
LR Press Release 01/05/07

Federal study launched to mislead the public into supporting failed efforts to recover endangered species

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For Immediate Release:

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Grand Canyon Cover Up

Federal study launched to mislead the public into supporting failed efforts to recover endangered species

(Phoenix, AZ) While native species continue to decline within one of the world's most famous river corridors, federal officials are soliciting public comments for remedies without acknowledging the problem, nor their intent to continue with the same failed strategies exacerbating the losses.

"The main problem in Grand Canyon is the loss of endangered species due to failure to operate Glen Canyon Dam according to the mandate of the Grand Canyon Protection Act," says John Weisheit, from Living Rivers. "Yet now that an out-of-court settlement has forced this new study on the operations of the dam, the public is not being informed of these impacts, nor that Grand Canyon is the principle victim of their mismanagement policies."

The launch of this new Environmental Impact Statement (EIS) comes after more than three decades of studies and experimentation, Congressional interventions, and millions of taxpayer dollars invested principally to reverse the decline of endangered species in Grand Canyon National Park.

The most egregious errors have come over the past ten years during the implementation of an extensive adaptive management and research program. Annual program reports repeatedly show that these efforts have not been sufficient to improve a single threatened natural or cultural resource.

Under adaptive management, one more fish species has gone extinct, the razorback sucker, and another, the humpback chub, has dwindled to just a few thousand fish. Additionally, Native American archeological sites that were to be protected, have either suffered further damage, or required emergency stabilization.

Despite this lack of progress, Bureau of Reclamation briefing materials introducing this new EIS, ignore any mention of endangered species, archeology or, with one minor exception, the Grand Canyon itself.

"If the Bureau won't honestly describe the problem, how can the public have faith that they are seriously interested in developing a solution," adds Weisheit. "The ten-year experimental plan they intend to develop demonstrates that nothing has changed and the Bureau of Reclamation remains intent on administering to the slow demise of the Grand Canyon."

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[Additional information](http://www.livingrivers2.org/archives/article.cfm?NewsID=744)

<http://www.livingrivers2.org/archives/article.cfm?NewsID=744>

[Reclamation web page about Glen Canyon Dam Long-Term Experimental Plan EIS](http://www.usbr.gov/uc/rm/gcdltep/index.html)

<http://www.usbr.gov/uc/rm/gcdltep/index.html>

LR in the News 01/14/07

Fight brewing over endangered fish

By GARY HARMON

The Daily Sentinel Sunday

The federal government is spending millions of dollars in Colorado to save endangered fish that, according to one organization, it's allowing to dwindle in the Grand Canyon.

The U.S. Bureau of Reclamation is embarking on a two-year process of putting together an environmental impact statement for a long-term experimental plan for operation of Glen Canyon Dam.

That study, said a Moab, Utah-based organization, Living Rivers, is a "cover-up" launched to mislead the public into supporting failed efforts to recover endangered species.

It is, actually, said Reclamation official Dennis Kubly, the beginning of an effort to balance management of Glen Canyon Dam with the needs of people and other species.

The idea, Kubly said, is to balance the operations of the dam with a multitude of needs, including the requirements of Colorado and other Upper Colorado River Basin states to deliver set amounts of water to the lower-basin states, the need for electrical generation, and the scenic needs of the Grand Canyon, as well as those of its fish.

"There are big stakes here," Kubly said. "Let's take the time to do it right and hopefully we won't have to do it over."

Reclamation, however, has a clear mission under the Endangered Species Act and the Grand Canyon Protection Act, said John Weisheit of Living Rivers.

The launch of the environmental impact statement follows three decades of studies and experimentation, Congressional interventions and millions of taxpayer dollars invested

principally to reverse the decline of endangered species in Grand Canyon National Park, Weisheit said.

Under the adaptive-management program used by Reclamation, the razorback sucker has become extinct in the canyon, and another, the humpback chub, has dwindled to just a few thousand fish.

"We're thinking the razorback never had very high numbers in the Grand Canyon," Kubly said, and the population of the "primary fish of interest," the humpback chub, has stabilized at about 5,000 adults after a decline.

"We hope we're turning the corner and getting some things right here," said Kubly, chief of the adaptive management group of Reclamation's Upper Colorado regional office in Salt Lake City.

The razorback and humpback, as well as the Colorado pikeminnow and bonytail chub, are the species targeted for recovery in the management of the Colorado River and its tributaries through Colorado, including the Grand Valley, and Utah.

Weisheit said the agency has ignored any mention of endangered species and archeology.

"Their attitude is that it's more important to make electricity to pay for the cost of the dams" than to meet the requirements of the law, Weisheit said.

The agency, however, needs time to experiment, Kubly said.

Reclamation hopes to complete its process by the end of 2008, then begin an estimated 10-year experimental flow program.

Take Action 01/18/07

Stop Congressional Ban on Studying the Decommissioning of Glen Canyon Dam

Every year, since 1998, there has been a section of the Department of Interior Appropriations' bill forbidding any study of decommissioning Glen Canyon Dam on the Colorado River. Your help is needed now to get this ban lifted.

The region's climate change is illustrating how irrelevant Lake Powell reservoir is for water storage, and the dam's mounting impacts on Grand Canyon's Colorado River ecosystem are becoming more devastating.

Congress is poised to take-up this legislation again and your help is needed now to ensure that federal studies on the future of Glen Canyon Dam can proceed unencumbered.

PLEASE CALL AND WRITE your representatives in Congress

Urge them to support an amendment to the Interior Appropriations Bill, to negate the language that bans the use of federal funds to study the decommissioning of Glen Canyon Dam.

POINT OUT THAT:

- Climatic changes in the Colorado River watershed reinforce the need for evaluating more efficient water storage options. The 24 million acre-feet that Lake Powell has stored for the present drought came with a cost of 40 million acre-feet of Colorado River water lost to evaporation and seepage since Glen Canyon Dam was built. This is valuable water that could be used by the environment and communities in the states of Arizona, Nevada, California and Mexico. We need to explore other ways to store water and create energy. Storing this same water in underground aquifers, a strategy proliferating across the southwest, has a 99 percent recovery rate. Glen Canyon Dam is wasting valuable water. It's time to evaluate the dam's decommission so this water can be efficiently managed.
- The dam blocks the flow of the Colorado River killing Grand Canyon National Park's famed river ecosystem below the dam. This damage continues despite more than \$200 million invested in federal efforts to alter Glen Canyon Dam operations in an attempt to comply with the 1992 Grand Canyon Protection Act. Studies must be allowed to evaluate the dam's decommissioning as a principle option for saving the Grand Canyon.

Sediment accumulation in the reservoir is steadily reducing the storage capacity and will eventually lead to failure of the dam, spillway erosion and collapse. The cost of managing this sediment must be addressed.

TO CONTACT YOUR REPRESENTATIVE For your REPRESENTATIVE'S specific contact information: phone, fax, address and email you can call the Capitol Switchboard (202) 225-1904 or go to the [House on-line look-up page](#).

TO CONTACT YOUR SENATOR For your senator's specific contact information: phone, fax, address and email you can call the Capitol Switchboard (202) 224-3121 or go to the [Senate's on-line look-up page](#).

Also send copies to:
Secretary Dirk Kempthorne
U.S. Department of the Interior
1849 C. Street NW
Washington, DC 20240
Phone: (202) 208-7351
Fax: (202) 208 6956
Email: exsec@ios.doi.gov
Or visit the [Department of the Interior's contact page](#)

THE LANGUAGE WHICH SHOULD BE OMITTED from the upcoming Interior Appropriations Bill.

No funds appropriated for the Department of the Interior by this Act or any other Act shall be used to study or implement any plan to drain Lake Powell or to reduce the water level of the lake below the range of water levels required for the operation of the Glen Canyon Dam.

SAMPLE LETTER

Dear Representative xxx
Dear Senator xxx

Please support eliminating, from the Interior Appropriations Bill, the ban to study Glen Canyon Dam decommissioning.

Please support an amendment to negate this ban so that the government can seek the best solutions for conserving precious Colorado River water and restoring critical river habitat in Grand Canyon National Park as called for in the Grand Canyon Protection Act.

The present drought situation reveals that Lake Powell reservoir is not the most efficient means for storing surplus Colorado River water. This drought is also coinciding with mounting evidence that the department of Interior's decade-long program to mitigate the impacts of Glen Canyon Dam on the resources within Grand Canyon National Park has been a failure. To aid in developing sound water use policy in the Colorado watershed, its critical that Congress allow the re-examination of how and if Glen Canyon Dam should remain operational.

Save Water for the Colorado's Future

Diverting water and storing it in underground aquifers represents the foundation for efficient Colorado River water storage, and should be vigorously pursued. It has become clear that above ground reservoir storage in the hot, arid desert is wasting vast amounts of precious water to evaporation. In addition the porous sandstone absorbs a lot of water that is not retrievable. We need to utilize underground storage in the places already proven feasible. Underground water banking programs can achieve up to 99 percent efficiency as compared to the 38 percent experienced with Lake Powell.

Assure Grand Canyon's Recovery

Since the 1992 passage of the Grand Canyon Protection Act more than \$200 million has been spent on mitigation efforts, but it isn't working. Glen Canyon Dam continues to devastate Grand Canyon's ecosystem.

The failure of this program to meet the goals of the Act was documented in the 2002 Bureau of Reclamation Report to Congress: Operations of Glen Canyon Dam Pursuant to the Grand Canyon Protection Act of 1992. More recent results of scientific studies

evaluating the Adaptive Management Plan have been even more disappointing. A review of their efforts to recover the endangered humpback Chub revealed that the Chub are spiraling toward extinction, declining by an average of 14 percent each year. We've already lost four of the eight fish species in Grand Canyon's river corridor and otters, muskrats, reptiles, insects and plants. It is critical that we now seek mechanisms that will actually comply with the Grand Canyon Protection Act.

Sediment Problems

Sediment accumulation in the reservoir is steadily reducing storage capacity and will eventually lead to failure of the dam, spillway erosion and collapse. In fact a high flow event occurring via monsoon or rapid snow melt could cause dam failure and disaster by moving the now high and dry exposed sediment, and the sediment in tributaries and depositing all of it at the face of the dam.

The cost of managing this sediment has not been addressed, nor have the effects of the absence of sediment in the Grand Canyon ecosystem been thoroughly analyzed. This too needs to be understood as we look toward a sustainable path for Arizona's water management.

As with the 84th Congress which allowed the creativity to design what was then felt optimal for Colorado River water management, so too must the 110th Congress allow federal water resource planners the same flexibility in guiding the Colorado's future. The public is ill served by banning analysis that could vastly improve both water storage efficiency on the Colorado, and a restored Grand Canyon river ecosystem.

Sincerely,
Your name and address

References and Additional Information 01/18/07

GLEN CANYON DAM AND ADAPTIVE MANAGEMENT PROGRAM

LIVING RIVERS

- [Living Rivers Press Release on the lawsuit settlement](http://www.livingrivers2.org/archives/article.cfm?NewsID=731)
<http://www.livingrivers2.org/archives/article.cfm?NewsID=731>
- [Letter by Living Rivers \(March 2004\) to initiate a supplemental EIS on operations of Glen Canyon Dam](http://www.livingrivers2.org/archives/article.cfm?NewsID=567)
<http://www.livingrivers2.org/archives/article.cfm?NewsID=567>
- [Letter by Living Rivers \(April 2004\) for initiating EIS on Temperature Control Device](http://www.livingrivers2.org/archives/article.cfm?NewsID=234)
<http://www.livingrivers2.org/archives/article.cfm?NewsID=234>
- [Letter by Living Rivers \(January 2002\) about the Strategic Plan of the Adaptive Management Program](http://www.livingrivers2.org/archives/article.cfm?NewsID=578)
<http://www.livingrivers2.org/archives/article.cfm?NewsID=578>

BUREAU OF RECLAMATION

- [Full Press Release by Bureau of Reclamation](http://www.usbr.gov/newsroom/newsrelease/detail.cfm?RecordID=14441)
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- [Federal Notice](http://www.usbr.gov/uc/rm/gcdltep/fedreg/NOI-NOPublicAMWGmtg110606.pdf) [1m PDF File]
<http://www.usbr.gov/uc/rm/gcdltep/fedreg/NOI-NOPublicAMWGmtg110606.pdf>
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- [Final EIS: Glen Canyon Dam](http://www.usbr.gov/uc/envdocs/eis/gc/gcdOpsFEIS.html)
<http://www.usbr.gov/uc/envdocs/eis/gc/gcdOpsFEIS.html>
- [Record of Decision](http://www.livingrivers2.org/pdfs/LRlibrary/gcdrod.pdf)
<http://www.livingrivers2.org/pdfs/LRlibrary/gcdrod.pdf>
- ["Sufficient Progress Reports" to the US Fish and Wildlife Service](http://www.livingrivers2.org/pdfs/LRlibrary/sufprogborofws.pdf)
<http://www.livingrivers2.org/pdfs/LRlibrary/sufprogborofws.pdf>
- ["Sufficient Progress Reports" from USFWS to Reclamation](http://www.livingrivers2.org/pdfs/LRlibrary/sufprogfwstobor.pdf)
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- [Report to Congress: Operations of Glen Canyon Dam](http://www.usbr.gov/uc/library/envdocs/reports/crs/pdfs/RptCongress03feb21.pdf)
<http://www.usbr.gov/uc/library/envdocs/reports/crs/pdfs/RptCongress03feb21.pdf>
- [Grand Canyon Protection Act](http://www.livingrivers2.org/pdfs/gcpa.pdf)
<http://www.livingrivers2.org/pdfs/gcpa.pdf>

ADAPTIVE MANAGEMENT PROGRAM (AMP)

- [AMP Web Page](http://www.usbr.gov/uc/rm/amp/index.html)
<http://www.usbr.gov/uc/rm/amp/index.html>
- [Discussion of the flow and non-flow options from the AMP](http://www.usbr.gov/uc/rm/amp/amwg/mtgs/06dec05/ExpOptions_06nov17.pdf)
http://www.usbr.gov/uc/rm/amp/amwg/mtgs/06dec05/ExpOptions_06nov17.pdf
- [AMP presentation on Sediment Augmentation Device](http://www.usbr.gov/uc/rm/amp/twg/mtgs/06jan25/Attach_04.pdf)
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- [Strategic Plan of the Adaptive Management Program](http://www.livingrivers2.org/pdfs/AMPstrategicPlan.pdf)
<http://www.livingrivers2.org/pdfs/AMPstrategicPlan.pdf>
- [Memo from Department of Interior](http://www.usbr.gov/uc/rm/amp/twg/mtgs/06nov08/ML_Memo_06nov01.pdf) [1m PDF File]
http://www.usbr.gov/uc/rm/amp/twg/mtgs/06nov08/ML_Memo_06nov01.pdf

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- [National Academy of Sciences: Review of the 1993 Draft Long-Term Monitoring Plan](http://www.livingrivers2.org/pdfs/GCDLong-TermPlanReview.pdf)
<http://www.livingrivers2.org/pdfs/GCDLong-TermPlanReview.pdf>
- [National Academy of Sciences: Colorado River Ecology and Dam Management \(1990\)](http://www.livingrivers2.org/pdfs/ColoradoRiverEcology1990NAS.pdf)
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GRAND CANYON MONITORING AND RESEARCH CENTER

- [USGS SCORE Report, released on October 25, 2005](http://www.gcmrc.gov/products/score/2005/score.htm)
The State of Natural and Cultural Resources in the Colorado River Ecosystem
<http://www.gcmrc.gov/products/score/2005/score.htm>
- [Guidelines of Grand Canyon Monitoring and Research Center](http://www.livingrivers2.org/pdfs/GCMRCguidelines.pdf)
<http://www.livingrivers2.org/pdfs/GCMRCguidelines.pdf>

US FISH AND WILDLIFE SERVICE

- [Biological Opinion: Glen Canyon Dam](http://www.livingrivers2.org/pdfs/BOgcd.pdf)
<http://www.livingrivers2.org/pdfs/BOgcd.pdf>
- ["Sufficient Progress Reports" from USFWS to Reclamation](http://www.livingrivers2.org/pdfs/LRlibrary/sufprogfwstobor.pdf)
<http://www.livingrivers2.org/pdfs/LRlibrary/sufprogfwstobor.pdf>
- ["Sufficient Progress Reports" to the US Fish and Wildlife Service](http://www.livingrivers2.org/pdfs/LRlibrary/sufprogbortofws.pdf)
<http://www.livingrivers2.org/pdfs/LRlibrary/sufprogbortofws.pdf>

GOVERNMENT ACCOUNTABILITY OFFICE

- [Review of Glen Canyon Dam EIS by Government Accountability Office](http://www.gao.gov/archive/1997/rc97012.pdf)
<http://www.gao.gov/archive/1997/rc97012.pdf>

Take Action 01/19/07

Save Grand Canyon from Glen Canyon Dam

New Environmental Impact Study Underway on Glen Canyon Dam Operations

Comments needed to demand that Bureau of Reclamation focus on actions for endangered species recovery in Grand Canyon National Park, not more experimentation for the



preservation of Glen Canyon Dam.

Submit by: Tuesday, February 28, 2007

In an attempt to comply with a settlement agreement reached last September between environmental groups and the Department of Interior, the Bureau of Reclamation has begun the scoping process for an Environmental Impact Statement on the operations of Glen Canyon Dam called the Long-Term Experimental Plan.

As presently conceived, this EIS will deliver nothing more than a continuation of studying Grand Canyon to death.

Your voice is needed to expose this fallacy and redirect the EIS away from experimentation aimed at preserving the operations of Glen Canyon Dam, and toward the principle objective of restoring and preserving Grand Canyon's unique river ecosystem.

[VIEW SAMPLE LETTER](#)

Submit comments to:

Mr. Rick Gold
Regional Director, Bureau of Reclamation
Upper Colorado Region
Attn: UC-402
125 South State Street
Salt Lake City, Utah 84138-1147



Fax: (801) 524-3858

[Click To Send E-mail](#)

E-mail: GCDExpPlan@uc.usbr.gov

[AUTOMATICALLY SUBMIT E-mail comments now!](#)

Background

For more than four decades the world-renowned Colorado River ecosystem in Grand Canyon National Park has been [deteriorating due to the upstream operations of the 700-foot-high Glen Canyon Dam](#). Beaches, endangered native fish and archeological sites have all disappeared as cold, nutrient-depleted water is released at the whims of dam operators on a daily basis, replacing the gradual seasonal fluctuations consistent with the Colorado River's natural hydrology.

Within ten years of the dam's completion, strong public outcry forced the Bureau of Reclamation (BoR) to begin exploring mechanisms to alter Glen Canyon Dam's operations to reverse its detrimental effects on Grand Canyon National Park. Despite hundreds of millions of dollars invested, major studies completed, and new laws enacted by Congress, BoR has continued to drag its feet citing an ongoing need for more studies. As a result, the damage persists.

One more endangered fish has become extinct in Grand Canyon, another has seen its population decline to just a few thousand, while non-native fish now flourish in the artificial environment created by the dam. In total, four of eight native fish species have gone extinct, otters and muskrats have disappeared, and the riparian ecology has been dramatically altered--from the river's native food web to the proliferation of non-native plants throughout the canyon.

Only through the public intervention yet again, has BoR been forced to re-examine the operations of Glen Canyon Dam due to its lack of compliance with federal environmental laws. But this exercise is already shaping-up to be nothing more than a continuation of the stall and divert tactics in BoR's ongoing effort to study the dam's impacts until there's nothing left of Grand Canyon's native riverine environment to protect.

There already exists an abundance of scientific understanding regarding how dam operations must change if Grand Canyon's river ecosystem is to be protected, much of it stemming from the first Glen Canyon Dam Environmental Impact Statement completed in 1995. The problem is that these recommendations are not being followed by the stakeholder group put in charge of implementing these regulations, The Glen Canyon Dam Adaptive Management Program.

Dominated by water and power interests, this group of advisors to the Secretary of the Interior has continuously sidestepped its directives as outlined in the 1995 EIS. They have failed to develop a recovery plan for the endangered razorback sucker or a second population of the endangered humpback chub. They have failed to augment the water temperature or to restore sediment. And despite ongoing declines in native fish, they have failed to implement river flows consistent with the river's natural hydrograph as also called for.

Additionally, this long-term experimental operating plan, which is to be the subject of this EIS represents the pieces of another failed effort by the AMP that was supposed to be completed two years ago.

The problem is not knowing what to do-the problem is actually doing it. The lack of commitment to the scientific mandate has lead many quality researchers to abandon the program. Others who have endeavored to remain, but challenged the AMP's lack of commitment to its mandate have seen their recommendations suppressed, and their contracts cancelled.

This direction of this EIS initiative itself is further evidence of these misplaced priorities. The ingredients for the restoration of the Colorado River through Grand Canyon must be evaluated independently of interests in Glen Canyon Dam operations, not the other way around. Furthermore, as has already been illustrated by Living Rivers and others, they are numerous arguments for evaluating the decommissioning the dam entirely, beyond those benefits which would accrue to Grand Canyon's river ecosystem.

It is therefore mandatory that independent scientific and economic guidance be employed to advise policy makers on the recovery and preservation strategy for the Colorado River corridor in Grand Canyon National Park, and no longer the AMP.

There are many alternatives to meeting the theoretical water storage and energy benefits provided by Glen Canyon Dam, there are however no substitute for the recovery and protection of Grand Canyon's unique riverine ecosystem.

[Additional information about Glen Canyon Dam and the Adaptive Management Program](http://www.livingrivers2.org/archives/article.cfm?NewsID=753)
<http://www.livingrivers2.org/archives/article.cfm?NewsID=753>

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Sample scoping comments' letter to Bureau of Reclamation for its EIS on the Long Term Experimental Plan for the Future Operations of Glen Canyon Dam

Submit on or before Tuesday, February 28, 2007

To send via email: GCDExpPlan@uc.usbr.gov To send via fax: (801) 524-3858

Mr. Rick Gold
Regional Director, Bureau of Reclamation
Upper Colorado Region
Attn: UC-402
125 South State Street
Salt Lake City, Utah 84138-1147



Dear Mr. Gold,

Thank you for the opportunity to submit the following scoping comments for the Environmental Impact Statement on the Long-term Operations for the Future Operation's of Glen Canyon Dam. The river ecosystem in Grand Canyon National Park has suffered immensely over the past forty years due to the operations of Glen Canyon Dam, and it's vital that a fresh look at the problem be undertaken. I have concerns, however, that the EIS as envisioned is destined to fail in this regard unless a number of critical issues are addressed.

First, I would like to express my tremendous dismay with the Department of Interior's mishandling of the recovery efforts in Grand Canyon National Park over the past 40 years, and that the information presented so far by the Bureau of Reclamation indicates that this EIS promises more of the same.

While new plans for ongoing investigation and experimentation can be beneficial, they are useless amidst a backdrop where the commitment to implement those plans is virtually non-existent. We've already experienced this with the completion of the first EIS twelve years ago, and there's nothing outlined in the purpose and need for this EIS process to indicate things will be any different once this process concludes. For this

exercise to yield any meaningful outcome, the EIS process must be reconceived incorporating the following:

1. Restructuring the focus of the EIS on the recovery.

The principal objective should not be the long-term operation of Glen Canyon Dam, but the ingredients necessary to bring about the recovery and preservation of endangered species within the Colorado River corridor of Grand Canyon National Park. While such objectives may not be mutually exclusive, this has yet to be proven, and as such, one should precede the other. The focus must first address the ingredients necessary to restore the natural process to Grand Canyon's river ecosystem, and secondly how, and at what costs, can the Glen Canyon Dam/Lake Powell reservoir system be operated in order to achieve this. The restoration ingredients must include:

- The return of river flows consistent with the Colorado River's natural discharge into Grand Canyon.
- The re-establishment of a water temperature regime consistent with seasonal temperature variations of the Colorado River in Grand Canyon.
- The re-establishment of sediment inputs into Grand Canyon consistent with the amount that would be received in a dam-free environment.
- The elimination of non-native species, which have taken hold in the artificial riverine environment created by Glen Canyon Dam operations.

