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Iconic Status Can't Spare Grand Canyon From Myriad Threats

By APRIL REESE of [Greenwire](#)

GRAND CANYON NATIONAL PARK, Ariz. -- From the rim, the Grand Canyon, 15 miles wide at its most expansive and a mile deep, looks like one of the wildest, most timeless places on earth. Ponderosa pines and juniper trees girdle its plateaus, giving way to canyon walls of ancient sandstone, shale and granite, chiseled over millennia by the Colorado River below, wending through the canyon's depths along the same general course it has followed for thousands of years.

But a closer look reveals a canyon ecosystem that has been deeply altered by human forces. And today, the park is facing an unprecedented convergence of threats, the long-term effects of which are largely unknown.

"I think it really is a time that's maybe the most significant in the history of the Grand Canyon, when there's just lots of things going on at once," said Park Superintendent Steve Martin. "And the decisions we make right now will be particularly important."

When Theodore Roosevelt created the Grand Canyon National Monument through a presidential proclamation in 1908, he called for its keepers to protect it as it was forevermore. "Let this great wonder of nature remain as it now is," Roosevelt said in announcing the creation of the monument. "You cannot improve on it. But what you can do is keep it for your children, your children's children, and all who come after you, as the one great sight which every American should see."

But as more and more people have followed Roosevelt's advice -- about 4.5 million tourists visit the Grand Canyon each year, compared to about 44,000 in 1918, the year Congress elevated the monument to national park status -- pressures on the unique environment have increased in ways Roosevelt likely could not have foreseen.

A major upstream dam now regulates the Colorado River's flow through the park and has rendered the river unnaturally clear and cool. And invasive species like salt cedar and trout are crowding out native species such as willow and the endangered humpback chub.

Above the river, air quality has deteriorated as pollution drifts into the park from power plants, automobiles and other sources near and far. Small aircraft offer tourists a bird's-eye

view of the immense, multi-hued chasm, but the overflights create both noise and visual pollution.

And now, a new uranium boom, triggered by a renewed interest in nuclear power, has made ore deposits on the park's fringes attractive to mining companies, leaving park managers wondering how uranium extraction could affect the park.

"There are few places where we have such challenges as here in the Grand Canyon," said Bert Frost, the Park Service's associate director for natural resource stewardship and science, at a joint congressional field hearing held here last week by the House Natural Resources Committee's subcommittees on national parks, forests and public lands, and water and power.

The hearing, held in anticipation of National Park Week, which runs April 17-25, was organized by Rep. Raúl Grijalva (D-Ariz.), chairman of the parks, forests and public lands subcommittee. Grijalva, a frequent critic of natural resource development near prized public lands, has introduced a bill to prohibit uranium mining on 1 million acres around the Grand Canyon's perimeter, but the measure has yet to win a sponsor in the Senate.

Grijalva, who titled the hearing "On the Edge: Challenges Facing Grand Canyon National Park," indicated that commercial interests are getting in the way of protecting the iconic 1.2 million-acre park, which is also a World Heritage Site.

"What about the needs of the park?" Grijalva asked during the four-hour hearing, after hearing testimony from water and power interests. "It seems like the needs of the park are not part of the equation."

Uranium mining redux

Of all the problems facing the Grand Canyon, uranium mining may be the most pressing. "That's the biggest one right now," said Grijalva.

During the 1980s, several mines operated on the canyon's north and south rims, including one about 13 miles from the Havasupai Indian reservation in a side canyon near the park boundary. As the uranium market waned in the late '80s and '90s, the canyon mines were mothballed -- until the renewed interest in nuclear energy and a subsequent rise in uranium prices focused new attention on the old mines.

The uranium issue flared publicly in 2008, when the Forest Service allowed exploratory drilling for uranium within a few miles of Grand Canyon National Park's south rim, the most popular area of the park. After environmental groups sued, a federal court halted the drilling, concluding that the service had failed to consider the environmental impacts of mining before granting its approval.

Exploratory drilling is still taking place on Bureau of Land Management lands on the north

rim of the canyon, but the Interior Department has imposed a two-year moratorium on new mining claims while it studies the potential impacts of new uranium mining in the area. A draft environmental impact statement (EIS) is scheduled for release in August, Frost said.

Critics, including the Havasupai and Hualapai tribes, environmental groups and some members of Congress, fear that mining uranium so close to the Colorado River will contaminate springs and groundwater that the tribes rely upon for drinking and agriculture. "Uranium mining ... has potentially direct impacts to the water in this region," said Abe Springer, a hydrogeology professor at Northern Arizona University.

Robert Arnberger, a former superintendent of Grand Canyon National Park who is now retired from the Park Service and lives in Tucson, said uranium mining could also have a chilling effect on Grand Canyon tourism, which generates \$300 million a year for local economies.

