River News 01/01/04

Persistent Drought in the Colorado River Basin

THE CONFLUENCE: Journal of Colorado Plateau River Guides
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Part One: Introduction

Scientists have studied tree-ring records that span the last seven centuries for five regions of the United States, including the Colorado River basin. These records have been used to examine both wet and dry cycles of climate that can sometimes last for many decades, or multidecadal. For example, droughts of 30-70 years persisted from the late 1500s until the mid-1800s in two of the five regions, and wet/dry cycles were synchronous at some sites until the drought of the 1950s. The pattern of severe drought in the late 1500s, followed by unusually wet conditions of the early 1600s, resembled the drought of 1942-1977 and the subsequent wet period from 1978-1998.
The megadrought of the late 1500s may have resulted from a cooling phase in the tropical Pacific Ocean with a warming phase in the subtropical North Atlantic Ocean, and marked a substantial shift for the climate of the Rocky Mountain region. In 1998, scientists recognized similar sea surface temperatures and forecasted the present drought situation we now find ourselves in, and the present indicators offer little hope for improvement in the next few years. It is unknown if the current drought will become multidecadal, but such a situation seems likely at some point in time, as do other extremes that include massive flooding, and higher sediment transport regimes.

Tree-Ring Chronologies

The identification of ocean oscillations from past centuries has been accomplished by scientists who have sampled tree-rings from, for example, logs from archeology sites (dwellings), and then comparing them with modern-day precipitation records. By modeling the climate records of the past by this method, there is a high degree of confidence within the science community that significant ocean oscillations in the future can be identified in order for communities to better prepare and manage the impacts of drought and floods.

Scientists have also refined the data for greater accuracy by examining more closely the chronologies from different tree species and geographic areas back to 1400 A.D. such as the central and southern Rocky Mountains. Although these two regions have different precipitation variables, historically they have suffered prolonged catastrophic droughts at similar times, such as the drought of the 1950s.

The results of refining the measurements from other tree-ring chronologies and from different regional areas mark both dry and wet periods that alternate for many

successive decades, sometimes even four decades and more. However, the frequency and strength of these periods do vary in time spans and among the various regions. In other words, climate cycles do not necessarily impact all regions at the same time. For example, chronologies from Yellowstone and the southwest Rocky Mountains have a strong moisture signal in a band from 30-70 years around 1250-1400 A.D., but these signals are absent from other regions. Additionally, the Bighorn Basin (northern Wyoming) chronology shows significant energy for an even longer wet period that lasted 128 years around 1300-1400 AD.

A significant oscillation was observed during a severe and prolonged drought throughout much of North America from roughly 1575-1595 AD, which was followed by an unusually wet period in the central and southern Rockies from 1600-1625 AD.

Multidecadal precipitation modes at 30-60 years do not persist after 1650 AD in either Yellowstone or the Colorado Plateau and remains so until the drought of the 1950s. However, the drought of the 1950s, though significant, did not resemble the severity of the drought that occurred in the late 1500s.

Discussion of Sea Surface Temperatures

In the North Pacific, much of the sea surface temperature variance occurs within a time scale of 15-25 years, and is accompanied by the strength and position of the Aleutian Low in winter. These variations have been defined as the North Pacific Oscillation (NPO) when referring to anomalies of the North Pacific, or Pacific Decadal Oscillation (PDO) if they extend into the tropics. The positive, warm phase of the PDO is associated with greater precipitation in all seasons throughout the central and southern Rockies (El Niño or wet). The 1900s were marked by two full +PDO cycles. The warm or positive +PDO regime prevailed from 1925-1946 and from 1977-1998. The cool or negative -PDO (La Niña or dry) regime prevailed from 1890-1924 and 1947-1976. In 1998, scientists noted the tropical Pacific Ocean was cooling (-PDO).

Warmer sea temperatures in the North Atlantic exhibit a 65-80 year cycle termed the Atlantic Multidecadal Oscillation (+AMO). Warm phases occurred during 1860-1880 and 1930-1960 and cold phases during 1905-1925 and 1970-1990. The AMO shifted to its warm phase around 1995, coincident with the apparent recent shift to the negative, cool phase of the PDO. During the warm phase of the AMO, the central U.S., including the central and southern Rockies, receives less than normal rainfall, particularly in summer.

By 1998 scientists were confident that having a warm North Atlantic and a cool tropical Pacific would spell out a persistent drought for the United States. They were right, for the last five years have substantiated the prediction with water year 2002 being the driest ever in the history of documentation by modern instruments.

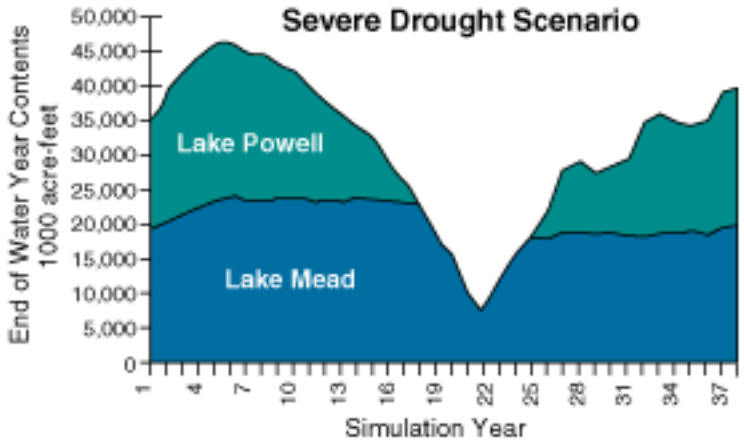
This phenomenon is also identified by dry springs (February-April) over most of the western states and were succeeded in the central and southern Rockies by failures in both the early summer (May-June) and late summer (July-August) monsoon moisture that originates in the Gulf of Mexico.

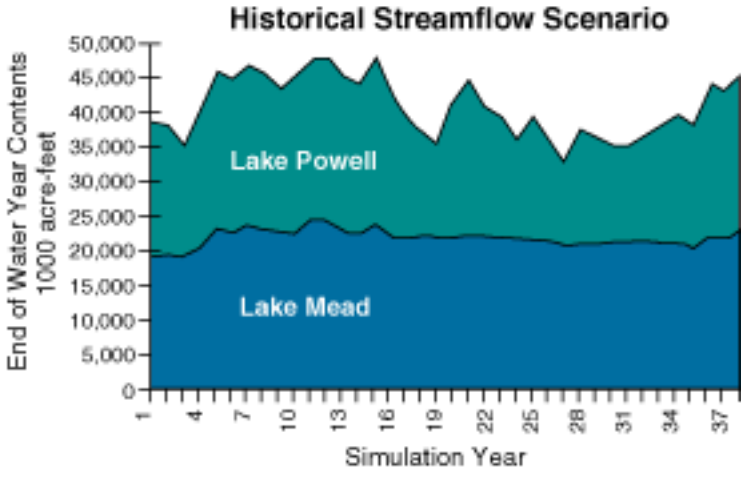
What the scientists envision is a similar pattern of intraseasonal drought for the megadrought of the late 1500s, which affected most of North America from northwestern Canada to the Valley of Mexico and the Atlantic Coast. Like the 1950s drought, the megadrought of the late 1500s was followed by an unusual wet period in the early 1600s, and both events were associated with intense and prolonged La Niña episodes typical of southwestern U.S. and Great Plains droughts. Such continental-scale droughts may be symptomatic of major reorganizations in both Pacific and Atlantic climate.

Long-term forecasting remains limited

There is considerable discussion about the steady state vs. chaotic behavior of multidecadal variables in climate, and thus about its predictability. An optimistic view is that knowledge about the present phase of the long-term -PDO or +AMO modes can be used to forecast climate more than a year in advance. Some recent forecasts are already taking into account the possible regime shift in both the Pacific and Atlantic sea surface temperatures during 1995-1998, which could signal prolonged drought in the central and southern Rockies.

Although there is plenty of multidecadal persistence in western North America climate, the instabilities argue against extending the forecasting window much beyond 2-3 years. At the very least, however, recent shifts to the cool phase of the -PDO and the warm phase of the +AMO provide little reason for optimism about ongoing drought in the Rockies.





It is probable that multidecadal variations in North American climate, specifically the occurrence of prolonged, continental-scale drought, involve complex interactions between the Atlantic and Pacific Oceans. Unraveling these relationships will require further development of multi-century, annually-resolved sea surface temperature analyses from the Atlantic and Pacific basins.

Part Two

The Future Hydrology of the Colorado River

The purpose of this next article is to demonstrate that the Colorado River can supply the water

required by humans and the environment, and is available right now and at little cost. This can be achieved by reducing consumption through management policies to increase efficiency. Otherwise the eventuality for all residents in these arid lands, as dictated by its present course in history, is to become another failed hydrosociety. If we simply reduced our water consumption to the national average, Lake Powell would not be needed and the ecosystems of the Grand Canyon and the Colorado River delta in Mexico can be restored.

The other alternative is invasive and economically burdensome, which includes financing and constructing: 1) massive power plants to provide energy; 2) large-scale wastewater and desalinization plants; 3) pipelines to deliver water to the users. These alternatives will increase our dependence on finite natural resources, such as petroleum and nuclear fuels. These fuels are very inappropriate considering: 1) our degraded atmosphere; 2) the expense and dangers associated with nuclear technology and waste; 3) our penchant as a country to generate unproductive relationships with other countries to support our rampant consumptive life style.

Another consideration includes the potential for water to become a commodity controlled by corporations, rather than managed as a public trust.

According to law, the water allocations of the seven states and Mexico is 16.5 million acre-feet. The real time average supply of the Colorado River is, at best, 14 million acre-feet. The total loss due to evaporation and leakage throughout the whole system is currently 3 million acre-feet, which is nearly the complete allocation for the state of Arizona (2.8 million acre-feet). Any objective financial analyst would be shocked at the poor performance of this business venture. Congress is fully aware of this poor performance because they continue to approve Band-Aid fixes and subsidies every year to maintain it.

When the persistent drought appeared in the middle 1900s, nobody really noticed the shortfall because the supply still exceeded the demand-leaks, evaporation and all. Afterwards, when the metropolitan building booms began, nobody noticed either, because the Colorado River over-produced and filled the reservoirs despite the development. Building so-called metropolitan dreams on luck is called greed, not business.

Things are different now that the swimming pools are dug and the golf courses seeded. The demand has almost peaked and the supply continues to wax and wane at the whim of climate. The drought situation at present is very similar to the 35 years of reduced supply that occurred between 1942 and 1977 when El Niños took a long nap and a negative Pacific Decadal Oscillation locked in for an extended stay (see previous article).

The total storage of the Colorado River system right now is below 50%. It took four years to get there. If the drought persists for another four more years, the trend will instead become a long reality and will completely drain Lake Powell reservoir. Obviously the drought will break-they always do. But what is the next climate regime going to bring our way? Will extreme flooding occur and bring the associated shuddering at Glen

Canyon Dam-as occurred in 1983 when the spillways choked at only 20% of capacity? Will the four-hundred fold sediment loads of the early 20th century return? The answer to these questions are-yes.

Models have been generated by hydrologists and resource economists with results posted on the web. Visit: . The diagram presented in this article is based on 400 years of tree-ring data and simulates a drought of the late 16th century (1570-1598). That severe and sustained drought had a 30 percent reduction in stream flow on average in a 19 year period.

How will a drained reservoir effect our river running? Our Colorado River trips will have to take out at the old ferry roads at Hall's Crossing.

Clay Hills Crossing on the San Juan River will continue to be impacted by sediment. The river incising into the sediment may leave the boat ramp perched above a down cutting river. Channel meandering may place the river on the opposite shore. Trips on the San Juan River may have to locate alternate sites to exit the river as well.

River News 01/04/04

RRFW Riverwire - 'Hijacking' A World's Wonder

A New Book From A Flagstaff Publisher Tackles The Commercialization Of The Colorado River In The Grand Canyon

By SETH MULLER Arizona Daily Sun Staff Reporter January 4, 2004
www.azdailysun.com

Advocates for noncommercial boat trips in the Grand Canyon are approaching this year with the same trepidation as a series of class VI, boulder-strewn rapids. By Dec. 31, 2004, the National Park Service must complete a Colorado River management plan for the waterway's Grand Canyon stretch before renewing or augmenting the concessionaire contracts for the 14 commercial raft companies.
The Park Service also will have to figure out how to deal with the growing demand for private permits to run the river-- the waiting list is more than 8,000 permits long and up to 20 years. Some private boaters have organized as River Runners for Wilderness, they will start the year by adding a significant tome to their argument that the river has become too commercialized. This week, the organization will release "Hijacking a River: A Political History of the Colorado River in the Grand Canyon" through the Flagstaff-based Vishnu Temple Press.

The 500-page book by Jeff Ingram of Tucson is a detailed, multi-sourced account of how river running, the idea of wilderness and federal management have had impacts on the Colorado in the Grand Canyon through the late 1960s, 1970s and early 1980s. Tom Martin of River Runners hopes "Hijacking" will give people an opportunity to learn about

how the river came to be managed like it is, with long waiting lists, continued motorized watercraft and bureaucratic resistance to wilderness designation. "When it comes to all the stuff we're dealing with today, Ingram has already been there," Martin said. "He knows the history, and this thing has been going on a long time."

Ingram became the first Southwest representative of the Sierra Club, a position given to him by then-president David Brower. In his work with the Sierra Club, Ingram found himself gaining intimate knowledge of the political landscape and how its changes affect management of the actual landscape. "Back in the 1970s, there was a number of things going on, with the proposed expansion of the park and river as wilderness," Ingram said. "I started collecting materials and saving files with the thought that I would write a history of Grand Canyon National Park and all of the things that have happened to it. Then, life got in the way, but modern history happened when the whole business of planning for the river started in late '90s."

Ingram met with Martin, and Martin asked him to write the book as a way to make more information public on how the past determined the present. "Today, the river runners haven't had a clue as to why we have to pack our solid wastes. They don't know how the commercial river companies become concessionaires," Martin said. "There's nothing else out there like ('Hijacking'). It's opening up a whole new realm of literature."

Martin and members of the River Runners contend that those who want to run private trips down the river are not getting much consideration. In December, park management decided to stop taking names for the private permit waiting list, noting that the list had grown too long. Reports from the Park Service show that they want to reduce the list's numbers as they are unsure of how the management plan will work. "I am just astonished," said Jo Johnson of River Runners, in an earlier interview. "I'm surprised they would do this, and it's not a nice surprise. There is already such a disenfranchisement of private boaters."

Martin said that, meanwhile, the Park Service has not put any restrictions on the commercial outfitters, which could conceivably book trips into 2005 and beyond. Martin is concerned that the park might be leaning toward a plan that penalizes private boaters, but he is optimistic that the Park Service has fully involved the public in the process. For river runners or environmentalists, Ingram has some advice based on his experiences with the Grand Canyon and the politics that affect it. "After 40 years in environmental matters, it's clear to me the most important thing is stamina," Ingram said. "It's possible that we could get a Democratic president and a Democratic Congress, and all of the sudden the political landscape changes."

Reporter Seth Muller can be reached at 928-913-8607 or smuller@azdailysun.com

The book is in! Advance orders are already in the mail (thank you!). RRFW is pleased to be able to take orders for Hijacking A River, 496 pages, including maps, readers guide, and index. The cost of this book is $20 ($17.95 each, plus $2.05 shipping and handling per book). Checks or money orders only please. Book sales will benefit River Runners For Wilderness, a not-for-profit organization seeking equitable access to a wilderness river running experience in Grand Canyon. Please send your order to

River Runners For Wilderness PO Box 17301 Boulder, CO, 80308-0301

For additional book information and dealer inquiries, contact: Vishnu Temple Press, PO Box 30821, Flagstaff, AZ 86003-0821 www.vishnutemplepress.com

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River News 01/05/04

RRFW Riverwire - Economic Study of Canyon River Runners Gets Low Marks

A recent masters thesis titled "Regional Economic Impacts of Grand Canyon River Runners", by Northern Arizona School of Forestry Masters student Evan Hjerpe, has received low marks. This according to Stephen Fullam, who runs a consulting firm for environmental groups and is a recipient of the prestigious Public Service Fellowship while at the Kennedy School of Government, Harvard University. Mr. Fullam notes "the study examines an issue that compares Macintosh apples (non-commercial river trips) with Granny Smiths (concessions river trips), but the data is so corrupt he's managed to compare apples and oranges." Hjerpa's analysis examines a very contentious, political issue - commercial vs. non-commercial use of a public wilderness area, in this case the Colorado River in Grand Canyon National Park, and the regional economic benefit river runners have on the local economy.

Fullam expressed concern in how data for the study was gathered. A survey was mailed to a large spectrum of non-commercial river runners, while in contrast, all economic data about commercial river running was provided by one source, the commercial river running trade association. "The analysis allows an industry trade group to report economic expenditures for their customers. Given the potential for upward bias, this data collection technique is flawed and should be questioned. Commercial river trip participants surely could have filled out a similar survey as non-commercial boaters. Furthermore, the study does not provide an example of the survey instrument used by commercial firms. These flaws bias any comparison and raise serious questions about the validity of results for the commercial sector" noted Fullam.

Tom Martin, co-director of River Runners for Wilderness, was also not impressed with the study. "We suspected the same thing" said Martin. "Highly detailed economic data from a large number of non-commercial river runners is compared to a lump sum figure reported by an industry trade group whose political motivations are crystal clear. Warning bells and whistles should be going off, but it doesn't even appear to raise the eyebrows of the study's author. I hope the Park Service distances itself from the results of this study."

The analysis not only allows this bias, but makes no effort to alleviate it in reporting from the commercial sector. In fact, Martin argues, commercial interests are more likely to report economic results with an upward bias since they are already organized as a political and economic entity on Grand Canyon wilderness and access issues. "The Grand Canyon River Outfitters Trade Association (GCROA) provided all the commercial data, and I'm sure they understand the political value of such a study" notes Martin. "The other group in this study, the general public who floats the river without using concessions services, are a scattered group of individual households with varying degrees of understanding of the issues. There is little or no expectation that do-it-yourself boaters in a single permit year would organize to over-report expenditures and potentially introduce upward bias."

Mr. Fullam points out other discrepancies with the study, such as the lack of appropriate distinctions between non-commercial user-days and commercial concessions user-days. "It is not clear whether commercial guide user-days are being counted. The omission of these days would inflate economic results since the total number of user-days would be under-reported for commercial firms. It is hard to believe that Hjerpe found that commercial boaters spend $161 per day on regional expenditures and non-commercials only $45. These figures should be less divergent and their divergence should have raised alarms for the author, especially about upward bias from commercial reports and possible downward bias from non-commercial reports" says Fullam.

Yet another flaw in the study, according to Fullam, is the lack of differentiation between commercial firms that run motorized trips verses those that run non-motorized trips. According to Fullam, "The majority of motorized trips make use of the Whitmore helipad and fly clients to Las Vegas. Clients flown to Las Vegas have left the regional economic zone defined by Hjerpe, which does not include Las Vegas. The lack of analysis of this negative economic impact raises more questions about the validity of commercial results. If a commercial customer starts and ends their trip in Las Vegas, then a substantial portion of their trip expenditures was never made in the regional economic zone of northern Arizona. It reflects the potential for additional upward bias or omission bias in reporting by commercial firms, especially motorized concessionaires."

The potential for capital flight by owners of river running concessions is also ignored in the study, according to Fullam. "Although warehouses may be located in the regional economic zone, it is not established to what degree the commercial firms leave revenues in the area."

Other deficiencies in the study have Fullam concerned. There is no consideration in the study of wholesale concessions orders of food, gear, and other services coming from outside the economic zone, which could greatly reduce the multiplier effects of the study. In contrast, non-commercial river runners reported on a case-by-case basis whether they purchased food, gear and other supplies within the economic area or not. Non-commercial trips are more likely to purchase all or most of their groceries, ice, and drinks at retail prices in the regional economic zone, while commercial outfitters can buy wholesale goods and have them transported from outside the economic zone. Fullam also points out that non-commercial trips are 2 to 3 times longer than commercial trips,

hence overall food expenditures can be expected to be 2 to 3 times higher on a per trip basis for non-commercial trips, especially factoring in the difference between retail and wholesale prices.

Fullam points out one last discrepancy. Despite the reporting on an aggregate basis and acknowledgment by Hjerpe that only 8 of the 16 firms even have bases within the economic zone, the analysis still states overly confident findings about economic impacts of commercial firms. Fullam says "confidence should be low given these conditions." Combine this with a lack of solid positive information, and Fullam rejects the study as a useful tool for Park Service decision-making. "Open-door methodology simply allows too many opportunities for bias in the economics of the commercial boaters. An economic comparison of the regional impacts from non-commercial and commercial boating would be a useful study, but it needs a more academically strict methodology and independent data collection applied coherently and equally to both groups," Fullam concludes.

The study can be read in its entirety at https://www.rrfw.org/programs/rrfw/pdfs/RiverRunnerImpacts.pdf

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River News 01/12/04

RRFW Riverwire - ARKANSAS RIVER MEETINGS SCHEDULED

By Colorado State Parks

Arkansas Headwaters Recreation Area Integrated Concept Plan Meetings Scheduled

SALIDA--The Arkansas Headwaters Recreation Area (AHRA) will hold four public meetings to discuss the proposals of the Integrated Concept Plan (ICP).
CONTACT: Gary Thorson 1313 Sherman St Room 618, Denver, CO, 80203 . Office: (303) 866-3203 ext. 337

For immediate release January 12, 2004

Arkansas Headwaters Recreation Area Integrated Concept Plan Meetings Scheduled

SALIDA--The Arkansas Headwaters Recreation Area (AHRA) will hold four public meetings to discuss the proposals of the Integrated Concept Plan (ICP). This plan was developed to provide assistance in resolving a number of Private Boat and Commercial Special Use Agreement issues that have been brought to the attention of Colorado

State Parks and the Bureau of Land Management (BLM). Adoption of the ICP could lead to modifications of the 2001 Arkansas River Recreation Management Plan.

All meetings will be held from 6 pm until 8 pm on the following dates and locations:

Tuesday, Jan. 20, Annex Meeting Room, Lake County Public Library, 1115 Harrison Avenue, Leadville;

Thursday, Jan. 22, Public Room, Community First Bank, 146 G Street, Salida;

Friday, Jan. 27, BLM Field Office Conference Room, 3170 East Main Street (Hwy 50), Canon City;

Monday, Feb. 9, REI Flagship Store, 1416 Platte Street, Denver.

All interested parties are encouraged to attend. For more information, please contact the AHRA office at (719) 539-7289.

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River News 01/18/04

RRFW Riverwire - Free Grand Canyon Slideshows In Salida and Portland

Author Tom Martin will update local boaters on the controversial Colorado River Management Plan (CRMP) now in progress for Grand Canyon National Park, and how this plan will affect the boating public. Tom will illustrate his talk with a slide show on the Grand Canyon based on his book, Day Hikes From The River: A Guide to 100 Hikes from Camps on the Colorado River in Grand Canyon National Park. The show will be in Salida, Colorado, at Bongo Billy's Coffee House, 300 W. 2nd St., at 8:00 p.m., Sunday, Feb. 8, and at Lewis and Clark College in Portland, Oregon on Tuesday, February 17, in the Templeton Student Center (Council Chambers) at 7:00 p.m.

The highly controversial CRMP, which was stopped by the Park in 2000, was restarted as part of a settlement agreement in a lawsuit filed by river running groups and individuals. The public comment period during the past summer gathered over 50,000 comments. "The wait for do-it-yourself river runners is so long, those at the bottom of the list will wait an incredible 20 years to get permission to run the river" said Martin, who notes that "you can book a commercial trip tomorrow for next summer, if you can afford it. This process is of vital interest to any canyon lover hoping to visit the Colorado River in Grand Canyon."

The free slide shows will be open to the public and feature beautiful vistas illustrating Grand Canyon hikes you can do from the river and exciting river running shots. Tom will

be signing his book, and copies of the new Grand Canyon book "Hijacking A River, A Political History of the Colorado River in the Grand Canyon", by Jeff Ingram, will also be available. Book sales will benefit River Runners for Wilderness, a non-profit group which is sponsoring the events. RRFW represents the interests of the boating public.

Look for upcoming shows in California and Washington in mid-February, times and locations to be announced.

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River News 01/19/04

RRFW Riverwire - Annual Outfitters Meeting Held With Park

On November 4, 2003, river concessions owners, their spouses, warehouse personnel, river guides, Hualapai Tribal members, representatives from the river outfitters trade association and National Park Service employees met at Albright Training Academy for the annual NPS-river concessions meeting. Nick Hardigg, Chief of Concessions Management, Grand Canyon National Park, advised the group of 54 that the park had received two requests from non-concessioner representatives to observe the meeting. RRFW was formally denied attendance at the November, 2002 and was turned away from the November 2003 meeting.

According to Grand Canyon historian and author Jeff Ingram, non-participatory public observers were once allowed to attend these meetings. That they are now excluded bothers public advocacy group River Runners for Wilderness. "We have asked to observe for the past two years, and have been denied." said Tom Martin, River Runners Co-Director. "We are amazed that the park would exclude the interested public, as the issues discussed directly affect all river runners. Excluding the public is a disservice to all river runners. Spouses, trade association representatives, river guides, warehouse managers and Native American tribal representatives are all allowed to participate, but the public is turned away."

RRFW has learned that the November topics discussed included a review of river accidents, including Norovirus illnesses, increases in river concessions rates, patrol trip contacts and frequency, availability of rescue helicopters, along with appropriate ways to contact the NPS during river incidents. Other topics included a Phantom Ranch Update on duffel service for river passengers and other Ranch improvements, cultural resource issues presentation, Colorado River Fund project review, and a review of the Cooperative Resource Conservation Program. This program uses river concessions to provide access to the canyon for scientists via chartered commercial river trips.

The group was informed the NPS would not discuss the Colorado River Management Plan, and one attendee was noted to say "We're not going to ask questions, since they cannot be answered." Park Service staff did read material aloud that is posted on the Park web site.

Representatives of the Hualapai Nation reviewed an incident between a concessions guide and non-concessions Hualapai guides at Diamond Creek. This incident resulted in the closure of the Diamond Creek take-out to all non-Hualapai activities between the hours of 7:00 am and 10:00 am daily. When asked by a concessioner whether there was the potential to coordinate use rather than have such a large daily prohibition of use, Hualapai representatives were optimistic that some sort of agreement could be scheduled between the concessionaires and the tribe. "It would be great if the non-commercial river runners could schedule with the Hualapai as well" noted Martin. "We will continue to seek cooperative ways to work with Grand Canyon National Park so that in the future the interested public will be able to attend these important meetings.

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River News 02/01/04

A Colorado River Sediment Inventory

THE CONFLUENCE
Journal of Colorado Plateau River Guides
Issue #27, December 2003

Updated Report

The presentation cited below is a compilation
of scientific data from reports written by government scientists.

Included in this presentation are reports to Congress by Authur Powell Davis and Frank Weymouth from the Bureau of Reclamation.

A very comprehensive study on sediment in Lake Mead reservoir was conducted by the USGS in 1948-49 and published in 1960 as Professional Paper #295. This paper set the standard for the study of sedimentation in large reservoirs that has yet to be repeated.

Subsequent studies, but limited in scope, have been accomplished such as the 1986 Lake Powell Survey by the Bureau of Reclamation, and an excellent report was written by Edmund D. Andrews of the USGS, Sediment Transport in the Colorado River Basin,

which was published in 1991 by the National Academy of Sciences. Unfortunately, the collection of data for sediment was discontinued by the USGS in 1989.

Two points of climate history must be considered when reviewing this data: 1) sediment loads vary considerably due to changes in climate regimes; 2) since the construction of Hoover Dam, additional reservoirs have been added to the plumbing system, which are collecting sediment independently throughout the entire basin. Incidentally, all river sections between dams have had their sediment loads reduced.

The government scientists who studied the sedimentation of Lake Mead in 1948 were actually alarmed at the rapid accumulation of sediment in that reservoir. To mitigate the problem, and to their chagrin, they recommended the building of upper basin dams. Though this provided more longevity for Lake Mead, it essentially spread the sediment problem to more than one place and effectively increased future mitigation costs substanitally. This demonstrates the mismanagement of water resources in the Colorado River basin, which can be summarized best as stealing the future to gain the present.

What the studies indicate is that sediment transport in the main stem of the Colorado River has been significantly reduced since 1942 because of a noticeable change in climate that demonstrates a waning of flash flood activity in the basin.

This does not necessarily mean that natural erosion on the Colorado Plateau is at rest. More likely, sediment is being stored in the arroyos of the basin and waiting for threshold events to transport their loads into the Colorado River, and subsequently into mainsteam reservoirs such as Mead and Powell.

For example, a flood with a peak discharge of 140,000 cfs roared through San Juan Canyon below Mexican Hat, Utah in October 1911. It is just a matter of time before similar flood events mobilize many decades worth of sediment from arroyos and send huge plugs of sediment into Lake Powell.