2. Evaluate the Decommissioning of Glen Canyon Dam.

The no-dam alternative must be evaluated as one means of achieving the restoration of the natural process necessary for the recovery and preservation of endangered species in Grand Canyon's river corridor. The no-dam alternative provides a valuable base line from which to evaluate other operational alternatives. Additionally, in light of the climate and human induced changes affecting flows into Lake Powell, and thus the viability of the dam to meet perceived water supply and hydroelectric benefits, BoR has additional incentive to examine a decommissioning or no-dam alternative consistent with the Council on Environmental Quality guidelines.

3. Replace the Working Groups of the Adaptive Management Program.

Despite being given specific instructions twelve years ago as outlined in the 1995 EIS on Glen Canyon Dam operations, the Glen Canyon Dam Adaptive Management Program (AMP) has failed to deliver in almost every aspect, causing Grand Canyon's river ecosystem to endure further damage. Many of AMP's failings were spelled out in the United State's Geological Survey's SCORE Report of October 2005. It was precisely these failings that have compelled BoR to undertake this new EIS process as part of its settlement agreement with environmental groups last year. Absent any structural changes to the AMP, any recommendations coming out of this EIS process will be of little value, as there are no mechanisms to ensure they won't be ignored as were those from the EIS twelve years ago.

Dominated by water supply and hydroelectric power interests, it's not surprising that the AMP has been intransigent toward addressing the true needs for endangered species recovery in Grand Canyon. Scientific, not political and commercial interests, should be the sole advisors to the Secretary of Interior on how Grand Canyon's river ecosystem should be studied, monitored and managed consistent with the recovery objectives.

Therefore, the AMP should be replaced by an open source and independent body of research and advisory scientists, where the monitoring and research data are consistently and thoroughly peer-reviewed prior to formulating any recommendations to the Secretary of Interior.

We're closing in on 50 years of ecological destruction in Grand Canyon National Park due to the operations of Glen Canyon Dam. For much of this time the public has been asking that this be remedied. We continue to lose valuable time and species as the BoR procrastinates and resists the public's mandate to put the resource first. While there are plenty of substitutes to achieve the benefits Glen Canyon Dam may provide, there will never be another Grand Canyon. It's time for the BoR to stop thwarting the public's interest to protect it.

Sincerely,

Regional News 02/16/07

Dams could contribute to climate change

Photo caption: A "mud volcano" emitting methane and hydrogen sulfide gases through the exposed reservoir sediment of Lake Powell in Cataract Canyon and Narrow Canyon above Hite Marina.



LOS ANGELES, Feb. 16 (UPI) -- Dams may contribute to global warming instead of being the clean energy source many have long thought, the Los Angeles Times reported Friday.

Greenhouse gases are emitted during construction and when the land behind a dam is flooded and vegetation rots, causing carbon dioxide and methane gas to be released, the report said. Additional emissions result as the dams operate, including when water is released and a pressure drop frees gases locked within it.

"If these are going to be built as a response to climate change, you at least need to convene some people to study the effect it will have," Danny Cullenward, a research associate at the Program on Energy and Sustainable Development at Stanford University, told the Times. "The facts are in that it's not a zero-impact source from an emissions standpoint."

Cullenward said methane from reservoirs alone could boost global inventories 20 percent.

"When you look at this on a global level, this actually is a really, really massive impact," he told the newspaper. "I would say, right now, this is totally under the radar."

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Regional News 02/21/07

Colorado River Basin Water Management: Evaluating and Adjusting to Hydroclimatic Variability

From the National Academy of Sciences

Contacts: Bill Kearney, Director of Media Relations
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FOR IMMEDIATE RELEASE

Tree-Ring Data Reveal Greater Variations in Colorado River Flows Than Previously Assumed

Extended Droughts Are Recurrent, May Become More Severe Because of Higher Temps

[Download Report](#)

LAS VEGAS -- Tree-ring based reconstructions of the Colorado River's flow over hundreds of years show that average annual flows vary more than previously assumed and that extended droughts are not uncommon, says a new report from the National Research Council. Future droughts may be longer and more severe because of a regional warming trend that shows no signs of dissipating, the report adds. It also states that a preponderance of evidence suggests that rising temperatures will reduce the river's flow and water supplies. Coping with water shortages is becoming more difficult because of rapid population growth, and technology and conservation will not provide a panacea for dealing with limited water supplies in the long run, the report warns.

The Colorado River basin covers 240,000 square miles and extends over seven states and a portion of northwestern Mexico. The river's annual average flow of roughly 15 million acre-feet of water is used by tens of millions of Americans for drinking and other

household uses, agriculture, landscape irrigation, hydroelectric power, and rafting and other recreational activities. The river also is home to diverse ecological habitats and is central to hundreds of miles of beautiful vistas that it carved out over millions of years, including the Grand Canyon.

Exceptionally dry conditions in much of the Colorado River basin in recent years, along with new streamflow reconstructions based on tree-ring data, prompted the Research Council to convene a committee to examine how hydroclimatic trends might affect the river's future flows.

For many years, understanding of the river's flow was based primarily on records from stream gages. But the tree-ring data is transforming that understanding by demonstrating that the river occasionally shifts into decades-long periods in which average flows are lower, or higher, than the 15 million acre-feet average of the gaged record. In particular, the tree-ring reconstructions show that the years 1905-1920 were exceptionally wet, which is significant because the Colorado River Compact that governs the allocation of water between upper and lower basin states was signed in 1922, when it was assumed that annual average river flow was closer to 16.4 million acre-feet. Tree-ring data also indicate that extended droughts are a recurrent feature of the basin's climate.

The tree-ring reconstructions, coupled with temperature trends and projections, suggest that extended droughts will recur and may be more severe than recent droughts, the report says. Many different climate models point to a warmer future for the Colorado River region, the committee noted, although projections of future precipitation are more uncertain. Significant warming in the region over the past few decades is shifting the peak spring snowmelt to earlier in the year and contributing to increases in water demands, especially during the summer, the committee found. Warmer temperatures also result in more water being lost to evaporation.

The committee also looked at how a steadily rising population and related increases in water demand will affect Colorado River water management. The population across the western United States has grown rapidly in recent decades. Arizona saw a roughly 40 percent rise in population since 1990, for instance, while Colorado's population grew by 30 percent in the same period. Despite some successful water conservation efforts, urban water use in the region has increased significantly along with the expanding population. For example, water consumption in Clark County, Nevada, which includes Las Vegas, doubled between 1985 and 2000.

Increasing urban demands for water are often met through sales, leases, or transfers of water rights from agricultural users. Although 80 percent of available water in the West is devoted to agriculture, this allocation is finite, the committee warned, and water transfer agreements will be limited in their ability to satisfy growing, long-term demand. In addition, such agreements may be inhibited by their potential effects on third parties, such as downstream farmers or ecosystems. Technology and conservation measures are useful and necessary for stretching existing water supplies, the committee

acknowledged, but any gains in water supply will be eventually absorbed by the growing population.

The combination of limited water supplies, rapidly increasing populations, warmer regional temperatures, and the specter of recurrent drought point to a future in which the potential for conflict among existing and prospective new water users will prove endemic, the report concludes. This will inevitably lead to increasingly costly, controversial, and unavoidable trade-offs among water managers, policymakers, and their constituents.

It was therefore a welcome development when the seven Colorado River basin states presented preliminary proposals for managing water shortages in a letter last February to the U.S. secretary of the interior, the committee said. Such interstate cooperation will prove increasingly valuable, and likely essential, in coping with future droughts and water demands. Likewise, a commitment to two-way communication between scientists and water managers will be critical. In addition, the federal government should ensure that the U.S. Geological Survey has the resources to maintain and expand the Colorado River gaging system, which collects streamflow measurements essential for sound water-management decisions.

Many water managers in western states and cities have developed innovative programs and policies for extending limited urban water supplies, but there have been few attempts to synthesize the results from these efforts across the region, the committee noted. And despite advances in understanding of the basin's hydrology and climate, knowledge is lacking on other important topics, such as the environmental effects of water transfers and how best to forecast water demand. The committee noted that urban water demands are far more prominent today than in earlier eras when the compact and other agreements, treaties, and laws governing the river were forged.

The committee called for a collaborative, comprehensive basinwide study of urban water practices and pressing issues in water supply and demand, which should be used as a basis for action-oriented water planning. The collaboration involved in preparing such a report could also promote better communication among federal agencies, states, and municipalities. The proposed study could be conducted by the Colorado basin states, federal agencies, universities in the region, or some combination thereof. The basin states should work with Congress on a strategy to commission and fund the study.

The Research Council study was sponsored by the National Academies, U.S. Bureau of Reclamation, California Department of Water Resources, Metropolitan Water District of Southern California, and the Southern Nevada Water Authority. The National Academies is made up of the National Academy of Sciences, National Academy of Engineering, Institute of Medicine, and National Research Council. They are private, nonprofit institutions that provide science, technology, and health policy advice under a congressional charter. The National Research Council is the principal operating agency of the National Academy of Sciences and the National Academy of Engineering. A

committee roster follows.

Copies of Colorado River Basin Water Management: Evaluating and Adjusting to Hydroclimatic Variability will be available from the National Academies Press; tel. 202-334-3313 or 1-800-624-6242 or on the Internet at <http://www.nap.edu>. Reporters may obtain a pre-publication copy from the Office of News and Public Information (contacts listed above).

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This news release and report are available at <http://national-academies.org>

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Regional News 02/22/07

Necessity of new reservoirs debated

Some say climate trends argue against building more dams

News source: NOAA

By Deborah Frazier, Rocky Mountain News

February 22, 2007

Climate change may mean less water in Colorado rivers and streams, but experts can't agree on whether building more reservoirs is a wise investment or a waste of billions.

A series of recently released studies on climate change in the West predict more drought, warmer weather and greater water loss because of evaporation.

"The future doesn't portend a new abundance of nature's water. Rather, nature will be taking more water than it's now delivering," said Martin Hoerling, of the National Center for Atmospheric Research in Boulder.

Hoerling's research focused on the Southwest and the Colorado River, which originates in the Rocky Mountain snowfields.

Denver, Aurora, Colorado Springs, Fort Collins and other cities tap the Colorado River in western Colorado and move about 500,000 acre-feet to reservoirs that serve the Front Range.

An acre-foot, 325,800 gallons, supplies one to four families for a year depending on lawn size and landscaping.

Hoerling and other weather researchers said that climate trends argue against building more reservoirs that rely on the Colorado River. "If you add reservoirs, you are not going to fill them," he said.

The Colorado River serves seven states - Colorado, Wyoming, New Mexico and Utah in the upper basin and Arizona, California and Nevada in the lower basin.

When the 1922 Colorado River Compact divided the water among the states, the annual flow was estimated at 15 million acre-feet.

Hoerling said that the recent annual flows are about 13 million acre-feet, but by 2050, climate change may drop that to about 10 million acre-feet - less than what is currently used by all of the states. That could mean there would be no extra water to store in Colorado, which hasn't claimed it's full share of the river, he said.

"You can build all the reservoirs you want, but there are no existing surplus flows to fill them," he said.

That's not the conclusion that Chips Barry, manager of Denver Water, draws from the studies. Denver Water supplies 1.2 million homes in Denver and the suburbs. "It's a powerful argument for building more storage," Barry said. "More storage is one of the ways to adapt to climate change."

Barry said the climate studies also found a trend toward episodic periods of heavy precipitation with earlier and heavier runoff seasons.

"When you have a highly variable precipitation pattern, you store as much water as possible in times of plenty," he said. "That's the lesson of the West. You need more storage for the swings."

That doesn't mean a revival of the big dam building era that started in the 1960s after the devastating droughts of the 1950s.

Barry said that the best dam sites - mountain canyons - already have reservoirs. Environmental issues, political conflicts and costs make new reservoir construction difficult, he said.

That includes a reservoir that Denver Water wants to build near Wolcott in Eagle County. Denver Water owns enough water rights to fill a new reservoir, but a federal mediator is trying to resolve conflicts with western Colorado interests who want to keep the water there.

Despite the opposition, Barry said that Denver Water will pursue the project. The reservoir's size hasn't been determined, he said. "I can't afford to wait to fix global warming," Barry said. "And, you can't conserve your way out of global warming."

Neil Grigg, a civil engineering professor at Colorado State University and a water resources consultant, said that smaller projects may be the future.

Blue Mesa Reservoir near Gunnison is the state's largest storage project, at 940,000 acre-feet. Denver's Dillon Reservoir holds 252,000 acre-feet.

"If you built a large project and climate change diminished the water supply, it would never fill," Grigg said. "You'd have a failure."

Smaller reservoirs store up to 200,000 acre-feet, he said.

Large reservoirs at lower and warmer elevations also lose more water to evaporation - up to 30 percent of the stored supply in the southwest, officials said.

Grigg and others said that projects with smaller reservoirs that capture water from several river systems will be the most effective.

The Northern Colorado Water Conservancy District, which serves Fort Collins, Greeley and other towns in Larimer, Weld and Boulder counties, is studying several new storage projects.

"As we look at the forecasts for less runoff and most of it coming down all at once, we think we need to grab it as fast as we can," said Brian Werner, the district's spokesman.

The district is studying a 500,000 acre-feet reservoir near Maybell in northwestern Colorado to capture the Yampa River flows, he said. The Yampa River flows into the Colorado River, so the project would claim part of the state's share of the river.

The project could bring water to the South Platte, where farmers have had irrigation wells shut off, and to the south metro suburbs, Werner said.

The climate change projections make the project, estimated at up to \$4 billion, more attractive, Werner said. "While the drier years will get drier, those few wet years will be wetter. In those high years, you need the largest vessel possible," he said.

Chuck Howe, an economics professor at the University of Colorado who specializes in water supply, agreed. "The runoff will come earlier and faster and you'll want to catch it," he said.

But Howe added a warning. "There are places where additional storage ought to be considered, but one has to consider whether they will fill."

Nolan Doesken, the state's climatologist, said that the recent studies have shifted the discussion from whether there was climate change to "what do we do about climate change?"

"We know we are grateful for the water-storage projects we have now, but will new ones be cost effective? I have no idea," he said.

"That decision is the greatest challenge for the combination of science and policy that our part of the country has seen in a long time."

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Regional News 02/26/07

Scientists fear shortages could hit Colorado River earlier

Associated Press

Feb. 26, 2007 07:59 AM

TUCSON - Scientists and public officials fear water from the Colorado River will run short more quickly than previously predicted because of booming population growth and drought.

There's a 10 percent chance of shortages in four to five years, and a 25 percent chance the river will run short between 2020 and 2025, according to two prominent water officials in Arizona.

"I have no doubt that within the next five to 10 years, we will be in a shortage," said David Modeer, Tucson Water's director and a member of the three-county board that manages the Central Arizona Project, which diverts water from the Colorado River to Arizona.

"It does not look good," Modeer said.

Larry Dozier, general manager of the Central Arizona Project, said when the shortages happen, they would not reduce water deliveries to cities.

Rather, he said it would primarily affect non-American Indian farms that are lower on the pecking order for getting water from the Central Arizona Project.

But Dozier said the pain from shortages should be eased, if not eliminated, because the state has been buying excess Central Arizona Project water and storing it in the ground for the past decade.

Originally, scientists who conducted a 1995 federal study predicted states would lose no more than 3 percent of their river supplies even in the worst drought year.

Instead, in the time since the study, Lake Powell and Lake Mead carried less water than had been predicted for the worst possible drought, users took more water than expected, and the river's flow was weaker than expected.

Ben Harding, an engineer and one of the authors of the 1995 study, said the Colorado River's woes are a "system drought," caused by the huge scale of the Colorado's reservoir system that 25 million people rely on for water, and by population growth that has come to rely on it.

"The bigger the reservoirs that you build, the bigger the system you build, the more sensitive it becomes to droughts (and) the longer it takes to recover," Harding said. "You have a bigger hole to fill."

Harding said the study's authors assumed the worst-case drought would be a very rare event and probably many years off and that the high cost of pumping water 300 miles uphill to Tucson from the Colorado would reduce the demand for the project's water.

"The current drought, however, has caught water managers unprepared," Harding wrote.

LR Letter 02/28/07

LR Letter to Secretary Kempthorne: LTEP EIS

[Living Rivers Press Release on LTEP EIS](#)

[Download letter](#) [350k PDF File]

February 28, 2007

Honorable Dirk Kempthorne
Department of the Interior
1849 C Street, N.W.
Washington DC 20240

Sent Via Fax: 202-208-6950

Re: Environmental Impact Statement for the Long-Term Experiment Plan for the future operations of Glen Canyon Dam

Dear Secretary Kempthorne,

Living Rivers & Colorado Riverkeeper, and the Center for Biological Diversity request your immediate intervention into the Bureau of Reclamation's (Reclamation) Environmental Impact Statement for the Long-Term Experiment Plan for the future operations of Glen Canyon Dam (LTEP EIS).

While this National Environmental Policy Act (NEPA) process on Glen Canyon Dam's operations is long overdue, we fear that absent some significant retooling, Interior's approach to this EIS will only bring further damage to critical habitat and archeological sites within the Colorado River corridor of Grand Canyon National Park and Glen Canyon National Recreation Area.

As presently conceived this EIS does not sufficiently focus on the fundamental objective of recovering downstream resources. Nor does it appear this EIS will address the longstanding stumbling blocks to the successful implementation of any preferred recovery alternative, which to this day continue to thwart valuable recommendations made in the past.

For more than three decades the public has been demanding that Reclamation aggressively respond to the devastating impacts Glen Canyon Dam's operations have brought to Glen, Marble and Grand canyons. This EIS itself is the result of the continuation of these efforts: part of the settlement agreement between the Center for Biological Diversity, et al., and yourself, is to address Reclamation's demonstrated lack of progress in achieving compliance with numerous federal environmental and resource management laws and statutes associated with Glen Canyon Dam's operations.

Our organizations had hoped that this agreement would have compelled Reclamation to finally address these matters through a comprehensive EIS process committed to recovery. However, it is clear from the scoping process underway to date, that Reclamation's interests lie more with going through the motions of compliance with the settlement agreement, and not resolving the issues underlying it.

With the exception of accumulating additional evidence to substantiate further litigation, as it now stands, this EIS will be yet another waste of the public's resources in support of Reclamation's ongoing failure to implement an actual recovery plan for this critical piece of the world's natural heritage being destroyed by the operations of Glen Canyon Dam.

We therefore request that you instruct Reclamation to restructure this EIS process in accordance with the recommendations below. This EIS process should then be re-launched to allow the public to be properly informed of the issues being addressed, and inviting them to contribute to something truly meaningful.

1. Accurately Represent the Baseline Issues

Reclamation must accurately articulate the severity of the issues at stake with this EIS to enable the public to adequately respond. This must include describing the nearly complete loss of the natural and cultural resources in Grand Canyon's Colorado River corridor as a result of the operations of Glen Canyon Dam, and Reclamation's failed efforts to comply with federal mandates to rectify them. This is the background and baseline situation that forced the initiation of a new EIS process, thus must be presented to the public for the NEPA process to be credible. Reclamation's omissions not only mislead the public about the issues in which they are being asked to comment, but help to reinforce a proposed action which only appears rational when viewed through such tainted lenses.

Although the impacts on Grand Canyon National Park are the sole impetus, and thus intent for this EIS, one is hard pressed to develop any grasp of these issues through Reclamation's materials. Reclamation also appears to actively avoid mentioning Grand Canyon whenever possible, preferring instead the term—"downstream resources."

This is far from a trivial matter. At best, it illustrates an ongoing pattern by Reclamation to shield the public from knowing the true impacts of Glen Canyon Dam, and at worst, reveals a fundamental disconnect within Reclamation and Interior as a whole—as to what the real issues are, and how they should be addressed.

The superlatives associated with Grand Canyon are extensive. As such, Grand Canyon is one of Interior's most featured national parks. The ecology of its river corridor, too, was once unparalleled, as was acknowledged by your predecessor, Secretary Norton:

"The native fish community in the Colorado River in Grand Canyon was once one of the most unique in the world, supporting eight species that occurred nowhere else. Of the eight native fish species, three (Colorado pikeminnow, roundtail chub, and bonytail chub) have been extirpated from Glen and Grand Canyons; one – listed as endangered (razorback sucker) – has not been observed in the system since 1991; one (humpback chub) is listed as endangered; one (flannelmouth sucker) is a candidate for listing; and the remaining two (bluehead sucker and speckled dace) appear to be doing reasonably well in the Grand Canyon although much remains to be learned about their ecology and population dynamics." (2002 Report to Congress, page 23.)

Glen Canyon Dam's role in this demise of the Canyon's native fish is unquestioned. Be it the release of water of unnatural temperature, quantity, quality, and frequency; depriving Grand Canyon of sediment and nutrients needed for natural beaches and wildlife habitat; or so severely altering the aquatic ecology of the Colorado River allowing nonnative species to displace native species. Glen Canyon Dam has become a death sentence for the main artery that nourishes Grand Canyon National Park.

Such impacts clearly run contrary to the National Park Service Organic Act which compels Interior “to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same by such means as will leave them unimpaired for the enjoyment of future generations.” The dam’s operations also run afoul of the Endangered Species Act of 1973. This is precisely why, in 1992, Congress passed the Grand Canyon Protection Act (GCPA) and forced Reclamation to complete its first EIS on Glen Canyon Dam’s operations (1995), and established a monitoring and research program with a specific mandate that Reclamation alter dam operations to reverse this decline and work to recover all native fish species in Grand Canyon National Park.

But ten years after the GCPA was passed, Secretary Norton reported to Congress that Reclamation’s efforts have failed to stem the population decline of the principle species it was mandated to protect:

“The first population estimate of humpback chub in the Grand Canyon suggests that in 1982 there were 7,000 to 8,000 humpback chub larger than 200 millimeters. Approximately ten years later, in 1992, it was estimated that there were approximately 4,000 to 5,000 humpback chub larger than 150 millimeters. In 2001, there were approximately 2,000 to 3,000 humpback chub larger than 150 millimeters. While there is some question over the accuracy of the absolute numbers, there is little question that the population of humpback chub in the Grand Canyon has declined over time. The decline in the abundance of fish larger than 150 millimeters appears to be the result of a sustained decline in recruitment beginning in 1992.” (2002 Report to Congress, page 25.)

The failure of Reclamation’s recovery efforts were further documented three years later by the United States Geological Survey’s “State of the Colorado River Ecosystem in Grand Canyon” (SCORE Report) of October 2005.

“Overall, about 15%–20% of the adult humpback chub are dying each year. If this mortality rate and the dramatically reduced recruitment rate of young chub experienced since the early 1990s remain unchanged, there will be a decline in the adult population of humpback chub from the present 3,000–5,000 fish to a level of 1,500–2,000 adult fish over the next 10–15 years.” (Page 45.)

“[D]am operations during the last 10 years under the preferred alternative of the MLFF have not restored fine-sediment resources or native fish populations in Grand Canyon, both of which are resources of significant importance to the program.” (Page 208.)

“At the same time, nonnative fish have increased in both diversity and abundance. The reasons for the decline of native fish are commonly cited to include dramatic changes in the thermal, sediment, and hydrologic regimes of the river because of the construction and operation of numerous dams in the basin, the introduction of nonnative predatory and competitive fishes, and the introduction of diseases and parasites.” (Page 208.)