Nikki Cooley, a Navajo forester and river guide whose grandfather died from cancer after working in a uranium mine in Utah, urged the congressional members to stop the "looming threat" of uranium mining near the canyon. "Uranium was never supposed to be removed from the earth. It's a poison. It comes out at a great cost to the people who live here," Cooley said.

"We depend on that water," added Carletta Tilousi of the Havasupai tribe. "For this reason, we are greatly concerned for human life and animal life in the bottom of the canyon." She then asked members of her tribe attending the hearing to stand. "These are the people of the Grand Canyon," she said, motioning to the dozen or so people who stood. "These are the lives that are at stake."

Bill Hedden, head of the Grand Canyon Trust, an environmental group based in nearby Flagstaff, Ariz., said the federal government is still spending billions of dollars to clean up old uranium mines, including one from the 1960s in an inholding within the park that is now a Superfund site, and there are other places in the Southwest to mine uranium besides the Grand Canyon.

But mining proponents say there is no evidence of water contamination from previous mining activity in the area and a uranium mining resurgence will help revive northern Arizona's economy.

They point to a recent study by the U.S. Geological Survey, which found that 95 percent of more than 1,000 water samples analyzed by the agency contained dissolved uranium under 30 parts per billion (ppb), U.S. EPA's health standard for drinking water. Two-thirds of the samples showed dissolved uranium levels below 5 ppb, while 20 samples showed dissolved uranium concentrations greater than 30 ppb ([Land Letter](#), Feb. 25).

However, the study found uranium and arsenic consistently exceeded natural levels in soil samples taken from six sites that underwent uranium mining in the Kanab Creek area north of the national park.

Andrea Alpine, head of USGS's Southwest Biological Science Center in Flagstaff, told the hearing that the study relied partly on data from old water samples and USGS is working to finish another study using more recent data. Furthermore, she said, USGS is studying whether the uranium in the water is from natural sources or unnatural sources such as mining.

"The administration has some tough choices to make," Grijalva said during the hearing. "We will continue to advance the idea of permanent withdrawal."

A river dammed

Another major issue facing park managers is how to protect the canyon's flora, fauna, archaeological sites and other resources that lie just downstream from Glen Canyon Dam.

The green, clear-running river that snakes through the park today used to be a ruddy, raging torrent at this time of year, swollen by spring snowmelt. But since Glen Canyon's floodgates closed in the 1960s, the river has become highly regulated, and releases from Lake Powell, the reservoir behind the dam, are generally timed to provide for optimal power generation. And the sediment the river once carried downstream, which settled into beaches and sandbars that created habitat for fish and other aquatic species, is now trapped by the dam.

"The Colorado River system is one of the most controlled water systems in the world," said Frost, the Park Service associate director for park stewardship and science.

Robert Lynch, a water attorney based in Phoenix, reminded the subcommittee members that Glen Canyon Dam "keeps the lights on" for millions of people in the Southwest -- and much more cheaply and reliably than solar or wind power would.

"At a time when we're facing water shortages, the last thing we want to do is reduce water supplies," said Rep. Tom McClintock (R-Calif.), whose 4th Congressional District north of Sacramento relies on both power and water from Glen Canyon Dam and Lake Powell.

"At a time of high electricity prices, the last thing we should be doing is reducing our electricity supplies," added McClintock, a member of the subcommittee on water and power. "And yet here we are, the House of Representatives, considering just that."

But Grijalva said altering dam management to better protect park resources would not necessarily require a drop-off in power generation, and water supply commitments could continue to be met. "We're not talking about taking Glen Canyon Dam offline," he said. "We're talking about some measures that would add some protection to the resource."

Adaptive management

Several panelists were also critical of "adaptive management" strategies being used to manage the Colorado River below the dam. The \$80 million program, overseen by the 25-member

Glen Canyon Dam Adaptive Management Work Group, was set up in 1996 to test various management practices and put the best ones to use.

Among other things, the group -- comprised of representatives of the hydropower industry, tribes, environmental groups, the Bureau of Reclamation and National Park Service, among others -- is charged with making recommendations to the Interior Secretary on how to meet legal requirements under the Grand Canyon Protection Act of 1992. That law requires the department to protect and recover park resources while continuing to provide power from the dam and honor water supply commitments under the Colorado River Compact, which divvies up the basin's water among seven Western states.

But the group is often at loggerheads ([Land Letter](#), May 7, 2009), and it has been criticized for focusing too much on research rather than making actual management improvements, said Arnberger, the Grand Canyon park superintendent from 1994 to 2000.

"The power industry has been supportive of extensive research to study the river, and the water released through the dam, to the extent possible to determine what is best for the resource," he said. "At times, though, it seems to me that research is being used as an artful dodge to making hard management decisions."

The Grand Canyon stretch of the Colorado River is one of the best-studied river systems in the United States, he added. "Does that mean that we know everything, or that there are still unanswered questions? Absolutely not. But we know enough to tilt the table toward doing the management regime to protect the park as required by law. The research needs to be turned into applied science."