A sediment management plan must be conducted in the very near future by the Bureau of Reclamation. This study must not only evaluate the sediment of all the mainstem reservoirs of the Colorado River and its tributaries, but it must also evaluate the storage of sediment in all the ephemeral arroyos, especially where soft Mesozoic rocks dominate the landscape such as the basins of the San Juan and Little Colorado rivers.

It must also determine the effects that sediment will have on dam safety, power generation, water storage, recreation, and the management of endangered species.

How Much Sediment Are We Talking About?

According to E. D. Andrews' very reasonable estimate, which was published in 1990, there are 44,400,000 tons of sediment arriving into Lake Powell reservoir on a yearly basis under the current climate regime. A truck pulling a street legal load has a carrying capacity of 22 tons. In one year, it would require 2.018 million truck loads to remove the annual sediment load of Lake Powell. That is 5,529 truck loads per day; 230 loads per hour; 4 loads per minute.

This scenario demonstrates very well the costs and impacts involved in solving the sediment problem of reservoirs. It also destroys the myth that federal dams are cost-effective and that hydropower is a renewable resource.

Sediment Presentation [15mb PDF File]

Regional News 02/20/04

Water Resources: As the West Goes Dry

By Robert F. Service

In a region already prone to water shortages, researchers now forecast that rising temperatures threaten the American West's hidden reservoir: mountain snow

MOUNT BACHELOR, OREGON-- Under the dome of a concrete-gray sky, Stan Fox assembles four pieces of aluminum tubing into a 3-meter-long hollow pipe. After standing it on end, he plunges it through more than 2 meters of snow at Dutchman Flat, an alpine meadow perched on the shoulder of this 3000-meter mountain. Fox, who heads the Oregon snow-survey program for the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), removes the tube and reads the snowpack depth, a measurement that has been tracked at nearby sites monthly since the 1930s. Today the snow is 250 centimeters deep, and by comparing the weights of the tube both filled and empty, Fox and a colleague determine that the snow contains about 30% liquid water. If all the snow were instantly liquefied, the water would be nearly 1 meter deep. Not too bad. In a region prone to spikes in precipitation, Dutchman Flat is more than 15% above its 30-year average. "The snow in these mountains is a virtual reservoir," Fox says. As the snow melts in the spring and summer, it will slowly release that water, filling streams and reservoirs, which provide lifeblood to the region during the normally bone-dry summer months.

But indications are that this age-old cycle is beginning to change. New assessments of decades' worth of snowpack measurements show that snowpack levels have dropped considerably throughout the American West in response to a 0.8:C warming since the 1950s. Even more sobering, new studies reveal that if even the most moderate regional warming predictions over the next 50 years come true, this will reduce western snowpacks by up to 60% in some regions, such as the Cascade Mountains of Oregon and Washington. That in turn is expected to reduce summertime stream flows by 20% to 50%. "Snow is our water storage in the West," says Philip Mote, a climatologist at the University of Washington (UW), Seattle, who leads a team that has produced much of the new work. "When you remove that much storage, there is simply no way to make up for it."

The impacts could be profound. In the parched summer months, less water will likely be available for everything from agriculture and hydropower production to sustaining fish habitats. Combined with rising temperatures, the dwindling summertime water could also spell a sharp increase in catastrophic fires in forests throughout the West. With much of the current precipitation headed downstream earlier in the winter and spring, the change is also likely to exacerbate the risk of floods.

For resource managers already struggling to apportion limited water supplies throughout the West, the predictions are grave. "If that's true, it would have a huge impact," says Christopher Furey, a policy analyst with the Bonneville Power Administration in Portland, Oregon, which markets electricity from over a dozen power-generating dams in the Columbia River Basin that provide power to millions of people. In a region where farmers, fishers, recreationalists, and municipalities already compete for water, climate change may be setting the stage for an entirely new round of conflicts. "We think of the water wars in the past," says Fox, referring to the epic battles over rerouting western waters in the early 20th century. "In the future they will probably be more peaceful but much more prevalent."

Too Wet, Too Soon

The root of the problem is easy to state: The semiarid West has too little water, spread too unevenly throughout the year. Most of Montana sees less than 46 centimeters of precipitation a year. Even rainy Portland receives only about one-tenth of its annual 91 centimeters of precipitation during the summer. For most of California the fraction is even smaller. Philadelphia, by contrast, typically receives 102 centimeters of annual precipitation, 30% of which comes in the summer.

Thanks to massive dam-building in the first half of the 20th century, more than 60 million people--roughly one-fifth of the U.S. population--now live in the Pacific and Intermountain West. Those tens of millions of people are dependent not just on water, but on snow. Snowmelt makes up 75% of all water in streams throughout the West. If that snow falls as rain or melts too early, there will be little water left in the virtual reservoir come late summer and fall. Unfortunately, that is just what appears to be happening.

Back down the mountain in a conference room at a small ski resort outside Bend, Fox and a collection of about 50 water experts from the Northwest settle in to listen to Mote describe some of his group's latest data on western snowpacks. Perhaps fittingly, outside the temperature has warmed up on this mid-January day to about 5:C. Icicles encircling the roof drip steadily.

Mote describes work published last year in Geophysical Research Letters, in which he took a detailed look at the trend in snowpack accumulations throughout the Pacific Northwest over the last half of the 20th century. Mote reviewed federal records of snow water equivalents (SWE)--the amount of water in a given depth of snow--on 1 April, typically the peak of the season's snowpack. Of the 230 sites where SWEs were measured back to the 1950s, Mote found that nearly all showed negative trends, even as precipitation increased in most places. The hardest hit: areas in the Cascade

Mountains in Oregon and Washington, which saw as much as 60% declines in total snow accumulation. The most likely explanation, Mote says, was the region's temperature rise. When he plotted the snowpack declines against the elevation of the snow-tracking sites, he found that the biggest decreases occurred at the lowest elevations, suggesting that the moderate warming throughout the region was raising the freezing level.

That's just the beginning. In work presented last month at the American Meteorological Society meeting in Seattle, Washington, Mote teamed up with UW Seattle colleague Alan Hamlet and University of Colorado, Boulder, hydroclimatologist Martyn Clark to expand his initial analysis to look at historical snowpack levels throughout the West (see righthand figure). The news was better, but not much. Snowpacks decreased at 85% of the nearly 600 snow-measurement sites throughout the West. The biggest decreases hit the Northwest, where the mountains are smaller and the temperatures warmer, thanks to their proximity to the Pacific Ocean. Declines in the northern Rockies were mostly in the range of 15% to 30%. In these inland areas, Clark points out, winter temperatures are typically far lower than in the Pacific Northwest, so a rise of a few degrees still does not push the mercury above freezing. "In the interior regions all the winter precipitation falls as snow," Clark says. And some regions in the Southwest even witnessed large SWE increases, thanks primarily to a rise in precipitation.

Other clues also suggest that the West's snowpack is changing. The biggest: Snow is melting earlier in the spring. "There has been a fairly broad tendency in snowmelt basins to exhibit advances in runoff timing," says Daniel Cayan, a climate researcher at the Scripps Institution of Oceanography in La Jolla, California. Last month, Cayan, postdoctoral assistant Iris Stewart, and Michael Dettinger, a hydroclimatologist with the U.S. Geological Survey (USGS) in San Diego, reported in Climatic Change that the peak of the annual spring runoff in streams throughout California's Sierra Nevada now comes as much as 3 weeks earlier than it did in 1948 (see lower figure). Again, the effect was most pronounced in streams adjacent to lower elevation snow that is more sensitive to temperature increases. "This is very consistent with the evidence Phil [Mote] and company have seen with the snowpack," Cayan says. In a paper now under review at the Journal of Climate, Clark and colleagues at the University of Colorado recently found much the same shift for streams in the Northwest. "There is definitely something happening," Clark says.

That evidence is further bolstered, Cayan points out, by records that track the first springtime blooms of flowers such as honeysuckle and lilac, which show a similar 1- to 2-week advance. "This is a totally independent measure and one that is quite strongly related to temperatures in the springtime," Cayan says.

Not everyone is yet ready to believe that these trends will continue. George Taylor, the state of Oregon climatologist and a climate researcher at Oregon State University in Corvallis, for example, argues that broad trends in temperature and snow accumulation over the past century are most likely due to natural multi-decade swings as the climate oscillates between periods of relative warm and cold temperatures. "There was significant warming in the 1920s, '30s, and '40s, cooling in the '50s and '60s, and

warming again from the 1970s through '90s," Taylor says. "In my opinion, the effects of human-induced global warming are small compared to the multi-decadal cycles."

Greg Johnson, a climatologist with NRCS in Portland, also points out that Mote typically starts his analysis of snowpack trends at the beginning of the 1950s, which saw some of the largest snow accumulations over the past century. "If you use those numbers, you will show large decreases," he says. Decadal swings in climate caused by El Niqo and the Pacific Decadal Oscillation, he adds, further muddy the numbers.

"I'm not saying it's a nonissue, just that we need to keep watching it closely," Johnson says. "The point is, if you look at the historical record, we've seen some warming and drops in low-elevation snowpack. The question is what can we tie it to. But from a planning standpoint, I think people have to be concerned about this."

Mote agrees that the trend data may be skewed to some degree by the high-snow years of the early 1950s. However, he says, before the 1950s there were so few snow measurement sites that earlier data are suspect. Furthermore, he says, the snow loss is still best explained by the region's modest warming. "The thing that really stands out is that the largest losses are at the lowest elevations, which can only be explained by warming," Mote says. As for whether this warming is best explained by the decade-long climate swings, Mote defers to the latest work by the Intergovernmental Panel on Climate Change (IPCC), the global body of hundreds of scientists that has assembled the "standard model" of climate change. Although IPCC's latest report does show that both natural and human-induced factors explain portions of the last century's global temperature record, climate models that take both into account do the best job at reproducing the complete temperature record.

Dry Times Ahead?

No matter what the historical picture, Mote, Cayan, and others argue that the picture for western snowpacks looks far more bleak when the anticipated future warming is taken into account. Here, too, several teams have been working to understand how events are likely to unfold. All agree there is considerable uncertainty. Precipitation trends, for example, "are all over the map" in different climate models, because precipitation can vary drastically over a short distance, Mote says. However, Mote, Cayan, and others agree that climate models generally do a far better job of estimating temperature, because temperature differences drive winds that tend to reduce those differences. Regional climate models suggest that over the next 100 years, western temperatures are likely to rise between 2: and 7:C, depending on--among other factors--the rate of increase of greenhouse gases in the atmosphere. And unlike the precipitation forecasts, the models all show an increase in temperature.

Modelers then feed these temperature data and other variables into another set of computer programs called hydrology models that compute the effects of changing climate on snowpack and stream runoff. And these hydrology models consistently show that even low-end temperature changes produce big effects. As part of a study described in last month's issue of Climatic Change , for example, UW Seattle hydrologist Dennis Lettenmaier and colleagues used a global climate model to compute

how the western snowpack would respond to modest temperature increases. They found that a temperature rise of 1.5:C by 2050 resulted in a loss of nearly 60% of the 1 April snowpack in the Oregon and Washington Cascades, and a 3: rise by 2090 reduced those snowpacks by 72% (see figure). "That's the best-case scenario," Mote says. "By the 2090s with a warm scenario, you would have essentially no snow left in Oregon by April 1st." When the Pacific Northwest is taken as a whole, the picture is only a bit better, showing a 35% loss in 1 April snowpack by the 2050s and 47% loss by the 2090s.

In a Geophysical Research Letters paper last year, Cayan and former postdoc Noah Knowles--now with USGS in Menlo Park, California--computed a similar analysis for the watersheds that make up the western drainage of California's Sierra Nevada Mountains. They found that a predicted temperature rise of about 2.1:C over the next century would reduce the Sierra snowpack by one-third by 2060, primarily at mid to low elevations, and would halve it by 2090. A separate analysis by L. Ruby Leung and colleagues at the Pacific Northwest National Laboratory in Richland, Washington, together with researchers from the National Center for Atmospheric Research in Boulder, Colorado, and Scripps reached similar conclusions when they looked at the effect of climate throughout the West. The one notable difference: In the Rockies, the colder wintertime temperatures are expected to limit the losses to 30%. Without putting too much faith in the exact amount of losses, Mote says, "it's nearly inescapable that we're going to continue losing snowpack."

"Enormous Impacts"

"It doesn't mean we've lost water," Cayan hastens to point out. "It means the water is coming off earlier." Rather than sticking around as snow into the late spring and summer, western snowpacks will wash down mountainsides in the winter and spring. Simply stated, the upshot is wetter winters and drier summers.

In the Sierras, for example, Knowles and Cayan's models predict that the portion of water that flows through the watershed's rivers from April through July each year will decline from 36% today to 26% by 2030. "This represents over 3 km [3 billion cubic meters] of runoff shifting from post-April 1 to pre-April 1 flows," the authors write. That figure nearly doubles by 2090. Other studies show that parts of the Columbia River Basin are likely to fare worse, whereas the Colorado River watershed, with smaller anticipated declines in snowpack and generally colder temperatures, is likely to emerge comparatively unscathed. Overall, however, a steady temperature climb will likely affect tens of millions of people. "There are enormous impacts from this potential change," Cayan says. "Water management in the West has been to use the snowpack as a natural reservoir. This reservoir is really important. It's water that will come later when a lot of the water demand is heaviest." Without that water "people will need to make some difficult choices," adds Todd Reeve, who directs watershed restoration programs for the Bonneville Environmental Foundation in Portland.

That's particularly true in the Pacific Northwest and California. Reservoirs in the Columbia River Basin capture only about 30% of the region's annual runoff, whereas

California's reservoirs hold slightly more. The typical pattern is to fill these reservoirs with late spring runoff and use that water throughout the summer and fall for irrigation and then in the early winter for power generation. An earlier snowmelt means that the water must be spread over a longer dry season when irrigation, recreation, and municipal demand peaks. "You're losing natural storage and taxing built storage. Something has to give," Lettenmaier says. (Here too, Lettenmaier says, the Colorado River Basin is unique, because reservoirs there can store four times the region's annual precipitation.)

With less summertime water, one of the hardest hit areas is likely to be agriculture. Today, farmers in California use about 75% of the state's water. Earlier this month, agricultural economists Wolfram Schlenker of the University of California, San Diego, and W. Michael Hanemann and Anthony Fisher of UC Berkeley presented a preliminary study at the American Economic Association meeting in San Diego of the likely impacts of climate change on California agriculture. Using a range of hypothetical climate and stream-flow scenarios in line with published modeling results, the researchers forecast that snowpack losses could lower farmland values by more than 15%. If that pattern holds for the state's 3.84 million hectares of irrigated farmland, the loss to the state's agriculture economy would be measured in the billions of dollars.

What is more, Fisher says, because access to irrigation water in California depends on the historical system of first-come, first-served water rights, those losses will likely be absorbed primarily by the farmers lowest on the water-rights totem pole, driving many out of business. That same pattern is likely to hold true in the Northwest, particularly in the dry lands east of the Cascades. "It's not going to be feasible to have the irrigated acreage we have now," Mote says--fighting words in a region long wedded to an agricultural way of life.

Forests are also likely to suffer, according to Anthony Westerling, a climate researcher at Scripps. Westerling recently fed data from Cayan and Knowles's climate and hydrology models of the Sierras into a model of his own that attempts to forecast changes in wildfires. Westerling says his preliminary results show that fire danger will soar. "The mean area burned more than doubled by 2090" relative to the present, Westerling says.

Although less easily quantified, low summertime stream flows are also expected to exacerbate problems with declining fish runs, crimp water supplies for recreation and cities, and increase the likelihood of winter and springtime flooding throughout the Northwest and California. But not all the impacts are sure to be bad. Last year, John Fazio, a river flow analyst with the Northwest Power and Conservation Council in Portland, plugged some of the UW group's hydrology forecasts into his Columbia River flow models and found that a warmer Northwest may actually benefit Northwest electricity consumers. Warmer winters, Fazio says, will likely lower the need for electricity during the region's peak demand period, and an expected small increase in wintertime precipitation could churn generators to the tune of an extra 1900 megawatts of power--nearly enough to power two cities the size of Seattle. Of course, if

precipitation swings toward the dry side, it could wind up costing rate payers hundreds of millions of dollars, he says.

No matter how the climate evolves, water managers will face uncomfortable tradeoffs between providing water for agriculture, hydropower, and recreation, and keeping it in streams to support fish runs. In their current Climatic Change paper, for example, Lettenmaier and colleagues show that to keep summertime flow levels in the Columbia River high enough to support endangered-fish recovery plans, water managers will likely have to sacrifice 10% to 20% of the river's wintertime hydropower generating capacity, because it will force water managers to draw down their reservoirs in the summer. "Even with these reductions in power, late-summer minimum flows would still be lower than at present," the authors write.

More Big Dams?

In a region prone to water shortages, talk of such tradeoffs doesn't go down easy. "We already have a problem with shortages," says Maury Roos, chief hydrologist for the state of California. And coming up with the water to deal with population growth throughout the region is already an acute problem, he adds. "This will certainly make the problem worse."

In hopes of heading off some of those problems, Roos and other water officials are beginning to incorporate climate change into their regional water plans. California's latest draft water plan, for example, discusses climate change, although it doesn't yet recommend changing California's infrastructure. Portland, Seattle, and other cities have begun studying the issue in detail to see whether they need to change their water-management plans.

Initial rumblings are also being heard among advocates for building new dams throughout the West. That comes as something of a surprise to many, because during the Clinton Administration, then-Secretary of the Interior Bruce Babbitt claimed that the era of big dam building was over, due to their adverse impacts on fish and wildlife. Already, for example, California is considering building several new dams as part of a joint state and federal effort to provide water for threatened ecosystems while keeping water available for farmers. Washington too is flirting with building a dam at a cost of more than $1 billion in the eastern part of the state to provide irrigation water for farmers near Yakima. And Idaho water managers say that climate change may force them to build new reservoirs to prevent winter floods along the Boise River, where one-third of the state's inhabitants currently live.

But due to their high dollar and environmental costs, many water experts doubt whether such projects will go forward. "Dams are tough fights and so expensive," says Hal Anderson, planning chief for the Idaho Department of Water Resources. And even if built, they will only soften the blow. With the amount of spring snow expected to be lost due to climate change, "there is no way we're going to build that many dams to capture it all," Mote says.

Other strategies may help. Most water officials agree that there is much that can be done to conserve water, particularly by lining irrigation canals and making other improvements to irrigation. As well, a handful of new programs have sprung up recently to buy or lease water rights from farmers and then keep the water in stream during the low-flow months to improve habitat for fish. Last year, for example, one umbrella effort called the Columbia Basin Water Transactions Program sponsored 32 such deals to keep 28.4 million cubic meters of water in tributaries where it's needed most. That amount of water pales in comparison to what stands to be lost. But for now, water planners still have some time to act before climate change alters the American West in a way humans have never witnessed.

Take Action 02/20/04

Demand New Study on Glen Canyon Dam Operations
To Save Grand Canyon, Again!

On March 3-4, the Department of Interior will convene a meeting in Phoenix of the Glen Canyon Dam Adaptive Management Working Group. Open to the public, the agenda will be to discuss the future operating plans for Glen Canyon Dam so as to mitigate the dam's impacts on the Colorado River in Grand Canyon National Park. Unfortunately, like its 15 previous gatherings over the past eight years, this meeting may accomplish little more than pandering to hydropower interests, while endangered fish in Grand Canyon's famed river ecosystem continue to go extinct. Please join Living Rivers in attending and helping to reverse this.

Top on their agenda is a plan to launch an Environmental Assessment for the installation of proposed temperature control devices on Glen Canyon Dam's water intake structure. Since completion, Glen Canyon Dam has been releasing water into Grand Canyon that is consistently about 48 degrees. Grand Canyon's native fish, however, are used to varying water temperatures that often approached 80 degrees. While a mechanism to warm the water is critical to recovering Grand Canyon's native fish, this device may not be the best choice, and its operation could actually bring remaining native fish species closer to extinction by promoting the proliferation of alien fish that feed on young native fish.

Living Rivers and others will be arguing that a full Environmental Impact Statement (EIS), as opposed to the much narrower and fast-tracked Environmental Assessment must be prepared. This EIS should investigate all potential alternatives to warming the water, including decommissioning the dam. Living Rivers will also argue that this EIS must address a range of "new" information not known when Glen Canyon dam's first EIS was completed in 1996, as is called for by the National Environmental Policy Act when programs such as the AMP demonstrate failure.

Glen Canyon Dam has ravaged Grand Canyon's river corridor, rendering it devoid of much of the life that frequented it when the Park was established. No longer can otters

or muskrats be found. Four of eight native fish are gone, as are all native insects. The dam's cold water releases, trapping of 95 percent of the sediment and nutrients that fed the ecosystem, and unnatural flow regime have made it increasingly difficult for the Canyon's native species to survive.

The AMP was charged with reversing this, but during its tenure the Razorback Sucker has become the fourth endangered fish species to disappear from the Canyon and another, the Humpback Chub, is now headed to be the fifth.

Forty years ago the public rose up and stopped the construction of two proposed dams in Grand Canyon to help preserve this natural wonder. It's now time to save this famed river ecosystem again.

Join us: Wednesday, March 3, 9:30 am – 5:00 pm Thursday, March 4, 8:00 am - noon Arizona Dept. of Water Resources 500 North 3rd Street 3rd Floor, Conference Room A & B Phoenix, Arizona

Bureau of Reclamation meeting information

Regional News 03/01/04

Moab Groundwater Report

On March 8, 2004, 7 p.m., Kip Solomon and Phil Gardner of the University of Utah presented their findings on the hydrology of the Matheson Preserve shallow and deep aquifers, the underlying strata revealed by cores from wells drilled 150 feet deep, and water consumption. These findings, detailed below, oblige us to call into question two geohydrological models upon which governmental decision-making is being based:
1. The geohydrological model used by the Department of Energy in evaluating the environmental impacts of the Atlas uranium tailings pile reclamation options. In summary, Solomon and Gardner's data indicate that (A) a highly saline head of water is coming under the Atlas tailings, crossing under the river, and moving well under the Matheson in a deep aquifer flowing through alluvial gravel which is still present at the maximum depth of 150 feet cores were taken; (B) in these gravels next to the portal, at a depth of 24 feet carbon materials test as less than 100 years old and at 35' as 900 years old; (C) below the top 15-18 feet of silty river alluvial deposits, indicating slow water movement, the next 135' of gravels are all flood-scoured with no silty lenses, indicating recurring flood velocities capable of carrying rocks up to fifteen inches in diameter. It is physically impossible to have a bedrock "choke" at the portal and also have these flood velocities immediately upstream of it where current DOE models predict a stillwater lake forming during flood events.

2. The Downs & Kovacs water budget model for the Glen Canyon Group pristine groundwater aquifer: the assumption in that model that the production of the Glen Canyon Group aquifer is 13,300 acre-feet per annum and 9,530 acre-feet of that production is flowing underground down Spanish Valley and discharging into either the

Matheson Wetlands or the Colorado River. In summary, Solomon and Gardner's data indicate that (A) they can account for only about 3,204 acre-feet of groundwater consumed in the Matheson by vegetation and evaporation; (B) they cannot find any outflow into the Colorado River through the Matheson from Spanish Valley in the shallow aquifer; (C) the chemical signature on the water in the Matheson does not match that of the Glen Canyon sandstone aquifer discharge, but instead appears to be "young" water from surface precipitation, irrigation outflow, and shallow flow from Mill and Pack Creeks. At most, 1,000 acre-feet of the Matheson water budget seems to come from the Glen Canyon aquifer, and its location indicates it is from Watercress and Skakel Springs behind the Grand Old Ranch House. (D) the flow in the deep aquifer under the Matheson preserve south of the Colorado River is highly saline water flowing under the river from the north; the center of the plume of saline water corresponds to the Moab Wash and Moab Fault orientation north of the river. In short, of the 9,530 acre feet of Glen Canyon aquifer outflow which is supposed to be flowing into or under the Matheson Preserve from the Spanish Valley valley fill aquifer, 8,530 acre-feet of it cannot be found. There are only two possible explanations for this:

Hypothesis 1: There is a deep gravel "drain" below 150 feet depth which is carrying water out of the Spanish Valley valley-fill aquifer under the Matheson and then beneath the surface water of the Colorado through the portal. There are currently no monitoring wells of sufficient depth to detect this "drain" if it exists.

Hypothesis 2: The water budget for the Glen Canyon sandstone aquifer is around 4770 acre-feet per annum, not 13,300 acre-feet per annum. If this is true, we are close to diverting the entire available output of this aquifer with the existing permitted water rights for the City of Moab and Grand Water Conservancy District culinary wells, and cannot develop more production from this aquifer to support future development.

I will discuss more detail of Solomon and Gardner's findings, and what we need to do in light of them, below.

In addition to Solomon and Gardner, attending the meeting were Sue Bellagamba of the Nature Conservancy; Jeff Freethey and Pat Lambert of the USGS; Laura Kamala of the Grand Canyon Trust; Barbara Morra of the Spanish Valley Water and Sewer Improvement District Board; Richard Lance Christie, Grand County Water Planning Administrator; and Dr. LaRue Christie.

In the Downs and Kovacs water budget (2000), sources of water into the Spanish Valley acquifer system were 13,300 acre-feet outflow from the Glen Canyon sandstone aquifer, 730 acre-feet from precipitation in Spanish Valley, and 3,300 acre-feet leakage from Ken's Lake (this figure includes aquifer recharge from Pack Creek flow). This inflow was accounted for by 6,400 acre-feet diverted and consumed by culinary and irrigation uses; 1,400 acre-feet surface stream flow and vegetative evapotranspiration in Mill and Pack Creeks; and 9,530 acre-feet discharge into the Matheson/Colorado River at the foot of the valley. The 13,300 and 9,530 acre-feet numbers were estimates of low reliability; the other numbers are relatively certain.

In other regional water studies, reliable water budgets have only been established through accurate measurement of discharge from an aquifer system. For a variety of technical reasons, it is very difficult and expensive to accurately measure inputs into aquifers.

The Glen Canyon Group sandstone aquifer water has a geochemical "fingerprint" - low in tritium (<1), R/Ra helium isotope ratio <1, and stable isotope content indicating the water went into the aquifer at high elevations under cold conditions. The water in the Matheson wetlands in the shallow aquifer is high in tritium (3.1, 2.6, 15, 5.9, 4.7 were typical values in various test wells), has a high R/RA ratio, and does not contain the stable isotopes indicating high elevation, cold conditions at entry into the ground. There is a "plume" of water more like the Glen Canyon water on the NE side of the Matheson which I observe corresponds to the outflow of the Watercress and Skakel spring discharge.

Diane Pataki studied sap flow in cottonwoods in the Matheson under various salinity conditions. They ended up mapping five salinity zones in the Matheson: unhealthy Tamarisk (extremely saline), healthy Tamarisk, unhealthy native, healthy native vegetation, and open water/water vegetation. Evapotranspiration rates were calculated for each zone based on the vegetation there and the sap flow data. Saline conditions across the zones ranged from <1000 microSeimens/cm to over 3,000 average. Evapotranspiration is half that in 3,000 than in 1,000 saline. Total evapotranspiration/ evaporation calculated was 3,204 acre-feet per annum.

The wells drilled to 150 feet depth encountered 15-18 feet of silty alluvium (indicating deposition by slow water) followed by cobbles and boulders to the 150 foot depth. There is a sharp transition between the top silty alluvium layer and the cobbles and boulders layer. There are no silty lenses in the cobbles and boulders, which can only have been deposited by swift-flowing current capable of carrying boulders to 15" size routinely. Wood was recovered from cores at 24 feet and 30 feet depth in the BL14 well just upstream of the portal and well back from the current edge of the river. The 24' sample was less than 100 years old and the 30' sample was 900 years old. This tells us that the river has repeatedly flooded at high velocity through an area 1.5 kilometers wide above the portal, and that the current has been swift enough to move 15"+ boulders as well as smaller cobbles, while carrying away anything smaller than about one inch in diameter. This flood cobble zone extends under the Atlas tailings and most of the Matheson. These floods have repeatedly occurred within the last thousand years - in other words, within historic times, and during them the river was scouring to at least 30 feet below today's surface. Since the same flood cobble and boulder formation extends to at least 150 feet depth, this means that the river was scouring at least 150 feet below its current bottom THROUGH THE PORTAL. If the portal had a bedrock sill, as the DOE hydrological models maintain, then the river could not scour below the top of this sill because the sill would slow down the flow of floodwater below the plane of the sill.

Re capping the Atlas tailings in place, with rip-rap armor to protect the cap against erosion from river flood, this kind of water velocity and scouring would make such armoring useless. Why? Because the river cuts down during flood events, and would

undermine the armor and the tailings themselves, causing them to slough into the spate. It would make no difference if the rip-rap was composed of cement-filled greyhound buses; they would still roll off into the flood undercut. Kip Solomon said in light of these findings, leaving the tailings in place "should not even be on the table." As Moab mining engineer Mel Swanson said in 1989, the decision to cap the tailings in place is a decision to put the tailings into the Colorado River; Swanson said it would be cheaper and more honest to shove the tailings into the Colorado with bulldozers for eight years during high water. The environmental effect would be the same as capping in the long run. Solomon's findings confirm Swanson's observation.

