon in September to pursue other interests.

Robyn Slayton-Martin, the Trust's Development Manager, left us in August. She is now teaching at NAU.

We wish them all success in their new pursuits.

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Restoration Program Coordinator

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Mission

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.

Vision

We work toward a region where generations of people and all of nature can thrive in harmony. Our vision for the Colorado Plateau one hundred years from now is:

- A region still characterized by vast open spaces with restored, healthy ecosystems and habitat for all native plants and animals.
- A sustaining relationship between human communities and the natural environment.
- People living and visiting here who are willing and enthusiastic stewards of the region's natural resources and beauty.

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