“[I]t is clear that the restrictions on dam operations since 1991 have not produced the hoped-for restoration and maintenance of this endangered species. During the MLFF,

basin hydrology has varied from drought to wet conditions and then back to drought conditions. Through these conditions, the decline of the humpback chub has continued. This trend leads to questions about whether daily, monthly, or even annual patterns of dam operation alone are relevant to native fish recruitment or whether changes in the sediment and thermal regimes of the river imposed by regulation have had the greatest influence on native fishes. Further, the issue of nonnative fishes and their potential to limit recruitment of native fish through predation and competition (although highly suspected by scientists as a significant factor) remains unresolved in Grand Canyon.” (P. 208.)

“[T]he relatively stable habitat conditions created under the MLFF during protracted drought conditions, coupled with a coarsening of substrate in the river channel, appear to have greatly favored rainbow trout (*Oncorhynchus mykiss*), particularly in the Lee’s Ferry reach, as reflected in their increasing numbers during the last decade.” (Page 214.)

“Research and monitoring have conclusively demonstrated a net loss of fine sediment from the Colorado River ecosystem under the MLFF. Closure of Glen Canyon Dam eliminated about 84% of the sand that historically entered Grand Canyon.” (Page 214.)

It’s now been 15 years since the GCPA was passed, and Reclamation’s dam operations have made no gains in recovering a single fish species in Grand Canyon. They have only reinforced what federal scientists already had told them: that without efforts to restore natural flows, water temperature gradients and sediment transport through Grand Canyon, there is no reason to believe that recovery can occur.

Despite the compelling evidence of poor performance, you yourself stated in December 2006, that the Glen Canyon Dam Adaptive Management Program (AMP) "is a cutting edge solution that provides an effective framework and process for integrating dam operations, downstream resource protection and management, and monitoring and research. We also are able to better safeguard natural resources and improve recreational opportunities at Glen Canyon National Recreation Area and Grand Canyon National Park."

The outreach materials also use the phrase “significant progress” when describing the AMP. However, when it comes to actually achieving what the principle objective of recovering endangered species, none of this is true. The public needs to know what the true state of play is in Grand Canyon, what cultural and ecological resources that have been lost due to the operations of Glen Canyon Dam and asked if they want to see it completely destroyed through continued implementation of activities such as those contemplated by the Long-Term Experimental Plan. If the public feels such losses are acceptable then end this fabled recovery exercise altogether. If not, then Interior must become serious about implementing an EIS that will achieve that result.

2. Accurately Assess the Failed History

A. Faulty Flows

Your positive spin on the AMP notwithstanding, the fact that this EIS process is underway at all is indicative that there must be problems with the program. As such, the EIS process must first conduct an independent audit to analyze how the performance of the AMP measures with the expectations of the GCPA and the AMP's charter and strategic plan.

One of the most critical aspects of the Grand Canyon Protection Act was to modify flows from Glen Canyon Dam to improve habitat conditions for native fish. Since the Act was passed, however, both Reclamation and the AMP have demonstrated resistance to implementing the flows and other recommendations from the US Fish and Wildlife Service (FWS) to achieve this objective. Even with a demonstrated reduction in native fish populations, Reclamation and AMP have been unwilling to implement a flow regime reflecting the river's natural hydrology, known as Seasonally Adjusted Steady Flows (SASF).

"It is my biological opinion that the proposed operation of Glen Canyon Dam according to operating and other criteria of the MLFF, as described in the Draft EIS and further modified by Reclamation's June 17, 1994, memorandum, is likely to jeopardize the continued existence of the humpback chub and razorback sucker and is likely to destroy or adversely modify designated critical habitat." (Biological Opinion, page 3.)

"Operate Glen Canyon Dam according to operating and other criteria of the SASF alternative. Draft EIS Elements common to all alternatives, habitat and maintenance flows, and elements two through seven of the Reasonable and Prudent Alternative would be part of this recommendation. The SASF has been analyzed as completely as any other alternative in the Draft EIS and would not require any additional analysis." (Biological Opinion, page 42.)

Reclamation defended its position to ignore this recommendation in its 1996 Record of Decision on the Final Glen Canyon Dam EIS stating:

"...the benefits from the Seasonally Adjusted Steady Flow Alternative were uncertain given the improvement in habitat conditions for nonnative fish this alternative would provide. Seasonally adjusted steady flows also would create conditions significantly different from those under which the current aquatic ecosystem has developed in the last 30 years and would adversely affect hydropower to a greater extent than the other two alternatives. The Modified Low Fluctuating Flow (MLFF) could substantially improve the aquatic food base and benefit native and nonnative fish. The potential exists for a minor increase in the native fish population." (1996 Record of Decision, Appendix G-12.)

The principle objective of most recovery strategies is to attempt to restore native habitat conditions, in this case stream flow, for the affected species. It was precisely the conditions of the previous three decades that had brought about this decline, yet Reclamation felt compelled to preserve as many of the unnatural conditions it created during this blip in history, as opposed to initiate flows more consistent with those of the previous three million years during which these species evolved.

While Reclamation argued that it wished to be cautious and not aggressively stress the system, they had already taken a significant step in altering Glen Canyon Dam's operating regime with the MLFF preferred alternative. The modifications to the hourly up and down ramping of river flows into Grand Canyon to meet the demands of the Western Area Power Administration (WAPA) had already somewhat altered the unnatural conditions of the past 30 years. What Reclamation and WAPA were not willing to do was support further flow restriction that would compromise hydroelectric revenue streams by an estimated 25 percent should the SASF be implemented as the preferred alternative.

While the Biological Opinion noted that during periods of high water, elements of MLFF may be appropriate to the extent they were consistent with the natural hydrograph, it was unambiguous regarding what to do during low water years, as has been experienced in the Colorado River for the past seven years.

"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 during low water years (releases of approximately 8.23 maf) to verify an effective flow regime and to quantify, to the extent possible, effects on endangered and native fish. Studies of high steady flows in the spring may include studies of habitat building and habitat maintenance flows. Research design and hypotheses to be tested will be based on a flow pattern that resembles the natural hydrograph, as described for those seasons in the SASF." (Biological Opinion, page 35.)

"If sufficient progress and good faith effort is occurring towards initiating experimental flows, implementation of experimental flows may occur later in 1997. If the Service believes there is not sufficient progress, Glen Canyon Dam would be operated as SASF flows during spring through fall (April to October) beginning in 1998." (Biological Opinion, page 32.)

In the last two FWS responses to Reclamation regarding sufficient progress on achieving this specific element of the Reasonable and Prudent Alternative (RPA) contained within the Biological Opinion, FWS clearly stated that progress was not being achieved.

"This element has not seen sufficient progress. Other than the controlled BHBF in 1996, there have been minimum efforts to develop experimental flows for native fishes. (Review of Sufficient Progress, May 27, 1999, page 3.)

"This element has not seen sufficient progress. We agree with your assessment that the delay in developing this element is largely attributable to the to the program being part of the adaptive management process, where multiple objectives, research and work assignments compete for time and attention of AMWG members. However, given the documented decline of humpback chub in Grand Canyon, additional delays in developing a program of experimental flows for native fish should not occur. (Review of Sufficient Progress, June 13, 2002, page 3.)

In light of this lack of sufficient progress, and the fact that flows have not exceeded 8.23 MAF since 2000, the RPA further states that "...Glen Canyon Dam would be operated as SASF flows during spring through fall (April to October) beginning in 1998." (Biological Opinion, page 35.)

Further support for the urgency to embark on steady flows came in 2002 from Grand Canyon Monitoring and Research Center's (GCMRC) principle aquatic ecology partners:

"Descending hydrographs of spring and fall are the best periods for the growth of the aquatic food base. We recommend a decade of the SASF alternative, with spring beach building flows as the climate permits and unlimited hydropower ramping within 10% of the predicted seasonal mean. We feel these flows in combination with alien fish suppression and thermal modification of GCD could make Grand Canyon a sanctuary for native fishes of the Colorado River basin." (Benenati, et al., 2002, page 10.)

The frustration of FWS and others is far from surprising since there has been only one low and steady flow test carried out, that in the summer of 2000. Worse still, now seven years later, the analysis of this test has yet to be completed. This is very discouraging, as it has been 11 years since the first experimental test flow took place, and it was the 2000 experiment that demonstrated that humpback chub populations "may have benefited from substantial in-stream warming." (USGS Press Release, August 3, 2006.)

The 1996 test of a Beach/Habitat Building Flow (BHBF) at 45,000 cubic feet per second (cfs) was conducted with much fanfare, and is still highly promoted by Reclamation as a major accomplishment. However, as was reported five years ago by the American Geophysical Union concerning the experimental releases from Glen Canyon Dam to conserve sediment, "Work conducted since the 1996 controlled flood has shown that the multi-year accumulation hypothesis on which the EIS was based is false..." (Eos, American Geophysical Union, v. 83, no. 25, page 237.)

The winter fluctuating trout suppression flows of 2004 and 2005 were a hastily conceived action in response to new information about declining humpback chub estimates. As pointed out by Korman et al., June 2005, these experimental flows were proven to be ineffective and have been discontinued. Surprisingly, these flows have now been included as one of the four alternatives for the LTEP EIS submitted by AMP in December 2006. Constrained releases in the fall of 2004 and 2005 were used to test the conservation of sediment (6,500 to 9,000 cfs). This has proved useful to understand that sediment can be retained during low flows, but the experiment has not provided any direct evidence of habitat benefits to endangered fish.

In November 2004 a BHBF similar to what was undertaken in 1996 was carried out at 42,000 cfs to coincide with sediment inputs from the Paria River. This experiment was considered more successful than the 1996 BHBF experiment in distributing marginal amounts of sand, but still in insufficient quantities to have any lasting effect on critical habitat conditions. Moreover, the subsequent trout suppression flows removed any sediment gains that may have occurred.

Overall, AMP's flow experimentations have been ineffective and imbalanced, with most of the focus on failed efforts to conserve sediment. With the exception of a few months in the summer of 2000, Reclamation and AMP have ignored the principle directive by FWS to carry out steady flow experiments at various times throughout the year

To this day, when it is clear that some significant alteration of this failed flow regime must be implemented, there remains virtually no support from Reclamation or AMP to embrace establishing a flow regime consistent with the river's natural hydrology as was called for by the FWS 12 years ago.

In the AMP's "Assessment of the Estimated Effects of Four Experimental Options on Resources Below Glen Canyon Dam" (the alternatives submitted as scoping comments for this EIS on the Long-Term Experimental Plan), two of the four options would allow even less restrictions on dam operations than the current MLFF baseline. The other two would make only modest changes to the current practice, with just Option B mentioning the SASF alternative, and to be implemented for just one two-year period, and not beginning until August 2011.

B. Failure to Implement Selective Withdrawal

The 1994 Biological Opinion and the 1996 Record of Decision both stressed the need to implement a mechanism to warm the water released from Glen Canyon Dam (selective withdrawal or temperature control device). The water's constant 46 degrees (F) temperature is too cold for native fish, which evolved with an annual temperature gradient from near freezing in winter months to up to 80 degrees (F) in the summer.

In 1998 the AMP initiated environmental review for proposed modifications to Glen Canyon Dam's intake towers that would allow for selective withdrawal, but this was suspended without sufficient explanation. Parties concerned with the impacts warmer water may have on the nonnative trout fishery, as well as the project's overall costs, were seen as impeding the process. Public pressure and the continued decline of humpback chub numbers forced the NEPA process to be started anew in 2003. But here, too, the process became bogged down as cost concerns were again raised.

The situation which compelled selective withdrawal to be a core component of the AMP's strategic plan is only more serious now, but Reclamation and AMP have refused to complete the evaluation, much less get a temperature control device installed. The likelihood that such a capital investment would be required, and that warmer water may impact the trout population was known to both Reclamation and FWS when they included this common element in the ROD and RPA respectively, thus such concerns should not have impeded the implementation.

"Temperature modification has been identified as central issue to be resolved in order to develop a mainstem spawning population of HBC. ... Reclamation has been working diligently to accelerate the technical and administrative process necessary for construction of the selective withdrawal structure. ... Funding will be requested as a separate appropriation through the Federal budget process under Section 8 of the

Colorado River Storage Project Act.” (Reclamation Response to FWS Biological Opinion, April, 6, 1995, page 4.)

Only as a result of the recent settlement agreement is the temperature control device now slated to have its environmental review completed as part of the LTEP EIS.

C. Failure to Establish a Second Population of Humpback Chub

The RPA instructs Reclamation to establish a second population of humpback chub in the main stem Colorado River below Glen Canyon Dam, or in one of Grand Canyon’s tributaries. Obviously the habitat of the main stem provides the most diversity and is the logical choice. This habitat is wide and abundant throughout Marble and Grand Canyon, and much preferable to a small and isolated tributary stream.

No protocols have been fully developed for locating an appropriate site on the tributary streams for a second population. For example, the habitat conditions required, water quality, consultation with the Havasupai Nation (Havasupai Creek), and/or how modifications to the habitat will be implemented to achieve suitable habitat conditions. Nor have any studies been fully completed, or are past due, on the genetic differences between those near the Little Colorado River and other aggregations, as specifically requested by FWS.

D. Lack of Little Colorado River Management Plan

As the AMP has yet to recover habitat conditions in the main stem Colorado to allow for humpback chub to spawn, the Little Colorado River (LCR) remains their sole spawning habitat. As such, the RPA instructed Reclamation to develop a management plan for the Little Colorado River. While Reclamation claims the LCR lies outside its jurisdiction, this does not mean, as FWS has explained, that Reclamation could not have been instrumental within a 12-year period to ensure a plan is put in place.

E. Lack of Progress on a Management Plan for the Razorback Sucker

The Grand Canyon reach of the Colorado River was designated as critical habitat for the razorback sucker before 1995. FWS instructed Reclamation in the RPA to assist in developing a management plan to re-establish habitat to support viable populations in Grand Canyon National Park. While a workshop has been conducted, it did not, as FWS stated, provide sufficient information to aid in the development of a plan and Reclamation has not been responsive to helping to identify recovery sites that provide spawning, nursery areas, floodplain, temperature and other aspects for restoration potential.

The directives set forth by the Grand Canyon Protection Act, the ROD and the RPA were clear, as were those set out in the AMP’s charter and strategic plan, but Reclamation and the AMP refuses to work to meet even these basic benchmarks, much less exhibit the forward thinking and pro-active leadership to bring about resource recovery in Grand Canyon. How can the public expect that such resistance will be any less apparent in future management plans for operations at Glen Canyon Dam?

3. Failure of the AMP Administration and Science

A. Address the Lack of Appropriate Leadership

The ROD called for the establishment of the AMP as a stakeholder group to advise the Secretary of the Interior on implementation of Grand Canyon programs. Known as the Adaptive Management Working Group (AMWG), this group is dominated by representatives of the seven basin states, hydropower marketers and consumers, along with environmental and recreation interests. These representatives have no legal responsibility, but have been given de-facto decision-making authority for determining the fate of Grand Canyon's River ecosystem. While promoted as an all-inclusive mechanism to ensure everyone interested in Grand Canyon's recovery have their say, this big tent strategy has proven to be nothing more than a convenient buffer to defend Interior against critics who challenge the lack of progress on mitigating the impacts of Glen Canyon Dam.

As exemplified by AMWG's unwillingness to comply with RPA programs, the decline in humpback chub, the extirpation of the razorback sucker, continued loss of essential sediment, and accelerated degradation of archeological sites, the AMWG has clearly failed. After 12 years of squandering public funds at the expense of Grand Canyon's river ecosystem, AMWG's proposed action for the LTEP only further illustrates that the group is more focused on self-preservation than in the resource it is supposed to protect.

This EIS is the result of interventions by parties outside AMP, due to the AMP's lack of commitment to undertake their responsibilities as defined by their strategic plan, charter or the Grand Canyon Protection Act. There is no need for most of these "stakeholders" to have a seat at the decision-making table. The management process for the river corridor in Grand Canyon is guided by federal laws that are not in need of a stakeholder group's interpretation or obfuscation.

The primary interest in the preservation of cultural and natural resources downstream of Glen Canyon Dam resides with the National Park Service, the Fish and Wildlife Service, and the Tribes. Reclamation should have no role in the decision-making as it relates to GCPA compliance. This should have been quite evident as early as 1995 when Reclamation clearly stated it was not interested in recovery of endangered species, only removal from jeopardy.

"By definition, the elements of an RPA describe an alternative action, which will avoid the likelihood of jeopardy, as opposed to actions to achieve recovery. The elements of the RPA seem to be focused on recovery. ... Recovery actions should be included in the Opinion only as a conservation recommendation." (Reclamation Response to FWS Biological Opinion, April, 6, 1995, pages 2-3.)

"We fully recognize our responsibility under Section 7 of the ESA to not only avoid action which will result in jeopardy to listed species, but a Federal agency we are also directed to utilize resources in furtherance of the ESA through carrying out programs for

conservation of endangered species.” (Reclamation Response to FWS Biological Opinion, April, 6, 1995, page 3.)

This statement is farcical. Were it true:

- The Biological Opinion it refers to would have been completed several years earlier, as Reclamation would not have dragged its feet on completing the original EIS, which commenced in 1989. No, only as a result to an act of Congress, the GCPA itself mandating completion of the EIS, did Reclamation finally, “recognize its responsibility under Section 7 of the ESA.”
- Reclamation would not have been quibbling with FWS over if and where such recovery objectives should be contained in an FWS Biological Opinion, or later arguing about subsequent recommendations in FWS’s response to Reclamation’s insufficient progress to the RPA. No, Reclamation would be embracing FWS advice on how recovery can best be achieved.
- No settlement agreement mandating yet another EIS would have been required to resolve Reclamation’s continued failure to comply with Section 7 of the ESA, and no letter such as this would have had to be written outlining the obvious deficiencies with Reclamation’s recognition of its responsibilities under the ESA and GCPA.

It is long past due for Interior to remove Reclamation of any role relating to how Glen Canyon Dam will be operated to ensure compliance with the GCPA. You must immediately direct NPS and FWS to be Interior’s primary voices cooperating with scientists in advising you as to how Reclamation must operate Glen Canyon Dam, as the GCPA states, “[T]o protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established, including, but not limited to natural and cultural resources and visitor use.”

Reclamation and all as other parties are free to intervene as allowable by law, but they should no longer be utilized to create an unnecessary ad hoc group that has a proven track record of ineffectiveness and obstructionism.

B. Cease to Support the Competing Objectives

Since the time of drafting the first EIS for Glen Canyon Dam, completed in 1996, there have been two distinct forces working against recovery of native fish in Grand Canyon: hydropower generation and nonnative fish protection. Nowhere in the Grand Canyon Protection Act is there any direct or indirect reference to these interests, yet they have become a major force nonetheless. Both have representatives in the AMWG, and of the 12 goals in the AMP Strategic Plan, two accommodate these interests directly:

- Maintain power production capacity and energy generation, and increase where feasible and advisable, within the framework of the Adaptive Management ecosystem goals.

- Maintain a naturally reproducing population of rainbow trout above the Paria River, to the extent practicable and consistent with the maintenance of viable populations of native fish.

As noted above, one of Reclamation's primary rationales for adopting the MLFF was to preserve hydropower benefits that would have been lost had Reclamation followed the SASF recommendations of FWS. Nearly every issue affecting dam operations within the AMP program is heavily debated and influenced by hydropower interests. Whether it be a Beach/Habitat Building Flow (BHBF), that causes more water to pass through the dam in excess of what the generators can accommodate, or running low flows in the summer months far below what hydropower interests would prefer, hydropower interest represent a major stumbling block to independent scientific experimentation necessary to allow for species recovery in Grand Canyon National Park.

Efforts to find balanced flow regimes that benefits both endangered fish species and hydropower are irrational as the science shows clearly that steady-state water flows are more beneficial to native fish, whereas they compromise hydropower revenues. Additionally, as the primary source for AMP funding is to come from hydropower revenues, having these interests in the decision-making process regarding recovery management choices, adds further to this conflict of interest.

The Grand Canyon Protection Act clearly recognized that to achieve its objective of mitigating Glen Canyon Dam's impacts to achieve habitat restoration for endangered species, hydropower production and revenue losses would likely be incurred. Section 1809 of the Act, "Replacement Power," deals solely with this issue.

"...shall identify economically and technically feasible methods of replacing any power generation that is lost through adoption of long-term operational criteria for Glen Canyon Dam as required by Section 1804 of this title. The Secretary shall present a report of the findings, and implementing draft legislation, if necessary, not later than two years after adoption of long-term operating criteria. The Secretary shall include an investigation of the feasibility of adjusting operations at Hoover Dam to replace all or part of such lost generation. The Secretary shall include an investigation of the modifications or additions to the transmission system that may be required to acquire and deliver replacement power." (Grand Canyon Protection Act, page 5.)

Furthermore, while the GCPA makes specific references to preserving flows to meet water delivery allocations, it makes no such reference as regards to power generation. Therefore, the only responsibility power interests should have is to undertake their own necessary planning for power sales and distribution, based on mitigation strategies necessary to achieve compliance with the Act. They should have no role in determining how, when or if any such strategies are implemented.

The same holds true for the protection of nonnative fish. The AMP wants to protect rainbow trout populations in one section of the river, while it has spent upwards of \$800,000 annually to remove them downstream.

It is known that cold-water and warm-water nonnative fish, such as rainbow trout and catfish, predate on juvenile humpback chub. (Marsh and Douglas, 1997; Gorman, et al. 2005.) Other studies have documented trout predation on threatened native fish, such as speckled dace and bluehead sucker. In January 2003, GCMRC's mechanical trout removal crew caught a rainbow trout with a flannelmouth sucker in its mouth (USGS press release of 3/4/2003).

While some assert that the real problem is brown trout predation on humpback chub, since an individual brown trout is more likely to include fish in its diet than an individual rainbow trout, the higher concentration of rainbows over brown trout causes rainbow trout to exert a higher overall impact on humpback chub. Estimates suggest that prior to recent trout removal near the Little Colorado River confluence, there were about 39 times more rainbow trout than brown trout. (SCORE Report, page 48.)

The National Park Service, which itself once stocked trout in Grand Canyon tributary streams, has abandoned this practice altogether, and has even erected weirs in an attempt to impede trout populations from spawning in these tributary streams.

As has been demonstrated during the recent drought, the warmer water, combined with low levels of dissolved oxygen, from Glen Canyon Dam releases have contributed significantly to reducing rainbow trout populations above the Paria River, so much so that Arizona Game and Fish had contemplated a restocking program prior to threatened litigation. Putting in more fish when there's no food will merely force them to migrate downstream to survive, potentially exacerbating the problems for the humpback chub.

Attempting to preserve this nonnative trout fishery stands in direct conflict with a principle requirement of the AMP: to implement the selective withdrawal program to increase the water temperature being discharged from the dam. Nonnatives have thrived in the cooler waters, while the natives continue to decline.

Such counterproductive objectives and stakeholders must be removed from the AMP process.

C. Address the Lack of Scientific Rigor A central component of the original AMP design was the development and administration of an independent, peer-reviewed science program. This program would carry out unbiased scientifically credible studies to inform the AMP's decision-making process. A small science staff (less than 12) was to administer the program through the competitive bidding process and to award research contracts to the most competent bidder. Both the bidding process and final reports were to be peer-reviewed to assure quality and non-biased reporting.

The GCMRC, the science management component of the AMP, is now operating much differently than established in the original guidelines set for this administrative component of the USGS. The science staff is very large and most programs are being done in-house with no independent peer-review.