The flow of water towards the Colorado is shallow. In the deeper hydraulic system in these cobbles, the water is highly saline, and the head is coming from the north (Moab Wash and Fault align with the center of the saline plume) under the river. As it comes under the Atlas tailings, the uranium concentration rises in a tongue which extends across the river in this saline water. The saline plume is fairly stagnant, so the uranium picked up from Atlas leachate is limited in its extent south of the river so far. Oxygen isotope "fingerprinting" of this water indicates it is not originally derived from either Mill Creek surface or Glen Canyon aquifer waters.

These findings underscore (1) the unfeasibility of a capping-in-place alternative for the Atlas tailings remediation. I've been dealing with this issue since 1989, and every bit of the geohydrology used by Atlas, the NRC, and now the DOE has turned out to be dead wrong. This appears to be yet another chapter in this sorry history. (2) the need to get a good study of the water budget of the Glen Canyon sandstone aquifer done so we know how much water can be supplied to culinary use by it.

Report by Phillip Gardner and Kip Soloman (with Addendum), University of Utah[8.3m PDF File]

LR Letter 03/01/04

Aspinall Unit/Gunnison River EIS Scoping Comments

March 12, 2004
Mr. Ed Warner
Bureau of Reclamation
Western Colorado Area Office
2764 Compass Drive, Suite 106
Grand Junction, CO 81506

RE: Scoping Comments for Environmental Impact Statement for the Aspinall Unit of the Gunnison River

Dear Mr. Warner:

Living Rivers and the Colorado Riverkeeper appreciate this opportunity to submit the following scoping comments on the proposed Environmental Impact Statement (EIS) for

the Aspinall Unit. Our organization collectively represents thousands of individuals from across the United States with an interest in the future of the endangered native fish species and ecological communities of the Colorado River basin, which includes the Gunnison River.

We wish to thank the Bureau of Reclamation (Bureau) for recognizing the seriousness of the plight of the four endangered native fish of the Colorado River basin: the Colorado pikeminnow (Ptychocheilus lucius), razorback sucker (Xyrauchen texanus), bonytail chub (Gila elegans), and humpback chub (Gila cypha).

There is wide agreement within the scientific community that dams in the Colorado River basin, including the Aspinall Unit on the Gunnison River, contribute significantly to the degradation of riverine habitat necessary for the survival and flourishing of these species. As builder and operator of many of these structures, the Bureau has a special responsibility to address issues related to the decline and potential extinction of these four federally listed species.

We understand that the Bureau is undertaking this EIS in response to proposed flow criteria established by the Upper Colorado River Endangered Fish Recovery Program (UCREFRP) pursuant to consultation with the US Fish & Wildlife Service under Section 7 of the Endangered Species Act (ESA). The Bureau is required to consider in an EIS, under the National Environmental Policy Act (NEPA), a range of alternatives that reasonably and practically fulfill the purpose and need of the proposed government action.

In our comments below we address some of the considerations necessary for a comprehensive EIS, including:

o Issues pertaining to the current operation of Aspinall Unit and reservoirs;

o Critical areas of analysis, including the need to incorporate decommissioning as a potential alternative; and

o Issues demonstrating the need for the Bureau to undertake a programmatic EIS for endangered species recovery for its activities throughout the Colorado River watershed.

I. ASPINALL UNIT OPERATIONAL ISSUES

A. Endangered Fish

The operation of Aspinall Unit has been known for many years to cause harm to native fish. The introduction of a successful fishery for non-native trout in the tail waters of the Aspinall Unit is testament to the conditions existing downstream that make the river inhospitable for native species which require warmer water for successful spawning and survival. The reservoirs trap vital sediments and woody material (carbon for the food web) behind the dams, thereby preventing replenishment of the silt, sand and nutrients. The dams form reservoirs, which have no fish passage structures and are also managed as a recreational sport fishery for several non-native species known to prey

on endangered natives. Conditions are marginal at best for endangered fish survival in the reservoirs and downstream environments created by the Aspinall Unit.

B. Water Supply

Aspinall Unit is operated as a water storage facility, part of the Colorado River Storage Project which includes Glen Canyon Dam on the Colorado River in Arizona, Navajo Dam on the San Juan River in New Mexico, the Flaming Gorge Dam on the Green River, and others. The Upper Colorado River Endangered Fish Recovery Program goals, as stated, include providing for "future water development." Reservoir evaporation can be significant, especially in warmer months, resulting in less water available for downstream uses, including instream flows for endangered fish. Furthermore, water conservation, not development, must become the Bureau's strategy for meeting future supply needs. Also, agriculture must begin to use their water more efficiently and, at the same time, become more productive by growing crops that are less water-intensive, such as alfalfa. These two factors require leadership from the Department of the Interior (DOI), which is presently lacking. Overall, we find Aspinall Unit's role for water supply purposes not sufficiently significant enough relative to the facility's impacts on endangered species and the alternatives available to fulfill water supply for human uses.

C. Hydroelectric Power Generation

Aspinall Unit was designed to produce hydroelectricity incidental to the primary function of water storage and flow regulation. The average output of the Aspinall Unit at 819 GigaWatt hours is but a small portion of the region's overall generating capacity. Any loss of hydropower from the Aspinall Unit would be relatively insignificant and could be made up through implementation of energy conservation policies and developing new technologies that are truly sustainable. In other words, hydropower loss is not as important an issue as is our consumption in lieu of conservation of natural resources, which includes native fish, and our lack of leadership as a nation to find power sources that are truly renewable and environmentally responsible.

It appears unlikely that the Basin Fund will ever fully repay the US Treasury for the loans provided to build the water projects of the Colorado River basin, because costs and losses associated with sediment mitigation alone will eventually exceed the Fund's capacity for repayment. It makes more sense for the Bureau to provide a complete long-term cost analysis of its hydropower production, as it compares to the mitigation costs of the future. We are confident that the cycle of public-supported subsidies related to Colorado River development will never be broken otherwise.

D. Recreation

The dams provide a local recreation industry centered primarily on sportfishing and motorboating. As noted in I.A. above and II.B. below, the introduction of non-native species to support sportfishing has impacted native endangered species. Motorized watercraft can contribute to water quality problems that also need to be taken into account.

E. Aspinall Unit and the Colorado River Basin

As noted in I.B. above, Aspinall Unit is a unit of the Colorado River Storage Project. In addition to the CRSP dams in the upper basin, an extensive system of dams exists in the lower basin, including Hoover Dam on the Nevada-Arizona border, and several smaller yet important water supply dams on the river between California and Arizona. The river exits the United States south of Yuma, Arizona, where the once-vibrant Colorado River delta ecosystem has been decimated, converted into an alkali flat polluted by agricultural pesticide and fertilizer runoff.

Water delivery contracts for the Upper Basin are structured pursuant to the Upper Colorado River Basin Compact. The compact has never been subjected to NEPA analysis.

Contracts for the lower basin are subject to allocation by the Secretary of the Interior, pursuant to the terms of the Colorado River Compact (passed into law as the Boulder Canyon Project Act in 1928), which led to implementation of basin wide water planning and allocation ever since. Thus the operations of Aspinall Unit are integrally connected to the operations of the CRSP, the Upper Basin Compact, and the Colorado River Compact/Boulder Canyon Project Act. Therefore its impacts are also tied to this larger system, and as described in item III. below, must be appropriately addressed.

II. CRITICAL AREAS OF ANALYSIS TO BE ADDRESSED IN THE EIS

A. Effects of Dam Operation on Black Canyon of the Gunnison National Park

The Bureau must consider the effects of Aspinall Unit operations on Black Canyon of the Gunnison National Park. The National Park Service is required by the National Park Service Organic Act to protect the Park’s natural features, ecological communities, streams, and native species, and to leave them unimpaired for future generations.

Aspinall Unit has caused many documented negative effects on the Gunnison River ecosystem downstream of the dam and in the Park. For example, the dam's cold water releases have for years impaired the native fish stocks. In addition, the absence of floods and sediment has negatively affected stream morphology characteristics important for native fishes.

Alternatives presented in the EIS must ensure compliance with National Park Service laws and regulations that provide for protecting the Gunnison River ecosystem and its native fish. The Bureau should analyze each alternative in light of expected effects on Black Canyon’s natural features and aquatic communities, especially on listed endangered species, sensitive species, and species of special concern. The EIS should explain in detail the impacts of the dam's past and present operations on Black Canyon. It should also show how future operations will impact park resources and natural regimes of sediment transport and distribution, depositional patterns, streamflow, temperature, riparian ecosystems, native plant communities, and native fish populations within the park. Finally, the EIS should explain in detail how operations at the Aspinall

Unit should be managed so as to ensure compliance with the non-impairment provision of the Organic Act.

B. Removal of Non-Native Fish Which Prey on Endangered Fish

For years the state and federal governments have operated Aspinall Unit and other dams in the Colorado River basin to promote and enhance sportfisheries and related recreation activities. In the reservoirs and downstream in the tailwaters, government policies have increased the numbers and habitat conditions suitable for non-native species such as trout which are known to prey in significant numbers on endangered native species. The Bureau must address the detrimental effects on endangered fish species, sensitive species, and species of special concern, caused by non-native species, and provide alternatives in the EIS that eliminates such predation, both in the reservoirs and in the tailwaters.

C. Endangered Species Recovery Goals at the Critical Habitat Level

The extensive system of dams and diversions throughout the Colorado River basin fragments and artificially isolates endangered fish populations. Historically, regulators have responded to declining populations of these species by attempting to formulate management criteria that fail to question the fundamental circumstances contributing to the endangerment in the first place. The US Fish and Wildlife Service and the Bureau have chosen to address endangered fish recovery by first declaring isolated populations to be distinct, then proposing recovery plans which fail to address the factors causing the isolation in the first place.

Some or all of the endangered Colorado River fish species are known to be migratory. In addition, evidence exists that the interruption of fish migration by construction of dams in the basin has had a detrimental effect on fish recovery. Within the EIS, the Bureau must evaluate the potential effects, including genetic health and reproductive success, on recovery of fish, including listed endangered species, sensitive species, and species of special concern, that are no longer isolated between dams.

For example, the single greatest threat to the critical habitat of endangered fish is Glen Canyon Dam because the Colorado, Green and San Juan rivers all terminate into Lake Powell reservoir. The genetic connectivity of the three basins has been effectively eliminated and has also isolated the native fish from their historic diversity of habitat; habitat that native fish require for both spawning and the rearing of their young according to their natural heritage. This includes reaches of river habitat that provide floodplains, gravel bars, sandbars, deep pools, massive eddies, and etc. These types of diverse habitats have been largely removed from the basin’s ecosystem. Glen Canyon Dam has negatively impacted over 500 miles of diverse habitat, including Cataract Canyon, Narrow Canyon, San Juan Canyon, Glen Canyon, Marble Canyon and Grand Canyon. Glen Canyon Dam also diminishes the ability to have a productive food web in these river reaches because nutrients and woody material is now stored uselessly in the sediment deposits of Lake Powell reservoir.

Therefore, a programmatic EIS that analyzes the dysfunction of the critical habitat in the entire basin is a more productive means to recover critical habitat than a piece-meal approach to reaches immediately downstream of the Aspinall Unit, Navajo Dam, Flaming Gorge Dam and Glen Canyon Dam.

D. Water Quality and Recreational Impacts

In recent years, a rapid rise in recreational use of motorized has resulted in increases of petroleum effluent in reservoirs and streams, such as Curecanti National Recreation Area. The EIS must quantify current and future trends in petroleum discharges from recreational watercraft, and address the potential impacts of these compounds on native endangered fish species. The EIS should analyze one or more alternatives that consider the effects of declining water quality on listed endangered species, sensitive species, and species of special concern. Finally, the EIS should consider alternatives, which implement greater restrictions or outright prohibitions on motorized watercraft, and other polluting machinery.

E. Dam Decommissioning Alternative

The Bureau must incorporate into its EIS alternatives which evaluate the potential for decommissioning (e.g., breaching, removing, or disabling) Aspinall Unit and allowing the Gunnison River to flow freely once again. Decommissioning is the most ecologically effective and economically efficient alternative for addressing the purpose and need of the EIS, namely recovering endangered native fish species. Most environmental impacts of dams cannot be adequately mitigated, e.g. loss of sediment deposition and nutrient composition downstream of the dam, and reduction of frequency and intensity of flood events. And as attempts to do so become more costly, complicated and ineffective, agencies such as the Federal Energy Regulatory Commission and the Army Corps of Engineers are now turning to decommissioning as a preferred alternative for habitat restoration and species recovery. The Bureau should also consider decommissioning alternatives amongst its recovery options.

The Bureau is obliged to consider a decommissioning alternative even if the implementation of such an alternative would be beyond the scope of the agency's discretion, so long as it is reasonable and practical.

36 CFR 219.12(f)(5). Reasonable alternatives which may require a change in existing law or policy to implement shall be formulated if necessary to address a major public issue, management concern, or resource opportunity identified during the planning process.

40 CFR 1502.14(a-c). Alternatives including the proposed action. This section is the heart of the environmental impact statement. ... In this section agencies shall:

(a) Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.

(b) Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits.

(c) Include reasonable alternatives not within the jurisdiction of the lead agency. ...

The Council on Environmental Quality (CEQ) addresses this question in the following excerpt from its "Forty Most Asked Questions Concerning CEQ's NEPA Regulations, 23 March 1981":

Question 2a. Alternatives Outside the Capability of Applicant or Jurisdiction of Agency. If an EIS is prepared in connection with an application for a permit or other federal approval, must the EIS rigorously analyze and discuss alternatives that are outside the capability of the applicant or can it be limited to reasonable alternatives that can be carried out by the applicant?

Answer. Section 1502.14 requires the EIS to examine all reasonable alternatives to the proposal. In determining the scope of alternatives to be considered, the emphasis is on what is "reasonable" rather than on whether the proponent or applicant likes or is itself capable of carrying out a particular alternative. Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant.

Question 2b. Must the EIS analyze alternatives outside the jurisdiction or capability of the agency or beyond what Congress has authorized?

Answer. An alternative that is outside the legal jurisdiction of the lead agency must still be analyzed in the EIS if it is reasonable. A potential conflict with local or federal law does not necessarily render an alternative unreasonable, although such conflicts must be considered. Section 1506.2(d). Alternatives that are outside the scope of what Congress has approved or funded must still be evaluated in the EIS if they are reasonable, because the EIS may serve as the basis for modifying the Congressional approval or funding in light of NEPA's goals and policies. Section 1500.1(a).

Given the increasing attention other federal and state agencies are not only paying to the examination of decommissioning alternatives, but selecting them as the preferred alternative, such an alternative in the case of Aspinall Unit does meet the definition of "reasonable" and "practical" under NEPA.

III. PERFORM A PROGRAMMATIC EIS ON COLORADO RIVER BASIN DAM OPERATIONS AND WATER MANAGEMENT

Problems facing endangered fish on the Gunnison River and elsewhere in the basin are not likely to be solved solely by addressing impacts associated with Aspinall Unit. Federal policy has too often chosen to view isolated, remnant populations of endangered fish as if they were and always will be isolated, ignoring the purpose and goals of the ESA—to restore viable, healthy populations throughout the species' range. The problems that lead to fish endangerment are not easily resolved at the micro level and must also be addressed from a watershed perspective.

The Bureau is currently engaged in a number of projects, studies, and current and potential litigation that collectively have and will continue to have a significant cumulative impact on these endangered species, including the following examples but not limited to:

1. Lower Colorado River Multiple Species Conservation Plan (LCRMSCP) for endangered fish and wildlife;

2. Adaptive Management Program for Glen Canyon Dam operations pursuant to the Grand Canyon Protection Act;

3. Upper Colorado River Endangered Fish Recovery Program for endangered fish;

4. San Juan River Basin Recovery Implementation Program

4. EIS for Navajo Dam (San Juan River) operations;

5. EIS for Central Arizona Project water allocations;

7. San Juan-Chama Diversion Project (recovery of the silvery minnow);

8. EIS for Flaming Gorge Dam (Green River) operations;

9. Proposals for new pipelines which would withdraw water from Navajo Reservoir and Lake Powell Reservoir;

10. Litigation by Indian tribes, seeking additional water rights or quantification of existing rights.

11. State of Colorado proposed water projects: AB Lateral, Dominquez Dam, and the Colorado Return Aqueduct Project ("Big Straw")

Council on Environmental Quality regulations require the Bureau to address those ongoing agency actions that relate to the proposed action. Since there are numerous NEPA actions underway within the Colorado River watershed which affect water use and allocation and endangered species management, the Bureau must therefore discuss and consider in the context of the Aspinall Unit EIS these other actions. 40 CFR 1501.7(a)(5). Furthermore, even if the impacts of each of these actions are to be analyzed separately, they still must be tiered to a larger programmatic EIS. 40 CFR 1508.28, 1502.20.

It is unclear whether the Bureau can adequately address long-term needs of the fish throughout the basin in the context of these individual projects. It is also unclear how the Bureau will ensure that the cumulative impacts of all these efforts will work together to guarantee, and not impede, recovery.

The Upper Colorado River Basin Compact has had a profound effect on the management, use, and allocation of water in the upper basin, including the Gunnison River. The compact controls all river operations, facility operations, and contracts. In the context of this EIS, the Bureau must look at alternative ways to implement the compact

in order to minimize effects on aquatic ecosystems, including endangered native fish species, sensitive species, and species of special concern, and to ensure compliance with water quality regulations under the Clean Water Act. Given the constraints of the compact, the Bureau must also consider modifications or changes to the compact that would contribute to the recovery of the affected endangered species, other sensitive species and species of concern, and achieve the purpose and need of the proposed action. As discussed in II.E. above, the Bureau is not constrained by existing laws or contracts in formulating and evaluating alternatives.

Given the extensive amount of federal activity within the Colorado River watershed, much of which directly addresses and/or affects endangered species, a comprehensive programmatic EIS covering the entire basin is not only warranted but also sorely needed. Historically, such an approach is not unprecedented for the Bureau to consider. A programmatic EIS for the Colorado River basin would provide for the multitude of issues affecting endangered species to be addressed in a comprehensive fashion. And as outlined in II.E above, such an EIS must evaluate dam decommissioning as an alternative.

The Bureau's operations of its dam and water diversion systems on the Colorado River have had massive and far-reaching environmental impacts, yet have never been the subject of an EIS. Were such an EIS to exist, it would inform the Bureau, other federal agencies, states, tribes, and the public on all aspects of the Bureau's operations and its "off-river" impacts from the continuing urbanization in the basin states that is able to occur only because of the continued supply of water, or at least the expectation of a continued supply of water, from the Colorado River.

While the construction of the dam system predated the passage of NEPA, the operations and management of the river have changed dramatically since Aspinall Unit and other dams were built–substantial activity, which can no longer be considered "grandfathered in" under NEPA. Such actions include the transfer of water from Imperial Irrigation District (IID) to San Diego, the development of off-stream banking, major increases in water consumption, additional water diversions, and the uses of the water diversions and supplies. These changes have altered the character and impact of river management to the extent that now any Bureau activities must trigger a NEPA process. "[When] an ongoing project undergoes changes which themselves amount to "major federal actions, the operating agency must prepare an EIS." Upper Snake River v. Hodel, 921 F.2d 232, 235 (9th Cir. 1990); see Andrus v. Sierra Club, 442 US 347, 363 n.21 (1979).

As a result, the present NEPA analysis will need to be much more comprehensive in order to compensate for the lack of pre-existing NEPA analysis and baseline information. Note here that the environmental baseline of NEPA encompasses impacts to additional aspects of the human environment—socioeconomic, environmental justice, recreation, cultural resources, wildlife and its habitat for non-sensitive species, air and water pollution—not included in the ESA environmental baseline of impacts to endangered species and critical habitat. The action to be analyzed in the scoping

notice, as well as the new actions mentioned above, would require changes in operations, which have never been analyzed in the first place.

In conclusion, we find the Bureau's initiative to address endangered fish below Aspinall Unit is an important exercise. However, we fear that unless the Bureau approaches this undertaking in the full spirit contained within the ESA and NEPA, that such an effort will be unable to guarantee species recovery. We have outlined assessment methodologies above that we believe will avoid such an eventuality, and look forward to working with the Bureau and other relevant agencies to ensure their appropriate incorporation into the current EIS process for Aspinall Unit.

Thank you for the opportunity to submit these comments and recommendations, and we look forward to your reply.

Sincerely,

John S. Weisheit
Living Rivers Conservation Director
The Colorado Riverkeeper

LR Press Release 03/03/04

Groups Demand Action to Halt the Extermination of Endangered Species in Grand Canyon

For immediate release

Contact: John Weisheit (435) 259-1063
Cell: (435) 260-2590
Environmentalists Demand Urgent Action to Halt the Extermination of Endangered Species in Grand Canyon National Park.

A coalition of national and international environmental groups blasted the Department of Interior today for ignoring mounting scientific and public policy evidence that a once highly touted federal river management program is failing to halt the continued loss of endangered species in Grand Canyon National Park.

In a ten page letter presented at the semi-annul meeting of the Glen Canyon Dam Adaptive Management Program (AMP) in Phoenix, Arizona, the groups charge that despite eight years and $80 million dollars, one more of Grand Canyon's endangered fish species, the razorback sucker, has joined the growing list to become extinct in the Grand Canyon. Another endangered fish species, the humpback chub, has declined to only 1,100 fish from 8,000 in 1993.

"Their job is to comply with the law and to bring these fish back. Instead, they are merely engaged in pseudo-science in an effort to mask the gravity of the situation," says John Weisheit, director of Living Rivers' Colorado Riverkeeper program, which is

leading the coalition. "Touting new, unverified fish counts, while ignoring the evidence that regardless of the new numbers, the decline is headed toward zero. This is a huge injustice to our national park system, not to mention the endangered fish."

The Glen Canyon Dam Adaptive Management Program was established in 1995 following the completion of an Environmental Impact Statement which recommends strategies to mitigate the tremendous impacts of Glen Canyon Dam's operations on the river ecosystem in Grand Canyon National Park.

The letter reveals that these recommendations are often being ignored, and even when adhered to, they are not achieving the intended results.

In the event that endangered fish populations did not increase by 1998, water released from Glen Canyon Dam was supposed to shift toward a regime of at least partially mimicking the river's natural flow. This has not occurred.

* A special set of flow recommendations for low water years was prescribed, but despite five years of drought, these recommendations have been ignored.

* The program has spent much of its resources attempting to conserve Grand Canyon's remaining sediment, as 95 percent of the Canyon's sediment and nutrients have been trapped behind the dam. These efforts have all failed to bring any lasting benefit to fish habitat or stabilization of cultural sites as called for by the EIS.

* Recent attempts to use dam operations to control alien fish predation on endangered native fish have been haphazard and have yet to demonstrate any meaningful results.

"As originally designed, the Adaptive Management Program was an excellent approach to addressing the serious impacts on Grand Canyon from this dam," adds David Haskell, retired Science Center Director for Grand Canyon National Park, who participated in the AMP program since its inception in 1995 and has monitored its progress since his retirement. "However, the 2002 AMP Report to Congress clearly indicated that six years of effort had not produced any beneficial results. Since then, the failure of the AMP to seek more effective methods to meet the goals of the Grand Canyon Protection Act has turned this once successful program into a dismal failure. The science done by this program in the past has been very good, but unless the decision makers involved in the AMP immediately seek to make the needed program adaptations, the serious decline of the river ecosystem in the Grand Canyon will continue."

The groups are calling for immediate changes to the program, beginning with and a new federal Environmental Impact Statement. The National Environmental Protection Act allows for such a study when new information and results reveal that the recommendations from a previous EIS to be inadequate.

"It's critical that a new EIS be completed before the AMP launches into its new scheme for installing a temperature control device on Glen Canyon Dam," says Michelle Harrington with the Center for Biological Diversity. "It was once thought that attempts to bring the Colorado River's water temperature to a level more consistent with native

conditions would be a simple proposition. The drought has taught us that disruptions to the food supply for the remaining endangered fish could be further disrupted, besides the fact that much of that food supply is being consumed by the growing number of alien fish. Temperature controls as well as the added impact of drought on management plans must be studied in a comprehensive manner before any such action is taken."

Previously, the AMP program has resisted efforts to undertake a new EIS, in part because Glen Canyon Dam proponents understand that such an EIS will have to explore the possibility of decommissioning Glen Canyon Dam as the best way to comply with the laws protecting the ecosystem in Grand Canyon's river corridor.

"Interior's actions paint a clear picture of disregard for the Grand Canyon Protection Act, Endangered Species Act, and National Park Service Organic Act," adds the Executive Director of the Waterkeeper Alliance, Steve Fleischli. "Why must the public always be forced into the courtroom in order to protect a piece of our famed natural heritage from government malfeasance? That needs to change."

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LR letter to the Adaptive Management Program: www.livingrivers2.org/archives/article.cfm?NewsID=567

Link to the AMP agenda and meeting info: http://www.usbr.gov/uc/enwvprog/amp/

LR Letter 03/03/04

Letter to AMP calling for SEIS on Glen Canyon Dam

March 3, 2004
Michael Gabaldon
Deputy Director of Operations
Bureau of Reclamation, Building 67
6th and Kipling
Denver, CO 80225-0007

RE: Supplemental Environmental Impact Statement for the Operations of Glen Canyon

Dear Mr. Gabaldon,

Living Rivers, Colorado Riverkeeper, American Whitewater, Arizona Wilderness Coalition, Bluewater Network, Californians for Western Wilderness, Center for Biological Diversity, Colorado Plateau River Guides, Escalante Wilderness Project, Friends of the Animas River, Friends of Arizona Rivers, Friends of the Earth, Friends of the River, International Rivers Network, Outdoor Adventure River Specialists, Inc., Tag-A-Long Expeditions, Inc., River Runners for Wilderness, Southern Utah Wilderness Alliance,

Waterkeeper Alliance and Wilderness Watch are extremely concerned about the failure of the Glen Canyon Dam Adaptive Management Program (AMP) to mitigate sufficiently the adverse impacts of the operations of Glen Canyon Dam on the Colorado River ecosystem in Grand Canyon National Park.

The most recent AMP report, submitted to Congress in 2002, and subsequent scientific conclusions clearly indicate that the AMP has made little progress in meeting the mandate of the Grand Canyon Protection Act (GCPA). Nor has the AMP met the goals established in the 1995 Environmental Impact Statement (EIS) for Glen Canyon Dam, the Record of Decision (ROD), the Biological Opinion that analyzed the environmental impacts of Glen Canyon Dam, nor subsequent objectives set by the AMP itself.

The AMP has failed because the original EIS has inappropriate limitations, the AMP administrative process is ineffective, and the AMP lacks responsible leadership from the agencies of the Department of Interior (DOI): Bureau of Reclamation (BOR), National Park Service (NPS), US Geological Survey (USGS) and US Fish and Wildlife Service (USFWS). Unless these fundamental deficiencies are corrected, the dedicated efforts of all involved will continue to fail to restore the ecosystem in Grand Canyon National Park.

At the same time, scientific evidence shows that the AMP can not succeed in meeting program goals while constrained by the limitations set by the current EIS. It is evident that unless additional, more effective management options are implemented, the AMP serves only the purpose of documenting the decline of the Grand Canyon river ecosystem. Thus, more than enough evidence exists to require the immediate preparation of a supplemental environmental impact statement (SEIS), to examine in detail and anew the impacts of Glen Canyon Dam based on the significant failures of the present efforts and the myriad of changed circumstances that affect the Colorado River system.

Since the release of the ROD in 1996, it is almost certain that the razorback sucker has joined the growing list of endangered species that have become extirpated in the Grand Canyon ecosystem. Grand Canyon National Park now faces the extirpation of yet another endangered species, the humpback chub. The ROD specifically foresaw the need for the recovery of this native fish, as well to establish a second population of humpback chub and to reestablish a population of the razorback sucker. Yet, scientific evidence indicates that neither objective will occur. The humpback chub's alarming decline and the failure to reinstate the razorback sucker tops a growing list of new scientific information that was not available or known when the 1995 EIS was completed.

Based on past failures, new information and new realities, which we detail below, the Bureau of Reclamation, together with her sister DOI agencies, is obligated to undertake the process dictated by the National Environmental Policy Act [NEPA] in relationship to the operation of the Glen Canyon Dam. According to the regulations implementing NEPA: "agencies **shall** prepare supplements to either draft or final environmental impact statements if: (i) the agency makes substantial changes in the proposed action that are relevant to environmental concerns; or (ii) there are significant new

circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts." 40 C.F.R § 1502.9(c) (emphasis added).

Here, the dramatic decline of the humpback chub, the extirpation of the razorback, the failure of the BOR and the AMP to abide by the terms of the Biological Opinion and to meet the goals of the Grand Canyon Protection Act, and the wealth of new information relevant to the recovery of these species and their habitat combine to require such a supplement.