Steve Carothers, founder of Phoenix-based SWCA Environmental Consultants and a co-author of the adaptive management portion of the Glen Canyon Dam environmental impact statement in the mid-1990s, said a collaborative group consisting of economic and ecological interests is not a very effective approach for managing the river corridor.

"The adaptive management program votes on science," Carothers told the field hearing. "It's not a good process. It's a disaster in the making."

But there are bright spots in the river's condition.

Last year, for example, USGS found that the Grand Canyon's federally endangered humpback chub population had increased by 50 percent between 2001 and 2008. While the cause of the fish's rebound remains unknown, researchers believe it is partly due to experimental high flow releases from the dam, the removal of invasive trout and warmer water temperatures due to prolonged drought ([Land Letter](#), April 30, 2009).

"Adaptive management probably has served native fish well, but to what degree and exactly how we are not sure," Carothers noted in his written testimony.

And researchers have learned much about the habitat requirements of native fish, as well as how to retain the sandbars and beaches created by the high-flow experiments. Such terra firma provides important camping and resting sites for the 20,000 rafters and kayakers who float down the canyon each year.

To keep the sediment from being washed downstream after high-flow events, researchers say the Bureau of Reclamation, which manages the river's hydrodams, should maintain low, steady releases. But that flow regime would result in a slight decrease in power generation.

Under current management policies, Reclamation conducts steady flows for two months, September and October, each year to help create warmer conditions that young humpback chub need to survive. But fisheries biologists have recommended that the agency conduct steady flows during the summer months instead, when the young chub first enter the mainstem Colorado River from the tributary habitat where they begin their lives.

According to the 2008 environmental assessment for that year's high-flow experiment, "increased hydropower costs was a factor in proposing a steady flow test during the fall rather than the summer when much higher economic impacts would occur."

Part of the problem is that it is unclear who would shoulder the economic burden of tweaking flows to more closely mimic historic conditions.

"We don't know right now how to transition from science to management," said Shane Capron of the Western Area Power Association, which heads the adaptive management program's technical working group, at a meeting last May. "There are big implications of moving these things into management: Who pays? Who implements?"

Other issues

Other major issues facing the Grand Canyon 40 years after Glen Canyon Dam's construction include the spread of invasive species such as tamarisk, which has colonized the river's banks within the park, deteriorating air quality from upwind pollution sources, controversial overflights and a \$300 million maintenance backlog -- one of the largest in the National Park System.

But the Park Service is working toward finding solutions for several of those problems, said Martin, the current Grand Canyon park superintendent.

Among other things, officials are nearing completion of a new overflight plan that should resolve a long-standing fracas between air tour operators and the Park Service over how many flights should cross the park's airspace each day. Complicating the issue is the matter of jurisdiction: Air traffic over the canyon is regulated by the Federal Aviation Administration, not the Park Service.

On air quality, park officials are working with the utility owners of the Navajo Generating Station near Page, Ariz., to retrofit the plant's coal-fired boilers to reduce harmful emissions, said Maureen Oltrogge, a spokeswoman for Grand Canyon National Park.

The maintenance backlog, which includes needed repairs to campgrounds, sewer systems, roads and other infrastructure, remains a major concern, however, and is unlikely to be resolved soon. "That deferred maintenance figure continues to grow," Martin said. "We're not able to keep up."

Another vexing problem is ensuring that the visitor services provided by private concessionaires, who run the park's hotels and restaurants, continue to meet quality standards.

The contract for one large concessionaire, Xanterra, is up for renewal next year. But under a complex new law that allows concessionaires to hold significant value in the buildings in which they operate, existing contract-holders may be able to effectively control their holdings, possibly undermining the Park Service's ability to solicit new bids from contractors.

"It's an odd situation with our concessionaires, and it may restrict our ability to improve the buildings, and it could affect the quality of visitor services over the coming years for millions of people," Martin said.

Other parks, such as Yellowstone, have received funding to allow the Park Service to essentially buy out the concessionaires' interest in buildings, an option Grand Canyon National Park is looking into, said Martin.

No easy answers

Arnberger, who was born at Grand Canyon National Park in 1947, when his father was a ranger there, said many of the threats facing the park today are the same ones he grappled with during the 1990s. While progress has been made on some fronts, the thorniness of the park's challenges may make it difficult to ever fully resolve some of them, he said.

"That doesn't mean there's been no progress on solving issues, it's just an indicator of the depth and seriousness of those issues," he said in a phone interview. "None of them are issues you solve overnight."

David Nimkin of the National Parks Conservation Association said Grand Canyon park officials face a particularly daunting challenge in that they are under pressure from a wide variety of interest groups -- including environmentalists, mining firms, air tour operators, hydropower providers and park visitors -- all of which have a major stake in how the park is managed.

While Nimkin said management policies should dictate how the Park Service responds to new

and existing challenges, "sometimes it's not always politically expedient."

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