Prior to the EIS the Glen Canyon Dam Environmental Studies program was seriously criticized by the National Research Council (NRC) for this same failure to meet

accepted methods to assure scientific credibility. An independent review of the current AMP science program would reveal a loss of integrity and standing when the original model was abandoned in favor of what currently exists today in the GCMRC.

At a time when the Grand Canyon is about to lose another native fish species, the AMP has cut back on scientific work, seemingly at the request of the Western Area Power Administration, whose hydropower revenues are used to fund the science. The research for the 2000 Low, Summer Steady Flow (LSSF) represents one of the most blatant examples of how the AMP science program has been affected. First, the experiment was fast tracked, with limited opportunity for outside input or competitive bidding for the monitoring. Pre-experiment flow data was not compiled and therefore the design of the experiment may not have been properly formulated. Scientists did not start collecting data on the river until after the first spike flow occurred. Although the design of the experiment was released for the competition, the one proposed by the contractor was not accepted. Also, this experimental flow was originally proposed to benefit native fish with relatively low, steady flows in accordance with the Biological Opinion, but the final experiment allowed for less than the recommended time.

The 1995 EIS assumed that experimentation and recovery efforts would be achieved with firm attention paid to proper scientific protocol and management of public funds toward endangered species recovery in Grand Canyon National Park. This is not occurring. In fact the opposite is true. The AMP has enacted budget reductions and caps without supplemental funds to adequately maintain and preferably improve monitoring and research in Grand Canyon National Park. Finally, AMP is not providing adequate management leadership while the USGS/GCMRC is not contributing credible independent data required by the mandates prescribed by the ROD, RPA and subsequent charters and guidelines.

It's unfortunate that the same weakness observed by the National Research Council in 1999, are still as relevant today: "The adaptive management chapters of the strategic plans suffer from the following weaknesses: (1) lack of clarity of the Center's roles within the Adaptive Management Program; (2) inadequate discussion of competing goals and "visions;" (3) lack of clearly-defined linkages between adaptive management, ecosystem management, and social learning; (4) disparate management objectives and information needs; (5) inadequate definition of the core adaptive management experiment; (6) insufficient contingency planning; (7) insufficient decision analysis; and (8) uneven progress toward independent program review." (Downstream: Adaptive Management of Glen Canyon Dam and the Colorado River Ecosystem, National Science Council, page 59.)

The AMP has run amuck with no clear leadership or direction. It's not that its mission has been unclear, but its structure is functionally incapable of achieving it.

Unless these shortcomings are addressed, revising its work plan through a new EIS will only exacerbate, not resolve, these problems. To that end, the AMP must discard AMWG and put in place an advice and decision-making apparatus based primarily on scientific principles. A wholly independent scientific body should be commissioned, that

works with the Park Service, FWS and Tribes to achieve the goals of the Grand Canyon Protection Act. Reclamation must no longer play any leadership or advisory role, in the AMP process, merely furnish any necessary information, and follow through on implementing operational changes at Glen Canyon Dam.

4. Must Revise the Proposed Action

Reclamation states that the, "Adoption of a Long-Term Experimental Plan is needed to ensure a continued, structured application of adaptive management in such a manner as to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation were established." (Federal Register Notice of 12/12/2006.)

Given that no significant progress has been made, and neither Reclamation nor the AMP has demonstrated the willingness to carry out the structured application of adaptive management that has already been put before them, along with known contradictions and decision-making impediments, why would such a process be continued?

It should be noted that the LTEP being conceived through this EIS process itself is the result of the failure of the AMP to complete its assigned tasks. This plan was launched in 2004, with the goal of finalizing the plan in 2005. It was not to be taken on by Reclamation as a convenient mechanism under which to attempt to comply with the conditions of the 2006 settlement agreement.

Reclamation's proposal to undertake the LTEP only further illustrates its inability to address the totality of issues that Reclamation's policies are having on Grand Canyon National Park. While some experimentation may indeed need to continue, experimentation is merely a tool, and should not be an objective in and of itself. It is precisely such reasoning that has led to the downward spiral of resources in Grand Canyon. So long as experimentation continues, Reclamation has felt that it has been fulfilling its duty to the public, although throughout this time the natural and cultural integrity of Grand Canyon's river corridor has only worsened.

The EIS's stated objective must be to develop alternatives that will bring about the preservation and recovery of the natural and cultural resources of the Colorado River corridor through Grand Canyon National Park and Glen Canyon National Recreation Area. To what extent Glen Canyon Dam's continued operations impedes or compliments this objective can then be evaluated through the standard practice of identifying the alternatives.

Further experimentation may or may not be warranted, but if so they should represent components of alternatives to achieve specific resource recovery and preservation objectives, not the objective of the EIS itself. Moreover, how and if the current elements and structure of the AMP are to be "continued" must be subject to the same principle: they must demonstrate how their continuation will help realize the successful implementation of the alternative, when history has proven otherwise.

5. Issues to be Addressed in the EIS

A. Reformulate the AMP's decision-making structure

To avoid repeating the past failings of the AMP, the EIS must contain an independent review of the AMP's progress to date in fulfilling its charter, strategic plan, the elements of the ROD and the RPA. This should include evaluating all experimentation to determine what baseline knowledge currently exists, and gaps if any need to be filled. All current and former GCMRC employees and consultants should be surveyed to determine their views on the efficiency and rigor of the experimentation to date and the leadership and follow through by GCMRC and the AMWG with regard to scientific findings. The review must address the issue of competing objectives, such as hydropower generation and exotic trout preservation, which have influenced management actions. How well the current AMP has addressed the 1999 National Research Council findings in *Downstream: Adaptive Management of Glen Canyon Dam and the Colorado River Ecosystem* should also be addressed.

These findings should be used in developing the framework for a new AMP decision-making structure to replace the AMWG comprised solely on those agencies with primary jurisdiction over the management of those downstream cultural and natural resources in Glen Canyon National Recreation Area and Grand Canyon National Park. The findings should also be used to establish a wholly independent GCMRC outside of the DOI to militate against agency bias in the quest for the best science to guide resource protection.

B. Consider climate variability and change

At an increasing rate, federal scientists are warning that DOI should prepare for flow reductions on the Colorado River in upwards of 10 to 40 percent as we continue through this century. The DOI must partner with National Oceanic and Atmospheric Administration to ensure the most up-to-date climate modeling is applied in evaluating each alternative's flexibility to climate variability. Particular attention must be given to evaluating alternatives against scenarios where Lake Powell reservoir has not only reached dead pool, but remains at dead pool over multiple years.

C. Identify appropriate timeframe

Based on the findings of the independent review, the EIS team should determine over what time frame, if any, the alternatives contained within this EIS should be implemented. Some proposals offered already for a ten-year timeframe are arbitrary, and are based on no scientific rationale as to whether or not certain outcomes may or may not be determined within such a period. The development of alternatives should focus first on determining what are the inputs necessary to achieve restoration and recovery, and then determine the appropriate timeline for delivery and evaluation.

D. Focus on native fish recovery

The EIS must identify specific baseline objectives for nonnative fish suppression, sediment and nutrient concentration, temperature gradients and flow characteristics that

are believed to stimulate recovery of critical habitat for Grand Canyon native fish. It must then evaluate how each alternative will achieve these objectives for the humpback chub population in the Little Colorado River, the establishment of a second humpback chub population downstream of Glen Canyon Dam, the establishment of razorback sucker habitat, and lastly, habitat for reintroduced bonytail chub, roundtail chub and Colorado pikeminnow.

E. Provide for flows that mimic the natural hydrograph

Flow decisions should be evaluated in accordance with how well they mimic the natural hydrograph. This is the principle behind the recommendations from FWS in their 1994 Biological Opinion, but has yet to be embraced by the AMP. As a result, all of AMP's flow recommendations should be rejected as none ensure that seasonally adjusted steady flows will be initiated any time soon. Steady flows will improve the productivity of the aquatic food base at higher trophic levels, and create the greatest opportunity for establishing a second population for the humpback chub, and create habitat for the razorback sucker as called for in the RPA and the Strategic Plan.

F. Address sediment augmentation

Much of AMP's focus has been on marginal to failing efforts to push small amounts of sediment and organic debris around Grand Canyon, while providing no demonstrated benefits for the habitat conditions of endangered fish. There is an urgent need for sediment and nutrients to be introduced back into the mainstem. The prospect of mechanical sediment augmentation, which would place Lake Powell sediment, carbon and other nutrients into the Colorado River below Glen Canyon Dam, has been discussed by AMP, but not acted upon. Implementing an immediate plan for sediment augmentation must be addressed by this EIS.

G. Recommend temperature control device for selective withdrawal

The EIS must recommend the installation of temperature control devices onto Glen Canyon Dam's intake structures. This project is already eight years behind schedule, despite being a top priority in both the ROD and RPA. Recent discussions have suggested that an alternative is being evaluated to construct devices on only two of the eight intakes. This would allow for only minimal changes to the temperature of the water, and will likely prove to have little value for experimental or habitat recovery purposes. Reclamation modeling also shows that the increase of temperature from a two-unit TCD is too modest, and insufficient for sustaining warm temperatures over time. The EIS must recommend that all eight penstocks be retrofitted at one time to maximize experimental flexibility, and thus the potential for achieving a positive result for native fish recovery.

H. Remove nonnative fish

The EIS should evaluate any and all reasonable mechanisms for nonnative fish suppression as necessary to improve habitat conditions for native fish. The EIS should

recommend that all stocking of nonnative trout cease below Glen Canyon Dam and that dam operations not be modified in any way to intentionally benefit nonnative fish habitat.

I. Address potential water quality impacts

With the probability of Lake Powell's conservation pool being exhausted during the timeframe of the proposed action, the potential for significant changes in the chemistry and quality of water flowing into Grand Canyon cannot be ignored. Anaerobic bacteria, hydrogen sulfide, and supersaline and metal-rich sediments are just some of the existing substances that could find their way through the dam's bypass tubes. The EIS must evaluate what these impacts might be, and how they would be mitigated.

For example, Reclamation was compelled to deal with low dissolved oxygen levels from the turbines at Glen Canyon Dam last winter. A plume of oxygen-depleted water reached the penstocks at the dam. The oxygen was depleted by decaying organic matter, because the Colorado and San Juan rivers are eroding into the exposed sediment deposits of Lake Powell due to the drawdown of the reservoir. The US Supreme Court has decided (*S.D. Warren v Maine*) that threats to water quality are the responsibility of the dam operators to mitigate. The EIS should also address the operational and safety impacts of coarse sediments flowing through Glen Canyon dam during low reservoir levels.

J. Establish sediment distribution to protect archeological resources

Archeological resources along the river continue to be threatened by the lack of sediment. The terraces of sediment that host hundreds of the cultural sites continue to slough off and move towards the river. As a result, artifacts must be removed, as opposed to being protected in-situ as prescribed by historic preservation legislation.

The EIS should mandate that a comprehensive cultural site degradation abatement program be established throughout the entire river corridor in accordance with NPS standards. To the extent high flows are implemented, they should be in a range that greatly exceeds 45,000 cfs, in order to provide the greatest opportunity for distribution of sediment to the affected archeology sites.

Many of the sites now suffering the greatest impacts due to erosion are those above the 120,000 cfs terrace, thus flows of this magnitude must also be accommodated.

Providing infill for the arroyos in the high benches of the river would be a great asset to the preservation of cultural sites. The benefits of sediment augmentation should also be examined to improve archeological resource stabilization.

K. Consider dam decommissioning

The most effective way to protect and restore the culture resources in Glen Canyon National Recreation Area and Grand Canyon National Park is to return all the natural processes which allowed these resources to evolve. The most effective way to achieve this is to decommission Glen Canyon Dam. As such, the decommissioning alternative must be evaluated.

L. Identify program funding sources

At current reservoir levels, it is possible that power generation, and thus CRSP and AMP revenue streams could be brought to a standstill by the time this EIS is completed. Two more years of flows at 50 percent of normal would lower Lake Powell to the point where power production is no longer possible. The potential for power revenue streams for AMP activities and research could be affected during the timeframe for the proposed action, thus the EIS must address how this may affect each of the alternatives. It must also address how funding will be made available for large capital expenses, such as selective withdrawal or sediment augmentation.

M. Establish a scientific baseline and conceptual modeling

There are currently no control sites for AMP experiments. In the book, *Downstream: Adaptive Management of Glen Canyon Dam and the Colorado River Ecosystem*, the National Research Council (National Academy of Sciences) has recommended that Cataract Canyon above Lake Powell would serve this purpose, but there has been no action on the part of the AMP or GCMRC to seize this opportunity. The EIS must mandate that establishing such controls be a top priority in further experimentation.

The EIS must also mandate the completion and implement a conceptual ecosystem modeling plan.

N. Complete a management plan for the Little Colorado River

Reclamation must ensure the development of a management plan for the Little Colorado River. This plan specifically should address a hazardous material component to protect humpback chub against toxic chemical spills. With the sole remaining Grand Canyon humpback chub population concentrated at the mouth of the Little Colorado River, they are particularly vulnerable to extinction should any water contamination accident or other stochastic event occur in this tributary. A chemical spill occurred at Lake Havasu last year affected the water of the reservoir.

Increasing the range of the critical habitat designation in the Little Colorado River should also be explored to further promote translocation programs for the humpback chub up this tributary.

CONCLUSION

The importance of an Adaptive Management Program to ensuring the future health and vitality of the globally significant Grand Canyon ecosystem cannot be overstated. However, growing evidence demonstrates not only an ongoing decline in many key indicators, but an inability of Reclamation and AMP to manage the recovery tasks asked of them. Without major changes in how this program is operated, the public should prepare itself for the ongoing declines in the cultural and natural resource base of Colorado River below Glen Canyon Dam.

The launching of a new EIS process on Glen Canyon Dam operations affords an excellent opportunity to deliver to reverse this trend. Unfortunately, the Long-Term

Experimental Plan proposed action illustrates that Reclamation is not yet serious about seizing this opportunity, but merely going through the motions in an effort to comply with the settlement agreement.

Grand Canyon National Park, and all those who cherish it, deserve better. The future of Grand Canyon is at a critical decision point. We hope you, as its principle steward, will take the corrective actions outlined above so that a truly valuable EIS process can get underway, and the Colorado River ecosystem through Grand Canyon can finally get on the road to recovery.

Sincerely yours,

John Weisheit, Conservation Director
Living Rivers & Colorado Riverkeeper

Michelle Harrington, Rivers Program Director
Center for Biological Diversity

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LR Press Release 02/28/07

Giving up on Grand Canyon! Groups Demand Interior Department Revamp Approach

For Immediate Release: February 28, 2007

Contact: John Weisheit, Living Rivers, (435) 259-1063, (435) 260-2590 (cell)
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MOAB, Utah— In a 21-page letter sent today to Interior Secretary Dirk Kempthorne, conservation groups Living Rivers/Colorado Riverkeeper and the Center for Biological Diversity demanded that the Secretary revise his plan to support a failing Colorado River restoration project in Grand Canyon National Park.

A 12-year-old program that was established to mitigate the impacts of Glen Canyon Dam, upstream of Grand Canyon National Park, is undergoing environmental review for a new set of experiments. The groups charge that continuing activities under the current

framework would be a death sentence for the remaining native species trying to survive the extensive ecological changes the dam's operations have brought to Grand Canyon.

"If their approach doesn't change, the end result will be more of the same," says John Weisheit, of Living Rivers. "Study after study clearly illustrates the current program is a disaster."

Citing findings from the National Research Council, U.S. Fish and Wildlife Service, U.S. Geological Survey and former Interior Secretary Gale Norton, the groups outline how the Glen Canyon Dam Adaptive Management Program has failed in its mission to reverse the decline of cultural and natural resources in Grand Canyon National Park as directed by the 1992 Grand Canyon Protection Act.

- Habitat conditions for endangered native fish like the humpback chub have not been improved, so its numbers have declined since the program began. Plans to reintroduce other endangered species lost to Glen Canyon Dam's operations have stalled.
- Requirements of the Fish and Wildlife Service to operate the dam more consistently with the river's natural water levels and rates of flow are repeatedly ignored .
- Hydroelectric-power interests override conservation objectives and hamstringing progress .
- Recommendations by scientists are ignored and critical studies, such as the 2000 low summer steady flow experiment, are left incomplete .

The main problem, the groups point out, is not how to mitigate the dam's impacts to allow Grand Canyon's recovery to begin, but the deeply flawed decision-making structure that impedes sound science from fulfilling the objectives of the Grand Canyon Protection Act.

"Glen Canyon Dam has caused the nearly complete loss of the natural and cultural resources in Grand Canyon's Colorado River corridor ," says Michelle Harrington with the Center for Biological Diversity. "The Adaptive Management Working Group has failed in its work and needs to be cut off."

Prior to Glen Canyon Dam, the Colorado River in the Grand Canyon supported one of the most unique fish communities in the world — eight species that existed together nowhere else on earth. Four are already gone, one has not been seen since 1992, and another, the humpback chub, has declined to the brink of extinction with just a few thousand fish.

This Environmental Impact Statement process was launched as part of a settlement reached in September 2006 between the Center for Biological Diversity, Living Rivers, Glen Canyon Institute, Sierra Club and Arizona Wildlife Federation, and the Department of Interior to address the worsening habitat conditions for endangered native fish in Grand Canyon.

“We chose to settle the lawsuit with the understanding that the environmental review would comprehensively address immediate recovery needs for endangered species in light of the documented failings of the Adaptive Management Program, but it appears Interior had no such intention,” adds Harrington.

The groups have asked Secretary Kempthorne to abandon the Environmental Impact Statement’s focus from a hastily conceived set of experimental options prepared by the Adaptive Management Working Group to a broad examination of the Adaptive Management Program process to date. They urge removal of the Bureau of Reclamation as an adviser on Grand Canyon issues, establishment of a truly independent scientific research and advisory mechanism to ensure ecological integrity, and a thorough examination of all options available to improve habitat conditions, including decommissioning Glen Canyon Dam.

“It’s time to stop pretending that this program can work,” concludes Weisheit. “Let’s either agree that the public does not care about Grand Canyon National Park’s unique river ecosystem, and spend these so-called conservation resources elsewhere, or get serious about reviving them as Congress mandated through the Grand Canyon Protection Act.”

[Living Rivers](#) is a nonprofit organization dedicated to the restoration of the natural hydrological and ecological processes within the Colorado watershed to protect native species and their habitats.

[The Center for Biological Diversity](#) is a nonprofit conservation organization with over 32,000 members dedicated to the protection of imperiled species and their habitats.

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Additional Information:

[Letter to Interior Secretary Kempthorne from Living Rivers and Center for Biological Diversity](#)

<http://www.livingrivers2.org/archives/article.cfm?NewsID=759>

[Information about the Environmental Impact Statement for Long-Term Experimental Plan on the operations of Glen Canyon Dam and its impacts on Grand Canyon National Park](#)

<http://www.livingrivers2.org/archives/article.cfm?NewsID=753>

Regional News 03/01/07

Shortage Criteria: Reclamation announces publication of DEIS and public meetings

Public Hearings Scheduled in Nevada, Arizona and Utah

The Interior Department's Bureau of Reclamation today released for public review and comment a Draft Environmental Impact Statement (EIS) on proposed interim guidelines for managing the Colorado River Storage System under drought and low reservoir conditions.

When approved the guidelines would be used for determining shortages in the Lower Colorado Basin and coordinating operations for Lake Powell and Lake Mead reservoirs.

As part of its efforts to seek public input on the draft EIS, Reclamation has scheduled three public hearings to receive written or oral comments.

Meeting dates, times and locations are:

- Tuesday, April 3, 2007 – 6 p.m. to 9 p.m.
Henderson Convention Center, Sierra Room
200 South Water Street
Henderson, Nevada
- Wednesday, April 4, 2007 – 6 p.m. to 9 p.m.
Phoenix Airport Marriott, Buckhorn Room
1101 North 44th Street
Phoenix, Arizona
- Thursday, April 5, 2007 – 6 p.m. to 9 p.m.
Hilton Salt Lake City Center, Canyon Room A & B
255 South West Temple
Salt Lake City, Utah

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Additional Information:

[The One-Dam Solution by Living Rivers](http://www.livingrivers2.org/pdfs/TheOne-DamSolution.pdf)

<http://www.livingrivers2.org/pdfs/TheOne-DamSolution.pdf>

[Link to Draft Environmental Impact Statement](http://www.usbr.gov/lc/region/programs/strategies/draftEIS/index.html)

<http://www.usbr.gov/lc/region/programs/strategies/draftEIS/index.html>

[Link to Executive Summary](http://www.usbr.gov/lc/region/programs/strategies/draftEIS/ExecSumm.pdf)

<http://www.usbr.gov/lc/region/programs/strategies/draftEIS/ExecSumm.pdf>

[Reclamation's web page on Shortage Criteria](http://www.usbr.gov/lc/region/programs/strategies.html)

<http://www.usbr.gov/lc/region/programs/strategies.html>

LR in the News 03/08/07

New experimental plan for Glen Canyon Dam operations likely to fall short, critics say

April Reese, Land Letter Western reporter

The Bureau of Reclamation is putting together a long-awaited, revised plan to experiment with various flow regimes and other efforts to restore the Grand Canyon ecosystem downstream from Glen Canyon Dam. However, environmental groups that previously filed suit to force the agency to craft the new plan say preliminary environmental impact statement documents indicate that the agency is not committed to fully recovering the canyon's resources.

The groups, Living Rivers and the Center for Biological Diversity, say that there is really nothing new in the bureau's latest proposal, and that it fails to acknowledge the shortcomings of the current flow management program. In a 21-page letter sent to Interior Secretary Dirk Kempthorne last week, the groups urged Interior to reassess its approach.

"As presently conceived, this EIS does not sufficiently focus on the fundamental objective of recovering downstream resources," the groups wrote.

The groups cited drafts of an environmental scoping report that is expected to be released later this month.

According to the Bureau of Reclamation's scoping announcement for the EIS, issued last November, the proposed plan would lay out a "structured, long-term program of experimentation" that could include altering dam operations, modifying intake structures in the dam, and removing non-native fish species below the dam.

For the past 11 years, Reclamation has been working under a dam operations plan from 1996 but is required under the Grand Canyon Protection Act to make sure operations are adequately protecting Grand Canyon resources. Under the 1996 plan, Reclamation has been operating the dam to create "modified low fluctuating flows," an approach that environmentalists and some scientists have criticized as insufficient to protect endangered fish and other downstream resources.

The agency, under the guidance of the Glen Canyon Adaptive Management Program, which involves various agencies and stakeholders and aims to assess the effects of dam operations and propose any necessary adjustments, have conducted several experiments over the past 10 years, including a "low steady flow" in the summer of 2000, a "beach habitat building flow" in 2004, the translocation of humpback chub and the removal of non-native fish.

In a recent lawsuit, CBD, Living Rivers, the Glen Canyon Institute and the Sierra Club argued that the program's efforts were not recovering endangered humpback chub and that the program was in violation of the Endangered Species Act.

The new EIS is the result of a settlement between the groups and the Department of Interior.

Reclamation plans to heavily weigh recommendations from the Adaptive Management Program, which includes an inter-agency team of scientists and managers.

The program has proposed four experimental options to include in the document, including one that calls for "seasonally adjusted steady flows" for increasingly longer periods over several years, two others that would allow for wider fluctuating annual flows, which would benefit hydropower, and another calls for a combination of steady flows in late summer and early fall and wider fluctuating flows during the rest of the year.

Bad habits repeated?

Michelle Harrington of the CBD's Phoenix office said that the groups settled the lawsuit with the understanding that the new environmental review would address the immediate recovery needs of the humpback chub and other endangered species and would result in some changes to the adaptive management program. "It appears that Interior had no such intention," she said.