Listed below are the primary areas of concern:

1. The AMP has failed to improve sediment balance that drives the physical ecological component of the ecosystem

New data collected since the EIS was completed confirms that the EIS needs to be modified to address sediment below Glen Canyon Dam. This is because the scientific community studying the native fish and involved in the recovery of these species, know far more about sediment dynamics than in 1992 when the EIS was developed. A core element of the ROD and the relevant Reasonable and Prudent Alternative (RPA) requires that BOR mitigate the impacts caused by the fact that sediment no longer enters Grand Canyon's river ecosystem. The plan required that experiments be conducted to conserve sediment in the ecosystem of the Colorado River. The first experiment took place in 1996 with subsequent attempts in the year 2000. In each case, efforts failed to produce permanent benefits of preserving beaches, stabilizing cultural sites, and enhance critical habitat conditions as intended. The report to Congress and all supporting sediment research since concludes that net sediment loss from the ecosystem will continue to occur. Natural sediment inputs, combined with organic nutrients, is a fundamental pre-dam ecosystem components necessary to sustain native fish species. Returning to peak-power flows, in a weak attempt to reduce rainbow trout spawning success, will likely accelerate further the rate of sediment loss.

There are other adverse environmental impacts of sediment loss below Glen Canyon Dam not previously anticipated. The continued loss of sediment and inability to regularly enhance beaches has brought about a change in NPS management strategies concerning cultural resource protection in the river corridor. While NPS policies favor the preservation of archeological sites *in situ*, the BOR now finds it necessary to consider immediate salvage operations to save what remains of sites threatened by further beach erosion. This will add federal costs to the program and increase tribal concern for these remnants of ancestral origin. These immediate and vital remedies were not considered in the original EIS.

The sobering conclusions regarding the inability to improve sediment resources have brought about discussions on how to augment sediment inputs in addition to reducing outputs. Any attempt to import sediment into the ecosystem below Glen Canyon Dam will be very costly and is not evaluated in the current EIS. In light of the inability to conserve sediment and meet Lower Basin water allotments as planned, options for improving the sediment and nutrient budget to benefit native fish and cultural sites must be explored in a SEIS.

2. The AMP is non-compliant with the Endangered Species Act and USFWS program recommendations

A. Razorback Sucker

The Biological Opinion uses urgent language to call for specific improvements of critical habitat for the humpback chub and the razorback sucker by 1998. The document states, "If the [Fish and Wildlife] Service determines a study design can not be developed that is expected to provide information to support removal of jeopardy to the razorback sucker and humpback chub populations in the Grand Canyon and associated tributaries, **such will be considered new information and may be grounds for reinitiating formal consultation**." (p. 35) (emphasis added)

Considering that a live, adult razorback sucker has not been observed in Grand Canyon for the last few years, many senior scientists believe that the razorback sucker has been extirpated from the Colorado River in Grand Canyon National Park. The lack of response to respect performance criteria gives ample evidence that jeopardy has not been removed, and is sufficient ground for reinitiating formal consultation and the NEPA process immediately.

B. Humpback Chub

Monitoring by the USGS through the Glen Canyon Monitoring and Research Center (GCMRC), has documented a major an alarming decline in humpback chub population. Since 1995, when the EIS was completed, the adult humpback chub population in the Little Colorado River has declined by 50 percent. Two years ago the GCMRC scientists estimated that the population could be as low as 1,100 fish. In April of 2003, the USFWS reported, "Results of this ongoing study indicate that despite low catch rates of nonnative fishes in the Little Colorado River, humpback chub continue to decline and that aging adults are not being replaced in the spawning population." (Sponholtz, Pam and Randy Van Haverbeke)

It is undisputed that there has been a major decline in the population of adult humpback chub. Some federal scientists have recently argued that while humpback chub numbers have indeed declined, the present population is stabilizing. Yet, these scientists present no evidence to support this assertion. Privately, some of the same scientists are also saying that extirpation for humpback chub is quite likely. In any case, both this rate of decline and the low absolute number of fish, constitute a vastly different humpback chub assessment than was assumed in developing the original EIS, and the steps necessary for humpback chub recovery.

Furthermore, there has been no progress made in establishing a second viable population of humpback chub in Grand Canyon as mandated by the ROD. Nor has a Management Plan for the Little Colorado River been implemented to protect the critical habitat of the humpback chub from pollution, reduction of instream flows, or truncation of their habitat due to unforeseen geologic events such as debris flows or landslides.

The RPA states that if sufficient progress is not made to remove humpback chub and razorback sucker jeopardy by 1998, then Seasonally, Adjusted Steady Flows (SASF) must begin at Glen Canyon Dam. This has not occurred. Additionally, the RPA also stated that in low water (drought) years, dam releases should be regulated using the SASF alternative. This, too, is not occurring.

As razorback sucker and humpback chub recovery efforts represented one of the cornerstones of the original EIS process, this new information, combined with the information we are presenting, constitutes ground to start a SEIS process.

3. Persistent drought conditions are likely to further complicate achieving program goals and are not being adequately considered or addressed

The Colorado River watershed is experiencing a fifth year of significant drought. Many climatologists are forecasting multidecadal drought conditions for the basin due to the occurrence of oscillating sea surface temperatures. This has already dropped the water level in Lake Powell reservoir by 113 feet to 44 percent of storage capacity. While specific flow recommendations were prescribed in the RPA for low water years, no assessment of management options has been conducted to address the impacts of sustained drought on achieving GCPA goals.

The reduced elevation of Lake Powell reservoir has already stimulated changes in water quality and the aquatic environment below the dam. The river's temperature has increased about 2° C, which is changing the dynamics of the food web and increasing the rates of colonization by exotic species such as the New Zealand mud snail. This particular alien species was discovered in the ecosystem after the ROD was signed. As the surface of Lake Powell reservoir continues to drop nearer to the penstocks, new pathogens, parasites and other exotic species are likely to invade the ecosystem in Grand Canyon and complicate the conservation of endangered native fish. Elevated temperatures raise questions about how this may affect alien fish populations and this predation threat to endangered humpback chub.

Furthermore, more water development projects for the Upper Basin are now being considered to fully deplete the already over-allocated waters of the Colorado River. Drought, consumptive loss, and synergistic effects of these two elements were not considered in the EIS. Predictions confirm that due to factors such as drought and over-appropriation, low levels will become the norm, rather than the exception, for Lake Powell reservoir. As a result, the BOR and her sister agencies must revisit its review the environmental impacts of Glen Canyon Dam and update the analysis to account for this new development.

4. New information relating to implementation of a temperature control device has not been addressed

The drought situation has led to an increased concern over the unforeseen impacts associated with increased water temperature flowing into Grand Canyon from Glen Canyon Dam. While the original ROD encouraged managers to direct efforts to achieve warmer water temperatures to improve native fish recruitment, the EIS did not address

in any detail the full range of impacts associated with such experiments. In 1999 uncertainty surrounding these impacts caused the BOR to shelve its plans to install a temperature control device (TCD) for Glen Canyon Dam's penstocks. Only the threat of legal action associated with the declining humpback chub population has resurrected the proposal. Although in 2003 the AMP Science Advisory Panel recommended full TCD testing and possible construction, along with flow modification and extensive research/ monitoring, DOI has taken no action until just recently and even than, the agency suggested a program that is much downscaled. The Environmental Assessment for the proposed TCD is not adequate because of incidental take and other critical habitat factors for humpback chub that has changed since the implementation of the ROD.

Another concern surrounding the TCD involves the impact of the parasitic Asian tapeworm, which could proliferate and heighten the potential of disease for the humpback chub. Since the Asian tapeworm was not discovered in the ecosystem until after the ROD, it too constitutes new information to be addressed in the SEIS.

Certainly, some of the risks associated with the TCD could be overcome by incorporating other operational strategies, such as importing sediment into the system to disadvantage hunt-by-sight predators, and by initiating a periodic spike flow. These were not addressed in the original EIS, and therefore will also need to be incorporated into the SEIS process.

5. Credibility of the AMP science program is in question

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 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 GCMRC 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 is cutting 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 example 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 original 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 occurring. 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. Together, these factors warrant immediate preparation of an SEIS.

6. Inability of the AMP decision-making process to address fundamental resource recovery requirements is limiting progress

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. The application of the ROD is the sole responsibility of the AMP. The AMP has been, and continues to be, controlled by the water and energy groups, groups whose self-interest is to avoid long-term change from the status quo. These groups necessarily are not ultimately dedicate to the protection and recovery of the Colorado River and the native fish it should support.

While the make-up of the group has provided for a bias toward representing water and energy interests, it was anticipated that the program's mandate to mitigate downstream impacts of dam operations would ensure that sufficient attention would be given to the needs of the resource. This has not occurred, as exemplified by the failure to undertake RPA programs, the decline in humpback chub, the extirpation of the razorback sucker, continued loss of essential sediment, and accelerated degradation of archeological sites. A key reason for this continued program failure is that the AMP decision-making process continues to demonstrate a clear bias toward minimizing loss of hydropower. Also, the AMP evades recommendations that would create legal conflicts between the Organic Act, Endangered Species Act, NEPA and even GCPA. The workings, the make-up and the ineffectiveness of the AMP must be reevaluated in the SEIS.

Evidence to support prejudice for one resource over another recently occurred when the trout population suppression flows were modified in a fast-track manner without proper consultation or due process within the AMP. Moreover, the current Sunday flow regime has proved to be inadequate for true trout suppression and demonstrates the concerns over hydropower prejudice for efforts to conserve endangered species. There has also been a recent suggestion for a flow regime of 5,000 to 25,000 cfs for year 2005. These

proposed flows, the environmental impacts of which have never been addressed, are outside the range prescribed for the conservation of natural and cultural resources by the ROD and the Biological Opinion.

Flow experiments, especially those designed to benefit humpback chub recruitment have been of limited duration, and as such generated inconclusive results. Results of the LSSF were inconclusive because data was neither collected prior to initiating the flows nor afterwards. In this particular experiment the flow was not timely, or sufficient enough for the food web to adjust and respond. The RPA recommended, "experimental flows will be conducted for a sufficient period of time to allow for experimental design, biological processes to function, and for variability inherent in riverine ecosystems to be expressed" (p. 36).

Overall, the AMP is failing to achieve GCPA goals because the ROD and subsequent program design do not allow for meaningful adjustments in key, aquatic ecosystem elements. The program continues to focus on treating the symptoms of ecosystem decline rather than what is actually causing the decline. In other words, the habitat is in dramatic decline and the AMP is doing nothing meaningful–is failing to make any hard choices–to bring the habitat closer to pre-dam conditions. These critical ecosystem elements are well documented and include:

A. Natural hydrograph that would redistribute sediment during the spring run-off and stimulate native fish spawning.

B. Natural thermograph with warmer summer water temperatures and colder winter temperatures.

C. Annual inputs of sediment, nutrients and woody debris to create generally turbid water conditions.

Again, these failures underscore the need to take a renewed look at a process that has not served the Colorado’s native fish and has not followed the guidelines, recommendations and requirements set forth to achieve recovery of these species.

7. Our concerns for the First Nations

The AMP has not fully engaged the process that threatens their cultural and natural heritage in Grand Canyon. They have also been given a minimal amount of resources to monitor their cultural properties in Grand Canyon. This is a violation of the trust that was developed with the tribes during Glen Canyon Environmental Studies and is allowing the government to continue to minimize the value of these tribal resources.

8. Recommendations

Based on the above, the following steps are legally required as part of the effort to protect and restore native fish and their critical habitat to the Colorado River below Glen Canyon Dam.

A. The AMP must immediately recommend to the Secretary of Interior that preparation of a SEIS to assess the environmental impacts of the operation of Glen Canyon Dam begin within six months.

B. A SEIS could take several years and there are a number of interim actions the AMP must take, both in terms of science and in the operations, to help impede the further decline of natural and cultural resources in the Grand Canyon while we await a new ROD.

C. Because the SEIS could take several years the AMP must undertake interim actions within six months to help forestall the further decline of natural and cultural resources in the Grand Canyon until a new ROD is issued.

1. Reorganize the AMP to be proactive so that it is comprised of only the responsible agencies and sovereigns: BOR, NPS, USFWS, and the Tribes. (Participation by other stakeholders would be available through public process as explained below in #2.)

2. Require the AMP meet twice a year with a 30-day comment period prior to each meeting. This program would use interactive communication and video technology that was not available during the 1996 EIS process and would provide for more stakeholders to be heard.

3. Reorganize GCMRC to be an administrative organization outside of the DOI. This would remove or militate against agency bias and shortcomings, and be a positive step toward a truly independent science organization. Competition and protocol development should follow NPS guidelines for science activities within national parks.

D. Humpback Chub population and habitat monitoring

All reports and analyses by the AMP have focused on humpback chub numbers, and not the relative condition of the fish or health of the critical habitat. This must change. While some of this data has been collected, there has not yet been any ongoing analysis on the condition factors of the humpback as recommended by the USFWS. Additionally, factors relevant to habitat such as feeding habits, water quality, age class, genetics, and recruitment and migration patterns for all periods of the humpback chub's life span need to be documented. The new AMP must also determine the population level and changes in biological parameters that would trigger a cessation of handling humpback chub so as to avoid incidental take on the remaining population.

E. Follow the Biological Opinion for the Humpback Chub and the natural river hydrograph

As a baseline, all flow decisions should be evaluated by how well they mimic the natural hydrograph. So far, the AMP has ignored this fundamental principle of river ecology. Without it there will likely be no hope of establishing a second population for the humpback chub, or of restoring its critical habitat as called for in the RPA and required by law. AMP should continue intensive alien fish suppression at the Little Colorado River reach.

F. Expand the critical habitat throughout the Grand Canyon, including the tributary streams and the Glen Canyon reach.

G. Develop a scientifically sound monitoring program that extends current non-GCMRC programs through the SEIS process so continuity of ecosystem data sets is achieved. These data sets should be linked with water quality, lower and higher trophic levels, riparian vegetation and beach sand monitoring. GCMRC monitoring programs should be delegated to past or present contractors for one year and then all contracts should be opened for competitive bidding under the new AMP and the SEIS. If these contractors do not want the work then the Grand Canyon Science Center will conduct the monitoring as protocols dictate.

H. Initiate a comprehensive, cultural site degradation abatement program throughout the entire river corridor in accordance with NPS standards.

G. Initiate development of a River Management Plan for the Little Colorado River as called for in the RPA.

In conclusion, the Grand Canyon is treasured by the citizens of the world and the natural values that make up this spectacular place must not be compromised any further. We urgently request serious and immediate action to address these matters. We look forward to receiving a detailed response to this letter explaining the steps you will take to further the goals of the Grand Canyon Protection Act, the Biological Opinion and RPA, NEPA, and the protection and recovery of the Colorado's endangered native fish and their critical habitat, as is required by law. Thank you in advance for your efforts to meet your statutory obligations.

Sincerely,

John Weisheit
Living Rivers Conservation Director
The Colorado Riverkeeper

American Whitewater
Arizona Wilderness Coalition
Bluewater Network
Californians for Western Wilderness
Center for Biological Diversity
Colorado Plateau River Guides
Escalante Wilderness Project
Friends of the Animas River
Friends of Arizona Rivers
Friends of the Earth
Friends of the River
International Rivers Network
Outdoor Adventure River Specialists
Tag-A-Long Expeditions
River Runners for Wilderness

Southern Utah Wilderness Alliance
Waterkeeper Alliance
Wilderness Watch

200 groups now support the SEIS

Take Action 03/07/04

Save Grand Canyon Native Fish: Demand EIS on the proposed temperature control device at Glen Canyon Dam

The last of Grand Canyon's native humpback chub are headed toward extinction, and the department of Interior is attempting to fast-track a controversial experiment that could kill what's left. Letters are urgently needed to ensure that a full environmental impact statement is prepared, and a sound recovery plan is developed for Grand Canyon's deteriorated river habitat.
On March 3 the Department of Interior began a 30-day scoping period for an Environmental Assessment (EA) to consider the feasibility of installing a temperature control device (TCD) at Glen Canyon Dam, Arizona to study the potential benefits of warming the temperature of water released from the dam to the downstream Colorado River through Glen and Grand Canyons.

First proposed in 1998 and scrapped in 1999, the temperature control device will take water from the warmer (upper) level of Lake Powell reservoir, as opposed to the reservoir's cooler (lower) elevations for turning the turbines that generate electricity.

Since completion in 1963, Glen Canyon Dam has been releasing water into Grand Canyon that is consistently about 47 degrees F, which are too low for native fish to spawn or mature. Before Glen Canyon Dam the river temperatures approached 80 degrees in the summer and near freezing in the winter.

While strategies to warm the water are critical to recovering Grand Canyon's native fish this device, especially on its own, may not be the best choice and its operation could actually bring the remaining native fish species closer to extinction by promoting the proliferation of alien fish that feed on the young native fish.

Living Rivers, Colorado Riverkeeper program and others are calling for:

- A full Environmental Impact Statement (EIS), as opposed to the much narrower and fast-tracked Environmental Assessment, as the magnitude of this federal action requires is too extensive for such limited environmental review.
- The potential for increases in the population of non-native fish species must be fully understood and addressed, including catfish, carp and Brown trout, which are known to prey on the young of endangered fish species.
- A full analysis of water quality concerns, including how they may contribute to new and increased levels of exotic animals and parasites, such at the New Zealand mud snail and the Asian tapeworm which are not native to Grand Canyon.
- The potential impacts on Grand Canyon's aquatic food web, and food security for Grand Canyon's native fish.
- The corresponding dam releases and flow regimes that must be undertaken in consort with temperature modification to mimic the historic flow pattern.
- The corresponding sediment augmentation that must also be undertaken in consort with temperature modifications to mitigate the loss of 95 percent of Grand Canyon's sediment and nutrients trapped behind the dam and to disadvantage hunt-by-sight alien fish predators.
- The impacts the of sustained drought on the need for, and operations of, a temperature modification.
- The safety risks associated with operating temperature control device poses a risk to the safety of the dam.
- All potential alternatives to warming the water, including permanently lowering the reservoir levels, and decommissioning the dam.
- The range of new information not known when Glen Canyon Dam's first EIS was completed in 1996, including the continued decline of endangered native fish populations, the ineffectiveness of sediment conservation measures, the likelihood of long-term drought, and the deteriorating credibility of the science program advising dam managers.

Please write to:
Ms. Nancy Coulam
Bureau of Reclamation
125 South State Street, Room 6103
Salt Lake City, UT 84138-1102

Phone: 801-524-3684
Fax: 801-524-5499
Email: ea_comments@uc.usbr.gov

Letters must be received by April 2, 2004.

You can automatically submit a letter by clicking "ACT NOW" at our affiliate's, Waterkeeper Alliance, web site:

For More Information:

Sample Letter

Grand Canyon/Glen Canyon Dam--The Facts

Letter to BOR requesting extension of public scoping period

Save Grand Canyon from Glen Canyon Dam

Living Rivers Colorado Riverkeeper letter demanding new EIS for Glen Canyon Dam

Department of Interior Glen Canyon Dam Adaptive Management Program

Draft Science Plan for TCD

Federal Register Notice for TCD

Letter from BOR announcing scoping for Temperature Control Device

NOTE: The Bureau of Reclamation's web site and email is down due to a court order concerning the Department of Interior's mismanagement of the Trust Funds for the First Nations.

Regional News 03/09/04

Many farms may not recover from this drought

By Gary Nabhan, director Center for Sustainable Environments Northern Arizona University

Whenever it has rained or snowed in the West this winter, ranchers and farmers have wondered whether the new moisture has been significant enough to break the drought and get their operations back to a normal business routine.

But the sad truth is that there is no "normal" condition in much of the arid West; we spend most of our time either in drought or recovering from it. And regardless of when the meteorological drought is finally broken, it will be many more years, if ever, that farms and ranches will be able to recover from what we might call hydrological and economic droughts. Reservoirs will take years to refill, and the food economy is fraught will instability.

Although this view may sound rather gloomy or cynical, a review of the consequences of the droughts in the 1930s and '50s bears me out. Range-fed sheep and cattle stocking rates never returned to what they were prior to those droughts. Because there were crop failures of dry-farmed grains and beans, many farms went belly-up in the Dust Bowl and never relied on rain alone again.

Still, two factors make this drought different than those in the '30s and '50s. First, today's farmers are not suffering crop failures as much as they are suffering from higher production costs that now keep them in debt. Rather than seeing their crops dry up because rains are sparse and reservoir levels are down, they are investing more in buying and transporting water, controlling pests and maintaining costly irrigation systems.

Since the drought began in 1997, Arizona farmers and ranchers have shouldered 22 percent more debt than they did before. Such debt has forced many out of business, so that we've been losing an average of 100 farms and ranches in Arizona since the drought began, opposed to the long-term average of 82 lost per year.

But the second, unparalleled factor at work today is much more insidious. Government policies on water allocation during drought have put farmers, ranchers and the food security they offer us at a selective disadvantage, whereas water-consumptive urban growth has continued unchecked.

During the past two years, when farmers in the Metro Phoenix area have been forced to cut back their irrigation by 30 percent, urban users have barely diminished their water use by 5 percent, and most of that savings has been due to the valiant efforts of city park managers to use less water.

Regardless of how much central Arizona farmers cut back on their irrigation needs, no more water is truly being conserved for wildlife habitats and future needs because 25,000 more users take up residence in Metro Phoenix every year. In general, residents of Southwestern cities have increased their per capita use by one-fourth over the past quarter century, while farmers have reduced per acre use by one-fifth. Is this fair?

The net effect is that during this drought, more food-producing land has been sold to shopping mall and subdivision developers than ever before. This is because there are few policies that assist farmers and ranchers in resisting urban sprawl. The long-term consequences of such gaps in land and water policy is that more and more of America's food is coming from off-shore sources. We have sacrificed some of the most fertile lands in the world to asphalt and concrete. In doing so, we have compromised our own food security and safety – few countries regulate pesticides and other contaminants to the extent that the U.S. does.

As an attempt to counter such devastating trends in the Southwestern states, the Center for Sustainable Environments is launching a branding campaign to help farmers and ranchers survive this drought. Their direct-marketed products can be labeled with tags and stickers urging consumers to "Get Yours Fresh from Canyon Country."

Nearly half of Arizona's consumers, when surveyed, say that they would be willing to pay more for such locally produced foods; they are particularly interested in fresh, good-quality produce and meats grown with water-conserving, environmentally friendly practices.

If households, restaurants and cafeterias choose to purchase more "Canyon Country Fresh" products, farmers and ranchers will gain more of each consumer food dollar, and will perhaps have the means to reduce their debts and recover from the economic drought.

It is time for Westerners to rally together to ensure that our region's farmers and ranchers are guaranteed enough water to provide our communities with secure food supplies. If we don't, we will be increasing our vulnerability to contaminated vegetables from Mexico and downer cattle from Canada.

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Dr. Gary Nabhan, Director of NAU's Center for Sustainable Environments, is co-author of a new study on drought and food security, available online at www.environment.nau.edu. He will speak on this topic at the Southwest Direct Marketing Network Conference in Flagstaff, Monday, March 16 at 9 am at the Radisson Hotel

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Take Action 03/12/04

SAMPLE LETTER: Temperature Control Device/Environmental Assessment

Ms. Nancy Coulam
Bureau of Reclamation
125 South State Street, Room 6103
Salt Lake City, UT 84138-1102
Phone: 801-524-3684
Fax: 801-524-5499
Email: ea_comments@uc.usbr.gov

Dear Ms. Coulam,

I submit the following scoping comments for the draft Environmental Assessment (EA) that the Bureau of Reclamation (BOR) is presently preparing for the proposed temperature control device (TCD) at Glen Canyon Dam, Arizona.

While it is critical that urgent action be taken to address the decline of endangered species in Grand Canyon National Park caused by Glen Canyon Dam's operations, the TCD initiative now underway may only further the native ecosystem's collapse. Its operation could actually bring the few remaining native fish closer to extinction, constituting an incidental take of endangered species.

The situation is particularly critical for the humpback chub, whose numbers have declined 85 percent since 1982. This decline, combined with abundant new information about the condition of the ecosystem in Grand Canyon since the TCD was recommended in 1995, compelled the BOR to halt the fast-tracking of the TCD proposal and undertake a more thorough review of the situation in Grand Canyon, including the

full range of alternatives available to address them. Specifically, I request the BOR address the following:

1) The present environmental review process be expanded to a full Environmental Impact Study to address the TCD and all new information that has come forward since the first Glen Canyon Dam EIS was completed in 1995.

2) Other alternatives to warming the water, including permanently lowering the reservoir and decommissioning the dam.

3) The potential for the TCD's operation to increase the population of non-native fish such as catfish, carp and brown trout, which are known to prey on the young of endangered fish species.

4) The effect the TCD will have on water quality, including new and increased levels of exotic animals and parasites. Specifically, it should address impacts to the New Zealand mud snail and the Asian tapeworm, which are not native to Grand Canyon ecosystem; and how will these impacts affect the recovery of the native fish, which were not addressed in the original EIS.

5) The TCD's potential impacts on the aquatic food web for Grand Canyon's native fish. This includes the impacts associated with the worsening drought situation and the quality and quantity of nutrients to provide carbon for the river's food chain.

6) The complimentary role other mitigation measures must play, especially sediment augmentation to replace the loss of 95 percent of Grand Canyon's sediment and nutrients trapped behind the dam, and the restoration of flow regimes that mimic the rivers annual, natural hydrograph.

7) The safety risks that these modifications to the penstocks my pose to Glen Canyon Dam, especially at low water levels.

Thank you for the opportunity to submit these comments.

Sincerely, Your name or organization

LR Letter 03/17/04

Letter of Extension for Scoping Period of TCD/EA

March 17, 2004
Ms. Nancy Coulam
Bureau of Reclamation
125 South State Street, Room 6103
Salt Lake City, UT 84138-1102
Via Fax: 801-524-5499

RE: Request for 30-day Extension of scoping comment period for Glen Canyon Dam Temperature Control Device Environmental Assessment.

Dear Ms. Coulam,

Living Rivers requests that the Bureau of Reclamation extend by 30 days, to May 2, 2004, the deadline for receipt of scoping comments for the Glen Canyon Dam Temperature Control Device Environmental Assessment.

This proposal by the Bureau represents one of the most unique and significant interventions into the Grand Canyon ecosystem at a time when a federally listed endangered fish, the humpback chub, is declining toward extirpation in Grand Canyon National park. Never before have such modifications been proposed for Glen Canyon Dam, nor temperature control experiments been undertaken in Grand Canyon. The public should be given sufficient time to comment.

Despite this significance, the public has received very little notification on the matter, and as of today, there is still no information pertaining to this scoping period on the Adaptive Management website.

Also, because of the recent disconnect of the Internet from various agencies of the Department of Interior, as ordered by Judge Royce Lamberth of the United States District Court, information access is now more limited and will delay full participation of the public.

Thank you for your attention to this matter.

Sincerely,

John Weisheit
Conservation Director
Colorado Riverkeeper

Letter to LR 03/24/04

Letter Announcing Scoping For Temperature Control Device

United States Department of the Interior
BUREAU OF RECLAMATION
Upper Colorado Regional Office
125 South State Street, Room 6107
Salt Lake City, Utah 84138-1102
FEB 23 2004
IN REPLY REFER TO: UC-720 ENV-6.00

Subject: Glen Canyon Dam Temperature Control Device Environmental Assessment

Dear Interested Parties:

I am personally inviting you to assist the Bureau of Reclamation and its partners in scoping the issues to be considered in the development of an Environmental Assessment (EA) under terms of the National Environmental Policy Act. As you will see, we are again considering the feasibility of installing temperature control devices (TCD) on the penstocks at Glen Canyon Dam, Arizona to study the potential benefits of warming the temperature of water released from the dam to the downstream Colorado River through Glen and Grand Canyons.

Prior to construction of Glen Canyon Dam, Colorado River temperatures ranged from freezing to about 85 OF. Since construction of the dam, releases from the dam have been consistently cold (about 45-50 OF), adversely impacting native fish. Reviewing the condition of the native fish in 1994, the U.S. Fish and Wildlife Service's biological opinion on the operation of Glen Canyon Dam Environmental Impact Statement required Reclamation to evaluate the feasibility of using a TCD to warm the temperature of the Colorado River below Glen Canyon Dam.

In January 1999, Reclamation released a draft EA on an eight-unit TCD for Glen Canyon Dam. Reclamation did not finalize this assessment and National Environmental Policy Act process due to questions about potential adverse impacts of the eight-unit device on downstream aquatic resources, particularly endangered fish, the need for an accompanying science plan, and concerns about the frequency of use of the TCD. Reclamation has continued studying the potential for a TCD that could warm the Colorado River below the dam and assist in the removal of jeopardy from endangered fish. Based on these additional studies, Reclamation has decided to begin preparation of a new programmatic EA analyzing the environmental effects of construction and experimental operation of a two-unit pilot project TCD. A monitoring plan and experimental program for testing the TCD using adaptive management will be designed by the U.S. Geological Survey, Grand Canyon Monitoring and Research Center.

This notice announces the opening of a 30 day scoping period. During this time, Reclamation encourages you to raise issues and concerns that should be addressed in the EA. You should focus your comments on the potential environmental effects of construction and operation of a two-unit pilot project TCD, as well as reasonable alternatives to the proposal and measures to avoid or lessen environmental impact. Comments received before April 2, 2004, will be considered during the preparation of the EA. Reclamation will use the EA in its decision-making process to determine whether to construct and test a pilot two-unit TCD or if a more detailed environmental impact statement should be prepared.

Comments should be sent to the U.S. Bureau of Reclamation, attention Nancy Coulam, UC-720, 125 South State Street, Room 6103, Salt Lake City, UT 84138-1102 or by email to ea_comments@uc.usbr.gov. If you do not want to submit comments at this time, but would like to receive a copy of the draft EA and other mailings, please contact Reclamation at the same address or email. If you need further information, please contact Nancy Coulam at 801-524-3684.

Sincerely,

Rick L. Gold Regional Director

Letter to LR 03/24/04

Federal Register Notice for TCD

United States Department of the Interior
Bureau Of Reclamation
Glen Canyon Adaptive Management Working Group (AMWG)
Notice of Meeting
Agency: Bureau of Reclamation, Interior
Action: Notice of public meeting

Summary: The Adaptive Management Program (AMP) was implemented as a result of the Record of Decision on the Operations of Glen Canyon Dam Final Environmental Impact Statement to comply with the consultation requirements of the Grand Canyon Protection Act (Pub.1. 102-575) of 1992. The AMP provides an organization and process to ensure the use of scientific information in decision-making concerning Glen Canyon Dam operations and protection of the affected resources consistent with the Grand Canyon Protection Act. The AMP has been organized and includes a federal advisory committee (AMWG), a technical work group (TWG), a monitoring and research center, and independent review panels. The TWG is a subcommittee of the AWMG and provides technical advice and information for the AMWG to act upon.

Date and Location: The AMWG will conduct the following public meeting: Phoenix, Arizona—March 3-4, 2004. The meeting will begin at 9:30 a.m. and conclude at 5 p.m. on the first day and begin at 8 am and conclude at noon of the second day. The meeting will be held at the Arizona Department of Water Resources, 500 N. 3rd Street, 3rd Floor, Conference Rooms A and B, Phoenix, Arizona

Agenda: The purpose of the meeting will be to recommend to the Secretary of the Interior the FY 2005 budget and work plan. Other items for discussion include AMWG operating procedures, environmental compliance on proposed actions, basin hydrology, public outreach, as well as other administrative and resources issues pertaining to the AMP. To view a copy of the draft agenda, please visit the Reclamation web site at: http://www.usbr.gov/uc/envprog/amp/amwg/mtgs/01mar03/mtgs1_00.html.

To allow full consideration of information by the AMWG members, written notice must be provided to Dennis Kubly, Bureau of Reclamation, Upper Colorado Regional Office, 125 South State Street, Room 6107, Salt Lake City, Utah, 84138; telephone (801) 524-3715; faxogram (801) 524-3858; e-mail at dkubly@uc.usbr.gov (5) days prior to the meeting. Any written comments received will be provided to the AMWG and TWG members prior to the meeting.

For further information contact: Dennis Kubly; telephone (801) 524-3715; faxogram (801) 524-3858; e-mail at dkubly@uc.usbr.gov.

Dated: January 29, 2004 Dennis Kubly Chief, Adaptive Management Group, Environmental Resources Division, Upper Colorado Regional Office, Salt Lake City, Utah. FR Doc. 04-3347 Filed 2-13-04; 8:45 am Billing code 4310-MN-P

LR Letter 04/01/04

The 159 (now 202) groups endorsing 4/2/02 letter to Bureau of Reclamation

Access for All (CA)
Alabama Environmental Council (AL)
Alamosa Riverkeeper (CO)
Allegheny Riverkeeper (PA)
Alliance for Sustainable Communities (MD)
Altamaha Riverkeeper (GA)
American Whitewater Association (MD)
Apalachicola Bay and Riverkeeper (FL)
Arizona Wilderness Coalition (AZ)
Audubon Upper Mississippi River Campaign (MN)
Baja California Coastkeeper (Mexico)
Biodiversity Conservation Alliance (WY)
Black Warrior Riverkeeper (AL)
Blackwater/Nottoway Riverkeeper (VA)
Bluewater Network (CA)
Bow Riverkeeper (Canada)
Buckeye Forest Council (OH)
Cahaba River Society (AL)
California Save Our Streams Council (CA)
Californians for Western Wilderness (CA)
Camp Us (CO)
Canyon Voyages (UT)
Cape Fear River Watch, Inc. (NC)
Cape Fear Riverkeeper (NC)
Cascadia Rising Ecological Defense Network (OR)
Casco Baykeeper (MA)
Center for Biological Diversity (AZ)
Central Lake Superior Watershed Partnership (MI)
Chattahoochee Riverkeeper (GA)
Chehalis River Council (WA)
Choctawhatchee Riverkeeper (AL)
Choqueyapu Riverkeeper (Bolivia)
Citizens of Lee Environmental Action Network (VA)
Clearwater Biodiversity Project (ID)

Clinch Coalition (VA)
Coalition for Jobs and the Environment (VA)
Coastal Land Trust (CA)
Colorado Plateau River Guides (UT)
Columbia Riverkeeper (WA)
Commencement Baykeeper (WA)
Community Clean Water Institute (CA)
ConservAmerica (NM)
Cook InletKeeper (AK)
Coosa River Basin Initiative (GA)
Devil's Fork Trail Club (VA)
DuPage River Coalition (IL)
Earth Island Institute (CA)
Electors Concerned about Animas Water (NM)
Endangered Habitats League (CA)
Erie Canalkeeper (NY)
Escalante Wilderness Project (UT)
Evergreen State College (WA)
Eyak Preservation Council (AK)
Eyes of Paint Branch (MD)
Flagstaff Activist Network (AZ)
Flint River Watershed Coalition (MI)
Florida Wildlife Federation (FL)
Forest Guardians (NM)
Forest Watch (VT)
Foundation for Global Sustainability (TN)
Four Corners School of Outdoor Education (UT)
Friends of Arizona Rivers (AZ)
Friends of Blackwater (WV)
Friends of Living Oregon Waters (OR)
Friends of Milwaukee's Rivers & Riverkeeper (WI)
Friends of the Animas River (CO)
Friends of the Earth (DC)
Friends of the Eel River (CA)
Friends of the Gualala River (CA)
Friends of the Nanticoke River (MD)
Friends of the River (CA)
Friends of the Riverfront (PA)
Fundy Baykeeper (Canada)
Galveston Baykeeper (TX)
Georgian Baykeeper (Canada)
Glen Canyon Institute (UT)
Global Exchange (CA)
Global Response (CO)
Grand Canyon Private Boaters Association (AZ)
Grand Riverkeeper (OK)

Grand Traverse Baykeeper (MI)
Great Egg Harbor Watershed Association (NJ)
Great Lakes United (NY)
Great Old Broads for Wilderness (CO)
Green Party of Utah (UT)
Greenaction for Health and Environmental Justice (CA)
Hackensack Riverkeeper (NJ)
Hells Canyon Preservation Council (OR)
Holiday River Expeditions (UT)
Housatonic River Initiative (MA)
Hudson Riverkeeper (NY)
Hurricane Creekkeeper (AL)
Idaho Sporting Congress (ID)
International Rivers Network (CA)
John Muir Project (CA)
Kalamazoo River Protection Association (MI)
Kansas Riverkeeper & Friends of the Caw (KS)
Kern Valley River Council (CA)
Kettle Range Conservation Group (WA)
Klamath Siskiyou Wildlands (OR)
Lake George Waterkeeper (NY)
Lake Ontario Waterkeeper (Canada)
Lands Council (WA)
Lawyers for Clean Water (CA)
Los Alamos Study Group (NM)
Lower Mississippi Riverkeeper (LA)
Lower Neuse Riverkeeper & Neuse River Foundation (NC)
Maine Rivers (ME) Maricopa Audubon (AZ)
Mattole Restoration Council (CA)
Milwaukee Riverkeeper (WI)
Montana River Action (MT)
Morava Riverkeeper (Czech Republic)
Narragansett Baykeeper (RI)
National Forest Protection Alliance (MT)
Native Forest Council (OR)
Native Forest Network (MT)
New Mexico Wilderness Alliance (NM)
New River Foundation (NC)
New York/New Jersey Baykeeper (NJ)
Northern California River Watch (CA)
Northwest Rafters Association (OR)
Northwoods Wilderness Recovery (MI)
Ocean Arks International (VT)
Ocmulgee Riverkeeper (GA)
Ohio Environmental Council (OH)
Oregon Natural Desert Association (OR)

Outdoor Adventure River Specialists (CA)
Patagonia (CA)
Patapsco Riverkeeper (MD)
Patrick Environmental Awareness Group (VA)
Pensacola Gulf Coastkeeper (FL)
Pequannock River Coalition (NJ)
Petitcodiac Riverkeeper (NB)
Protect Our Public Lands (OR)
Puerto Rico Coastkeeper (PR)
Puget Soundkeeper Alliance (WA)
Red Rock Forests (UT)
Red Rock Foundation (AZ)
Ridgeline & Open Space Coalition (CO)
Riparian Improvement Organization (CA)
River Project, The (NY)
River Runners for Wilderness (CO)
Riverhawks (OR)
Russian Riverkeeper (CA)
Sacramento River Preservation Trust (CA)
Salt Creek Watershed Network (IL)
San Diego BayKeeper (CA)
Santa Barbara Channelkeeper (CA)
Savannah Riverkeeper (GA)
Save America's Forests (DC)
Save Barton Creek Association (TX)
Save the Illinois River (OK)
Sea Shepherd Conservation Society (WA)
Seeds of Simplicity (CA)
Shundahai Network (UT)
Sitka Conservation Society (AK)
Sky Island Alliance (AZ)
Society of Environmental Communicators (AZ)
Solar Energy International (CO)
South Riverkeeper (MD)
Southern Appalachian Biodiversity Project (NC)
Southern Appalachian Forest Coalition (NC)
Southern Utah Wilderness Alliance (UT)
Spirit of the Sage Council (CA)
St. Johns Riverkeeper (FL)
Sublette Riders Association (WY)
Superior Wilderness Action Network (MN)
Tag-A-Long Expeditions (UT)
Taking Responsibility for the Earth and Environment (VA)
Taxpayers for the Animas River (CO)
Tennessee Clean Water Network (TN)
Tennessee River Revival (TN)

The 21st Paradigm (ID)
Tribal Environmental Watch Alliance (NM)
Tualatin Riverkeeper (OR)
Upper Chattahoochee Riverkeeper (GA)
Upper Neuse Riverkeeper (NC)
Upper Susquehanna Riverkeeper (PA)
Utah Environmental Congress (UT)
Ventura Coastkeeper (CA)
Virginia Forest Watch (VA)
Virginians for Wilderness (VA)
Wabash Riverkeeper (IN)
Waccamaw Riverkeeper (SC)
Wakulla/Aucilla Waterkeeper (FL)
Wasatch Mountain Club (UT)
Water Watch of Oregon
Waterkeeper Alliance (NY)
Waterkeepers Northern California (CA)
Waterkeepers of Austrailia
Western Watersheds Project (UT)
Western Wildlife Conservancy (UT)
Wetlands Action Network (CA)
Wild South (AL)
Wild Wilderness (OR)
Wildcoast (CA)
Wilderness Watch (MT)
Willamette Riverkeeper (OR)
Wolf River Conservancy (TN)
Wyoming Outdoor Council (WY)
Youghiogheny RiverKeeper (PA)

LR Letter 04/02/04
EIS/TCD Letter to Bureau of Reclamation

April 2, 2004
Ms. Nancy Coulam
Bureau of Reclamation
125 South State Street, Room 6103
Salt Lake City, UT 84138-11027

RE: Scoping Comments for proposed Temperature Control Device at Glen Canyon Dam

Dear Ms. Coulam,

Living Rivers, the Colorado Riverkeeper, and the undersigned organizations submit the following scoping comments pertaining to the Temperature Control Device (TCD) at Glen Canyon Dam as published in the Federal Register on February 17, 2004.

First, we find the notice in the Federal Register to be utterly vague, with no direct reference to the TCD environmental review process. Additionally, due to a Federal District Court order suspending public access to the Bureau of Reclamation via email and web pages, the public has been further inconvenienced in learning about this process. We therefore request that the scoping period be extended for at least another 30 days to adequately involve the public in this critical mater affecting the ecological integrity of Grand Canyon National Park. We also request that the Bureau of Reclamation seek consultation with the US Fish and Wildlife Service concerning the application of a TCD program for operations at Glen Canyon Dam.

While the 1996 Record of Decision (ROD) on the 1995 Glen Canyon Dam Environmental Impact Statement (EIS) addresses the need to pursue temperature control strategies at Glen Canyon Dam, it did so amidst a climate of much different information than presently exists. In fact, four years later the scientific controversy surrounding viability of such a proposal caused the Bureau of Reclamation to abandon its plans for this temperature control device (TCD). As noted below, even more information now exists to reinforce the concerns raised four years ago. This new information not only calls into question the merits of an independent TCD proposal, but the ROD's applicability to guiding Glen Canyon Dam operations as they pertain to endangered species recovery in Grand Canyon National Park. We therefore request that the proposed TCD be evaluated through an Environmental Impact Statement as opposed to the more cursory Environmental Assessment (EA) presently contemplated, and that this EIS, or a supplemental EIS, also address the areas of new information unknown or unforeseen when the 1995 EIS was prepared.

The initial EIS and ROD recommended pursuit of temperature modification strategies for Glen Canyon Dam releases amidst a range of other dam management proposals aimed at recovering endangered native fish at Grand Canyon. However, the Glen Canyon Dam Adaptive Management Program's most recent report to Congress, submitted in 2003, along with subsequent scientific conclusions clearly indicate that these programs have made little progress in meeting the mandate of the Grand Canyon Protection Act (GCPA). Nor have they met the goals established in the EIS, ROD, the Biological Opinion that analyzed the environmental impacts of Glen Canyon Dam, nor subsequent objectives set by the AMP itself.

The AMP has failed because the original EIS had inappropriate limitations, the AMP administrative process is ineffective, and the AMP lacks responsible leadership from the agencies of the Department of Interior (DOI): Bureau of Reclamation (BOR), National Park Service (NPS), US Geological Survey (USGS) and US Fish and Wildlife Service (USFWS). Unless these fundamental deficiencies are corrected, the dedicated efforts of all involved will continue to fail to restore the ecosystem in Grand Canyon National Park.

At the same time, scientific evidence shows that the AMP can not succeed in meeting program goals while constrained by the limitations set by the current EIS. It is evident that unless additional, more effective management options are implemented, the AMP serves only the purpose of documenting the decline of the Grand Canyon river ecosystem. Thus, more than enough evidence exists to require the immediate preparation of a supplemental environmental impact statement (SEIS), independent of the current TCD proposal, to examine in detail and anew the impacts of Glen Canyon Dam based on the significant failures of the present efforts and the myriad of changed circumstances that affect the Colorado River system. Since the release of the ROD in 1996, it is almost certain that the razorback sucker has joined the growing list of endangered species that have become extirpated in the Grand Canyon ecosystem. Grand Canyon National Park now faces the extirpation of yet another endangered species, the humpback chub. The ROD specifically foresaw the need for the recovery of this native fish, as well to establish a second population of humpback chub and to reestablish a population of the razorback sucker. Yet, scientific evidence indicates that neither objective will occur. The humpback chub's alarming decline and the failure to reinstate the razorback sucker tops a growing list of new scientific information that was not available or known when the 1995 EIS was completed.

As outlined below, the TCD must be evaluated through an EIS process, and this should be done in concert with a supplemental EIS process to address new information and new realities, which are also detailed below. The Bureau of Reclamation, together with her sister DOI agencies, are obligated to undertake such processes dictated by the National Environmental Policy Act (NEPA) in relationship to the operation of the Glen Canyon Dam. According to the regulations implementing NEPA: "agencies shall prepare supplements to either draft or final environmental impact statements if: (i) the agency makes substantial changes in the proposed action that are relevant to environmental concerns; or (ii) there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts." 40 C.F.R § 1502.9(c) (emphasis added).

Here, the dramatic decline of the humpback chub, the extirpation of the razorback, the failure of the BOR and the AMP to abide by the terms of the Biological Opinion and to meet the goals of the Grand Canyon Protection Act, and the wealth of new information relevant to the recovery of these species and their habitat combine to require such a supplement.

Listed below are the primary areas of concern:

1. New information relating to implementation of a temperature control device has not been addressed

The current drought situation has led to an increased concern over the unforeseen impacts associated with increased water temperature flowing into Grand Canyon from Glen Canyon Dam. While the original ROD encouraged managers to direct efforts to achieve warmer water temperatures to improve native fish recruitment, the EIS did not address in any detail the full range of impacts associated with such experiments. In

1999 uncertainty surrounding these impacts caused the BOR to shelve its plans to install a temperature control device (TCD) for Glen Canyon Dam's penstocks. Only the threat of legal action associated with the declining humpback chub population has resurrected the proposal. Although in 2003 the AMP Science Advisory Panel recommended full TCD testing and possible construction, along with flow modification and extensive research/monitoring, DOI has taken no action until just recently and even then, the agency suggested a program that is much downscaled. An Environmental Assessment for the proposed TCD is not adequate because of incidental take and other critical habitat factors for humpback chub that has changed since the implementation of the ROD.

Another concern surrounding the TCD involves the impact of the parasitic Asian tapeworm, which could proliferate and heighten the potential of disease for the humpback chub. Since the Asian tapeworm was not discovered in the ecosystem until after the ROD, it too constitutes new information to be addressed in a SEIS.

Certainly, some of the risks associated with the TCD could be overcome by incorporating other operational strategies, such as importing sediment into the system to disadvantage hunt-by-sight predators, and by initiating a periodic spike flow. These were not addressed in the original EIS, and therefore will also need to be incorporated into an EIS process for the TCD.

2. The AMP has failed to improve sediment balance that drives the physical ecological component of the ecosystem

New data collected since the EIS was completed confirms that the EIS needs to be modified to address sediment below Glen Canyon Dam. This is because the scientific community studying the native fish and involved in the recovery of these species, know far more about sediment dynamics than in 1992 when the EIS was developed. A core element of the ROD and the relevant Reasonable and Prudent Alternative (RPA) requires that BOR mitigate the impacts caused by the fact that sediment no longer enters Grand Canyon's river ecosystem. The plan required that experiments be conducted to conserve sediment in the ecosystem of the Colorado River. The first experiment took place in 1996 with subsequent attempts in the year 2000. In each case, efforts failed to produce permanent benefits of preserving beaches, stabilizing cultural sites, and enhancing critical habitat conditions as intended. The report to Congress and all supporting sediment research since concludes that net sediment loss from the ecosystem will continue to occur. Natural sediment inputs, combined with organic nutrients, are a fundamental pre-dam ecosystem components necessary to sustain native fish species. Returning to peak-power flows, in a weak attempt to reduce rainbow trout spawning success, will likely accelerate further the rate of sediment loss.

There are other adverse environmental impacts of sediment loss below Glen Canyon Dam not previously anticipated. The continued loss of sediment and inability to regularly enhance beaches have brought about a change in NPS management strategies concerning cultural resource protection in the river corridor. While NPS policies favor the preservation of archeological sites in situ, the BOR now finds it necessary to consider

immediate salvage operations to save what remains of sites threatened by further beach erosion. This will add federal costs to the program and increase tribal concern for these remnants of ancestral origin. These immediate and vital remedies were not considered in the original EIS.

The sobering conclusions regarding the inability to improve sediment resources have brought about discussions on how to augment sediment inputs in addition to reducing outputs. Any attempt to import sediment into the ecosystem below Glen Canyon Dam will be very costly and is not evaluated in the current EIS. In light of the inability to conserve sediment and meet Lower Basin water allotments as planned, options for improving the sediment and nutrient budget to benefit native fish and cultural sites must be explored in a SEIS.

3. The AMP is non-compliant with the Endangered Species Act and USFWS program recommendations

A. Razorback Sucker

The Biological Opinion uses urgent language to call for specific improvements of critical habitat for the humpback chub and the razorback sucker by 1998. The document states, "If the [Fish and Wildlife] Service determines a study design can not be developed that is expected to provide information to support removal of jeopardy to the razorback sucker and humpback chub populations in the Grand Canyon and associated tributaries, such will be considered new information and may be grounds for reinitiating formal consultation." (p. 35) (emphasis added)

Considering that a live, adult razorback sucker has not been observed in Grand Canyon for the last few years, many senior scientists believe that the razorback sucker has been extirpated from the Colorado River in Grand Canyon National Park. The lack of response in respect to performance criteria gives ample evidence that jeopardy has not been removed, and is sufficient ground for reinitiating formal consultation and the NEPA process immediately. B. Humpback Chub

Monitoring by the USGS through the Glen Canyon Monitoring and Research Center (GCMRC), has documented a major an alarming decline in humpback chub population. Since 1995, when the EIS was completed, the adult humpback chub population in the Little Colorado River has declined by 50 percent. Two years ago the GCMRC scientists estimated that the population could be as low as 1,100 fish. In April of 2003, the USFWS reported, "Results of this ongoing study indicate that despite low catch rates of nonnative fishes in the Little Colorado River, humpback chub continue to decline and that aging adults are not being replaced in the spawning population." (Sponholtz, Pam and Randy Van Haverbeke)

It is undisputed that there has been a major decline in the population of adult humpback chub. Some federal scientists have recently argued that while humpback chub numbers have indeed declined, the present population is stabilizing. Yet, these scientists present no evidence to support this assertion. Privately, some of the same scientists are also saying that extirpation for humpback chub is quite likely. In any case, both this rate of

decline and the low absolute number of fish, constitute a vastly different humpback chub assessment than was assumed in developing the original EIS, and the steps necessary for humpback chub recovery.

Furthermore, there has been no progress made in establishing a second viable population of humpback chub in Grand Canyon as mandated by the ROD. Nor has a Management Plan for the Little Colorado River been implemented to protect the critical habitat of the humpback chub from pollution, reduction of instream flows, or truncation of their habitat due to unforeseen geologic events such as debris flows or landslides.

The RPA states that if sufficient progress is not made to remove humpback chub and razorback sucker jeopardy by 1998, then Seasonally, Adjusted Steady Flows (SASF) must begin at Glen Canyon Dam. This has not occurred. Additionally, the RPA also stated that in low water (drought) years, dam releases should be regulated using the SASF alternative. This, too, is not occurring.

As razorback sucker and humpback chub recovery efforts represented one of the cornerstones of the original EIS process, this new information, combined with the information we are presenting, constitutes ground to start a SEIS process.

4. Persistent drought conditions are likely to further complicate achieving program goals and are not being adequately considered or addressed

The Colorado River watershed is experiencing a fifth year of significant drought. Many climatologists are forecasting multidecadal drought conditions for the basin due to the occurrence of oscillating sea surface temperatures. This has already dropped the water level in Lake Powell reservoir by 113 feet to 44 percent of storage capacity. While specific flow recommendations were prescribed in the RPA for low water years, no assessment of management options has been conducted to address the impacts of sustained drought on achieving GCPA goals.

The reduced elevation of Lake Powell reservoir has already stimulated changes in water quality and the aquatic environment below the dam. The river's temperature has increased about 2° C, which is changing the dynamics of the food web and increasing the rates of colonization by exotic species such as the New Zealand mud snail. This particular alien species was discovered in the ecosystem after the ROD was signed. As the surface of Lake Powell reservoir continues to drop nearer to the penstocks, new pathogens, parasites and other exotic species are likely to invade the ecosystem in Grand Canyon and complicate the conservation of endangered native fish. Elevated temperatures raise questions about how this may affect alien fish populations and this predation threat to endangered humpback chub.

Furthermore, more water development projects for the Upper Basin are now being considered which would further deplete the already over-allocated waters of the Colorado River. The synergistic effects of drought and consumptive loss were not considered in the EIS. Predictions confirm that due to factors such as drought and over-appropriation, low levels will become the norm, rather than the exception, for Lake Powell reservoir. As a result, the BOR and her sister agencies must revisit its review the

environmental impacts of Glen Canyon Dam and update the analysis to account for this new development.

5. Credibility of the AMP science program is in question

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 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 GCMRC 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 is cutting 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 example 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 original 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 occurring. 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. Together, these factors warrant immediate preparation of an SEIS.

6. Inability of the AMP decision-making process to address fundamental resource recovery requirements is limiting progress

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. The application of the ROD is the sole responsibility of the AMP. The AMP has been, and continues to be, controlled by the water and energy groups, groups whose self-interest is to avoid long-term change from the status quo. These groups necessarily are not ultimately dedicated to the protection and recovery of the Colorado River and the native fish it should support.

While the make-up of the group has provided for a bias toward representing water and energy interests, it was anticipated that the program's mandate to mitigate downstream impacts of dam operations would ensure that sufficient attention would be given to the needs of the resource. This has not occurred, as exemplified by the failure to undertake RPA programs, the decline in humpback chub, the extirpation of the razorback sucker, continued loss of essential sediment, and accelerated degradation of archeological sites. A key reason for this continued program failure is that the AMP decision-making process continues to demonstrate a clear bias toward minimizing loss of hydropower. Also, the AMP evades recommendations that would create legal conflicts between the Organic Act, Endangered Species Act, NEPA and even GCPA. The workings, the make-up and the ineffectiveness of the AMP must be reevaluated in a SEIS process.

Evidence to support prejudice for one resource over another recently occurred when the trout population suppression flows were modified in a fast-track manner without proper consultation or due process within the AMP. Moreover, the current Sunday flow regime has proved to be inadequate for true trout suppression and demonstrates that concerns over hydropower prejudice for efforts to conserve endangered species. There has also been a recent suggestion for a flow regime of 5,000 to 25,000 cfs for year 2005. These proposed flows, the environmental impacts of which have never been addressed, are outside the range prescribed for the conservation of natural and cultural resources by the ROD and the Biological Opinion.

Flow experiments, especially those designed to benefit humpback chub recruitment have been of limited duration, and as such generated inconclusive results. Results of the LSSF were inconclusive because data was neither collected prior to initiating the flows nor afterwards. In this particular experiment the flow was neither timely, nor of sufficient duration for the food web to adjust and respond. The RPA recommended, "experimental flows will be conducted for a sufficient period of time to allow for experimental design, biological processes to function, and for variability inherent in riverine ecosystems to be expressed" (p. 36).

Overall, the AMP is failing to achieve GCPA goals because the ROD and subsequent program design do not allow for meaningful adjustments in key, aquatic ecosystem elements. The program continues to focus on treating the symptoms of ecosystem decline rather than what is actually causing the decline. In other words, the habitat is in dramatic decline and the AMP is doing nothing meaningful–is failing to make any hard

choices–to bring the habitat closer to pre-dam conditions. These critical ecosystem elements are well documented and include:

A. Natural hydrograph that would redistribute sediment during the spring run-off and stimulate native fish spawning.

B. Natural thermograph with warmer summer water temperatures and colder winter temperatures.

C. Annual inputs of sediment, nutrients and woody debris to create generally turbid water conditions.

Again, these failures underscore the need to take a renewed look at a the whole process, not just the TCD proposal, as this process has not served the Colorado's native fish and has not followed the guidelines, recommendations and requirements set forth to achieve recovery of these species.

7. Our concerns for the First Nations

The AMP has not fully engaged the process that threatens the cultural and natural heritage of the First Nations in Grand Canyon. They have also been given a minimal amount of resources to monitor their cultural properties in Grand Canyon. This is a violation of the trust that was developed with the tribes during Glen Canyon Environmental Studies and is allowing the government to continue to minimize the value of these tribal resources.

8. Recommendations

Based on the above, the following steps are legally required as part of the effort to protect and restore native fish and their critical habitat to the Colorado River below Glen Canyon Dam.

A. The BOR must undertake an EIS for the proposed TCD. This EIS, or a supplemental EIS, must address all new information unknown or unforeseen when the original EIS was prepared.

B. As an EIS or SEIS could take several years and there are a number of interim actions the BOR and the AMP must take, both in terms of science and in the operations, to help impede the further decline of natural and cultural resources in the Grand Canyon while we await a new ROD.

C. Because an EIS or SEIS could take several years, the AMP must undertake interim actions within six months to help forestall the further decline of natural and cultural resources in the Grand Canyon until a new ROD is issued.

1. Reorganize the AMP to be proactive so that it is comprised of only the responsible agencies and sovereigns: BOR, NPS, USFWS, and the Tribes. (Participation by other stakeholders would be available through public process as explained below in #2.)

2. Require the AMP meet twice a year with a 30-day comment period prior to each meeting. This program would use interactive communication and video technology that was not available during the 1996 EIS process and would provide for more stakeholders to be heard.

3. Reorganize GCMRC to be an administrative organization outside of the DOI. This would remove or militate against agency bias and shortcomings, and be a positive step toward a truly independent science organization. Competition and protocol development should follow NPS guidelines for science activities within national parks.