"There's a habit that's being repeated here, which is 10 years of not complying with the Grand Canyon Protection Act," added John Weisheit, conservation director for Living Rivers.

The groups want to see Interior undertake a broad analysis of the effectiveness of the program's efforts to date and make any changes necessary.

"It's time to stop pretending that this program can work," said Weisheit, who has advocated decommissioning or breaching Glen Canyon Dam.

While the dam, built in the 1960s, allows for water storage in Lake Powell and for power generation, it has also altered the river ecosystem downstream, regulating flows that once raged and wimpered, cooling water temperatures and removing sediment that endangered fish once depended on to hide from predators.

A report issued in 2005 by the Grand Canyon Research and Monitoring Center, overseen by the U.S. Geological Survey, concluded that the canyon's resources had not made progress toward recovery under the modified low fluctuating flow regime (MLFF).

"MLFF is what we've been running since 1996 and the 2005 report basically says every resource has declined," said Nikolai Ramsey of Grand Canyon Trust, who serves on the Adaptive Management Work Group and helped craft the steady flow option in the group's recommendations. "It doesn't work."

While Reclamation has been experimenting with varied water release levels to try to help restore downstream resources, the agency has only once undertaken the kind of nature-mimicking experimental flow recommended by the U.S. Fish and Wildlife Service, in the summer of 2000, the groups say. And the results of that experiment still have not been adequately studied, they contend.

Fish population improvement seen According to data released by the U.S. Geological Survey in August, the canyon's adult humpback chub population increased to 5,000 fish between 2001 and 2005, up from about 3,500 in 2002. Scientists also found more juvenile and newly hatched fish in 2005, suggesting that the fish are successfully reproducing, according to the report. But Ramsey said as many as 10,000 fish are needed to reach recovery (Land Letter, Aug. 10, 2006).

Sam Spiller, a FWS biologist who represents the agency on the Glen Canyon Dam Adaptive Management Work Group, said option C, which FWS and the National Park Service helped develop, would help recover the chub while also providing for power needs. That option calls for revisiting dam operations if humpback chub numbers fall below a certain threshold.

Efforts to maintain the endangered humpback chub include a decade of experimenting with water flows on the Colorado River. Photo courtesy of FWS. "We're in a real vulnerable mode right now with chub," Spiller said. While the population has stabilized, reservoir levels in Lake Powell are still low, and it is unclear what long-term effect that will have on the fish, he explained. A shrunken Lake Powell releases warmer water downstream, which Spiller says may be partly responsible for the recent boost in chub numbers, but warmer temperatures may also benefit catfish and other predatory non-natives. "We want warm water, but we know there are questions that come with it," Spiller said.

Spiller added that the option that calls for seasonally adjusted flows, which was proposed by the Grand Canyon Trust, would "definitely" help the fish, but may not meet hydropower needs.

Just how much consideration Reclamation needs to give to hydropower interests remains a major point of contention among stakeholders in the basin. The Grand Canyon Protection Act directs water managers to protect the resources downstream from the dam, but in a way that complies with the Colorado River Compact and other laws governing the "allocation, appropriation, development, and exportation of the waters of the Colorado River Basin."

Environmental groups say Reclamation gives too much weight to hydropower in managing the dam, while the agency contends it is one of several interests it must consider.

"[The agency] says nothing in the act says it should disturb water allocation, but it doesn't say anything about hydropower," Ramsey said.

But Randy Peterson, manager of Reclamation's environmental resources division, said the agency has to consider all of the uses on the river, including hydropower.

"Hydropower is one of the resources that we would evaluate the impacts on from any of the alternatives," he said. "The list is long."

Peterson added that while Reclamation plans to evaluate the work group's four options, it has not yet completed its analysis of all of the scoping comments it has received, and the actual alternatives proposed in the forthcoming draft EIS could be very different.

Peterson emphasized that the purpose of the new plan is not to completely overhaul dam operations. "It is an experiment," he said. "It's not a wholesale revision of previous decisions. It's trying to find answers to important scientific questions." The agency hopes to have the answers to those questions by the end of the experiment, which will likely span seven to 10 years, Peterson said.

Reclamation's scoping report, which will include an analysis of public comments, is due this month, with the draft EIS expected in April 2008. A final document is scheduled for release in October 2008, and Reclamation hopes to begin the experimental flows in 2009, Peterson said.

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[Living Rivers Press Release](http://www.livingrivers2.org/archives/article.cfm?NewsID=760)

<http://www.livingrivers2.org/archives/article.cfm?NewsID=760>

LR Testimony 04/04/07

Public Meeting on Reclamation Shortage Criteria DEIS, Phoenix, Arizona

Models are only as valuable as the inputs they receive. While the sophistication and effort put into these projections are unprecedented and well appreciated, the model's inputs, however, fail to provide the public with the results necessary from which to make an informed decision as to merits of any of the proposed alternatives.

Garbage in garbage out as they say, but this garbage is so well masked that people of the Colorado River Basin are being asked to put the rubber stamp on a Katrina in the making. Those levees did not hold, and neither will the assumptions painted on what otherwise is probably a valuable model.

Scientists have been in agreement for decades that Colorado River flows of the past century were among the wettest in 1,200 years. Scientists are also in agreement that the Colorado River Basin has warmed upwards of two degrees during this period and the trend is expected to continue, compromising streamflows to upwards of 20 percent in the next 50 years.

We're now in the longest drought in recorded history. Things are changing all over the basin, but not at the Bureau of Reclamation. The results produced by their inflated inputs are based recorded historical streamflow, that while useful, in and of themselves must not alone be used to gauge future runoff.

Failing to account for a more long-term historical view of streamflows coupled with the climate change we are already experiencing is tremendously misleading to the public when developing shortage strategies.

But most importantly, we must begin to accept the reality of climate change. A ten percent reduction on long-term flow estimates show an annual deficit right now of 1.1 maf rising to 2.8 maf by 2060. Anyone will notice how the reservoirs are dropping. Adjust this to 20 percent, as an increasing number of scientists are recommending, and we're looking at a 2.6 maf deficit now and nearly 4 maf in 50 years.

We're at ground zero tonight: Phoenix, Chandler, Tucson, are not going to be protected by token changes in reservoir operations or even its ground water banking. Arizona is first in line for cuts, and there is no plan for how the state will survive if the rosy inputs put into this model evaporate away as Lake's Powell and Mead drop lower and lower.

The public is quite fortunate the National Research Council has completed its recent Colorado River report at this time. It reiterates the warnings that have yet found their way into the assumptions used by this model. We certainly hope this changes and the Final EIS will present a more realistic view of what the future may hold.

And the public would also benefit from a more comprehensive presentation of what the real benefits are to these minimal dam operational changes it is being asked to support. Chart 4.3-26 and 27 illustrate that a significant amount of water savings, at least in terms of increased levels for Lake Mead, occur not because of new operating plans that are the focus of these documents, but the result of anticipated, but as yet mostly undetermined, water conservation activities.

It's already clear in looking at the plotted data presented that at the 50th percentile, the net volume of stored water in Lake's Powell and Mead is greater under the No Action alternative than what the Basin States hope to implement. Reclamation must present a comparable analysis of strictly the reservoir operation component of the Basin States Alternative, not volumes of studies and charts based on undefined activities that may be exaggerating these limited benefits.

There is no question that the objective of this DEIS is critical, or that valuable work has not gone into developing the model, but the public is anxiously awaiting some assurances that the water managers they rely on will develop a real strategy to guide us through what looks to be a very parched future ahead.

Unfortunately, Reclamation is still hoping history repeats itself, and high flows will bail us out as demand continues to grow and temperature continues to rise. But we're already at the end of what the river has historically provided. There's no water left and climate change is taking what's there back. It's time for Reclamation to admit this, and get on with the real task ahead: developing a solution for managing a system headed for failure.

Regional News 04/06/07

Permanent drought predicted for Southwest

Study says global warming threatens to create a Dust Bowl-like period. Water politics could also get heated.

By Alan Zarembo and Bettina Boxall
LA Times Staff Writers

The driest periods of the last century — the Dust Bowl of the 1930s and the droughts of the 1950s — may become the norm in the Southwest United States within decades because of global warming, according to a study released Thursday.

The research suggests that the transformation may already be underway. Much of the region has been in a severe drought since 2000, which the study's analysis of computer climate models shows as the beginning of a long dry period.

The study, published online in the journal *Science*, predicted a permanent drought by 2050 throughout the Southwest — one of the fastest-growing regions in the nation.

<http://www.riversimulator.org/Resources/ClimateDocs/2007Seager.pdf>

The data tell "a story which is pretty darn scary and very strong," said Jonathan Overpeck, a climate researcher at the University of Arizona who was not involved in the study.

Richard Seager, a research scientist at Lamont-Doherty Earth Observatory at Columbia University and the lead author of the study, said the changes would force an adjustment to the social and economic order from Colorado to California.

"There are going to be some tough decisions on how to allocate water," he said. "Is it going to be the cities, or is it going to be agriculture?"

Seager said the projections, based on 19 computer models, showed a surprising level of agreement. "There is only one model that does not have a drying trend," he said.

Philip Mote, an atmospheric scientist at the University of Washington who was not involved in the study, added, "There is a convergence of the models that is very strong and very worrisome."

The future effect of global warming is the subject of a United Nations report to be released today in Brussels, the second of four installments being unveiled this year.

The first report from the Intergovernmental Panel on Climate Change was released in February. It declared that global warming had become a "runaway train" and that human activities were "very likely" to blame.

The landmark report helped shift the long and rancorous political debate over climate change from whether man-made warming was real to what could be done about it.

The mechanics and patterns of drought in the Southwest have been the focus of increased scrutiny in recent years.

During the last period of significant, prolonged drought — the Medieval Climate Optimum from about the years 900 to 1300 — the region experienced dry periods that lasted as long as 20 years, scientists say.

Drought research has largely focused on the workings of air currents that arise from variations in sea-surface temperature in the Pacific Ocean known as El Niño and La Niña.

The most significant in terms of drought is La Niña. During La Niña years, precipitation belts shift north, parching the Southwest.

The latest study investigated the possibility of a broader, global climatic mechanism that could cause drought. Specifically, they looked at the Hadley cell, one of the planet's most powerful atmospheric circulation patterns, driving weather in the tropics and subtropics.

Within the cell, air rises at the equator, moves toward the poles and descends over the subtropics.

Increasing levels of greenhouse gases, the researchers said, warms the atmosphere, which expands the poleward reach of the Hadley cell. Dry air, which suppresses precipitation, then descends over a wider expanse of the Mediterranean region, the Middle East and North America.

All of those areas would be similarly affected, though the study examined only the effect on North America in a swath reaching from Kansas to California and south into Mexico.

The researchers tested a "middle of the road" scenario of future carbon dioxide emissions to predict rainfall and evaporation. They assumed that emissions would rise until 2050 and then decline. The carbon dioxide concentration in the atmosphere would be 720 parts per million in 2100, compared with about 380 parts per million today.

The computer models, on average, found about a 15% decline in surface moisture — which is calculated by subtracting evaporation from precipitation — from 2021 to 2040, as compared with the average from 1950 to 2000.

A 15% drop led to the conditions that caused the Dust Bowl in the Great Plains and the northern Rockies during the 1930s.

Even without the circulation changes, global warming intensifies existing patterns of vapor transport, causing dry areas to get drier and wet areas to get wetter. When it rains, it is likely to rain harder, but scientists said that was unlikely to make up for losses from a shifting climate.

Kelly Redmond, deputy director of the Western Regional Climate Center in Reno, who was not involved in the study, said he thought the region would still have periodic wet years that were part of the natural climate variation.

But, he added, "In the future we may see fewer such very wet years."

Although the computer models show the drying has already started, they are not accurate enough to know whether the drought is the result of global warming or a natural variation.

"It's really hard to tell," said Connie Woodhouse, a paleoclimatologist at the University of Arizona. "It may well be one of the first events we can attribute to global warming."

The U.S. and southern Europe will be better prepared to deal with frequent drought than most African nations.

For the U.S., the biggest problem would be water shortages. The seven Colorado River Basin states — Colorado, Wyoming, Utah, Nevada, New Mexico, Arizona and California — would battle each other for diminished river flows.

Mexico, which has a share of the Colorado River under a 1944 treaty and has complained of U.S. diversions in the past, would join the struggle.

Inevitably, water would be reallocated from agriculture, which uses most of the West's supply, to urban users, drying up farms. California would come under pressure to build desalination plants on the coast, despite environmental concerns.

"This is a situation that is going to cause water wars," said Kevin Trenberth, a scientist at the National Center for Atmospheric Research in Boulder, Colo.

"If there's not enough water to meet everybody's allocation, how do you divide it up?"

Officials from seven states recently forged an agreement on the current drought, which has left the Colorado River's big reservoirs — Lake Powell and Lake Mead — about half-empty. Without some very wet years, federal water managers say, Lake Mead may never refill.

In the next couple of years, water deliveries may have to be reduced to Arizona and Nevada, whose water rights are second to California.

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Press Release from Lamont-Doherty Earth Observatory

New Study Shows Climate Change Likely to Lead to Periods of Extreme Drought in Southwest North America

<http://www.riversimulator.org/Resources/ClimateDocs/2007Seager.pdf>

How anthropogenic climate change will impact the arid regions of Southwestern North America has implications for the allocation of water resources and the course of regional development. The findings of a new study, appearing in *Science*, show that

there is a broad consensus amongst climate models that this region will dry significantly in the 21st Century and that the transition to a more arid climate may already be underway. If these models are correct, the levels of aridity of the recent multiyear drought, or the Dust Bowl and 1950s droughts, will, within the coming years to decades, become the new climatology of the American Southwest.

The study's findings have implications on policies and decision making that protects the region from such extreme climate conditions. "The arid lands of southwestern North America will imminently become even more arid as a result of human-induced climate change just at the time that population growth is increasing demand for water, most of which is still used by agriculture," said Richard Seager, Senior Research Scientist at the Lamont-Doherty Earth Observatory and one of the lead authors of the study. "The West, and in particular, the United States and Mexico, need to plan for this right now, coming up with new, well-informed and fair deals for allocation of declining water resources."

Projections of anthropogenic, or man-made, climate change conducted by 19 different climate modeling groups around the world, using different climate models, show widespread agreement that Southwestern North America—and the subtropics in general—are heading toward a climate even more arid than now. The models show that human-induced aridification becomes marked early in the current century. In the Southwest the levels of aridity seen in the 1950s multiyear drought, or the 1930s Dust Bowl, become the new climatology by mid-century: a perpetual drought.

According to the study, as the planet warms, the Hadley Cell, which links together rising air near the Equator and descending air in the subtropics, expands poleward. Descending air suppresses precipitation by drying the lower atmosphere so this process expands the subtropical dry zones. At the same time, and related to this, the rain-bearing mid-latitude storm tracks also shift poleward. Both changes in atmospheric circulation, which are not fully understood, cause the poleward flanks of the subtropics to dry.

In contrast to historical droughts, future drying is not linked to any particular pattern of change in sea surface temperature but seems to be the result of an overall surface warming driven by rising greenhouse gases. Evidence for this is that subtropical drying occurs in atmosphere models alone when they are subjected to uniform increases in surface temperature. "Our study emphasizes the fact that global warming not only causes water shortage through early snow melt, which leads to significant water shortage in the summer over the Southwest, but it also aggregates the problem by reducing precipitation," said Mingfang Ting, Doherty Senior Research Scientist also at Lamont-Doherty and one of the study's co-authors.

Drying of arid lands in the southwestern United States and northern Mexico will have important consequences for water resources, regional development and cross border relations and migration. According to the models the drying should already be underway and, over the length of time it takes to plan significant changes in water resource engineering and allocation (years to a few decades), will become well established.

The study also shows that, in addition to the Southwestern North America other land regions to be hit hard by subtropical drying include southern Europe, North Africa and the Middle East as well as parts of South America.

The study was conducted in close collaboration with scientists at the NOAA Geophysical Fluid Dynamics Laboratory. This collaboration emphasizes the close ties between Columbia University and NOAA that has developed since the establishment of the NOAA Cooperative Institute for Climate Applications and Research at Lamont in 2003.

LR Testimony 04/30/07

LR comments: Shortage Criteria DEIS

Comments by Living Rivers on Draft Environmental Impact Statement for Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead

[Living Rivers Document](#)

Additional Information:

[The One-Dam Solution by Living Rivers](#)

<http://www.livingrivers2.org/pdfs/TheOne-DamSolution.pdf>

[Link to Draft Environmental Impact Statement](#)

<http://www.usbr.gov/lc/region/programs/strategies/draftEIS/index.html>

[Link to Executive Summary](#)

<http://www.usbr.gov/lc/region/programs/strategies/draftEIS/ExecSumm.pdf>

[Reclamation's web page on Shortage Criteria](#)

<http://www.usbr.gov/lc/region/programs/strategies.html>

Reference materials for LR's comment letter to the Bureau of Reclamation

[1\) Barnett2004](#)

[2\) Cayan2001](#)

[3\) Christensen2004](#)

[4\) ChristensenLettenmaier2007](#)

[5\) Dawdy1991](#)

[6\) Gray2003](#)

[7\) Herweijer2007f](#)

[8\) Hildago2000](#)

[9\) Hidalgo2004](#)

[10\) Hoerling2007](#)

[11\) McCabe2007](#)

[12\) McCabeClark2005](#)

- [13\) Miller1997](#)
 - [14\) Milly2005](#)
 - [15\) Mote2005](#)
 - [16\) National Academy of Sciences2007](#)
 - [17\) NashGleick1993](#)
 - [18\) Piechota2004](#)
 - [19\) Piechota2004Eos](#)
 - [20\) Stewart2003](#)
 - [21\) StocktonJacoby1976](#)
 - [22\) Tootle2006](#)
 - [23\) Webb2005](#)
 - [24\) Woodhouse2003](#)
 - [25\) WoodhouseGrayMeko2006](#)
 - [26\) Woodhouse2005](#)
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Regional News 05/18/07

Epic ancient drought grim news for West

Shaun McKinnon The Arizona Republic May. 18, 2007 12:00 AM

A 60-year drought struck the Colorado River during the 12th century, an epic dry period more persistent than any on record and one that suggests a similar megadrought could strike again with devastating consequences.

University of Arizona researchers found evidence of what they call the medieval drought in tree rings used to reconstruct the river's past. Reaching back to A.D. 762, the researchers drew a picture of a river with flows more vulnerable to dry periods than once thought.

What surprised the researchers most was this drought's staying power: For 25 years in the 1100s, the Colorado flowed an average of 15 percent below what is now considered normal. For 13 consecutive years in that period, the river failed to reach that normal level even once.

A recurrence of those conditions would likely drain the reservoirs that store water from the river for Arizona and six other Western states. A streak of just five consecutive below-normal years, from 2000 to 2004, emptied Lake Powell and Lake Mead of more than half of their supply.

"We didn't expect to see that severe a drought," said David Meko, an associate research professor at UA's Laboratory of Tree-Ring Research. "The individual years were not extremely dry by themselves. . . . It was year after year without having a real wet year."

The new study, which provides the longest record of the Colorado's historic flows, could also help other scientists predict the effects of climate change. A study earlier this year

predicted that warmer temperatures could reduce runoff into the Colorado and other rivers significantly.

"This shows that we can have natural events like this regardless of whether there's greenhouse warming," Meko said. "I would expect climate change, if anything, would exacerbate the type of droughts we saw in the past, putting greater and greater stress on the environment."

The UA team collected samples from living and dead trees in both the upper and lower Colorado River basin. Some of the oldest samples actually dated to about 320 B.C., Meko said, but scientists focused on the time periods with the greatest array of samples.

Using cores from living trees, researchers can examine the rings, which tell the story of the surrounding environment. A thin ring means little growth occurred, which suggests drought; a wide ring means the tree collected enough moisture to grow more.

To delve deeper into the past, scientists examined remnant wood, some of which lingered in a forest for centuries after the tree itself died. The remnants still yield a remarkable trove of data.

"This is part of ongoing work to try to understand the climate system that creates these patterns," said Christopher A. Baisan, a UA senior research specialist. "You need the basic data about what happened before you can ask questions such as 'Why were there 60 years of low flow on the Colorado?' ."

Earlier tree-ring studies found serious droughts in the 16th century, both on the Colorado and on the Salt and Verde rivers in Arizona. Other research has suggested that severe droughts swept through the West during the 1100s, forcing entire populations to flee.

This study appears to confirm that the West turned viciously dry in the 12th century and with a persistence few thought possible.

"Seeing those big droughts was a real eye-opener," said Connie Woodhouse, an associate professor at UA and co-author of the study. "Other work in the western U.S. had indicated that period was one of widespread drought. Our question was, 'How did that look in the Colorado River basin?' ."

The length of the medieval dry periods and the lack of intervening wet years would push Western states nearer to crisis than the severity of the conditions. One wet year in the midst of numerous dry years can replace some of the lost reservoir storage. A wet winter in 2005 helped the West avert possible shortages at Lake Powell.

"Having those wet years can really help with recovery," Woodhouse said.

Finding evidence of a six-decade drought in the 12th century doesn't mean a six-decade drought will occur again, Woodhouse said, but the studies help create a record that adds context to actual observations. On the Colorado, those observations, produced by

flow gauges, led state officials in the 1930s to believe the river was more robust than it turned out to be.

"The ironic thing about the gauge record is that the big droughts of the last 100 years are not much compared to the long record," Woodhouse said. "And the wet years of the early 1900s are pretty unusual."

Reach the reporter at shaun.mckinnon@arizonarepublic.com

Congressional Testimony 06/06/07

Senate hears testimony on Impacts of Climate Change

Subcommittee on Water and Power
Wednesday, June 6, 2007

The purpose of the hearing is to receive testimony on the impacts of climate change on water supply and availability in the United States, and related issues from a water use perspective.

[Link to the subcommittee web page](#)

Witnesses

[Philip W. Mote, JISAO/CSES Climate Impacts Group](#)

[Bradley H. Udall, Cooperative Institute for Research in Environmental Sciences](#)

[Christopher Milly, United States Geological Survey](#)

[Patrick O'Toole, Family Farm Alliance](#)

[Tim Brick, The Metropolitan Water District of Southern California](#)

[Jack Williams, Trout Unlimited](#)

[Tim Culbertson, Representing National Hydropower Association](#)

[Terry Fulp, United States Bureau of Reclamation](#)

Regional News 08/09/07

Vile, 'scary' mussel threatening to overrun Lake Powell

By Judy Fahys

The Salt Lake Tribune

Article Last Updated: 08/10/2007

07:39:37 AM MDT

Quagga mussels have arrived in Utah. Think invasion of the boat-



motor-snatchers; think fields gasping for irrigation; think slimy creatures choking drinking-water pipes; think hydropower sputtering to a stop; think of 'Jaws' the size of thumbnails threatening Lake Powell.

The possibilities sound creepier than an environmental horror flick, ever since wildlife officials confirmed this week they've found mussel larvae at Lake Powell.

"These things are incredibly scary," said Larry Dalton, Utah's new Aquatic Nuisance Species Coordinator.

"They may represent the single largest impact to the aquatic environment that I've seen in 36 years."

Thursday, four government agencies - the Glen Canyon National Recreation Area, the Utah Division of Wildlife Resources, the Arizona Fish and Game Department and the U.S. Fish and Wildlife Service - announced they found three microscopic larvae in water samples taken from Wahweap Marina and near the Glen Canyon Dam.

The agencies are not sure how widespread the mussels might be or if there is an established population. They don't know how the mussels might change the Lake Powell ecosystem or spread to other premiere Utah recreation spots, such as Bear Lake and the Jordanelle Reservoir.