D. Humpback Chub population and habitat monitoring

All reports and analyses by the AMP have focused on humpback chub numbers, and not the relative condition of the fish or health of the critical habitat. This must change. While some of this data has been collected, there has not yet been any ongoing analysis on the condition factors of the humpback as recommended by the USFWS. Additionally, factors relevant to habitat such as feeding habits, water quality, age class, genetics, and recruitment and migration patterns for all periods of the humpback chub's life span need to be documented. The new AMP must also determine the population level and changes in biological parameters that would trigger a cessation of handling humpback chub so as to avoid incidental take on the remaining population.

E. Follow the Biological Opinion for the Humpback Chub and the natural river hydrograph

As a baseline, all flow decisions should be evaluated by how well they mimic the natural hydrograph. So far, the AMP has ignored this fundamental principle of river ecology. Without it there will likely be no hope of establishing a second population for the humpback chub, or of restoring its critical habitat as called for in the RPA and required by law. AMP should continue intensive alien fish suppression at the Little Colorado River reach.

F. Expand the critical habitat throughout the Grand Canyon, including the tributary streams and the Glen Canyon reach.

G. Develop a scientifically sound monitoring program that extends current non-GCMRC programs through a SEIS process so continuity of ecosystem data sets is achieved. These data sets should be linked with water quality, lower and higher trophic levels, riparian vegetation and beach sand monitoring. GCMRC monitoring programs should be delegated to past or present contractors for one year and then all contracts should be opened for competitive bidding under the new AMP and a SEIS. If these contractors do not want the work then the Grand Canyon Science Center will conduct the monitoring as protocols dictate.

H. Initiate a comprehensive cultural site degradation abatement program throughout the entire river corridor in accordance with NPS standards.

I. Initiate development of a River Management Plan for the Little Colorado River as called for in the RPA.

In conclusion, the Grand Canyon is treasured by the citizens of the world and the natural values that make up this spectacular place must not be further compromised. We urgently request serious and immediate action to address these matters, beginning with a new EIS process.

Sincerely,

John Weisheit
Colorado Riverkeeper

On behalf of the following 159 groups

LR Press Release 04/02/04
159 groups demand new EIS to save Grand Canyon from Glen Canyon Dam

Can Grand Canyon Survive Glen Canyon Dam?
National Coalition Demands New Federal Study!

Contact:
John Weisheit
(435) 259-1063 (435) 260-2590

From Alaska to Florida, more than 150 environmental, social justice and recreation groups today are calling for a new federal study of if, and how, the nation's fourth tallest dam should continue to be operated. Charging that eight years of tinkering with flows from Glen Canyon Dam on the Colorado River have failed to reverse the dam's impacts on endangered fish in Grand Canyon National Park, as required by law, the groups insist that the government is legally compelled to prepare a new Environmental Impact Statement (EIS) on dam operations.

In an eleven-page letter being submitted today to the U.S. Bureau of Reclamation, which built and operates the dam, groups reveal how despite more than $80 million dollars invested in fish recovery efforts, one more of Grand Canyon's endangered fish species, the razorback sucker, has joined the growing list to become extinct in the Grand Canyon. Another endangered fish species, the humpback chub, has declined to only 1,100 fish from 8,000 in 1993.

In response to the decline, the Bureau of Reclamation's Glen Canyon Dam Adaptive Management Program is accepting public comments on a fast-tracked proposal to install a temperature control device on the dam to warm the water flowing into Grand Canyon.

"This represents the continuation of the same flawed, piecemeal approach that has got us where we are," says John Weisheit, director of Living Rivers' Colorado Riverkeeper Program, which is leading the coalition calling for the new EIS. "Glen Canyon Dam has robbed Grand Canyon of the natural flows, sediment and nutrients, and warm water necessary to sustain the unique ecosystem of this World Heritage Site. The public has

had enough, and wants all of these issues addressed in comprehensive manner before we lose what little we have left."

Following completion of an EIS on Glen Canyon Dam in 1995, the Glen Canyon Dam Adaptive Management Program was established to mitigate the tremendous impacts of the dam's operations on the river ecosystem in Grand Canyon National Park. The coalition's letter demonstrates how these recommendations are being ignored, and even when adhered to, are not achieving the intended results, thus warrant a new EIS as prescribed for by the National Environmental Policy Act.

* The program has spent much of its resources attempting to conserve Grand Canyon's remaining sediment, as 95 percent of the Canyon's sediment and nutrients have been trapped behind the dam. These efforts have all failed to bring any lasting benefit to fish habitat or stabilization of cultural sites as called for by the EIS.

* Recent attempts to use dam operations to control alien fish predation on endangered native fish have been haphazard and have yet to demonstrate any meaningful results.

* In the event that endangered fish populations did not increase by 1998, water released from Glen Canyon Dam was supposed to shift toward a regime of at least partially mimicking the river's natural flow. This has not occurred.

* A special set of flow recommendations for low water years was prescribed, but despite five years of drought, these recommendations have been ignored.

"Bottom line, It's numbers, and we have far fewer fish now than when they started; that's way it's critical that a new EIS be completed before installing a temperature control device on Glen Canyon Dam," says Michelle Harrington with the Tucson-based Center for Biological Diversity. "It was once thought that attempts to bring the Colorado River's water temperature to a level more consistent with native conditions would be a simple proposition. The drought has taught us that absent natural flows and new sediment inputs, that disruptions in temperature changes could affect the food supply for the remaining endangered fish, and we could also see an increase in alien fish which prey on the natives."

"As originally designed, the Adaptive Management Program was an excellent approach to addressing the serious impacts on Grand Canyon from this dam," adds David Haskell, retired Science Center Director for Grand Canyon National Park, who participated in the AMP program since its inception in 1995 and has monitored its progress since his retirement. "However, the 2002 AMP Report to Congress clearly indicated that six years of effort had not produced any beneficial results. Since then, the failure of the AMP to seek more effective methods to meet the goals of the Grand Canyon Protection Act has turned this once successful program into a dismal failure."

To date, the Glen Canyon Dam Adaptive Management program has resisted efforts to undertake a new EIS, in part because Glen Canyon Dam proponents understand that such an EIS will have to explore the possibility of decommissioning Glen Canyon Dam

as the best way to comply with the laws protecting the ecosystem in Grand Canyon's river corridor.

"Interior's actions paint a clear picture of disregard for the Grand Canyon Protection Act, Endangered Species Act, and National Park Service Organic Act," adds Steve Fleischli, Executive Director of the New York-based Waterkeeper Alliance. "Why must the public always be forced into the courtroom in order to protect a piece of our famed natural heritage from government malfeasance? That needs to change."

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Additional Information

April, 2, 2004 Letter to the Bureau of Reclamation

List of the 159 groups endorsing the letter

Proposed temperature control device

River News 04/04/04
Water ebbs, worry flows

Through several years of drought, Colorado and neighboring states have relied on Lake Powell to deliver water downstream. But as the reservoir's water levels drop, fears of a water war, or of severe shortages, rise.
By Theo Stein Denver Post Environment Writer Sunday, April 04, 2004 -

Lake Powell, the desert oasis that has served Colorado as a crucial fail-safe for water deliveries throughout the Southwest during five years of hard drought, is now more than half empty.

If the drought persists a year or two more, the 186-mile-long reservoir in Utah and Arizona could be drained dry as early as 2007, federal officials say.

That would propel Colorado - and 30 million other Westerners who depend on the Colorado River for their drinking water - into an uncertain future punctuated by recurring water shortages and decades of litigation, experts warn.

On Friday, the Bureau of Reclamation said it expects only 55 percent of the normal runoff to flow into Lake Powell between April and July. That guarantees the big reservoir, already down to 42 percent of capacity, will recede even further by 2005.

"Time is running out," said Pat Mulroy, director of the Southern Nevada Water Authority. "The drought no one thought would even happen is here."

Under the Colorado River Compact of 1922, the states of Colorado, Wyoming and Utah are required to allow an average of 7.5 million acre-feet per year to flow past a river gauge below Lake Powell for use by California, Arizona and Nevada.

The four upper-basin states have met their compact obligations during the five-year drought by releasing water from Lake Powell. But if Powell dries up - and hydrologists caution that is still a big if - the state could eventually be required to turn off the massive transmountain tunnels that have supplied Colorado River water to Front Range residents and Eastern Plains farmers for more than 50 years.

Federal and state officials have not thought through how they would react to the nightmare scenario of a severe extended drought. But Lake Powell's steadily declining levels have convinced many that the time to evaluate the vulnerability of the West is now.

"That's something we in Colorado need to address," said Scott Balcom, a Glenwood Springs water lawyer who represents the state on Colorado River issues. "These issues haven't been explored as deeply as we need to this year."

State Engineer Hal Simpson said that if the next year is dry, he will begin a formal process of developing a plan for shutting off state water users in the event that Powell drains.

Simpson, who spent most of the 1990s involved in fights with Kansas and Nebraska over Colorado's overuse of the Arkansas and Republican rivers, said developing a curtailment plan would be difficult.

"But if this year's predictions hold true and we drop Lake Powell an additional increment, we have to make sure we're in a position to administer the state's water," he said.

The forecast released Friday follows four years in which mountain runoff was 62, 59, 25 and 53 percent of average, and establishes the period as the driest five consecutive years in a century of record-keeping, Bureau of Reclamation hydrologist Tom Ryan said.

"We can handle another two or three more years like this," Ryan added. "Then it's too late to plan."

Lake Powell was created to be a 24.3 million-acre-foot water bank, storing snowmelt in wet years and releasing it in dry years. (An acre-foot is 325,851 gallons, or enough to supply two families for a year.)

As recently as 1999, the lake brimmed full, forcing engineers to spill excess water through the dam - water that was quickly slurped up by California.

But the lake's volume dipped to 10.2 million acre-feet this month, a level not seen since 1971 - when the impoundment was first filling.

Now the receding shoreline has stranded the once-bustling marina in Hite, Utah, and forced National Park Service officials to stop laying new concrete boat ramps to chase the falling waters for boaters at Wahweap, on the Utah-Arizona border.

Drought is also draining Lake Mead, Powell's slightly larger downstream sibling reservoir, which sits at 59 percent of capacity. During the past five years, the two vast impoundments have lost a volume equivalent to a full Lake Mead, officials say.

Several water experts point out that the lakes are functioning exactly as intended, and that the seven states that depend on the river still have time to prepare for a worst-case scenario - and settle contentious and unresolved issues outside of the courtroom.

"It makes you thankful for the people who had the wisdom to build Powell as big as it did," said Department of Natural Resources Director Russell George, Colorado's top water official.

Several former state and federal officials added that, at minimum, the threat of continued drought should force water managers to seriously consider questions that were once unthinkable.

For example, what would happen if Simpson had to start shutting down existing Western Slope water users to allow the legally required amount of water to flow to California, Arizona and Nevada?

Or should the administration of Colorado Gov. Bill Owens continue with plans to encourage diversions of more Western Slope water to the Front Range to provide for the estimated 2.8 million new residents the U.S. Census Bureau estimates will flood into Colorado by 2030?

"The moral is that if we think we have more Colorado River water that's developable, we'd better think again," said David Getches, dean of the University of Colorado Law School. "We may already be beyond the point of safe development of Colorado."

It's unclear whether, under a continuing severely dry scenario, there is additional water to be developed, agreed Denver Water Manager Chips Barry, whose agency is evaluating a project that will bring more water from the Western Slope.

Getches, the state's natural resources director under Gov. Dick Lamm, knows he is delivering an uncomfortable message.

"If there is a compact call, we hit the wall," he said. "We wouldn't be able to use water called by the lower basin. We have to think about that."

If Powell were to dry up, the upper basin might still have two or three years of grace before the Interior Department, which is the lower-basin river master, declares a "deficit" and orders Colorado, Wyoming and Utah to curtail their use.

The compact requires an average of 7.5 million acre-feet a year for 10 years, but the Bureau of Reclamation has been releasing 8.23 million acre-feet a year from Powell. State officials say Colorado would argue that it owed the lower basin no water until the 10-year average fell to the minimum of 7.5 million acre-feet a year.

In addition, Bureau of Reclamation officials would first drain Blue Mesa and other federally operated reservoirs in the upper basin before demanding more from the states. That might buy Colorado one more year of grace.

But after that, ranchers, ski resorts and cities whose water rights postdate 1922, the year of the compact, could be required to stop using the water they have come to depend on.

"One scenario is, we start with most junior rights and start regulating those until we get the desired amount of flow at the state line," Simpson said.

But very little of the state's western waters were developed prior to the compact, so experts warn that a call on the Colorado River has the potential to affect nearly everyone.

If the shutoffs proceeded in a strictly chronological order, the losers could potentially include:

The Colorado-Big Thompson project, which takes about 250,000 acre-feet of Colorado River water to Fort Collins, Loveland, Greeley and the farms of the Eastern Plains.

Denver Water's transmountain diversions, including water from Lake Dillon and the Fraser River Valley, which average 120,000 acre-feet a year.

Colorado Springs' supplies, including the Homestake Tunnel and the Frying Pan-Arkansas Project.

A large majority of the water users in the Gunnison Valley who draw water from Blue Mesa Reservoir - which would be one of the first to be drawn down by federal officials.

Summer mountain recreation, particularly golfing and rafting.

But Simpson said there might be an argument for spreading the shutoffs around the state's western basins based on criteria other than strict adherence to the prior appropriation doctrine.

"It gets quite complicated," he said. "And at the same time there would be some really big legal issues with other states that would have to be dealt with."

One of those issues involves whether the upper basin is required to contribute half of the 1.5 million acre-feet the United States owes Mexico every year. Colorado, Wyoming and Utah might demand credit for their contribution, several water lawyers said.

Other fights would likely erupt in the lower basin, where Arizona could get shut off completely.

"That would be the single most counterproductive thing they could do," argued Mulroy of the Southern Nevada Water Authority, whose agency is spending $32 million this year alone to rip out turf across Las Vegas to free up more water.

Mulroy said a megadrought like those recorded in tree rings and other paleontologic records would require Westerners to suspend fiercely guarded traditions regarding water use. That could mean some residents of one state would temporarily give up the use of their water to prevent a crisis in another state, she said.

It could also mean suspending the "doctrine of prior appropriation," which has assumed an almost sacred position in Western water law, Mulroy said.

"We will have to shift from what's on paper to what's needed for homes and communities," she said. "It doesn't have to be perpetual, but in order to get through an emergency, it's going to have to happen."

Many water scholars point out that the laws governing the Colorado River, of which the 1922 compact is but one part, have never really been tested. Rather than a coherent whole, the "law of the river" - a mix of compacts, congressional acts and legal decisions - is "really a bunch of moving parts," said John Leshy, a Hastings College law professor who served as a lawyer with the Clinton administration.

"If there is a compact call, we really are in no man's land," he said. "If there can't be some sort of settlement patched together, we're looking at horrendous litigation."

Leshy said the legal fights could drag out for decades against a backdrop of severe water shortages.

"It would stack up as the biggest water war in the West."

Even if Powell doesn't bottom out, Bureau of Reclamation officials say it will take a minimum of 13 years to refill with average precipitation. With current demand in the upper and lower basins, an average inflow year will increase system storage only by about 3 percent, they said.

As long as Powell remains less than half full, Colorado could remain vulnerable to an extremely dry year.

"If Lake Powell is sitting there with 10 million acre-feet or less, we will always be at risk of the next 2002 or 2004," said Eric Kuhn, manager of the Colorado River Water Conservation District.

Others wonder whether the potential crisis may be a trial run for a rancorous new future that may be closer than anyone imagined.

"If this is the beginning of global warming," said Mulroy, "then we've got issues."

A top federal water official had a grimmer message: The massive plumbing network built to serve the exploding Western states has removed much of the cushion that was available in earlier decades.

"We're no longer fighting about the water we will need decades in the future," said Assistant Interior Secretary Bennett Raley, a former Colorado water lawyer.

"The crises we will face will be in normal years, and they'll be about meeting existing demands.

"There's just not enough water."

Letters to the editor

April 11, 2004

More serious problems

Your article on the natural draining of the Lake Powell reservoir served the public well in preparing those who rely on the Colorado River for sustenance. But the problem is actually more serious, considering other factors related to the lowering of reservoirs held back by high dams in desert regions such as the Colorado River basin.

For example, in the upper reaches of Lake Powell, the Colorado and San Juan rivers combined are currently flowing over 60 miles of exposed sediment fill. It is this sediment fill that closed the boat access at Hite Marina. Through natural erosion, these two rivers are re-mobilizing sediment and organic materials into Lake Powell. The re-mobilized sediment is advancing closer to Glen Canyon Dam and diminishing its lifespan, and the decomposition of the organic material is consuming the oxygen in the reservoir and lowering the water quality.

Another water-quality problem is that there is not enough input of fresh water, and the saline content of the reservoir is consequently much higher. Saline water is detrimental for agriculture and corrodes the plumbing systems in our homes and businesses.

Power production is also in jeopardy. When Lake Powell reaches a capacity of 6 million acre-feet, the turbines cannot be safely operated any longer. With only 10 million acre-feet in the reservoir at present, we are closer than we realize to occasional shutdowns of turbines at Glen Canyon Dam.

When a turbine shutdown occurs, the emergency river outlets must be opened to keep the river ecosystem in Grand Canyon National Park alive. This water comes from the very bottom of the dam where the water is not only very saline, but is also high in hydrogen sulfide, which is corrosive to the metal working parts of Glen Canyon Dam. It is obviously not ideal water for an ecosystem that has already lost four species of native fish.

More importantly, we are not fully aware of the amount of waste that occurs from evaporation and seepage from our reservoirs and canals. Basinwide, the total loss from such unconsumed water amounts to 3 million acre-feet per year.

Keeping Lake Powell drained and then decommissioning Glen Canyon Dam makes more and more sense. It is obvious that we have too much storage in the system and that we have planned our communities to be water-intensive, as opposed to water-conservative. If we want a healthy Colorado River ecosystem and healthy communities,

we must re-evaluate the way we manage the Colorado River system as soon as possible.

JOHN WEISHEIT

Moab, Utah The writer is conservation director of Living Rivers, a national organization that promotes large-scale river restoration, habitat preservation and water user responsibility.

Regional News 04/08/04

Shorter winters, drier summers hint at climate change

By LORNA THACKERAY Of The Gazette Staff

Early snowmelt has become a hallmark of Montana's prolonged drought. Some scientists are beginning to think that it may be much more than that.

Full-fledged climate change, which could mean shorter winters and drier summers, is already under way across the Western United States, said Steve Running at the University of Montana.

"We have every reason to believe that it will continue or even accelerate," he said.

"Absolutely, we are in a multi-decadinal change in climate."

Running is director of UM's Numerical Terradynamic Simulation Group, which makes software for NASA's environmental satellites. The group operates the Montana Climate Center, which opened last fall in Missoula.

Evidence collected over the last 50 years suggests that rising temperatures have fostered a decline in springtime snowpack of 15 to 30 percent in Montana and that springtime peak river flows now come an average of two weeks earlier, he said.

The snowpack, which holds about 75 percent of the West's water supply, acts as a reservoir that keeps streams flowing in the summer months. If the melt continues to recede earlier into spring, resulting summer water shortages could affect everything from agriculture and hydropower to fish habitat, the professor said.

It's a fear that he shares with Belgrade native Kelly Redmond, Western regional climatologist for the National Oceanic and Atmospheric Administration Climate Center in Reno, Nev.

The degree of change in spring melt varies, Redmond said, but the trend toward earlier melt is widespread across the West. Yellowstone Basin snow begins to melt five to 15 days earlier than it did 56 years ago.

The trend becomes more pronounced as waters flow west. West of the Divide in Montana and into Idaho, Washington and Oregon, spring melt comes 15 to 25 days earlier, Redmond said.

"It's kind of taken us all aback," he said in a telephone interview. "It's kind of hard to see this happening right under our nose without us noticing."

Only in the last few years has early snowmelt drawn much interest, he said, but he expects to see research and public information on the trend accelerate.

Evidence for earlier melts is strong on a lot of fronts, Redmond said.

At the top of the list are temperature statistics. Records indicate that America is warming, especially in the West, and especially in February, March and April. For most of the West, Montana included, temperatures during that critical period have increased a half-degree to a full degree every decade for the last 30 to 40 years.

March 2004 stands out as a prime example, Redmond said. It was an "exceptional" month, the climatologist said.

All across the West, it was warm and dry. For south-central Montana, 2004 produced the fourth-warmest March since 1895. It was also among the driest.

"Normally, March is a snow production month," he said. "But this year it was a deficit month." Montana wasn't alone in its lack of snowpack. Utah started the month expecting near average spring runoff for a change, Redmond said. By the end of the month, the state was bracing for one of the lowest runoffs ever.

Statistics from Natural Resources and Conservation Service snow surveys show that snowpack declined 16 percent in Montana between March 1 and April 1. The losses were more severe elsewhere in the West, including Nevada, 54 percent; Arizona, 51 percent; New Mexico, 43 percent; Utah, 39 percent; and Wyoming, 19 percent.

A warm March and a warm winter worked together. In Montana, the average temperature from October through March was 3 degrees above normal - the 11th-warmest winter on record. Even winter-ravaged northeastern Montana surpassed its winter average by 1 degree.

Running said that studies of the Missoula area showed the number of frost-free days has increased 15 days there in the last 50 years and that annual snowfall has fallen from an average of 55 inches to 40 inches.

Related, but separate evidence of earlier snowmelt comes from studying peak spring flows for more than 1,000 streams in the Western states, Western Canada and Alaska over the last 50 years, Redmond said. Those studies show snowpack disappearing from one to three weeks earlier in the spring. What researchers measured was the "spring pulse" of all those streams.

Snowmelt begins after the pack has ripened, Redmond said. It accumulates enough heat that the entire pack reaches 32 degrees, before it starts to melt.

"When the snow begins to melt, it does it in a fairly abrupt fashion," Redmond said. Scientists can go back through streamflow records and mark the date when the water starts to come down - that's its spring pulse. Records show that the pulse happens almost simultaneously throughout the region. The pulses kick in usually within two or three days of each other, he said. Research shows that, from New Mexico to Alaska, the pulse is getting earlier, Redmond said. This spring a river gauge in California's Yosemite National Park recorded the spring pulse on March 6, the earliest ever in 87 years of monitoring.

A third body of evidence originated more than 40 years ago when then-Montana Climatologist Joe Caprio began collecting data on the life cycles of lilacs and honeysuckle, Redmond said. Caprio recruited 500 observers in 11 states to record when the plants first showed signs of life in the spring and when they blossomed.

Analysis of the information indicated that the plants are blooming seven to 10 days earlier now than they did 40 years ago, Redmond said. "They all kind of give a consistent pattern," he said of the temperatures, spring pulses and blooming dates.

Warmer springs and earlier melts mean a longer growing season and that plants will be using more water, Redmond said. It may also mean that more moisture will go directly into the atmosphere, he said.

"The major thing to sort out here has been whether this is a natural variation in climate or if it is something else," he said. "There is strong evidence that a good part of it is natural."

For Running, the debate has already been resolved. He said human activity is clearly playing a significant role in climate change.

"We'd better start getting serious about energy that's not based on petroleum," he said. If the world community doesn't find some solutions, consequences will be dire, Running said.

"People are going to have to face up to it head on or get used to less and less snowpack and more and more drought," he said.

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LR in the News 04/13/04

Colorado tops list of rivers in danger

Radioactive tailings near Moab blamed
By Lee Davidson
Deseret Morning News

WASHINGTON — National environmental groups are declaring the Colorado "America's Most Endangered River," mostly because they say 110,000 gallons of

contaminated water seep into it daily through radioactive uranium tailings near Moab.

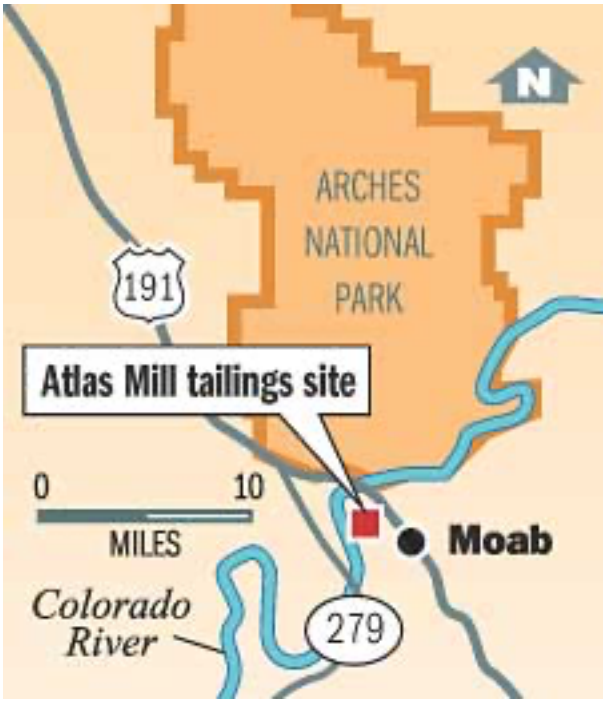

Photo caption: A pond is on top of uranium tailings at the old Atlas Minerals site near Moab in 1998. In the background is the Colorado. Environmentalists are worried that the tailings may be capped in place instead of being removed.

"The Colorado River is not yet the most polluted river in the country, but it could become so if the current problems are allowed to fester," said Rebecca R. Wodder, president of the environmental group American Rivers.

It and partner groups — ranging from the Sierra Club to the Grand Canyon Trust and Friends of the Earth — each year release a list of America's most endangered rivers. They plan to formally release it this morning at the National Press Club.

The groups explained in advance that they put the Colorado atop this year's list largely out of worry that the Energy Department may not remove tailings from the old Atlas uranium mill site adjacent to the river and instead cap them in place.

"Someday a big flood like those that raged through these canyons in the 19th century is going to lift that pile into the river and irradiate Canyonlands National Park. It is pure folly not to move this pile away from the flood plain of the Colorado River," said John Weisheit with the environmental group Colorado Riverkeeper.

Bill Hedden, with the Grand Canyon Trust, added, "As long as this material remains on the riverbank, it poisons the river every day and threatens water supplies with catastrophic failure."

The Energy Department is scheduled to release next month a draft environmental impact statement that will identify a preferred option for handling the tailings. Utah politicians have vociferously opposed capping it on site — the cheapest alternative — as have California politicians worried about radiation in their downstream drinking water.

About 13,000 tons of uranium tailings are on 130 acres at the Atlas site. Interim remediation by the Energy Department now includes dewatering the tailings and pumping contaminated groundwater to an evaporation pond on top of the pile.

However, environmental groups say an estimated 110,000 gallons of contaminated water still seep into the river from the unlined pond every day — with contaminants

including uranium, radium, ammonia, cadmium, arsenic, selenium and other heavy metals.

"Because this pile is so large and because we are so few in this remote region, they may be thinking they can save millions of dollars and justify their actions to stabilize this pile in place next to the river," Weisheit said. "Well, they would be wrong to think this way. Losing this pile to a big flood or the river's migration could affect Los Angeles as much as it would affect us here in rural Utah."

Sarah Fields, coordinator of the Nuclear Waste Committee of the Sierra Club Glen Canyon Group, said, "For thousands of years this tailings pile will remain toxic and radioactive to humans and animal life. In the scale of hundreds of years, it is inevitable that a catastrophic flood will consume this pile and devastate the down-river environment."

The environmental groups say the Colorado is also threatened — but not so dramatically — from human waste reaching it from boom towns in California and Arizona.

They say fast-growing areas there have the largest concentration of people in America that use septic tanks. They say overloaded systems are allowing high levels of nitrates to seep into the river and efforts to upgrade wastewater systems there are hampered by lack of federal support.

Also, the groups say that toxic ammonium perchlorate is trickling into the river from a former military facility near Henderson, Nev.

"Our tests last year found that perchlorate levels in winter lettuce irrigated by the Colorado were four times higher than the EPA's recommended safe dose for a glass of drinking water," said Bill Walker, vice president of the Environmental Working Group.

"The cropland irrigated by the river produces most of the lettuce and other produce sold nationwide during the winter months," he said, "which means that perchlorate is not just a local or regional problem but a concern for every American."

Wodder with American Rivers said, "The problems identified here all require immediate action, but those should be just the first steps towards a comprehensive restoration effort." She added, "We call on the nation's leaders to take the next step and develop a binding cleanup plan to ensure that the Colorado River can meet the many demands placed on it for generations to come."

LR Press Release 04/13/04
Colorado River: most endangered river for 2004

April 14, 2004
For immediate release

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Uranium Waste Pile at Moab, Utah Threatens Public Health

(Moab, UT.) - American Rivers, a national river protection and advocacy organization, today announced it has designated the Colorado River as America's Most Endangered River for 2004. Their annual report's focus is on rivers facing the most uncertain futures, not on those with the worst chronic problems.

On the Colorado River the most dangerous and volatile situation is the Moab Uranium Mill site (former Atlas Mill) near Moab, Utah. There is an estimated 110,000 gallons of radioactive groundwater seeping into the River each day from a crude, unlined riverbank impoundment where almost 12 million tons of radioactive waste is stored. The National Academy of Sciences has warned that it is "nearly certain that the River's course will run across the Moab site sometime in the future." The Department of Energy (DOE) will soon release the Draft Environmental Impact Statement the site. The DEIS will not identify a preferred remediation alternative. Donald Metzler, DOE's Program Manager for the Moab Mill Project, has stated that the DOE has not yet made a decision regarding whether the impoundment will be capped in place or moved to an off-site location. The DEIS will announce the preferred alternative for groundwater remediation so that the U.S. Fish and Wildlife Service will be able to complete its Biological Opinion.