In fact, the DNA and microscope tests that were used to identify the mussels do not tell for sure whether the Lake Powell mussels are quaggas or their close cousins, zebra mussels. The state has estimated it will cost \$17 million a year to deal with quaggas if they spread statewide, not including the impacts of fishing. The fear has prompted the creation of Dalton's month-old position, which will eventually oversee an agency with about 40 people, and an emergency expenditure by the state of about \$1 million through next spring.

"If we wait a year," he said, "it will be too late."

Once the mussels are established, they are virtually impossible to eradicate.

Utah officials have kept a wary eye on mussel developments for years, Dalton noted.

One study showed Great Lake facilities spent \$69 million over seven years to deal with mussels. A Canadian report referred to on the Web site 100thmeridian.org described a price tag of more than \$172 million because of mussel infestations at eight hydropower stations, 86 municipal plants and 67 industrial facilities.

"It's just been killing those guys back there," said Dalton, "so we have been worried."

Then, in January, quagga mussels were found downstream on the Colorado River, in Lake Mead.

"That," he said, "put us on high alert."

In late June, quagga mussels were found on a boat at Wahweap Marina that had been in infested waters. It was decontaminated before the boat was allowed to launch.

Water samples were taken from the two Lake Powell locations on July 19 and 30. Three of the five samples showed "extremely small" numbers of larval mussels. A good contrast is Lake Mead, where the infestation is believed to have started two years ago and where similar samples contain hundreds or thousands of mussels.

Baby mussels are about the size of a grain of sand and take about a year to reach full size. Adults are the size of a thumb nail.

All spring, the government agencies with roles at Lake Powell have pushed mussel prevention. Signs posted around the lake urge boaters to inspect their crafts if they have been in other waters in the past 30 days and to use 140-degree pressure washers to clean up the boats, plus a five-day period of drying, before launching into Lake Powell.

State Sen. Curt Bramble, a Provo Republican who owns a houseboat on Lake Powell, said it was "inevitable" that quagga mussels would come to Utah.

He said the findings announced Thursday "could be a serious concern," far more important than its affect on recreation.

Yet, he added: "I'm not sure the research is in and what the ramifications will be."

Kitty Roberts, superintendent of the Glen Canyon National Recreation Area, noted that that the search for better answers is already under way.

"Additional samples have been collected from Lake Powell and are being analyzed for quagga and zebra mussels," she said. "In the coming weeks, more samples will be collected from various location around the lake to determine if mussels are present in other areas."

Dalton said a biologist donning diving gear had inspected 150 boats Thursday. There are another 1,000 to go.

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Quagga quagmire

A freshwater mollusk indigenous to the Dnieper River in Ukraine has invaded waterways of the United States, altering the food chain and rapidly colonizing on hard surfaces, such as the hulls and outboards of watercraft.

* Range: Found in January in Lake Mead, downriver from Lake Powell. First U.S. sighting was in the Great Lakes in 1989.

* Treatment: Chemical controls pose environmental risks; chlorination has been applied routinely. Biological controls are being researched.

* Prevention: Recreationists are urged to clean their watercraft to curb spread of the mussel.

Regional News 08/28/07

Navajo Tribe must haul own water

Shaun McKinnon
The Arizona Republic
Aug. 26, 2007 12:00 AM

TONALEA - Ethel Whitehair ran out of water again over the weekend, emptied every bucket and pot, drained the barrels lined up outside her front door. The community well was closed until Monday.

Water from a well at a nearby windmill could supply the sheep, but it was untreated and made Whitehair's skin itch. At another windmill down the road, vandals had torn the cover off the storage tank. Deep inside, a car battery steeped in the soupy dregs, the surface stirred by the bloated bodies of three dead crows.

So Whitehair waited, as she had so often during her 87 years on Arizona's Navajo Reservation. She waited for her children to come and haul water from the good well. She waited for someone to end an unthinkable water crisis.

It is a wait shared by nearly 80,000 others who must haul water to meet basic needs. They live far from a water pipeline, and their communities barely have enough water to sustain what few lines exist.

The Navajos' water crisis has persisted so long, it has wormed its way into the routines of life on the nation's largest Indian reservation. Easing the crisis will require decades of work, billions of dollars and the patience to cut through the politics of Western water.

Tribal leaders have stepped up pressure on federal and state officials to settle claims for water guaranteed by the Supreme Court. Ignore those claims, Navajo President Joe Shirley says, and risk a water war.

"There is so much misunderstanding," said Lena Fowler, vice chairman of the Navajo Nation Water Rights Commission. "We live in a situation where we can't even meet our own basic human needs, which is just a drink of water. When we get up in the morning, after we pray, we have to start thinking about how much water we have. That's the first thought we have every day. Do we have to haul water?"

Link to poverty

Little comes easy for the 200,000 people who live on the Navajo Reservation, which surrounds three of the four corners in Arizona, New Mexico and Utah. Homes and

communities lie scattered across an area the size of West Virginia. The land is harsh, the climate dry, the distances long, the opportunities to earn money few.

Unemployment rates run as high as 26 percent. Per capita income is about \$7,000 a year, compared with about \$21,000 elsewhere in Arizona. With no casinos yet on the reservation, the tribe can't rely on gaming revenue. More than 40 percent of the people live below the poverty line, about the same proportion who lack running water.

Tribal officials say they can't ignore the link between poverty and lack of water. Without reliable water systems, businesses can't survive. New housing must wait. Indian Health Services, the federal agency that installs local water infrastructure on the reservation, faces a construction backlog of \$250 million, or about 700 unbuilt systems.

So people haul water, as many as 80 percent of people in some communities. It is a task that cuts deeply into meager incomes, especially as gasoline prices climb. The Bureau of Reclamation estimated in a 2004 study that the total economic cost to haul water on the reservation is about \$113 per 1,000 gallons, or \$37,000 for an acre-foot. A Phoenix homeowner pays about \$5 a month for as much as 7,480 gallons.

"We're talking about things a lot of people take for granted," said Ray Benally, director of the tribe's water resources department. "It's about our quality of life. The lack of clean, potable water has an effect on people's health."

Water haulers

Water haulers inhabit a subculture of reservation life, easily identifiable by the plastic tanks bulging from pickup truck beds. They learn where the good water is, when the lines form and how to stretch time between trips to the well.

At the Seventh Day Adventist mission in Monument Valley, Utah, a line of trucks forms early each day, snaking past low-lying red rocks buffed smooth by incessant winds. People chat while they wait. Kids bound in and out of truck beds. No one leaves early.

The well is a rarity, a reliable and clean source of water, clean enough that haulers will pass by other wells and make longer trips to fill up. It's a source of pride for Goulding's Lodge, which took it over for the church and offers the water for free.

"We have to take samples and send them to the tribe and the EPA (Environmental Protection Agency)," said Ronnie Biard, Goulding's general manager. "From what we're told, our water is so pure you could actually bottle it right out of the ground. We're very fortunate."

Amy Yazzie and her boyfriend, Jonathan Greyhatt, must haul water from the Tonalea community well and then empty it into a cistern that is buried on a small hill above their house. A pipe from the cistern runs to the house, a wooden hogan with a square addition that encloses a kitchen and a bathroom.

Like many reservation homes, the plumbing fixtures in this one hold more hope than water, installed with promises of a modern water line from Tonalea or Tuba City.

On a recent morning after returning from the well with a second tank full, Greyhatt started the siphon hose from the back of the truck and, as it drained, hiked down to the house. He filled bucket after bucket, more than a dozen in all, a process that made more room in the cistern for a third trip to the well. The buckets sat on tables, chairs, on the floor, like a scene after a long rain beneath a leaky roof.

Greyhatt moved efficiently, spilling little.

"We had a leak last month," he said. "We thought we had enough water to last awhile. But we came back, and it was gone."

Greyhatt and Yazzie drive 8 miles round trip to get water, but it's not uncommon for people to drive 30 miles or more, one way. During the summer, livestock can require daily trips on long stretches of dirt roads.

The reservation sits atop several huge aquifers, but not all wells produce usable water. A shallow well can turn brackish without warning. Many dry up in a drought. Windmill-powered pumps break down, often for weeks at a time. Running water guarantees nothing in communities like Cameron, where what comes out of taps isn't always safe to drink.

Three major rivers flank the reservation - the San Juan on the north, the Colorado on the west and the Little Colorado on the south - but the tribe has never secured rights to divert adequate water nor can it afford to build large-scale delivery systems.

New Mexico has signed a deal that would set aside water for a strip of the reservation along the Arizona border and build a pipeline to it, but money and politics threaten to sink that plan and delay other agreements. Arizona wants broader regional claims settled before Congress signs off on the New Mexico deal and also wants the tribe to drop a lawsuit that accused the federal government of mismanaging the Colorado. Failure to resolve the Navajo Nation's need for water would thrust the issue into court - and threaten water supplies for millions of people.

A way of life

With resources stretched so thin, the Navajos have adapted into some of the most efficient water users anywhere.

In a day, an average Navajo uses as little as 10 to 15 gallons of water in a water-hauling home, closer to 80 gallons in a home with running water. In Phoenix, the average person uses as much as 170 gallons per day.

"We know how to conserve. We know how to get by with less," said Sharon Williams, whose family lives a few miles from the Coyote Canyon chapter house in western New Mexico. "People in Phoenix have it made. They have water for grass. They can step in a shower any time. They never have to wonder if they have water."

She cracked a wry smile. "If they had to come up here and live like us for a day," she said, with only a trace of taunting in her voice, "they wouldn't make it."

Williams' parents still live in the same house on the edge of a canyon the family owns. The house sits at the top of a small rise, overlooking sheep pens and planting fields. A dirt courtyard is kept immaculate. An enclosure offers shade, its slatted roof alive with vines that Williams' mother, Annie Tsosie, fusses over daily.

Mark Tsosie, who is 78, retired from the railroad a few years back and now tends the livestock. He rises with the sun each day to check on the sheep and the crops, and about every other day he waters the cattle and horses that graze in the bottom of the canyon. This is not as easy as it sounds.

The canyon slices through the rolling plateau, its rounded rocks colored with shades of tan and dusty orange and occasional streaks of red. In one crevice, the wind has bored a hole big enough to frame a view straight down, a drop of more than 100 feet.

No water runs through the canyon, except after rainstorms. The old wells on the canyon floor dried up, leaving only a well up top not far the Tsosie house.

So Tsosie built an irrigation system, a rickety but reliable routine that depends on the health of an old GMC pickup, one that sometimes doesn't start and that, on one recent morning, sat disabled with a flat tire until one of Tsosie's sons arrived with a tire pump.

The tire inflated, Tsosie filled the tank and drove the truck along a rocky path to the canyon rim. He backed the truck to the edge and attached a hose from the tank to a plastic pipe that drops down to the floor, where it fills a trough.

"I've been taking care of this for 60 years," he said, more comfortable with English than he lets on sometimes. "I've got to get them water. This is the only way."

Back at the house, Annie had heated a kettle of water on the stove. Her son Matthew poured some of it into a plastic basin and took it outside onto a table. He looked around for his children and their cousins and grabs one.

"Time to wash hair," he said.

Each of five children took a turn at the basin. Shampoo, rinse, no repeat. Same basin of water. If it holds up long enough, it'll be used to wash hands. Later, sponge baths are given with a larger basin, but the water is still shared.

"I had a great shower a few weeks ago when it rained," Matthew said "I hiked down to a ledge on the canyon and stood under water pouring over the side. I got so clean."

Claims to water

Another storm threatened to develop on a recent afternoon. Black clouds piled up on each other above the mesas, building billowy towers that give the desert its own skyline. John Leeper, the director of the tribe's water-management branch, is keeping a close watch on some of the reservation's most vulnerable water systems.

"A monsoon storm can wash out a system," he said. "It's tough to keep it going. We're hoping to build some robust infrastructure that can support a sustainable community, but you can't just build them and forget them. We don't have what we need right now."

Navajo Mountain, a remote community on the Arizona-Utah border, causes a drugstore full of headaches these days.

The springs that supply it drop rapidly during dry weather, forcing the tribe to haul water in tanker trucks. Sometimes that fails when the trucks tear up the dirt road, leaving them nearly impassible.

The tribe is working on regional water projects that would shore up its delivery systems, but most of them are still in the planning stages. The two most critical, pipelines tapping the San Juan and Colorado rivers, will require as much as \$2 billion from the federal government, a check Congress appears unwilling to write.

Opposition from the Bush administration and other Colorado River states has frustrated Navajo officials, who insist they're not asking for a pipeline to nowhere.

"The water needed is not that big an amount," said Benally, the water-resources director. "And there is money. It's just a question of where you put it."

He cited a report by government auditors who found more than \$1 billion wasted in Hurricane Katrina recovery efforts.

"That could have funded our Gallup project all by itself," Benally said. "They put a lot of money into rebuilding after a natural disaster, but out here, we have nothing to start with. This is a basic necessity."

Benally said the tribe is preparing for a drawn-out process to settle claims with Arizona, another fight to secure federal funding for delivery projects and years of studies and construction. He sees it all as entirely unnecessary.

"The question they should be answering," he said, "is how come they didn't include the Indian people to begin with? Why weren't we at the table with everyone else?"

Still waiting

Tribal officials acknowledge they may never provide full running water to every home. The reservation is just too big, the ancestral lands too widely spread.

A more practical goal is ensuring that water haulers can find clean sources within shorter distances.

Back in Tonalea, Amy Yazzie and Jonathan Greyhatt filled their cistern and moved the truck across a dirt clearing to a one-room house, where Yazzie's mother, Ethel Whitehair, waited.

"She stays by herself for long stretches of time . . . I worry," Yazzie said. "She can't go get the water herself anymore."

Whitehair brightened as Greyhatt began to fill the barrels.

She found a pot and started boiling water for noodles.

Navajo music played on a radio above the stove.

A black and white kitten sniffed at a bowl of milk, mixed from powder.

"In the winter, the barrels sometimes freeze," Yazzie said as Greyhatt topped off the last one. "Then we have to move them inside by the stove to thaw out."

Greyhatt pointed toward the main highway.

Surveyors have staked some of the area for water lines, and some neighbors say they expect work to begin soon.

But so far only a few broken stakes remain.

And so they will haul water again in another week or two.

And wait.

"It's hard. . . . It's hard," Yazzie said. "They say we're going to get water out here sometime, but it never happens."

Regional News 08/31/07

Water rationing said likely

By Fred Ortega, Staff Writer Whittier Daily News Article Launched: 08/31/2007 11:26:13 PM PDT

A federal judge's ruling Friday means Southern California's primary supplier will likely call for water rationing as soon as next year, officials said.

U.S. District Court Judge Oliver Wanger imposed limits on flows caused by pumps sending water from the San Joaquin-Sacramento River delta to users around the state, saying the pumps were drawing in and destroying the endangered delta smelt.

Wanger's ruling — which only lasts for a year — imposes the limits from the end of December, when the smelt are about to spawn, until June, when young fish can move into areas with better habitat and more food.

Metropolitan Water District officials called Wanger's ruling one of the largest court-ordered water curtailments in state history. They said based on initial estimates supplied by the state, MWD stands to lose as much as 30 percent of its supplies from Northern California next year and possibly longer.

That, combined with reduced supplies from the Colorado River and this year's record dry spell, means the MWD has to plan for a shortfall in deliveries to its 26 member cities and agencies, MWD Board President Timothy Brick said earlier this week.

"All of these factors may necessitate Advertisement a curtailment," said Brick, noting that the Southland has gone from having 60 inches of rainfall during the record wet season two years ago to just 3 inches in Pasadena this year. "We don't think (rationing) will happen this year, but maybe next year.

"We are doing everything we can to avoid it, but it is important for people to know this is on the horizon," he said.

MWD General Manager Jeff Kightlinger offered a somber assessment Friday night.

"California simply cannot lose important water supplies without real consequences throughout the state," he said in prepared remarks. "This historic court decision affirms what the water community has realized for some time, but the general public may not fully appreciate — the delta, both as a valuable ecosystem and essential water supply, is broken. This court ruling did not fix it."

The MWD provides water for 18 million residents in parts of Los Angeles, Orange, Riverside, San Bernardino and San Diego counties.

But local agencies like the Upper San Gabriel Valley Municipal Water District have ample reserves in the form of local groundwater supplies, and could probably stave off rationing for up to two years, said district General Manager Timothy Jochem.

"After three years we may have to institute some mandatory reductions," said Jochem, whose agency imports about 35 percent of its water each year from the MWD.

The drought may continue into the next two years and beyond, said JPL climatologist Bill Patztert, meaning San Gabriel Valley agencies will likely end up instituting some type of mandatory cutbacks like those already being implemented in Palmdale and the Coachella Valley.

"Another decade (of drought) is not out of the question," said Patztert, adding that climatologists believe the entire Southwest is undergoing a prolonged dry spell similar to the 20-year-long drought that affected the region in the 1950s and '60s.

"The last eight years have been the driest on record on the Colorado River," said Patztert. "Normal flow on the Colorado is about 15 million acre-feet per year, and there were periods in the 1980s and '90s when we were above 20 million. The average over the last eight years has been about 10 million acre-feet."

An acre-foot of water is equivalent to about 326,000 gallons.

As a result, today the MWD is importing half as much water from the Colorado as it did just five years ago, said Brick.

At the same time increased demand on the State Water Project, which taps the Sacramento River delta, has contributed to an ecological crisis that has threatened native species like the delta smelt.

The tiny fish forced the closure of the pumps that send river water to Southern California for about 10 days in June. The crisis led to a lawsuit against the state by environmental groups led by the National Resources Defense Council.

Wanger on Friday ruled to protect the fish, which experts say might be on the brink of extinction. He said pressure from the pumps helped reverse the natural direction of water within the estuary, damaging habitat and killing delta smelt.

"The evidence is uncontradicted that these project operations move the fish," he said after hearing objections from defendants, who had argued that other factors led to the fish's decline. "It happens, and the law says something has to be done about it."

Jochem said any mandatory reductions imposed by the MWD could include financial incentives for member agencies, like it did the last time water was rationed in the late '80s and early '90s. For example, an agency that consumes below a certain percentage of the water it imported the previous year could get a reduction in rates.

"The agencies can then pass on the savings to consumers or use the money to implement water conservation programs," said Jochem, noting that his agency used extra money from the last round of mandatory cutbacks to begin a low-flow toilet installation program.

As for how agencies would force customers to use less water, one need only look to Palmdale.

That city has already imposed restrictions limiting lawn watering to no more than three alternating days a week, and only during nighttime hours; prohibiting the hosing down of sidewalks; and asking restaurants not to serve water to customers unless they ask for it.

Regular violators can face \$1,000 fines and disconnection of water service.

The MWD's plans are not only necessary and inevitable, said Patztert, but must be part of a sea change in the way Southern Californians consume water.

"In Southern California we overwater our lawns by anywhere from 6 to 8 feet per year, wash our cars twice a week and sprinkle our streets and sidewalks," said Patztert, noting that 70 percent of local domestic water consumption is used to water lawns. "If we got rid of the English gardens and lawns and replaced them with drought-tolerant landscaping, we could conserve enough water to sustain twice the present population."

And coupled with the fact that the area's population is projected to continue growing over the next 30 years, there are little options left to the area's water purveyors.

"The MWD and associated water districts might as well start thinking about this now," Patztert said. "Because more people and less water is what our future looks like."

The Associated Press contributed to this story.

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Regional News 09/02/07

Dam release coalition blocked

By CYNDY COLE Sun Staff Reporter Sunday, September 02, 2007

The Colorado River in the Grand Canyon grows and shrinks tremendously every day.

The volume of water passing through the turbines at Glen Canyon Dam is incrementally doubled or halved in 24 hours to meet momentary power needs in Nevada, Utah, Wyoming, Colorado, New Mexico and Arizona.

But a growing coalition of national park officials, federal biologists, conservationists and river guides contend such dramatic fluctuations are detrimental to the Grand Canyon ecosystem and possibly illegal during low-water years.

They want Interior Secretary Dirk Kempthorne to order that daily flows be evened out and the water releases to more closely mimic seasonal river changes.

But power companies say such a move would cost millions of dollars to replace the cheap power that would be lost if they cannot ramp up releases during hot, summer afternoons.

They outvoted the growing coalition at a showdown meeting in Flagstaff Thursday, but the insurgents, led by the Grand Canyon Trust of Flagstaff, said the issue is far from settled.

The Fish and Wildlife Service recommended a decade ago that such an experiment be conducted to see if it would benefit endangered fish in the Grand Canyon.

"We would love to be able to have a sufficient duration of steady flows to be able to see what the response would be of humpback chub," said Sam Spiller of the U.S. Fish and Wildlife Service.

But other federal agencies and power officials defeated a proposal on Thursday that would have recommended the Interior Department adjust water flows by season, saying they didn't want an experiment that could cost ratepayers tens of millions of dollars in higher utility bills.

A similar experiment conducted for a few months in 2000 cost customers \$31 million in power production, according to one calculation. The dam supplies power directly to the Navajo Nation, Hopi Tribe and Arizona Strip and sells power to wholesalers that serve an estimated 4.9 million individuals in six states, mostly in rural areas.

The Trust proposed changing water releases from the dam by season only -- not by day -- which would limit the dam's ability to generate more hydroelectricity when electricity demand peaks.

This is an experiment required by law during years when a minimum amount of water is released from the dam, the group said.

Recent drought years have led to such minimal releases, along with reduced power production.

"The Grand Canyon Trust believes the flows currently coming from Glen Canyon are illegal," said Nikolai Ramsey, of the Trust.

Such a change would force utilities to buy power elsewhere during peak hours, said Clayton Palmer, of the Western Area Power Administration, a federal agency.

NO MORE SPRING FLOODS

Before Glen Canyon Dam was built, the Colorado River used to flood wildly.

The dam, completed in 1963, has eliminated seasonal floods that were once powerful enough to toss around house-sized boulders.

Now, even held fully open, the nation's second-tallest dam couldn't produce the large floods that once existed.

So representatives from Colorado River states, utilities, regional tribes, federal entities and environmental and recreational groups meet every few months to hash out management ideas for the river.

They look over technical reports and data, negotiate, and eventually make a recommendation to the secretary of the Interior Department. Interior makes the decisions.

The Grand Canyon has steadily seen beaches erode, river temperatures change and the number of humpback chub decline in recent decades, according to a 2005 report from the Grand Canyon Monitoring and Research Center at USGS in Flagstaff.

"As a result of dam operations and decreased sand supply, the Colorado River now typically transports more sand downstream than tributaries supply on a seasonal to annual basis," U.S. Geological Survey researchers wrote in one report.

The sandbars and beaches in the Grand Canyon have been eroding since 1963, USGS has found, now at an average rate of 15 percent per year.

That spells trouble for the river runners who camp on beaches, as documented in a series of photos taken by Northern Arizona University geologists.

Grand Canyon River Guides support changing dam operations.

"As camping beaches continue to diminish, crowding and congestion will become even more of an issue, especially in areas where beaches are in high demand, or few in number," said Lynn Hamilton, executive director of Grand Canyon River Guides. "Sediment is the lynchpin for the health of multiple resources in Grand Canyon, including the recreational resource. River runners care deeply about everything that makes Grand Canyon and the Colorado River so unique, and finding better ways to manage and restore the health of those resources is critical."

Cyndy Cole can be reached at 913-8607 or at ccole@azdailysun.com

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Arizona Daily Sun OpEd

Watershed year for Colorado River and Glen Canyon Dam

Sunday, September 16, 2007

http://azdailysun.com/articles/2007/09/16/news/opinion/20070916_opinion_50.txt

Serving on the Editorial Advisory Board this week were Publisher Don Rowley, Editor Randy Wilson, and citizens Jacqueline LaFave Perkins, Laurel Shelton, Mary Black and Thomas Gorman.

This is a watershed year for the Colorado River below Glen Canyon Dam, and in more ways than one.

Low snowmelt in the Rockies has again meant lower water levels in Lake Powell, which affects the power production from the dam and how much water can be released into the Grand Canyon below.

Now, with the publication of a new USGS study that shows the increasingly harmful effect of the dam's operations on the native fishes, plants and beach habitats downstream, pressure is mounting to change water releases from the dam.

Raising the stakes even higher is the Grand Canyon Trust, which is calling federal power officials on the carpet for failing to adjust dam releases to account for drought years. Federal rules call for much lower and steadier flows during the hot, summer months and higher flows in the spring to mimic seasonal floods, not the high-volume releases each day in summer to accommodate the power needs of air-conditioned Las Vegas and Phoenix.

As Cyndy Cole reported earlier this month, the Trust, along with officials from Grand Canyon National Park, the Fish and Wildlife Service and river outfitters, confronted the federal group that advises the Interior Secretary on dam releases at a meeting in Flagstaff. They lost by a vote of 14-4 on a motion to implement the drought-year river protections, but that's not the end of the issue. Legal action might come next, along with taking their case to the public. As one of the insurgents noted, "This isn't the Glen Canyon Dam State. It's the Grand Canyon State."

On the surface, the dispute might seem like much ado about nothing. The warmwater, native humpback chub, which is the canary in the coal mine for advocates of river preservation, is not particularly photogenic. Its successors, the coldwater rainbow and brown trout, are much preferred by sport fishermen. As for disappearing beach habitat caused by high summer dam releases, some would say that's an unavoidable cost if urban-dwellers are to survive the searing Southwest desert heat.

If the drought cycle in the Southwest was temporary, we might be inclined to agree that worries over the Colorado River ecosystem's ability to adapt to the massive changes caused by Glen Canyon Dam are overblown. The Grand Canyon has been around for eons and no doubt seen many changes in the river's flow, so why would it not be able to adapt now?

The difference is that those epochal changes occurred gradually, not overnight, as was the case when the dam first closed its gates in 1964. River water temperatures have dropped up to 25 degrees, spring floods no longer occur, and daytime flows in summer now fluctuate wildly, depending on how much hydropower the dam needs to generate on a hot afternoon. It's no wonder that a prehistoric fish like the chub, which took millions of years to adapt to the unique river conditions in the Canyon, is now nearly extinct within four decades, and that other native plants and animals are following suit.

The plan to restore some of the balance being advanced by the Trust, Fish and Wildlife, the national park and others is not an either/or choice. It calls for a modest, three-month experiment that would scale back peak daily releases in the hot summer months and open the floodgates in the spring. The lost power would cost the electric utilities an estimated \$30 million a year to replace it from higher-priced sources, including coal-fired plants.

So the issue is not so much cost -- \$30 million is a drop in the bucket compared to the billions of dollars worth of power sold each year on the Southwest electric grid. Nor is it particularly expensive to customers: There are an estimated 5 million people who use power from Glen Canyon Dam, so the experiment would cost just \$6 apiece. What's more compelling is the concern that, by restoring the Grand Canyon ecosystem, advocates of river preservation would be increasing the carbon "footprint" of power consumption in the Southwest by relying more on coal. Until industrial solar and wind plants go online or nuclear power makes a comeback, this area's cheapest and least-polluting source of power will remain hydroelectric dams.

The major flaw in that argument is related to why the river-flow experiment is needed in the first place: drought. If rain and snowfall continue to be low in the Colorado River basin, setting low summer flows won't be optional, they will be mandated by Mother Nature. That will mean less power can be generated from dams as lake levels decline because there isn't as much water pressure to drive the turbines. At some point in the very near future, all of us in the Southwest might have to come to grips with the demise of hydroelectric power, regardless of how we feel about restoring the Grand Canyon's pre-dam ecosystem.

It's for those reasons that we can't emphasize enough -- as we have in this space before - the importance of ramping up industrial-scale renewable energy plants. If that means a major expansion of the tax credits available to the developers of solar and wind plants, so be it. Climate change is not only exacerbating the problems in the Grand Canyon caused by Glen Canyon Dam. It should force us to rethink what kind of energy infrastructure will support population growth in the Southwest and, indeed, how power consumption might need to be radically modified. As we said above, it's a watershed year not just for the Colorado River in the Grand Canyon but for all of us who depend for power on the dam that controls its destiny.

Regional News 10/04/07

Ariz. fights changes in Colo. River plan

Shaun McKinnon The Arizona Republic Oct. 4, 2007 12:00 AM

Arizona balked Wednesday at proposed changes to a Colorado River drought plan and appealed to the federal government to settle the dispute or delay approval of the plan.

In a letter to U.S. Interior Secretary Dirk Kempthorne and the other six states that take water from the Colorado River, Arizona officials said attempts to rewrite an agreement reached earlier this year put Arizona's share of the river at an unacceptable risk.

"We worked hard to try to put together this agreement, and the only thing Arizona asked is that it did not harm Arizona water users," said Herb Guenther, director of the state Department of Water Resources.

At issue is whether a new system of managing reservoirs on the river would threaten the portion of Arizona's allotment that serves Phoenix and Tucson. Arizona argues that changes sought by states on the upper river could deprive Arizona of water even when storage levels in one reservoir were high.

The request for federal mediation could upset an already-tenuous peace among the seven states, which negotiated for more than two years over how to manage the river in times of drought.

The states' version was undergoing a final review, and Kempthorne was expected to approve it in December.

The federal government wanted the plan in place to avoid protracted legal battles if drought or shifting climate continued to shrink the river's flow.

Growing demand for water among the nearly 30 million people who rely on the Colorado River has also increased tension.

Guenther said a delay could help the states produce a better operating plan and, in turn, ward off future lawsuits.

"We think the whole process is moving too quickly," he said.

"We're not giving enough time to seriously resolve this particular issue. It would be our feeling that it would not hurt to slow the process down a little and give the negotiations a chance to succeed."

Federal officials acknowledged the stalemate between Arizona and the other states but suggested further work within the current framework.

"In light of the fact that in the last eight years the Colorado River has suffered through the worst drought in recorded history, it is extremely critical that we implement new guidelines for managing the Colorado River under low-water conditions this year," said Robert Johnson, commissioner of the U.S. Bureau of Reclamation, the Interior Department's water agency.

Johnson said the bureau had been working with the states for the past two months to resolve the differences and even delayed release of the final environmental-impact statement on the operating plan.

He said he will meet with representatives from the states this week, "however, time is short."

"The basin is still in the grasp of this drought, and it is critically important that we resolve this issue now," Johnson added.

The other states hadn't seen Arizona's letter Wednesday and reacted cautiously.

"Utah's position is we're still talking among the basin states, and we are optimistic that an agreement can be reached that will not harm Arizona and that will be beneficial to all the basin states," said Dennis Strong, director of the Utah Division of Water Resources.

Arizona identified several concerns about the agreement in its letter, but the dispute hangs mostly on proposed changes to the way the states manage water in Lake Powell and Lake Mead, the two largest storage reservoirs on the Colorado River.

Under the proposed drought plan, shortages are triggered by water levels in Lake Mead, which stores water for Arizona, Nevada and California. As the lake level declines, the size of the water shortages grows, which is why the three lower-river states have proposed ideas to increase storage.

Arizona would feel the main brunt of any shortage because it gave up legal seniority to part of its allocation in exchange for the Central Arizona Project Canal, which delivers water to Phoenix and Tucson. The water in that canal is the first to be cut off in a shortage.

The agreement called for a system of balancing the water in Mead and Powell, which store water on behalf of the upper-basin states of Colorado, Utah, Wyoming and New Mexico. Those states fear that if Powell drops too low, they could suffer shortages.

Arizona argues that the upper-basin states tried to rewrite the formula for balancing water in the two reservoirs, producing rules that could create a shortage on Lake Mead even when ample water remained in Lake Powell.

"It's a scenario that may never develop," Guenther said. "But it could happen. And if it did, we don't feel it would be appropriate to short Arizona water users when there was water in Lake Powell."

Regional News 11/02/07

Reclamation Issues Final EIS for Colorado River Operations under Low Reservoir Conditions

Lower Colorado Region, Boulder City, Nev.

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Released On: November 02, 2007

Commissioner of Reclamation Robert Johnson today announced that the Bureau of Reclamation (Reclamation) has issued a final Environmental Impact Statement on the proposed adoption of specific Colorado River Lower Basin shortage guidelines and coordinated reservoir management strategies to address operation of Lake Powell and Lake Mead, particularly under low reservoir conditions.

"These proposed operational guidelines will provide Colorado River water users and managers in the U.S. a greater degree of certainty about how the two large reservoirs on the Colorado River will be operated under low water conditions, and when - and by how much - water deliveries will be reduced in the Lower Basin in drought or other low reservoir conditions," Johnson said.

The Final EIS presents six alternatives, including a No Action Alternative and a Preferred Alternative. The Preferred Alternative proposes that:

- * specific water levels in Lake Mead be used to determine when a shortage condition (the availability of less than 7.5 million acre-feet of water) would be declared in the lower Colorado River Basin, and how that shortage would be shared by the three Lower Division States - Arizona, California and Nevada;

- * specific reservoir conditions at Lakes Powell and Mead be used to determine the annual operation of these reservoirs, in a manner that would minimize shortages in the Lower Basin and avoid the risk of water delivery curtailments in the Upper Basin;

- * a mechanism be implemented to encourage and account for augmentation and conservation of water supplies in Lake Mead to minimize the likelihood and severity of

potential future shortages and to provide additional flexibility to meet water use needs, particularly under low reservoir conditions; and

* the Interim Surplus Guidelines established in 2001 be modified and extended through 2026.

"The Preferred Alternative was developed by Reclamation after extensive collaborative efforts with the Colorado River Basin States, environmental organizations and other stakeholders," said Johnson.

"It was designed to allow the river to be managed to meet the demands being placed on it today and into the future. I commend the states and all the other stakeholders who worked so long and hard to develop these guidelines and management strategies - this truly is an historic accomplishment."

Development of the guidelines was spurred by the current drought in the Colorado River Basin, which began in the fall of 1999. In the eight years since then, the Basin has experienced the worst drought conditions in 100 years of recorded history, and storage in Colorado River reservoirs has dropped from nearly full to about 54 percent of capacity.

Because there are currently no specific guidelines for determining shortage conditions in the Lower Basin, or the coordinated operation of Lake Powell and Lake Mead during drought and low reservoir conditions, a public process was initiated in September 2005 to develop them. They are expected to be adopted by the Secretary of the Interior in December, and take effect in January 2008. They would then be used each year through 2026 to develop the Annual Operating Plan for Colorado River reservoirs.

The Final EIS is available for viewing and copying at [Reclamation's project website](#). Alternatively, a compact disc or hard copy is available upon written request to: Regional Director, Lower Colorado Region, Bureau of Reclamation, Attention: BCOO-1005, P.O. Box 61470, Boulder City, Nevada 89006-1470; fax at (702) 293-8156; or [Email: strategies@lc.usbr.gov](mailto:strategies@lc.usbr.gov)

[Reclamation Fact Sheet](#)

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Reclamation is the largest wholesale water supplier and the second largest producer of hydroelectric power in the United States, with operations and facilities in the 17 Western States. Its facilities also provide substantial flood control, recreation, and fish and wildlife benefits. Visit our website at <http://www.usbr.gov>.

LR in the News 11/03/07

SLC hydrologist says the arrangement means 'everyone shares the pain'

Plan manages Colorado River in drought

By Patty Henetz

The Salt Lake Tribune

Article Last Updated: 11/03/2007 12:25:59 AM MDT

The Law of the River has gotten another adjustment with a federal plan to manage the Colorado River during dry years.

The U.S. Bureau of Reclamation on Friday released a final environmental impact study that could be a way to avoid renegotiating an 85-year-old agreement based on inflated notions of how much water really is in the river.

Or, according to river advocates, the plan that will govern use and allocation through 2026 could be a way to ensure none of the seven Western states that share the river ever has enough water.

The study's conclusions drew from a consensus decision by the seven Western states that depend on the Colorado River on what to do during low-water years, officials said.

"This is an arrangement for operating the river where everyone shares the pain when you're going through a drought time," said Tom Ryan, a Bureau of Reclamation hydrologist in Salt Lake City.

The Bureau of Reclamation began the environmental study in 1999. Since then, the river basin has experienced the worst drought in 100 years of recorded history, and its two largest reservoirs - Lake Powell and Lake Mead - have gone from being nearly full to just over half-full.

The report, expected to be final in December, plans how the upper basin states - Utah, Colorado, Wyoming and New Mexico - will respond to demand from California, Arizona and Nevada, the lower basin states, which have more people and older water rights.

While the Bureau of Reclamation implicitly acknowledges that the 1922 Colorado River Compact is based on estimates from unusually wet years and its report assumes ongoing shortages, it doesn't suggest any changes to the agreement.

"Nobody wants to renegotiate the compact. The feeling is the compact provides an adequate framework for managing the river," Ryan said.

But to John Weisheit, conservation director for the non-profit organization Living Rivers, the bureau's solution entrenches wastefulness and refuses to acknowledge ways to store water more effectively.

"We're extremely disappointed," he said. "Now we're playing this balancing act between two reservoirs that climate change is going to keep empty."

Living Rivers has long campaigned to decommission the Glen Canyon dam and rely on Lake Mead for surface water storage. The organization also believes using aquifers in Arizona and California to store water underground would be a better solution. But the main problem with the bureau's solution is there's not enough water, which speeds destruction of the river ecosystem, Weisheit said.

phenetz@sltrib.com

LR in the News 11/08/07

Reclamation finalizes drought-sharing plan

Eryn Gable, special to Land Letter

The Bureau of Reclamation on Nov. 2 released a final environmental impact statement outlining management of the Colorado River during dry years.

The plan, which will guide the operation of lakes Powell and Mead until 2026, is based on an agreement by seven Western states that depend on the Colorado River. It is expected to be adopted by the Interior Department secretary in December and take effect in January 2008.

"These proposed operational guidelines will provide Colorado River water users and managers in the U.S. a greater degree of certainty about how the two large reservoirs on the Colorado River will be operated under low water conditions, and when -- and by how much -- water deliveries will be reduced in the Lower Basin in drought or other low reservoir conditions," said Reclamation Commissioner Robert Johnson in a statement.

Development of the guidelines was spurred by the current drought in the Colorado River Basin, which began in the fall of 1999. In the eight years since, the basin has experienced the worst drought conditions in 100 years of recorded history, and storage in Colorado River reservoirs has dropped from nearly full to about 54 percent of capacity (Land Letter, April 12).

The final EIS acknowledges that the 1922 Colorado River Compact is based on estimates from unusually wet years, but it doesn't suggest any changes to the agreement, which divvies up water among the seven states.

The document also acknowledges the potential effects of climate change, including decreased mean annual flow, increased variability, more frequent and severe droughts, and decreased runoff. However, Reclamation argues that the science surrounding climate change is not yet precise enough to determine exactly what those effects will be.

Brad Udall, director of the Western Water Assessment, a joint effort by the University of Colorado and the National Oceanic and Atmospheric Administration, said that is a good tack for Reclamation to take. "I actually think that Reclamation did a good job of looking

at the state of the science and acknowledging this is a problem, but the science at the regional level just isn't good enough to provide the answers," he said.

The final EIS presents six alternatives, including a no-action alternative and the agency's preferred alternative. The preferred alternative proposes that:

Specific water levels in Lake Mead be used to determine when a shortage condition (the availability of less than 7.5 million acre-feet of water) would be declared in the lower Colorado River Basin, and how that shortage would be shared by the three lower basin states -- Arizona, California and Nevada.

Specific reservoir conditions at Lakes Powell and Mead be used to determine the annual operation of these reservoirs, in a manner that would minimize shortages in the lower basin and avoid the risk of water delivery curtailments in the upper basin.

A mechanism be implemented to encourage and account for augmentation and conservation of water supplies in Lake Mead to minimize the likelihood and severity of potential future shortages and to provide additional flexibility to meet water use needs, particularly under low reservoir conditions.

The Interim Surplus Guidelines established in 2001 be modified and extended through 2026.

Too optimistic?

John Weisheit, conservation director for the nonprofit organization Living Rivers, said his group doesn't like the agreement at all. "We think the Bureau of Reclamation is hiding behind a model when they really haven't looked at all the parameters we think they should look at," he said.

For example, Weisheit noted Reclamation used the most optimistic estimates of annual yield on the Colorado River based on tree ring records -- 14.7 million acre-feet. Other models show yields as low as 13 million acre-feet, he said.

"There's reason for that," Weisheit said. "The model at 14.7 million acre-feet shows that the world is still rosy, but the model at 13 or 14 million acre-feet shows both reservoirs go empty for a long period. That's not what the Bureau of Reclamation wants the public to know. They're not being honest with the American public."

"There's not going to be water for anything eventually," Weisheit added. "They basically are praying for rain."

Weisheit said his group has not yet discussed whether they will challenge the bureau's plan in court. However, it appears likely that there will be some sort of legal challenge to the plan based on violations of the National Environmental Policy Act.

Gable is an independent energy and environmental writer in Woodland Park, Colo.

LR Press Release 11/15/07

Federal Water Managers Ignore Climate Change on the Colorado River, but You Don't Have to.

FOR IMMEDIATE RELEASE

November 15, 2007

Contacts: Owen Lammers - 435-261-4163; Niklas Christensen - 206-617-2050

Federal Water Managers Ignore Climate Change on the Colorado River, but You Don't Have to.

New simulator puts water shortage forecasting on your desktop.

Two weeks ago the Bureau of Reclamation released its first ever plan for managing the Colorado River under shortage conditions. However, their strategy is based on a narrow set of assumptions that underestimate the potential for future shortfalls, and the risks to the region's \$1.2 trillion economy.

Using the same techniques employed by Reclamation's forecasters, the Colorado River Open Source Simulator (CROSS)* has been developed to allow the public the opportunity to explore a more complete range of scenarios which nature may have in-store for Colorado River water users.

"CROSS's simple interface is designed for anyone to use, whether familiar with the Colorado or not," says Niklas Christensen, who developed the simulator for Living Rivers and is releasing it today at the American Water Resources Association's annual conference in Albuquerque. "Most importantly, using the same inputs, CROSS outputs validate well against Reclamation's far more sophisticated and expensive model, making this a credible and valuable public tool in this era of Colorado River uncertainty."

As a leading scientist on assessing the impact of climate change on the hydrology and water resources of the Colorado river, Christensen is fully aware of the risks that may lie ahead for the watershed. Results from his research, funded by the Department of Energy, predict up to a ten percent reduction in flows by the end of the century. Findings by other scientists, such as Martin Hoerling from the National Oceanic and Atmospheric Administration, predict the change could be much greater and come more quickly, up to a 40 percent reduction in flows by the middle of the century.

"None of us can say with precision what's going to happen, but what the science is telling us is that something very likely will, and it's quite surprising that such an important variable has been omitted from Reclamation's shortage forecasting," adds Christensen.

CROSS shows that a reduction in the middle range of predictions, 20% by the year 2100, would render it highly unlikely that Lake Mead, the nation's largest reservoir, would ever fill again, and a strong likelihood of being empty for good by 2050. By contrast, Reclamation's shortage assumptions have Lake Mead holding steady

throughout their 2008 – 2060 forecast period. Worse still, should flows mimic what the basin has experienced so far this century, CROSS shows how Lake Powell, the Nation's number two reservoir, and Lake Mead would likely become operationally empty within the next five years.

“With the region in its longest recorded drought, reservoirs at below 50% capacity, it's amazing that Reclamation modelers assume the Colorado of the future will likely mimic its high flow periods of the past,” says Owen Lammers, Executive Director of Living Rivers. “With every drop of water already allocated, and just a 2% mistake equivalent to losing Las Vegas's Colorado River water supply, providing the public with comprehensive forecasting is no trivial matter.”

Even if climate change were not an issue, Reclamation's forecasts still errors toward the positive. Current estimates of the long-term annual flow of the Colorado River range from 13.0 to 14.7 million acre-feet (maf). Reclamation's forecasting is largely based on flows of 15.0 maf—the recorded average streamflow from 1900 - 2005. These 20th century flows, however, are now recognized to be among the wettest in 1,200 years. While Reclamation acknowledges this, and has conducted some alternative analysis with flows as low as 14.6 maf, it failed to examine the full range of variability offered by researchers.

CROSS illustrates how at 14.0 maf Reclamation's new shortage policy will be immediately taxed, very likely requiring consultation with the Secretary of Interior to determine who gets what water and when, the precise action these policies were designed to avoid. At 13 maf, the new system collapses altogether with Lake Mead likely operationally empty by 2020, rising for only brief periods through the rest of the century.

“It's not that we feel such scenarios are any more valid than what Reclamation has offered, its just their omission misrepresents the potential for shortages that science suggest we ought to acknowledge,” stresses Lammers. “Fortunately with CROSS, anyone can explore the full range of possibilities, as well as the amount of water conservation we can employ to successfully navigate any uncertainty.”

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*CROSS requires the use of Microsoft Excel installed on a Microsoft Windows operating system. CROSS is designed to be a self-contained application and does not require the user have previous experience with Microsoft Excel.

To download, obtain more information, or view screenshots and sample outputs from CROSS: visit the CROSS page at [onthecolorado.org](http://www.onthecolorado.org), a new website committed to the latest news and views on how we live work and play on the Colorado.

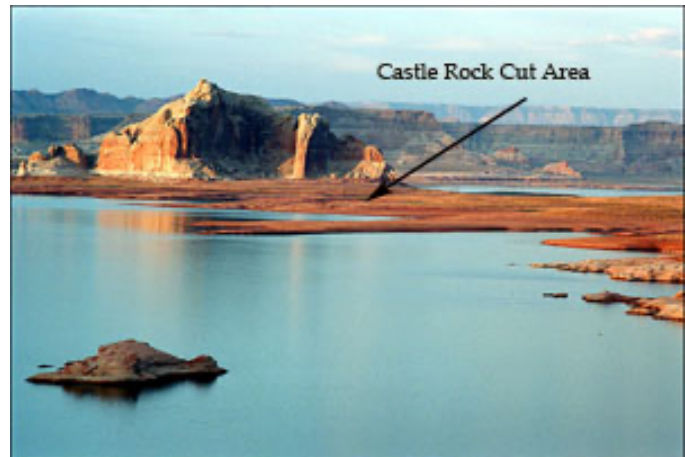
<http://www.onthecolorado.org/cross.cfm>

LR Letter 12/02/07

Scoping letter: Castle Rock Cut at Lake Powell

December 2, 2007
Mr. Kevin Schneider
Public Affairs Office
Glen Canyon National Recreation Area
P.O. Box 1507
Page, AZ 86040-1507

Sent via email:
Kevin_Schneider@nps.gov
Sent via fax: 928-608-6259



Re: Environmental Assessment (EA) for the Castle Rock Cut

Dear Mr. Schneider,

Thank you for this opportunity to provide scoping comments for the proposal to excavate a deeper cut at the divide near Castle Rock for the passage of boats during low reservoir conditions. Our comments are written on behalf of the following organizations:

Living Rivers (www.livingrivers2.org)
Colorado Riverkeeper (www.coloradoriverkeeper.org)
Colorado Plateau River Guides (www.riverguides.org)
River Runners For Wilderness (www.rfw.org)
Southern Utah Wilderness Alliance (www.suwa.org)
Wildlands CPR (www.wildlandscpr.org/utah)

The cut should be left as it is. The previous excavations should be considered as mistakes by administrations of the past.