One of the partners for the Most Endangered River Initiative is the Colorado Riverkeeper, John Weisheit, who works daily from an office that is located within a mile of the Atlas Mill site, the second largest uranium waste pile in the United States. "Visitors come from all over the world to enjoy the Colorado River through Canyonlands National Park downstream. They enjoy the scenery, the rapids and all the good things one expects to find from such a treasured landscape. Someday a big flood like those that raged through these canyons in the 19th Century is going to lift that pile into the River and irradiate Canyonlands National Park. It is pure folly not to move this pile away from the floodplain of the Colorado River."

Many other grassroots activists from rural Utah are also working with the Colorado Riverkeeper, a project sponsored by Living Rivers, a river advocacy group from Moab that promotes large-scale restoration for the Colorado River. Among them is Sarah Fields, who too resides within a mile of the pile and has engaged herself in efforts to remove the pile for over ten years. Fields is also the coordinator of the Nuclear Waste Committee of the Sierra Club Glen Canyon Group. "It is a fact that for thousands of years this tailings pile will remain toxic and radioactive to humans and animal life. In the scale of hundreds of years, it is inevitable that a catastrophic flood will consume this pile and devastate the down river environment. As irresponsible as it was to put this pile by the River, it is equally as irresponsible to let it remain by the River."

As the Colorado Riverkeeper, Weisheit has an intimate background with the river as a professional river guide, who has led more than 250 expeditions through the famous rapids of Cataract Canyon in Canyonlands National Park. "Uranium waste piles have

been mitigated before through removal by the Department of Energy, including many others sites on the Colorado River and its tributaries upstream of Moab. But, because this pile is so large and because we are so few of us in this remote region, they may be thinking they can save millions of dollars and justify their actions to stabilize this pile in place next to the River. Well, they would be wrong to think this way. Losing this pile to a big flood or the River's migration could affect Los Angeles, as much as it would affect us here in rural Utah."

Through grassroots advocacy, Living Rivers and the Colorado Riverkeeper are currently building a national and international coalition for Colorado River protection and restoration and is now supported by over 170 groups.

For more information:

American Rivers Press Release (pasted below)

1. Fact Sheet on DOE Moab Mill Site

2. Remedial Action at the Moab Site -- Now and for the Long Term: Letter Report Committee on Long-Term Institutional Management of DOE Legacy Waste Sites: Phase 2, The National Academies, National Research Council, Board on Radioactive Waste Management, report to the Secretary of Energy on a plan for remediation for the Moab Mill, June 11, 2002.

3. "Investigation of the Hydrogeologic Connection between the Moab Mill Tailings and the Matheson Wetland Preserve," Philip Gardner and D. Kip Solomon, Department of Geology and Geophysics, University of Utah, December 11, 2003 (with Addendum) [PFD 8.3m]

5. Department of Energy Moab Mill Project

5. Utah Division of Radiation Control, Moab Mill Stakeholder Group

6. Nuclear Regulatory Commission

For web-based access to the Nuclear Regulatory Commission's (NRC's) Public Electronic Reading Room for relevant correspondence between the Nuclear Regulatory Commission and the Department of Energy regarding the reclamation of the Moab Uranium Mill Tailings Site:

1. Go to http://www.nrc.gov/reading-rm/adams.html

2. Click on "Web-Based Access".

3. Click on "Advanced Search".

4. In "Docket Number" box, enter: WM-00110 Click on "Search" button.

5. For Atlas records related to the Moab Mill, in the "Docket Number" box, enter: 04003453

6. Click on document icon or document description to view document.

Citrix access to NRC records is also available.

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American Rivers
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Colorado River Regional Sewer Coalition
Environmental Working Group
Friends of the Earth
Grand Canyon Trust
Lake Havasu City, Ariz.
Sierra Club

Wednesday, April 14

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Colorado River "Most Endangered" Colorado #1 on annual list released today - www.americanrivers.org

(Washington, DC) American Rivers and its partners today designated the Colorado River the nation's Most Endangered River for 2004, citing mounting problems with radioactive, human, and toxic waste in the river that have been largely overlooked during interstate conflict over water allocations. The annual America's Most Endangered Rivers report highlights rivers facing the most uncertain futures rather than those with the worst chronic problems. American Rivers and its partners warned that without a coordinated national effort to clean up the sources of contamination, pollution levels in the river will take a sharp turn for the worse in coming years.

"The Colorado River is not yet the most polluted river in the country, but it could become so if the current problems are allowed to fester," said Rebecca R. Wodder, president of American Rivers. "A concerted national solution is necessary to roblems that reach far beyond the banks of the river." The most dangerous and volatile situation is the Atlas Mill site near Moab, Utah. There, an estimated 110,000 gallons of radioactive groundwater seep into the river each day from a crude, unlined riverbank impoundment

where almost 12 million gallons of radioactive waste are stored. The National Academy of Sciences has warned that it is "nearly certain that the river's course will run across the Moab site sometime in the future." The Department of Energy will soon announce its plans for the site, but has signaled its intention not to relocate the material to a safer location.

"As long as this material remains on the riverbank, it poisons the river every day and threatens water supplies with a catastrophic failure. New evidence suggests that disposing of it in an underground salt formation might be an affordable alternative," said Bill Hedden with the Grand Canyon Trust. "The Energy Department must now expedite studies of this alternative to confirm if it is truly the ideal solution." --More-- Colorado River "Most Endangered"

Of equal concern are the rising predictions for human waste reaching the river from riverfront boomtowns in California and Arizona. This area has the largest concentration of people in the United States using septic tanks. These overloaded systems allow increasing quantities of nitrates to seep into groundwater and the Colorado River. High nitrate levels in drinking water can deplete oxygen in infants' blood ("blue baby" syndrome) and are suspected to cause certain types of cancer. Local communities' efforts to upgrade their wastewater infrastructure have been hampered by lack of federal support.

"For too long we've ignored the connections between ground and surface water," stated Robert Glennon, professor of law at the University of Arizona and author of a recent book, Water Follies: Groundwater Pumping and the Fate of America's Fresh Waters. "Each of these pollution problems facing the Colorado River involves contaminants migrating through groundwater and eventually emerging into the surface waters of the Colorado."

Finally, in Henderson, Nevada, the toxic chemical ammonium perchlorate is trickling into the river from a former military facility. Perchlorate has been measured in Lake Mead at concentrations as high as 24 parts per billion, interferes with proper thyroid function and disrupts the body_s normal hormonal balance. Produce grown with Colorado River water often contains trace amounts of the chemical and is sold at supermarkets nationwide. Even as scientists debate how much exposure to perchlorate is safe, Congress is considering relieving the Department of Defense of the responsibility to clean up after itself at Henderson and elsewhere.

"Our tests last year found that perchlorate levels in winter lettuce irrigated by the Colorado were four times higher the EPA's recommended safe dose for a glass of drinking water," said Bill Walker, Vice President/West Coast of the Environmental Working Group, which has studied perchlorate contamination since 1999. "The cropland irrigated by the river produces most of the lettuce and other produce sold nationwide during the winter months, which means that perchlorate is not just a local or regional problem, but a concern for every American."

"The ongoing drought situation for the Colorado River basin is exacerbating our water quality problems," says the Colorado Riverkeeper John Weisheit, who lives next to the river in Moab, Utah. "Lack of freshwater inputs and high evaporation from the reservoirs are increasing the rates of salt, phosphorous, nitrates, and heavy metals. Not only is this detrimental to our health and infrastructure, it is also detrimental to our national parks at Canyonlands and Grand Canyon. "

Groups call for action The groups called for action to ensure that the Colorado River can continue to be a liquid lifeline for the Southwestern United States. The groups called on the Department of Energy to commit to removing the uranium tailings to a more secure location out of the river floodplain. They called on Congress to reject proposed cuts in federal aid to communities seeking to construct or maintain wastewater treatment infrastructure. They called on Congress to deny requests from the Defense Department for relief from its obligation to clean up contamination at former military facilities. -- More-- Colorado River "Most Endangered"

"The problems identified here all require immediate action, but those should be just the first steps towards a comprehensive restoration effort," said Rebecca R. Wodder, president of American Rivers. "We call on the nation’s leaders to take the next step and develop a binding cleanup plan to ensure that the Colorado River can meet the many demands placed on it for generations to come."

Colorado River not unique While the situation along the Colorado River is particularly urgent, it is sadly far from unique. Scientific data reveals that America’s rivers, streams, and lakes have become progressively more polluted since 1998. Conservationists warned that the White House and Congress have made little effort reverse this trend -- and have in fact cut law enforcement and spending on clean water over the past three years.

About America's Most Endangered Rivers Each year, American Rivers solicits nominations from thousands of river groups, environmental organizations, outdoor clubs, local governments, and taxpayer watchdogs for the America's Most Endangered Rivers report. The report highlights the rivers facing the most uncertain futures rather than those suffering from the worst chronic problems. The report presents alternatives to proposal that would damage rivers, identifies those who will make the crucial decisions, and points out opportunities for the public to take action on behalf of each listed river.

River News 04/13/04

Colorado River is ranked most endangered by group

By Judy Fahys The Salt Lake Tribune

The Colorado, polluted by uranium milling, toxic chemicals and human waste, is the nation's most endangered river, the environmental group American Rivers planned to announce today.

After being on the group's top-10 list four times previously, the Colorado River was singled out this year not because there might be water shortages but because there is too much contamination. The "most-endangered" designation will encourage government and citizens to act swiftly to address the growing pollution threat to a resource used by 25 million people, said Eric Eckl, a spokesman for the Washington D.C.-based environmental group.

"We believe the people who hold the fate of the Colorado River in their hands are more likely to make the right decisions if they know the American people are paying attention," he said.

American Rivers identified three major threats to the Colorado:

* The 12-million-ton uranium waste pile from the river's banks outside of Moab. Because the tailings release uranium, ammonia and other pollutants into an area of the river prized for its endangered fish habitat and for recreation, many Utah leaders and environmentalists have pushed for the waste's removal, instead of the cheapest of the five solutions the Department of Energy is currently considering, capping the waste in place.

* The area below Hoover Dam has the nation's highest concentration of people using septic tanks, which, as they become overloaded, leach nitrates into the river that are blamed for depleting the oxygen in infants' blood and for certain types of cancer. Charlie Cassens, a spokesman for Lake Havasu City, Ariz., said contamination prompted the city's 50,000 residents to endorse phasing out the septic systems in favor of a sewer system.

* A Cold War missile-fuel plant site in Henderson, Nev., which releases 400 pounds of ammonia perchlorate daily. An ingredient of rocket fuel blamed for hormone disruption in humans, perchlorate has been found in high concentrations in Lake Mead and in trace amounts on leafy vegetables irrigated with Colorado River water. American Rivers said Congress should toughen clean water controls and clean up the site.

This year the Snake was the only other Western river on the group's top-10 list, which was developed in collaboration with environmental groups. The Colorado River made the list previously because of the Glen Canyon Dam's impacts and the endless fight over rights to its water. Bill Hedden of the Grand Canyon Trust applauded the shift in focus this year.

"Every time we dump junk into it, someone else has to deal with it downstream," he said.

"We haven't thought much about the quality of the water so many people are drinking and putting on crops," he said.

Sarah Fields, a Moab environmental activist, noted that the Energy Department is set to announce its decision on the Atlas tailings next month. Like American Rivers, she opposes capping the tailings in place instead of moving them.

"It's obvious the river will impact the [current] tailings impoundment through flooding or if the riverbed meanders," she said.

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Endangered rivers

The following is a list of the 10 most endangered U.S. rivers for 2004, according to the conservationist group American Rivers.

No. Name of River State(s)

1. Colorado Colo., Utah, Ariz., Nev., Calif.
2. Big Sunflower Miss.
3. Snake Wyo., Idaho, Ore., Wash.
4. Tennessee Tenn., Ala., Miss., Ky.
5. Allegheny, Monongahela W.Va., Pa., N.Y.
6. Spokane Idaho, Wyo.
7. Housatonic Mass., Conn.
8. Peace Fla.
9. Big Darby Creek Ohio
10. Mississippi 10 different states

Source: American Rivers.org

The Salt Lake Tribune

LR in the News 04/14/04
Colo. River named most endangered

Shaun McKinnon The Arizona Republic Apr. 14, 2004 12:00 AM
Special report

Radioactive runoff, toxic rocket-fuel chemicals and human waste threaten the health of the Colorado River as much as the growing number of people who use it, according to a conservation group that today puts the Colorado at the top of a list of rivers at risk. The 1,400-mile Colorado is the nation's most endangered river for 2004, a title bestowed each year by American Rivers to focus attention on waterways facing uncertain futures.

Although the Colorado has been caught for years in squabbles over how much water-thirsty Western states can take from it, American Rivers cites water quality rather than quantity.

"The Colorado River is not yet the most polluted river in the country, but it could become so if the current problems are allowed to fester," said Rebecca Wodder, the group's president. Cited are three pollution sources that spew millions of gallons of contaminated water into the river each year:

• An abandoned Atlas Corp. uranium-tailings site on the river's bank just outside Moab, Utah. An estimated 110,000 gallons of radioactive groundwater seeps into the Colorado daily.

• A defunct war-munitions complex near Las Vegas. Ammonium perchlorate, a rocket-fuel additive, continues to contaminate Lake Mead.

• Septic-tank systems in river communities. Seepage from the systems has increased nitrate levels in the river just miles from where water is diverted into the Central Arizona Project Canal and a canal to Southern California.

The new report is not meant to cast doubt on Arizona's drinking water, American Rivers spokesman Eric Eckl said. The river itself and the reservoirs along its length help dilute the contaminants, and municipal treatment plants remove most of what remains.

At stake now, he said, is the river's long-term health.

"We're not trying to tell anybody they should be afraid of what's coming out of their taps, but we're asking people to not take that for granted," Eckl said. "People have been so focused on the conflict over who gets how many drops that the question of how clean this water is has gone largely unasked. Now that people are starting to ask that question, the answer is not very reassuring."

Other river advocates applaud the focus on the Colorado's water quality.

"We've spent per gallon more money putting the Colorado River to use for people than any other sizable river on Earth," said Bill Hedden, executive director of the Flagstaff-based Grand Canyon Trust. He said the report highlights "problems that people have created; there are decisions on the table that could provide answers to these things." Among pending decisions:

• The Department of Energy is about to release its statement on cleanup at the Moab site. Environmental groups want the tailings moved, but a plan to leave it in place would cost millions of dollars less.

"It's true the cost of capping it in place would be less," said Sarah Fields, who works for the group Living Rivers. "But over the long term, it would probably cost a great deal more."

• Congress is considering requests from the Defense Department to exclude some current and former military sites from certain environmental rules. That could affect efforts to fully remove perchlorate-tainted soil from the Nevada munitions complex.

• The Bush administration has proposed cuts in a federal loan program that helps communities upgrade water and wastewater systems. Lake Havasu City voters approved a $500 million bond issue to help retire thousands of septic systems in that community, but the problem is larger.

"Our voters have stepped up to the plate to correct our local problem, but that doesn't have much of an impact on all the other areas that are developing up and down the river," said Charlie Cassens, a spokesman for Lake Havasu City. "We can't do it alone."

This isn't the first time American Rivers has focused on the Colorado. It put the river at the top of the endangered list in 1991, citing the environmental effect of Glen Canyon Dam and has included all or part of the river on the top 10 list three other times since then.

River News 04/27/04

U.S. may cut water to state / Southwest drought slashes Colorado River flows

By Stuart Leavenworth
Sacramento Bee Staff Writer
(Published April 27, 2004)

The Bush administration is threatening to impose unilateral water cutbacks on California, Arizona and Nevada if the three states can't come up with a plan to deal with a historic drought on the Colorado River.
Following five years of dry weather, the two largest reservoirs on the Colorado are roughly half-empty and dropping fast, and Interior Department officials are urging water agencies to work together on a contingency plan or have one imposed on them.

"We need the three basin states to get their act together and deal with shortages," said Assistant Interior Secretary Bennett Raley in a recent meeting with water officials from California, Arizona and Nevada. If the three states can't work out a plan, he said, the Interior secretary "will have to do it."

For years, Los Angeles, Las Vegas and other fast-growing cities in the region have depended on surplus water from the Colorado - supplies that exceed their entitlements. Now, the Southwest is shifting to a much drier period, and states are facing not only the loss of surplus but also cutbacks that could affect tens of millions of people.

In California, the water squeeze is already being felt statewide. With less water from the Colorado River, Southern California is pushing conservation, more use of groundwater banks and extra pumping from the Delta.

"We are entering some new territory," said Raley, who notes that the modern Southwest has never had to deal with an extended drought.

Since 1999, Lake Mead has dropped more than 80 feet and is at 58 percent of capacity. With less water pressure going through its turbines, Hoover Dam is losing some of its capacity to generate power, and Las Vegas is preparing to deepen its water intake in Lake Mead to keep up with a moving target.

Upstream, at Lake Powell, the water loss is even more dramatic. In four years, Powell has dropped nearly 120 feet, and now holds 42 percent of its maximum water capacity. Never before have both Lake Mead and Lake Powell been at such a low state at the same time, according to officials for the U.S. Bureau of Reclamation.

Water leaders in the Southwest are closely watching these lake levels, and so are those in other Western states. Under the 1922 Colorado River Compact, the upper-basin states of Colorado, New Mexico, Utah and Wyoming must deliver 7.5 million acre-feet of water to the three lower-basin states each year. Lake Powell was built so the upper basin could deliver on that promise, but now Powell's future is in doubt.

According to federal forecasts, drought and water deliveries could drain Powell in three years. In such a situation, the upper basin would be forced to forgo river withdrawals or risk a major court battle.

To head off that prospect, water officials from seven states have been meeting regularly in recent months, said Dennis Underwood, a former reclamation commissioner who now works for the Metropolitan Water District of Southern California. The most recent meeting was held Monday in Phoenix, where officials discussed options for keeping the taps flowing.

Some of those options, said Underwood, include storing lower-basin water in upper-basin reservoirs to reduce the huge evaporation that occurs in Lake Mead. Agencies are also discussing water trades and "forbearance agreements" - paying farmers not to irrigate - to help vulnerable areas through a drought.

One such spot is Las Vegas, the nation's fastest growing city and one that draws 98 percent of its water from the Colorado. Not wanting to gamble on their future, Nevada officials have been pressing for some type of interstate water-sharing arrangement.

Pat Mulroy, general manager of the Southern Nevada Water Authority, said the recent talks are a recognition that the regional water situation is serious. "People are finally realizing that the drought is real," said Mulroy, "and not something I thought up in a bar."

In a December speech in Las Vegas, Interior Secretary Gale Norton laid out some of the possible scenarios. Under the 2001 Interim Surplus Guidelines, Norton said she is

required to cut surplus supplies to California, Arizona and Nevada if the surface of Lake Mead drops to 1,125 feet in elevation - 10 feet below its current level.

Further down the road, Norton could use her court-appointed authority as Colorado "river master" to declare a shortage and impose cutbacks. Some water experts believe Norton could make such a declaration when Lake Mead's surface level hits 1,083 feet elevation - about 52 feet below its current elevation - but the law isn't specific.

To ratchet up the pressure, Interior officials invited Southwest water leaders and a group of journalists on a boat trip this month down the Grand Canyon, where Raley repeated his warning Norton was ready to take action. "Time lost now is time we may not be able to recover," said Raley, pacing across a sand bar like Gen. George Patton.

Some environmentalists say the Bush administration is delaying tough decisions by playing this kind of drawn-out pressure politics. This year, they note, the Bureau of Reclamation declared a partial surplus on the Colorado River, which further depleted Lake Mead. Now federal officials are preaching drought preparedness.

"The bureau is dragging its feet," said Jeff Van Ee, a water watchdog for the Sierra Club in Las Vegas. "They haven't taken this drought seriously."

Raley, who oversees the Bureau of Reclamation, said he started working closely on the drought problem in January. Before that, he helped seal a landmark settlement that quantified how much water California's cities and farms could draw from the Colorado River. By agreeing to limit its water withdrawals to 4.4 million acre-feet, California was given a 13-year grace period to continue receiving "surplus" water from the river.

Now, say water officials, that grace period appears to be moot.

River News 05/01/04

Looming Colorado River shortage forcing tough choices in the West

By Seth Hettena, Associated Press

GRAND CANYON NATIONAL PARK, Arizona — The Colorado River runs cold and fast through the Grand Canyon, a postcard picture of the water wealth that greens farms and slakes the thirst of booming cities.

But there's a lot less to the Colorado than meets the eye. Five years ago, the vast reservoirs at both ends of the Grand Canyon were essentially full, brimming with water for showers, kitchen sinks, irrigation, and ornamental fountains. Today, they are both half empty as drought in the region enters its fifth consecutive year, making this the driest five-year period on record.

The river supplies water to 25 million people in seven states and more in Mexico.

But with no end to the drought in sight, the Interior Department may be nearing the first declaration of a water shortage on the Colorado River, said Bennett Raley, the department's assistant secretary for water and science. Such a declaration would mean a cut in the amount of water that can be drawn from the river, Raley told reporters during a 224-mile rafting trip through the canyon in April.

"If current trends continue ... the secretary would be forced to take action certainly within three years and potentially within two," unless the states offer a solution, Raley said.

The severity of the cut would be up to the interior secretary, but even a small reduction would ripple across the West. The 1,400-mile-long river grows U.S. and Mexican crops, generates electricity, supports a huge recreation industry, and delivers water to some of the nation's driest and hottest cities, including Phoenix and Las Vegas.

Drought is already doing what environmentalists could only dream about: It's draining Lake Powell, the reservoir just upriver from the Grand Canyon that submerged hundreds of miles of scenic canyons and countless archaeological sites.

Powell is so low that hikers are beginning to explore glorious sandstone canyons once submerged under 100 feet of water. The lake has fallen to 42 percent of capacity, its lowest since it was filled in 1970. At the downstream end of the Grand Canyon is Lake Mead, the huge lake formed by Hoover Dam. It is at 59 percent of capacity and could reach the same state as Powell as early as 2008.

Las Vegas is almost entirely dependent on Lake Mead for water and is worried about the effect continued drought could have on its explosive growth. The city is stressing conservation to avoid a self-imposed drought emergency, and water managers are ripping out water-guzzling lawns.

In a shortage declaration, Arizona would be the first to suffer. Under a 36-year-old compromise the state now regrets, Arizona would lose all the Colorado River water that now goes to Phoenix, the nation's sixth-biggest city, before California would lose a single drop.

Colorado, Utah, New Mexico, and Wyoming are worried as well. Under a 1922 accord they would be required to cut their own water to guarantee a supply to California, Arizona, and Nevada.

While the states depend on a steady source of water, nature is anything but steady. A study of tree rings at the headwaters of the Colorado River found evidence of a drought as recently as the 16th century that lasted 20 years.

In fact, tree rings have led scientists to believe that much of the past century was unusually wet and that more dry years could lie ahead, said Robert H. Webb, a hydrologist who studies the Grand Canyon for the U.S. Geological Survey and is co-author of "Floods, Drought, and Climate Change."

"We have no idea how long this drought is going to last," Webb said. "Every indication says this one's gone beyond all our past experience."

Raley is pushing the states to do something unusual: share the water. The best chance of avoiding a shortage may lie in California, Nevada, and Arizona working together to help each other. One possibility is an interstate water bank in Lake Mead that the three states could share.

However, when it comes to water, the states are more used to bickering than cooperating. Arizona and California waged legendary battles over the Colorado, including Arizona's comical effort to stop construction of a dam intended to divert water to Los Angeles by sending five soldiers to the river in 1934.

During the rafting trip, Raley asked three water managers from Arizona, California, and Nevada what they would do, hypothetically, to prevent the interior secretary from declaring a shortage next year. As they discussed the problem, the age-old feud between California and Arizona flared again.

"I'm not going to be looking to California to help me out. I'm not figuring Arizona's going to do much to help California until the reservoirs turn around," said Sid Wilson, general manager of the Central Arizona Project, the 336-mile concrete channel that carries Colorado River water to Phoenix and Tucson.

However, Wilson did say that Arizona is trying to help Nevada.

Pat Mulroy, general manager of the Southern Nevada Water Authority, says she will have to turn to Arizona or California for help if the river continues to shrink. But Mulroy isn't optimistic.

"All the legal mechanisms are set up for disaster," she said. "We can't seem to get the idea that if we share we get so much further."

LR in the News 05/02/04

Drought Settles In, Lake Shrinks and West's Worries Grow

The New York Times

NEW YORK, SUNDAY, MAY 2, 2004

Drought Settles In, Lake Shrinks and West's Worries Grow

By KIRK JOHNSON and DEAN E. MURPHY

DRY SPELL

LOW WATER
LAUNCH AT
OWN RISK

By KIRK JOHNSON and DEAN E. MURPHY
Sunday Cover Story
New York Times

Published: May 2, 2004

DRY SPELL Articles in this series will examine the effects of prolonged drought on states in the Colorado River basin.

PAGE, Ariz. — At five years and counting, the drought that has parched much of the West is getting much harder to shrug off as a blip.

Those who worry most about the future of the West — politicians, scientists, business leaders, city planners and environmentalists — are increasingly realizing that a world of eternally blue skies and meager mountain snowpacks may not be a passing phenomenon but rather the return of a harsh climatic norm.

Continuing research into drought cycles over the last 800 years bears this out, strongly suggesting that the relatively wet weather across much of the West during the 20th century was a fluke. In other words, scientists who study tree rings and ocean temperatures say, the development of the modern urbanized West — one of the biggest growth spurts in the nation's history — may have been based on a colossal miscalculation.

That shift is shaking many assumptions about how the West is run. Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming, the states that depend on the Colorado River, are preparing for the possibility of water shortages for the first time since the Hoover Dam was built in the 1930's to control the river's flow. The top water official of the Bush administration, Bennett W. Raley, said recently that the federal government might step in if the states could not decide among themselves how to cope with dwindling supplies, a threat that riled local officials but underscored the growing urgency.

"Before this drought, we had 20 years of a wet cycle and 20 years of the most growth ever," said John R. D'Antonio, the New Mexico State engineer, who is scrambling to find new water supplies for the suburbs of Albuquerque that did not exist a generation ago.

The latest blow was paltry snowfall during March in the Rocky Mountains, pushing down runoff projections for the Colorado River this year to 55 percent of average. Snowmelt is the lifeblood of the river, which provides municipal water from Denver to Los Angeles and irrigates millions of acres of farmland. The period since 1999 is now officially the driest in the 98 years of recorded history of the Colorado River, according to the United States Geological Survey.

"March was a huge wake-up call as to the need to move at an accelerated pace," said Mr. Raley, assistant secretary of the interior for water and science.

Losing Water at Lake Powell

Photo caption: The loss of nearly 60 percent of Lake Powell's water led to cracks five feet deep in the dried lake bed near Hite, Utah, as the Colorado River cut a new channel in the sediment.

Some of the biggest water worries are focused here on Lake Powell, the vast blue diamond of deep water that government engineers created in one of the driest and most remote areas of the country beginning in the 1950's. From its inception, Lake Powell, the nation's second-largest artificial lake, after Lake Mead in Nevada, was a powerful

symbol across the West. Some saw it as a statement of human will and know-how, others of arrogance.

Powell, part of the Glen Canyon National Recreation Area, has lost nearly 60 percent of its water and is now about the size it was during the Watergate hearings in 1973, when it was still filling up. White cliffs 10 stories high, bleached by salts from the lake and stranded above the water, line its side canyons. Elsewhere, retreating waters have exposed mountains of sediment.

The tourist economy here in Page has been battered. The National Park Service, which operates the recreation area, has spent millions of dollars in recent years just to lay concrete for boat-launch ramps that must be extended every year, a process that one marina operator here called "chasing water."

Daniel C. McCool, a professor of political science at the University of Utah and director of the American West Center, says Powell is the barometer of the drought because what has happened here is as much about politics, economics and the interlocking system of rules and rights called the law of the river as it is about meteorology.

Part of the lake's problem, for example, dates to a miscalculation in 1922, when hydrologists overestimated the average flow of the Colorado River and locked the number into a multistate agreement called the Colorado River Compact. The compact, along with a subsequent treaty with Mexico, requires Lake Powell to release 8.23 million acre-feet of water each year below the river's dam, Glen Canyon, no matter how much comes in.

Because the river's real average flow was less than the 1922 compact envisioned, Powell very often released more than half of the water the Colorado River delivered. But it did not really matter because the upper basin states were not using their share. Now, communities from Denver to Salt Lake City and Indian tribes with old water rights in their portfolios are stepping forward to stake their claims. Lake Powell, which has been called the aquatic piggy bank of the upper West, is overdrawn.

If water levels continue to fall, Powell will be unable to generate electricity as early as 2007 or sooner, some hydrologists say. And it would be reduced more or less to the old riverbed channel of the Colorado River not long after that. Even now, the lake's managers say, it would take a decade of historically normal rainfall to refill it.