To many people the managing guidelines for multiple-use criteria at a National Recreation Area (NRA) does not include large-scale, extraordinary alterations to the natural landscape. The basic facilities for the users of the NRA have already been provided. The cut at Castle Rock is an extraordinary development activity that is inappropriate.

The Park Service must surely be aware that this development plan borders on the unethical and is therefore highly controversial within the public perception. It would be wise and prudent for the Park Service to do no harm and, instead, accept the circumstances that Nature presents.

The issues of safety and congestion at The Narrows, near Antelope Point Marina, is a consequence of the Park Service's decision to allow a marina to exist at a poor geographic location. It has essentially been decided by the Park Service that there are

no safety concerns at The Narrows, since the marina at Antelope Point exists at the discretion of the Park Service. Therefore, this issue has already been determined by the Park Service as a non-issue.

If safety is now an issue, then the Park Service needs to also include a remedy to their planning error, and in addition to the whatever decision is made concerning the cut near Castle Rock. Living Rivers addressed this safety issue on the matter of the development plan for Antelope Point Marina in year 2000. We declared that the marina should not be developed for this and many other reasons, and so it is appropriate for us to ask that an alternative to close Antelope Point Marina be appraised.

If the Park Service permits the excavation at Castle Rock, then this also implies that the Park Service will also be responsible for all the other access issues the multiple-users of the NRA may have concerning facilities when the reservoir levels of Lake Powell are low.

For example, does this mean that the Park Service will also excavate a bedrock take-out at Hite Marina and Clay Hills Crossing for river runners? Will the Park Service excavate a trail in the cliffs of Dark Canyon so that river visitors can circumvent the treacherous sediment deposits at this side canyon? Will the Park Service also excavate a trail so that visitors can once again access Clearwater Canyon?

Additionally, what about the impossible and unsafe camping situations due to massive sediment deposits at lower Cataract Canyon, Narrow Canyon, and lower San Juan Canyon? Will the Park Service also be willing to excavate campsites in the bedrock cliffs so visitors can prepare meals and sleep in safety without having to worry about landslides and blocks of dried sediment tumbling into their camps?

On this matter of declining reservoir levels, as it applies to the visitor experience at the NRA, it is apparent that a Environmental Impact Statement (EIS) is clearly in order because a comprehensive assessment of the issues and remedies will be required for the Park Service to make appropriate decisions. We highly suggest that the Park Service implement such a strategy.

For example, considering that the Shortage Criteria EIS prepared by the Bureau of Reclamation has not considered paleoclimate data or atmospheric warming data into their hydrology model, serious management unknowns yet remain about addressing development plans that are presumed necessary to implement in response to lowering reservoir levels at Lake Powell.

We suggest that the Park Service provide the leadership that Reclamation has demonstrated a reluctance to provide; a reluctance that leaves management plans by cooperating agencies, such as the Park Service, hanging in the realms of uncertainty.

We also suggest that the Park Service investigate a recently released open source simulator to determine for itself how persistent drought and climate change would effect Lake Powell. The simulator is called CROSS and is available at the following web site: www.onthecolorado.org/cross.cfm

It is highly probable that the Castle Rock Cut is not a remedy at all in the long-term. For example, if this drought becomes any more persistent than it has already proven to be, is the Park Service contemplating yet another excavation, and yet another, as it chases an ever declining reservoir? If so, then this issue also needs to be addressed more comprehensively as an EIS.

At this time, the most prudent and reasonable alternative for this proposed management action is to leave the cut at Castle Rock the way it is and accept the extraordinary consequences of Nature.

Sincerely yours,

John Weisheit, Conservation Director
Living Rivers
Colorado Riverkeeper
Colorado Plateau River Guides

Jo Johnson and Tom Martin, Co-Directors
River Runners For Wilderness

Scott Groene, Executive Director
Southern Utah Wilderness Alliance

Laurel Hagen, Utah Program Director
Wildlands CPR

LR in the News 12/09/07

States agree on plan to make water last

As reservoirs dwindle, river states agree to a landmark conservation plan

Shaun McKinnon

The Arizona Republic

Dec. 9, 2007 12:00 AM

Water users from the seven Colorado River states are expected to ratify a regional drought plan this week in Las Vegas, ending years of bickering over how to balance uncertain resources with growing demand.

The heart of the plan is the heart of the river system, its two largest reservoirs along Arizona's northern borders. Lake Powell and Lake Mead hold not only the water needed to survive long dry periods but also the key to a landmark deal meant to give the states a chance to find longer-lasting solutions.

Drought has drained the two reservoirs to below half capacity, increasing the threat of water shortages upstream and in Arizona, along with the loss of cheap hydropower and

damage to riparian habitat and recreation sites. With that much at risk, some of the states were prepared to fight costly legal battles. The drought plan can't keep the lakes from shrinking further if dry conditions persist and could trigger the first shortage as early as 2010. But by focusing on the reservoirs and the way they help manage the river's limited supply, the states hope to protect users from the worst effects of drought.

The plan guides management of the river through 2026 using reservoir levels to trigger rationing and a series of experimental conservation programs. Environmental groups say the plan fails to protect the river itself, but the states insist they produced what they could within their limits.

"This won't eliminate the risk of shortage, but it prolongs the period of time before we experience one," said Sid Wilson, general manager of the Central Arizona Project, which delivers Colorado River water to Phoenix and Tucson. "None of us doubt that drought is a more ominous threat than we ever realized."

Finally, a plan

The seven river states - Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming - had never written a drought plan because they never needed one. The region survived a severe dry stretch in the 1950s, before growth pushed up demand. And when a string of wet years followed, the states instead adopted rules to manage surplus water.

Almost before those rules took effect, drought hit again. Faced with potential shortages and threats from the Interior secretary to impose a federal solution, water users started talking about what happens if the river can't supply demands.

What emerged from negotiations was a plan built around the two big reservoirs.

Until now, separate rules governed the way water flowed from Lake Powell - which was built to benefit Colorado, New Mexico, Utah and Wyoming - into Lake Mead, which stores water for Arizona, California and Nevada.

The drought plan, which includes parts of the old surplus guidelines, would impose one set of rules to operate the reservoirs, balancing the needs of users in both the upper and lower basins. Low water levels in Lake Mead will trigger rationing in Arizona and Nevada under the plan; other measures will attempt to delay shortages.

The first trigger would cut Arizona's allocation by 320,000 acre-feet (about 11 percent) until lake levels recovered. Arizona could lose up to 17 percent of its allocation under the plan's most dire scenario. State officials say agricultural users would absorb most, if not all, of the losses.

Lake Mead currently sits about 36 feet above the first shortage trigger. Federal hydrologists say the lake should remain at least 25 feet above the trigger in 2008.

"By managing the two reservoirs together rather than fighting over how much water will be released every year, we'll help mitigate the probability of Arizona taking shortages," said Herb Guenther, director of the Arizona Department of Water Resources.

How it works

Barely 300 miles separate Lake Powell, on the Arizona-Utah border, and Lake Mead, on the Arizona-Nevada border, but what happens at the two reservoirs reverberates up and down the Colorado River.

If water levels at Powell drop too low, upstream users would face cutbacks. Hydropower generation would decline. Recreation venues would close. As Lake Mead shrinks, so would Arizona's CAP supply, cutting off farmers in Maricopa, Pinal and Pima counties until water levels rise again.

How water users along the Colorado manage the water conversely affects the lakes and the people and businesses that surround them.

The construction of Glen Canyon Dam in the 1960s gave birth to Page on the shores of Lake Powell; when drought reduced the reservoir to one-third of its capacity, tourism revenue in the city plummeted.

Mike McNabb has fished Lake Powell for most of the 27 years he has lived in Page and now runs a fishing-guide business. He has seen the city's fortunes rise and fall with the lake levels, and he watches warily as the states plan the future.

"They say it'll never be full again," he said. "But we could have some unbelievable winters and in about three years fill that lake up again. You just never know."

Two years ago, spring runoff inundated parts of the lake that had been dry, covering tamarisk and other plants that had sprouted. With a new food source under water, the fish population exploded.

Anglers get used to events like that, McNabb said. "Right now, the water's going down, and I know a lot of places where it's good when it's down. In the spring, when the lake comes up, I've learned where the good spots are."

Because Lake Powell sits in a narrow river gorge, fluctuating water levels can uncover rocky outcrops and alter boat lanes. The National Park Service, which manages the lake's recreational amenities, is considering a plan to cut a deeper passage through Castle Rock, where exposed rocks have added 12 miles to a trip upstream.

"The problem is now we have to go through the narrows, between the cliffs, and smaller boats have to wait for the big ones to go through so they don't get caught in the wakes," McNabb said. "Sooner or later there's going to be an accident."

Environmental groups have protested the dredging plan, calling it a temporary fix that will degrade the canyon and the lakeshore. They say the boat path, like the broader drought plan, risks the Colorado River's riparian health and ignores the threat of climate change.

Some of those groups proposed their own drought plan, which would have imposed stricter conservation measures. The states' plan, environmentalists say, relies too heavily on the river's past behavior.

"With the region in its longest recorded drought and reservoirs at below 50 percent capacity, it's amazing that the states would assume the Colorado of the future will mimic its high flow periods of the past," said Owen Lammers, executive director of the group Living Rivers.

Brad Udall, an environmental engineer at the Western Water Assessment in Boulder, Colo., helped analyze future climate shifts for the seven states. He said water managers need to consider that the river may behave differently.

"In the Southwest, almost all the models point to drier conditions," he said.

Scientists and decision makers must now figure out which models to believe.

The states say the drought plan before them now will help bridge the gap in scientific study and avoid paralyzing conflicts over water supplies.

"We now have a better understanding of the risks and what the impacts will be associated with those risks," said Wilson, the CAP executive.

The greater immediate risk was failing to reach an agreement and allowing the dispute to spill into a courtroom.

"Failure was not an option," said Pat Mulroy, general manager of the Southern Nevada Water Authority. "Failure is uncertainty for all of us, it's chaos for all of us, it's spending public dollars in absolutely useless ways.

"You'll never get as good an arrangement from a judge," she said. "No matter how well-intentioned or how well-informed a judge is, he's still not responsible at the end of the day to deliver water to people. We are."

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LR in the News 12/10/07

Federal pact would allocate Colorado River water to Western states

New York Times

International Herald Tribune

By Randal C. Archibald

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LOS ANGELES, Dec. 9 — Facing the worst drought in a century and the prospect that climate change could yield long-term changes on the Colorado River, the lifeline for

several Western states, federal officials have reached a new pact with the states on how to allocate water if the river runs short.

State and federal officials praised the agreement as a landmark akin to the Colorado River Compact of 1922, which first outlined how much water the seven states served by the river — California, Nevada, Arizona, Colorado, Utah, New Mexico and Wyoming — would receive annually.

The new accord, outlined by federal officials in a telephone news conference Friday, spells out how three downriver states — California, Arizona and Nevada — will share the impact of water shortages. It puts in place new measures to encourage conservation and manage the two primary reservoirs, Lake Mead and Lake Powell, which have gone from nearly full to just about half-empty since 1999.

The accord is expected to forestall litigation that was likely to have arisen as fast-growing states jockey for the best way to keep the water flowing to their residents and businesses in increasingly dry times. It would be in effect through 2026 and could be revised during that time.

Some environmental groups said the pact did not go far enough to encourage conservation and discourage growth. But federal officials said they took the best of several proposals by the states, environmental organizations and others and emphasized the importance of all seven states agreeing with the result.

“I think for the first time in 85 years we are on the same page,” said Herb Guenther, the director of water resources in Arizona, which had initially balked at some terms of the agreement and was threatening legal action over it.

But with water levels in reservoirs dropping, a record eight-year drought, the prospect that climate change could bring more dry spells and new scientific analyses suggesting the West could be drier than has been traditionally believed, the states were pushed to act.

These factors “forced the issue to the head and we decided to do something unique and different,” Mr. Guenther said.

The agreement, the product of two-and-a-half years of negotiation and study, establishes criteria for the Interior Department to declare a shortage on the river, which would occur when the system is unable to produce the 7.5 million acre-feet of water, enough to supply 15 million homes for a year, that the three downriver states are entitled to.

Water deliveries would be decreased based on how far water levels drop in Lake Mead and Lake Powell. The Bureau of Reclamation, which manages the river system, predicts about a 5 percent chance of such a shortage being declared by 2010, but it all depends on how much the states are able to conserve and, of course, the weather.

The probability projection “does not imply it can’t happen,” said Terry Fulp, a bureau official involved in managing the river.

Water districts, anticipating an eventual cutback of Colorado River water, have been storing large amounts of water and the accord encourages them to continue to do so.

The pact, which Interior Secretary Dirk Kempthorne is expected to sign Thursday, includes a bundle of agreements with the states. One is approval for water managers in the Las Vegas area, which gets 90 percent of its water from the Colorado, to get a greater share of Lake Mead water in exchange for financing a reservoir in California to capture large amounts of river water destined for Mexico but beyond that country's entitlement by treaty.

"It's hugely important for us," said Scott Huntley, a spokesman for the Southern Nevada Water Authority. "This really does provide the bridge for us to get into the next decade."

But John Weisheit, conservation director for Living Rivers, a Utah-based environmental group, said the agreement sends the message to the states that growth trumps sensible water management. Mr. Weisheit said the conservation should have been emphasized and the government's computer modeling was overly optimistic about future water supply.

"There is more water on paper than there actually is on the landscape," he said. "They are looking at this in a way that will allow more development even though the water is not theoretically there."

LR in the News 12/12/07

Scientists want to flush out Grand Canyon again

Past releases from Glen Canyon Dam haven't beefed up sandbars

By Patty Henetz

The Salt Lake Tribune

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LAS VEGAS - Flushing water through the Glen Canyon Dam to try to build up sandbars, beaches and backwaters hasn't worked in the past, but that's not a deterrent to federal scientists who want to try again.

Speaking during a meeting of the Upper Colorado River Commission, U.S. Geological Survey scientist John Hamill said plans are afoot to release 41,500 cubic feet per second of water from behind the dam into the river below for 60 hours.

The release would be a way to incorporate previous results from other experiments to try to find a way to sustain sand flow in a healthy way in the river to discourage exotic invasive vegetation and create safe harbors for species including the endangered humpback chub, said Hamill, chief of the USGS monitoring and research center in Flagstaff, Ariz.

The Upper Colorado River Commission, which manages the Colorado River rights for Utah, Montana [Wyoming], New Mexico and Colorado, met during the annual Colorado

River Water Users Association meeting. The association includes the lower basin states - California, Arizona and Nevada - that have prior rights on the river and hold the balance of power over the entire river system's allocations.

The U.S. Bureau of Reclamation, which already has spent more than \$200 million seeking ways to counter the dam's downstream damage, is actively planning for the release, even though a 2005 USGS report said 13 years of similar efforts had been unsuccessful.

Previous attempts have either blasted away the sand that had accumulated naturally from tributary inflow, or simply didn't deposit any sand. This time, Hamill said, the river below the dam is relatively sandy, and changes in Grand Canyon management have allowed warmer water and more sediments to flow through the dam.

The technique is called "adaptive management," kind of a learn-as-you-go series of experiments designed to run over the long term. The 2008 test would be a synthesis of previous experiments, including a test in summer 2000 where dam releases were kept at a steady 8,000 cubic feet per second from June 1 to Sept. 1.

Hamill said that resulted in water temperatures in backwaters and shallow shoreline habitats reaching about 50 degrees Fahrenheit - the river below the dam is usually about 20 degrees Fahrenheit [colder than the pre-dam river temperature]. The steady release also limited sand drift downstream and kept healthy a population of humpback chub that had been moved near the mouth of the Little Colorado.

Still, there's a limit to building up sandbars; it is only possible if there's already a lot of sand in the river - and there's not.

Scientists acknowledge that the tributaries that feed the Colorado River below the dam, such as the Paria and Little Colorado, don't provide enough sand to keep ecosystems healthy.

And as Lake Powell sediments become increasingly polluted, just sending them down-river isn't a good answer, either, said Living Rivers director John Weisheit. The only solution, he says, is to remove the dam.

Built in 1963, Glen Canyon Dam has provided water and power for the West. The sand-flow issue must be resolved - both because of the need for sandbars in the Grand Canyon, and because the buildup of sediment in Lake Powell will eventually threaten the reservoir and the functions of the already-impaired hydropower plant.

LR in the News 12/13/07

Interior secretary signs historic plan as basin states work on water conservation, augmentation

(Thursday, December 13, 2007)

April Reese, Land Letter Western reporter

After two-and-a-half years of negotiations amid a record drought, an unprecedented agreement aimed at helping the seven states in the Colorado River basin endure future water shortages is final. Interior Secretary Dirk Kempthorne signed the accord today at a ceremony in Las Vegas.

The states and the Bureau of Reclamation claim the new plan will stretch shrinking water supplies in the basin, provide more certainty to the states about what will happen when reservoir levels drop and help avoid lawsuits. Within the framework of the agreement are a series of water management stipulations for the states and a host of conservation and water augmentation measures.

The seven states and the Bureau of Reclamation claim the new plan will stretch shrinking water supplies in the basin and provide more certainty to the states about what will happen when reservoir levels drop. Map courtesy of the Department of Interior.

The agreement, the "Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead," spells out how much the states will be required to reduce their take of the Colorado River during dry times and under what circumstances. In 2005, then-Interior Secretary Gale Norton directed the states to work together to find ways to ease the pain of projected shortages in the basin. The drought, now in its eighth year, along with climate change impacts and increasing growth in many basin states, provided a strong incentive for the states to hammer out their differences during negotiations, federal officials said.

"It really has taken a lot of participation and good will and the commitment among the seven basin states and Reclamation to try to find solutions," said Barry Wirth, spokesman for Reclamation's upper Colorado River Basin office. "They were challenged by the secretary to come up with shortage strategies, and they did."

"It had to be done to stretch the water supply and get through the tough times that are inevitably ahead," said Don Ostler, executive director of the Upper Colorado River Commission. "I think everyone is hopeful this will make a significant difference."

The drought -- the worst the basin has seen in 100 years -- has shrunk water levels in the Colorado River's two main storage reservoirs, Lake Powell and Lake Mead, to about half full. In 1999, before the drought hit, the lakes were near capacity (Land Letter, April 12). Meanwhile, population growth -- and the increased demand it brings -- continues to tax water supplies in the basin, pushing some states to the limit of their Colorado River allocation.

"This is a critical time -- perhaps even an historic time -- in the Colorado Basin," Kempthorne said, during the accord ceremony today.

"We're really trying to take a holistic approach to managing these two reservoirs and come up with a management scheme that really benefits both [upper and lower] basins," said Terry Fulp, area manager for Reclamation's Boulder Canyon operations office and one of the officials involved in writing the plan.

Skeptics of the plan

But river advocates gave the accord mixed reviews. Jennifer Pitt, of Environmental Defense's Boulder, Colo., office, commended BuRec and the states for providing "badly needed flexibility" for managing the river's water. And she lauded a provision that helps clear the way for Mexico to negotiate releases from Lake Mead that could send more water to the beleaguered Colorado River Delta (Land Letter, March 22). But in the end, there may simply not be enough water to go around, she added.

"The bottom line is, if the hydrology stays bad and growth continues, we're still going to be in a water crunch," said Pitt, who submitted a conservation-based proposal during the review process for the plan.

Others criticized the document as a testament to wishful thinking in an increasingly water-strapped -- and overdeveloped -- basin.

"They're not going to conserve a gallon of water," said John Weisheit, conservation director for Living Rivers, an environmental group based in Moab, Utah, that advocates breaching Lake Powell's Glen Canyon Dam. "They're just going to turn around and build another house."

"I'm very skeptical," added Nikolai Lash, senior program director for the Grand Canyon Trust in Flagstaff, Ariz. "It doesn't recognize that we have a very flawed framework of water distribution, that it's based on [estimates from] wet years rather than the realistic climate change years we're in the midst of. We'll be revisiting this agreement 10 years from now."

The 1922 compact that divvies up the river's water among the seven states was negotiated during an unusually wet period in the Colorado River basin, and the allocations to the states may not reflect the hydrological reality in the basin, particularly as climate change takes its toll, he said. In the new plan, Reclamation acknowledged that it may have overestimated average flows in the basin but does not suggest revisiting the compact (Land Letter, Nov. 8).

A balancing act

Reclamation took the best ideas from proposals submitted by the states, environmental groups and other entities, officials said.

Under the 1922 compact and other agreements collectively known as the "law of the river," Lake Powell, on the Utah-Arizona border, stores water for the upper basin, and

Lake Mead, on the Arizona-Nevada border, stores water for Arizona, Nevada and California. The upper basin is required to send 7.5 million acre-feet of water downstream for use in the lower basin each year, and all seven basin states must collectively deliver 1.5 million acre-feet to Mexico.

Under the new agreement, which is intended to direct management of the river until 2026, the two reservoirs will be operated in tandem to ensure that neither drops too low. That will help prevent shortages in the lower basin and the need for curtailments of water usage in the upper basin, Wirth said.

If there is a shortage, which would have to be declared by the secretary of Interior, the states will be required to make specific cuts in their use of Colorado River water, based on three trigger points in Lake Mead.

Under the pecking order laid out in plans, Arizona would be hit first if levels in Mead fell to the first trigger point set in the plan. The state would need to cut 320,000 acre-feet, or 11 percent of the state's Colorado River allocation, until water levels in Lake Mead rose again. If reservoir levels continued to fall, Nevada would then have to reduce its use. Further drops would prompt cuts by California, although some officials question whether reservoir levels would drop that low, even in a severe drought.

In most cases, agriculture would be hardest hit.

Levels in Lake Mead are now about 35 feet above the first trigger point. Fulp of Reclamation said there is a 5 percent chance that shortages will occur in the basin by 2010.

Conservation and augmentation

In an effort to cushion the blow of a potential shortage, the lower basin states also agreed to undertake a host of measures and projects to improve efficiency in the system, increase conservation, and tap alternative supplies to lessen their dependence on the Colorado River and leave more water in Lake Mead to avoid reaching shortage triggers.

Population growth taxes water supplies in the basin, pushing some states to the limit of their allocation. Photo courtesy of NOAA.

For instance, the Southern Nevada Water Authority, which relies on the Colorado River for 90 percent of the water that quenches the fast-growing Las Vegas area, will be able to draw more water from Lake Mead in exchange for helping to build a new reservoir in California, called "Drop Two." The reservoir, which will be built near the Mexican border, will capture additional water not needed by Mexico. Currently, if rainfall adds more water to the lower reaches of the basin, it simply ends up as a bonus to Mexico because there is currently no way to store it, said Bob Walsh, a spokesman for Reclamation's lower Colorado River office.

The lower basin states also have come up with ways to make it easier for managers to transfer water from agricultural lands to cities.

Creating new water supplies through desalinization, which involves treating ocean water to turn it into potable water, is also under discussion.

Essentially, those conservation and augmentation measures would allow states to leave more water in Lake Mead that they could later withdraw for future use. "If you provide that water instead of Colorado River water, therefore saving water in Lake Mead, it could be conserved and used by a state," said Ostler of the Upper Colorado River Commission. Currently, a state that banks water in the reservoir loses it if it is not used within one year.

Under the agreement, only the state that adds water to Lake Mead can remove it later. But about 5 percent of a water contribution is banked for use in the entire lower basin, and some of that water can be used for environmental purposes -- a provision for which environmental groups fought.

The new guidelines, which will go into effect in January, can be revisited if the states or Reclamation feel they are not working or if new information about climate change impacts required a retooling of the plan, Wirth said.