"If we're only in the middle of this drought, then Lake Powell might be very close to some very dramatic problems," said Dr. John C. Dohrenwend, a retired geologist for the Geological Survey who lives near the lake.

Insufficient water for the Glen Canyon Dam turbines would be only the beginning. At that point, much of the lake bottom would be exposed, creating a vast environment for noxious weeds like tamarisk and thistle. The next step in the spiral would come at what is called "dead pool," where decades' worth of agricultural chemicals at the lake bottom would begin mixing more actively with the reactivated river. The question then,

environmentalists say, is what would happen to the Grand Canyon, just south of the dam.

An Issue That May Go to Congress

"Americans won't stand for the Grand Canyon being endangered," said John Weisheit, the conservation director for Living Rivers, an environmental group in Moab, Utah, that advocates removing the dam at Glen Canyon and allowing the river to return to its natural course. "In another year, they're going to be talking more seriously about Powell in Congress."

But the fact is, no one knows: the weather could change tomorrow. Many past Western droughts have ended suddenly, with a bang of precipitation. But some dry spells persisted for generations. From about 900 to 1300, scientists say, periodic drought in the West was the norm. Only a few times during that period, according to tree-growth measurements, was precipitation anywhere near the relatively high levels of the 20th century.

"What is unusual is not the drought periods, but the above-average wet periods," said Dr. Robert Webb, a hydrologist with the Geological Survey who specializes in the Colorado River.

The uncertainty has local, state and federal officials along the 1,450-mile river scurrying to secure water allotments while also preparing for the worst.

Already in Las Vegas, the regional water agency is removing the equivalent of a football field of grass every day from front lawns, playgrounds and golf courses to save on outdoor watering. Farther downriver, Arizona officials are pumping billions of gallons of water into aquifers to save for an even less rainy day.

Electricity has become a concern. The Western Area Power Administration, the federal agency that distributes power from hydroelectric projects in the Rocky Mountain West, plans to reduce by about 25 percent the amount of electricity it can promise in future years.

Conserving on a Large Scale

In Los Angeles, a representative from the West's largest urban water agency, the Metropolitan Water District of Southern California, is among a group of Western water officials dusting off plans to help limit evaporation from reservoirs, which could save billions of gallons. One idea is to pour a nontoxic substance over the reservoirs to form a water-trapping barrier.

The group, which has been holding meetings, is even looking at far-off solutions like raising the height of Hoover Dam so that more water could be collected and saved during wet times.

"We understand we have a problem and we are working on it," said the Los Angeles representative, Dennis Underwood, a former head of the federal Bureau of Reclamation, which oversees dams and reservoirs in the West.

There are also worries downstream from Powell at Lake Mead, which serves Nevada, Arizona and California. It could drop low enough as early as next year to force officials to declare a drought emergency. That would hurt the booming southern Nevada economy through significantly higher water rates and outright bans on things like new swimming pools, said Patricia Mulroy, general manager of the Southern Nevada Water Authority.

Mr. Raley of the Interior Department said he wanted the states to consider a water bank, in which unused water could be leased or sold across state lines. Some previous efforts to create banks, with federal oversight, have been contentious because they were seen by smaller states as a means to funnel more of the river to water-guzzling California.

But the notion of cutting private water deals on the Colorado is gaining broader acceptance, in large part because of the drought. The most celebrated example was a deal last year to sell irrigation water in the Imperial Valley of Southern California to the urban water district in San Diego.

Some advocates for agriculture fear that water-to-the-highest-bidder could ravage ranches and farms if owners were induced to sell their irrigation rights. But private-market supporters say the truth, like it or not, is that farmers own most of the West's water, and ultimately there will be fewer of them.

There is some concern that if the Colorado River goes into crisis, the ensuing tangle of litigation over water rights, endangered species and border disputes could undo the system of Western water law that has evolved over the last 100 years.

Some say that would be a good thing.

"The law of the river is hopelessly, irretrievably obsolete, designed on a hydrological fallacy, around an agrarian West that no longer exists," Professor McCool at the University of Utah said. "After six years of drought, somebody will have to say the emperor has no clothes."

Water officials in Arizona and Nevada say they would also like to rethink the law of the river to put their states on a more equal footing in sharing the Colorado River. But Mr. Raley said such talk invites disaster and chaos, especially during a drought.

"This isn't the time to plunge into chaos," he said.

Other people who live here on the fringe of Lake Powell say that the West's great reservoirs have, in their very decline, proved their value in stretching out limited water resources and underlined the difference between past civilizations here that anthropologists say were wiped out or displaced by drought.

"Those people back then had nothing to catch and save their water — now we do," said Ronald W. Thompson, district manager of the Washington County Water Conservancy District in southwestern Utah.

"I'm a believer that history repeats itself — long-term drought could return," Mr. Thompson said. "But I suspect our civilization can weather this."

Kirk Johnson reported from Page, Ariz., for this article and Dean E. Murphy from Grand Canyon National Park.

LR in the News 06/01/04
Waterkeeper Alliance inaugural magazine issue

Forty years ago, an enormous public outcry stopped the construction of two major dams that would have inundated Grand Canyon National Park. The famed Colorado River and its unique desert ecosystem would be preserved-or so it was thought.
However, a less noticeable, but lethal blow had already been delivered. On Jan. 23, 1963, the United States Bureau of Reclamation began filling a reservoir behind the 700 foot-high, Glen Canyon Dam upstream from Grand Canyon National Park. Immediately Glen Canyon Dam unleashed a current of devastation on the park. Four decades and numerous violations of federal taws later, the dam has nearly destroyed all the native habitat of Grand Canyon's famed river corridor.

Ninety-five percent of the sediment and nutrients that should flow into Grand Canyon's riverine ecosystem are trapped behind Glen Canyon Dam. The loss of sediment is eroding recreational beaches, reducing sandbar habitat for native fish, disturbing prehistoric cultural sites and gives an advantage to predators, like exotic trout species, that hunt-by-sight. It's also reduced the input of woody debris that should be providing carbon for a healthy food web. In contrast, the sediment behind the dam is fitting Lake Powell and has already plugged 100 miles of canyons with thick, weed infested mud flats.

Seasonal water temperatures that previously fluctuated from freezing to 80 degrees now range from 47 to 50 degrees. The lack of warm water prevents the trigger necessary for native fish reproduction, but gives a reproductive advantage to non-native fish species. These non-native fish not only compete for available food, but also feed on the few young native fish that manage to hatch.

Natural flows, which fluctuated seasonally from 3,000 to 90,000 cubic feet per second (cfs), can now fluctuate daily and are restricted to only 8,000 to 20,000 cfs. This has

been devastating to the Grand Canyon's unique desert ecosystem. Native fish, like the razorback sucker, depended on high, natural flows to spawn. Without these flows, the species has become extirpated in the Grand Canyon. In fact, of the eight native Colorado River fish, four have died out and two are struggling for survival. At least twenty-four alien fish species now thrive in the artificial environment.

Fish haven't been the only animals to suffer though. Of the 50 to 100 native insect species (nobody counted before the dam) that once formed the food base of the Grand Canyon, none remain in the Colorado River today. They have been replaced by twenty-five families of alien invertebrate species, including the New Zealand mudsnail and the Asian tapeworm.

In 2001, Living Rivers' Colorado Riverkeeper began to draw public attention to the failure of federal efforts to reverse the impact Glen Canyon Dam has had on the Grand Canyon's river ecosystem. The group has built a nationwide coalition to demand major changes in the operation of this program. It has assembled a network of scientists to aid in formulating these strategies, as welt as legal experts to prepare for litigation should these strategies not be acted upon.

LR Press Release 06/16/04
New USGS report on drought

For immediate release
Contact: Owen Lammers - (435) 259-1063/(435) 260-2590

USGS says no clear evidence that "Early 21st Century Drought" is waning.

In a paper released today by the United States Geological Survey on what is now being called the "early 21st Century drought," there is no clear evidence that wetter periods lie ahead for the Colorado River basin.

Titled, "Climatic Fluctuations, Drought, and Flow in the Colorado River", the paper discusses several mechanisms for predicting future Colorado River flows. Two forecast indices reveal dry times for the next five to thirty years, and one indicates that we should be experiencing higher flows now, but they have yet to materialize.

What is undisputed, the paper notes, is that this is the driest period in 500 years for the Colorado River basin. Flows into Lake Powell reservoir are averaging just 5.4 million acre feet per year--50 percent of normal. Even the dry Dust Bowl years between 1930 and 1937 had flows that averaged 10.2 million acre feet, the paper says. (To reflect today's current rate of consumption above Lake Powell, the amount would be adjusted to 7.5 million acre feet.)

Conversely, the paper points out how data from the past 450 years show that the years actually sampled to determine the legal allocation of Colorado River water amongst the seven Colorado River states, were part of the highest ever for the historic record

(1906-1930). The paper also states that the most unusual aspects of Colorado River flows are the periods of high flow and not the periods of drought.

"Its time that we recognize the dry periods are the norm for the Colorado River basin, and that we are using far more water than the river can provide," says Owen Lammers, Living Rivers executive director. "Regardless of whether we're at the beginning of significant climate change, or just moving through a sustained drought period, the bottom line is that our use of Colorado River water is based on mistaken mathematics which must be corrected before all excess storage runs dry."

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USGS Report: "Climatic Fluctuations, Drought, and Flow in the Colorado River"
[800k PDF File]

LR in the News 06/18/04

Western drought worse than Dust Bowl

By ANGIE WAGNER
Associated Press Writer

LAS VEGAS -- The drought gripping the West could be the worst in 500 years, with effects in the Colorado River basin even worse than during the Dust Bowl years, scientists at the U.S. Geological Survey say.
"That we can now say with confidence," said Robert Webb, lead author of the new fact sheet released Thursday. "Now I'm completely convinced."

The drought has produced the lowest flow in the Colorado River on record, with an annual average flow of only 5.4 million acre-feet at Lees Ferry during the period 2001-2003, adjusted for the effect of Glen Canyon Dam. By comparison, during the Dust Bowl years, between 1930 and 1937, the annual flow averaged about 10.2 million acre-feet, the report said.

Scientists use tree-ring reconstructions of Colorado River flows to estimate what conditions were like before record-keeping began in 1895. Using that method, the lowest five-year average of water flow was 8.84 million acre-feet in the years 1590-1594. From 1999 through last year, water flow has been 7.11 million acre-feet.

"These comparisons suggest that the current drought may be comparable to or more severe than the largest-known drought in 500 years," the report said.

Environmental groups say water managers should take heed.

"The water managers, they just continue to pray for rain," said Owen Lammers, director of Living Rivers and Colorado Riverkeeper. "They just say, well, we hope that things change and we see rain."

Lammers said the report reinforces the need to figure out a better way to manage the Colorado River before reservoirs run dry.

"Once our reserve supply is gone, we have no plan of action for what to do," he said.

The report said the river had its highest flow of the 20th century during 1905 to 1922, the years used to estimate how much water Western states would receive under the 1922 Colorado River Compact.

The compact should now be reconsidered because of the uncertain water flow, said Steve Smith, a regional director for the Wilderness Society.

"We've got to figure out a new way of distributing the water that exists in the Western United States and be a lot more deliberate about our cautious and efficient use of the water," he said.

The report didn't surprise water managers.

"The big lesson is communities cannot afford to put all their eggs in the proverbial basket. You need .. a diverse portfolio of resources," said Adan Ortega, spokesman for the Metropolitan Water District of Southern California, the largest wholesale water supplier in the country.

Ortega said the water district is increasing water storage, buying water from farmers and investing in alternatives to the Colorado River.

Vince Alberta, spokesman for the Southern Nevada Water Authority, said water use in southern Nevada this year is actually down and the authority continues to enforce watering restrictions, impose fines for water waste and promote conservation.

"I think we can be successful managing this drought, but it's going to take a unified effort with everybody making sacrifices," Alberta said.

Herb Guenther, director of the Arizona Department of Water Resources, said the agency continues to plan for a continuing drought.

"It's serious, but the sky is not falling. Of course, we wish it would in the form of rain," he said.

Webb said predicting when the drought will end isn't easy because the Colorado River is difficult to forecast.

"It's sort of a split-personality river. It has headwaters up in Wyoming as well as headwaters in Colorado," Webb said. "Those two regions tend to respond to different things. ... We can't explain it very well."

Droughts seldom persist for longer than a decade, the report noted. But that could mean the current drought is only half over.

"If you're a betting person, you will bet that we will come out of this drought next year," Webb said. "It's a very severe event and these things tend to end fast. There are other indications, though, that suggest that this drought could persist for as long as 30 years.

"We don't really know."

EDITOR'S NOTE -- Angie Wagner is the AP's Western regional writer, based in Las Vegas.

On the Net:

http://water.usgs.gov/pubs/fs/2004/3062/

http://www.livingrivers2.org

http://www.wildernesssociety.org

LR in the News 06/24/04

Current Colo. River Basin dry spell could be worst in 500 years

April Reese, Land Letter Southwest correspondent

A new report by the U.S. Geological Survey suggests the drought parching the Colorado River Basin could be the worst in 500 years, prompting water watchdogs to warn of an impending water crisis in the region. But federal water managers say there is still plenty of the West's most precious natural resource to go around.

The USGS report -- "Climatic Fluctuations, Drought, and Flow in the Colorado River" -- summarizes the most recent data on drought and water supplies in the basin. It says the current dry spell reduced flows in the Colorado River to the lowest levels on record -- about 5.4 million acre-feet (maf) during 2001-2003.
Looking at five-year averages, 7.11 maf flowed down the Colorado between 1999 and 2003. The next-lowest five-year period occurred more than 400 years ago, from 1590-1594, according to tree ring data.

"These comparisons suggest that the current drought may be comparable to or more severe than the largest-known drought in 500 years," the report states.

USGS researchers also noted that the period used by federal water managers to divvy up the river's water under the Colorado River Compact -- 1905-1922 -- had some of the

highest flows of the 20th century. The average flow for that period was 16.1 maf, more than the twice the level of recent flows.

Gregory McCabe, a Denver-based USGS scientist who co-authored the report, said a confluence of climatic forces from both coasts is responsible for the current drought.

While alternately cool and warm currents in the Pacific Ocean have long been known to influence conditions in the Interior West, researchers have found that East Coast weather dynamics also play a role. "When you have a warm North Atlantic, you have a good chance of drought," McCabe said.

Does the current system work?

If drought is the normal condition in the Colorado River Basin, water managers need to change their way of thinking, said Owen Lammers, executive director of Living Rivers, an advocacy group based in Moab, Utah.

"Whether it's five, 10 or 15 years [long], we're going to face this at some point, so we might as well put in place a system to deal with it," he said. "In order to do that, we have to address the demand question. So let's start doing it, instead of waiting until we're in a crisis."

Storing water underground, where less is lost to evaporation and sediment build-up, could be part of the solution, Lammers suggested. But since nature is cutting the supply, water managers and consumers have to cut demand, he added. Switching from water-intensive crops such as alfalfa, which is grown to feed cattle, to less thirsty food crops and adopting municipal conservation and efficiency measures could cut the region's consumption of Colorado River water in half -- enough to bring demand in balance with supply, Lammers said.

Under the Colorado River Compact, signed in Santa Fe, N.M., in November 1922, the river's water was divided equally between upper and lower basin states, with the line drawn at Lee's Ferry, located above the Grand Canyon in northern Arizona. Colorado, New Mexico, Utah and Wyoming fell above the line, while Arizona, California and Nevada fell below.

Each basin was to receive 7.5 maf per year. Allocations for individual states vary widely, from California's 4.4 maf to Nevada's 300,000 acre-feet (Land Letter, Feb. 5).

If the drought continues, which many scientists say is likely, Lake Powell and Lake Mead could run dry, Lammers warned.

"Right now we're seeing twice as much water being used in Lake Mead than is coming [into the reservoir] from Lake Powell," he said. "At that rate, we're going to see Lake Powell empty in two to three years, then Lake Mead not long after that. In 2006, there's going to be real, real problems. That's when we may not have enough water to meet all the allocations downstream."

But Bureau of Reclamation spokesman Barry Wirth pointed out that Lake Powell and other reservoirs in the Colorado River Basin are fulfilling their purpose as a water insurance policy and so far have passed the most severe drought test since the system was built.

Bennett Raley, assistant Interior secretary for water, said that even if the drought worsens, there will be enough water.

"We think the drought is serious but not a crisis, because under any foreseeable scenario, there's going to be water for the economic engines of the West to continue to grow and prosper," he said in a phone interview from Denver, where BuRec was meeting with USGS researchers to discuss the drought. "Even under severe drought, the West doesn't dry up and blow away."

Raley noted that about 5 maf of the 7.5 maf allocated to the lower basin states is used for agriculture. If the drought worsens, some of the water consumed by farms could be transferred to cities, he said. Some urban areas have already cut deals with farmers to secure more water (Land Letter, March 18).

The federal government has a limited role to play in preparing the region for an extended drought, he added. "I just am at a loss where in the Colorado River Compact it requires Soviet-style planning," Raley said.

The federal government will step in to help resolve disputes between states, as it did when tensions over water use flared between Arizona and California, Raley said. "The federal government has said pretty strongly that if the states don't come up with a solution, it will fill the vacuum."

But so far, the states have been proactive in working together to find solutions to water challenges, he added. The upper basin states met in Salt Lake City recently, and drought was a priority topic of discussion at a meeting of the Western Governors' Association in Santa Fe this week.

LR in the News 07/06/04

Electricity output slashed as Powell water level shrinks

Article Published: Monday, July 05, 2004

By Theo Stein Denver Post Staff Writer

Plummeting water levels in Lake Powell have drastically slashed electricity generation at the reservoir's Glen Canyon Dam, forcing power authorities to cut deliveries to utilities from the Front Range to Provo, Utah.

Federal officials fear that $100 million worth of hydropower generated annually by Lake Powell could dry up completely by 2009 - if dam managers continue releasing water at pre-drought rates.

That would deal a crushing economic blow not only to utilities that depend on cheap hydropower from Lake Powell, but also to a host of federal and state programs, including Colorado's endangered-fish recovery efforts.

Meanwhile, water levels in Lake Powell have fallen so low that Colorado and neighboring states are considering asking the federal government to preserve the lake's water for drinking supplies, which would cut hydropower production even further.

"We are looking to see if there are ways to slow down the decline of Lake Powell and Lake Mead," said Russ George, Colorado's natural resources director. "We can't make more water. We're asking ourselves: 'Are there things we can be doing to avoid taking water out?'"

Federal officials say they welcome state input on how best to manage the water supply in Lake Powell and its sister reservoir in Arizona, Lake Mead, during the drought.

On June 17, the seven Colorado River basin states - California, Arizona, Nevada, Utah, Wyoming, New Mexico and Colorado - asked the U.S. Bureau of Reclamation for a series of computer models simulating the impact of various drought and water-delivery scenarios. The results will form the basis of a report to the Interior Department offering recommendations for water management during the drought and after.

Interior Secretary Gale Norton "is very serious about the states being in the lead as long as possible," Bennett Raley, the assistant Interior secretary who oversees the Bureau of Reclamation, said last week.

Only if the states can't develop a conservation plan will the federal government step in, Raley said.

Lake Powell and Lake Mead were designed decades ago to provide drought-proof supplies of drinking water for the arid Southwestern states along the Colorado River. Cheap hydropower from Mead's Hoover Dam and Powell's Glen Canyon Dam was a side benefit that became a critical foundation for the region's 20th century urban and industrial growth.

The five-year drought has already drained Lake Powell to 43 percent of capacity, reducing the pressure of water entering Glen Canyon's turbines. That lost pressure, or "hydraulic head," has slashed the dam's generating capacity by some 30 percent, leading to higher costs for Colorado's electric utilities served by the Western Area Power Administration.

In 2002, WAPA, which sells power from dams in the Colorado River Storage Project, raised rates 18 percent. During the past two years, WAPA was forced to buy $135 million worth of power to honor existing contracts with Colorado and Utah utilities. The power administration also had to slash deliveries by a quarter this year.

If Glen Canyon Dam's output is cut completely, "(our) power could be priced out of the market," warned WAPA's Brad Warren.

And still Lake Powell continues to fall.

Last winter's meager snows were expected to yield only half the average runoff to the Colorado River, continuing a trend that started with the onset of drought in 2000.

Powell is so low that federal hydrologists estimate there is a 20 percent chance that drought could eliminate hydropower within five years. A repeat of the disastrous 2002 drought year - or even two more marginally better years like 2004 - could interrupt electric generation even sooner.

"If hydro is curtailed, they'll be forced to go from low-cost electricity that's locked in to higher-priced power and the vagaries of the market," said Jim Owens, a spokesman for the Edison Electric Institute, a Washington, D.C.-based industry group.

Those costs are already being passed on to customers.

"We had a 10 percent rate increase in 2002 and another small increase last year," said Jim Van Someren, a spokesman for Westminster-based Tri- State Generating and Transmission, the Colorado River Storage Project's biggest customer.

This summer, the Tri-State board will probably have to consider another rate hike for 2005, he said.

If the drought worsens, falling hydropower revenues also will shrink the revolving fund that contributes $50 million each year to environmental programs, including the state's endangered-fish recovery efforts.

Since 1988, $138.7 million has been raised by federal and state agencies for the recovery program, which seeks to restore healthy populations of the Colorado pikeminnow, the razorback sucker, humpback chub and bonytail in the upper Colorado and San Juan river systems.

Glen Canyon has contributed about $51 million. By contrast, Colorado, Wyoming and Utah only gave $14.6 million during the same time period.

Protecting that federal contribution "is at the top of our agenda," George said.

Some environmental groups, such as Living Rivers of Salt Lake City, believe a more cost- effective way to recover the four endangered fish is to decommission the Glen Canyon Dam once drought drains the lake behind it.

They believe the region has entered a drier climate regime that was much more common in the past.

Owen Lammers, the group's executive director, chafes at the description of dam's hydropower as clean, cheap energy.

"That ignores the tremendous impact the dam has had on Grand Canyon and Glen Canyon," Lammers said.

Lammers said it is likely that Lake Powell will take many years to refill - if it refills at all. That will reduce electric revenues in perpetuity and put pressure on federal officials to divert money from projects meant to repair the damage caused by plugging up the river.

"If we can encourage 10 million households in the basin to put in a couple of compact fluorescent lights," Lammers said, "we can eliminate the power needed from Glen Canyon Dam - at a cost that's one-seventh of the power the dam produces."

Staff writer Theo Stein can be reached at 303-820-1657 or tstein@denverpost.com.

River News 07/10/04

Groups supporting efforts to Save Grand Canyon Again!

Access for All (CA)
Alabama Environmental Council (AL)
Alamosa Riverkeeper (CO)
Allegheny Riverkeeper (PA)
Alliance for Sustainable Communities (MD)
Altamaha Riverkeeper (GA)
American Whitewater Association (MD)
Apalachicola Bay and Riverkeeper (FL)
Arizona Wilderness Coalition (AZ)
Audubon Upper Mississippi River Campaign (MN)
Baja California Coastkeeper (Mexico)
Biodiversity Conservation Alliance (WY)
Black Warrior Riverkeeper (AL)
Blackwater/Nottoway Riverkeeper (VA)
Bluewater Network (CA)
Bow Riverkeeper (Canada)
Buckeye Forest Council (OH)
Cahaba River Society (AL)
California Save Our Streams Council (CA)
Californians for Western Wilderness (CA)
Camp Us (CO)
Cape Fear River Watch, Inc. (NC)
Cape Fear Riverkeeper (NC)
Cascadia Rising Ecological Defense Network (OR)
Casco Baykeeper (MA)
Center for Biological Diversity (AZ)
Central Lake Superior Watershed Partnership (MI)
Chattahoochee Riverkeeper (GA)

Chehalis River Council (WA)
Choctawhatchee Riverkeeper (AL)
Choqueyapu Riverkeeper (Bolivia)
Citizens of Lee Environmental Action Network (VA)
Clearwater Biodiversity Project (ID)
Clinch Coalition (VA)
Coalition for Jobs and the Environment (VA)
Coastal Land Trust (CA)
Colorado Plateau River Guides (UT)
Columbia Riverkeeper (WA)
Commencement Baykeeper (WA)
Community Clean Water Institute (CA)
ConservAmerica (NM)
Cook InletKeeper (AK)
Coosa River Basin Initiative (GA)
Devil's Fork Trail Club (VA)
DuPage River Coalition (IL)
Earth Island Institute (CA)
Electors Concerned about Animas Water (NM)
Endangered Habitats League (CA)
Erie Canalkeeper (NY)
Escalante Wilderness Project (UT)
Evergreen State College (WA)
Eyak Preservation Council (AK)
Eyes of Paint Branch (MD)
Flagstaff Activist Network (AZ)
Flint River Watershed Coalition (MI)
Florida Wildlife Federation (FL)
Forest Guardians (NM)
Forest Watch (VT)
Foundation for Global Sustainability (TN)
Four Corners School of Outdoor Education (UT)
Friends of Arizona Rivers (AZ)
Friends of Blackwater (WV)
Friends of Living Oregon Waters (OR)
Friends of Milwaukee's Rivers & Riverkeeper (WI)
Friends of the Animas River (CO)
Friends of the Earth (DC)
Friends of the Eel River (CA)
Friends of the Gualala River (CA)
Friends of the Nanticoke River (MD)
Friends of the River (CA)
Friends of the Riverfront (PA)
Fundy Baykeeper (Canada)
Galveston Baykeeper (TX)
Georgian Baykeeper (Canada)

Glen Canyon Institute (UT)
Global Exchange (CA)
Global Response (CO)
Grand Canyon Private Boaters Association (AZ)
Grand Riverkeeper (OK)
Grand Traverse Baykeeper (MI)
Great Egg Harbor Watershed Association (NJ)
Great Lakes United (NY)
Great Old Broads for Wilderness (CO)
Green Party of Utah (UT)
Greenaction for Health and Environmental Justice (CA)
Hackensack Riverkeeper (NJ)
Hells Canyon Preservation Council (OR)
Holiday River Expeditions (UT)
Housatonic River Initiative (MA)
Hudson Riverkeeper (NY)
Hurricane Creekkeeper (AL)
Idaho Sporting Congress (ID)
International Rivers Network (CA)
John Muir Project (CA)
Kalamazoo River Protection Association (MI)
Kansas Riverkeeper & Friends of the Caw (KS)
Kern Valley River Council (CA)
Kettle Range Conservation Group (WA)
Klamath Siskiyou Wildlands (OR)
Lake George Waterkeeper (NY)
Lake Ontario Waterkeeper (Canada)
Lands Council (WA)
Lawyers for Clean Water (CA)
Los Alamos Study Group (NM)
Lower Mississippi Riverkeeper (LA)
Lower Neuse Riverkeeper & Neuse River Foundation (NC)
Maine Rivers (ME) Maricopa Audubon (AZ)
Mattole Restoration Council (CA)
Milwaukee Riverkeeper (WI)
Montana River Action (MT)
Morava Riverkeeper (Czech Republic)
Narragansett Baykeeper (RI)
National Forest Protection Alliance (MT)
Native Forest Council (OR)
Native Forest Network (MT)
New Mexico Wilderness Alliance (NM)
New River Foundation (NC)
New York/New Jersey Baykeeper (NJ)
Northern California River Watch (CA)
Northwest Rafters Association (OR)

Northwoods Wilderness Recovery (MI)
Ocean Arks International (VT)
Ocmulgee Riverkeeper (GA)
Ohio Environmental Council (OH)
Oregon Natural Desert Association (OR)
Outdoor Adventure River Specialists (CA)
Patagonia (CA)
Patapsco Riverkeeper (MD)
Patrick Environmental Awareness Group (VA)
Pensacola Gulf Coastkeeper (FL)
Pequannock River Coalition (NJ)
Petitcodiac Riverkeeper (NB)
Protect Our Public Lands (OR)
Puerto Rico Coastkeeper (PR)
Puget Soundkeeper Alliance (WA)
Red Rock Forests (UT)
Red Rock Foundation (AZ)
Ridgeline & Open Space Coalition (CO)
Riparian Improvement Organization (CA)
River Project, The (NY)
River Runners for Wilderness (CO)
Riverhawks (OR)
Russian Riverkeeper (CA)
Sacramento River Preservation Trust (CA)
Salt Creek Watershed Network (IL)
San Diego BayKeeper (CA)
Santa Barbara Channelkeeper (CA)
Savannah Riverkeeper (GA)
Save America's Forests (DC)
Save Barton Creek Association (TX)
Save the Illinois River (OK)
Sea Shepherd Conservation Society (WA)
Seeds of Simplicity (CA)
Shundahai Network (UT)
Sitka Conservation Society (AK)
Sky Island Alliance (AZ)
Society of Environmental Communicators (AZ)
Solar Energy International (CO)
South Riverkeeper (MD)
Southern Appalachian Biodiversity Project (NC)
Southern Appalachian Forest Coalition (NC)
Southern Utah Wilderness Alliance (UT)
Spirit of the Sage Council (CA)
St. Johns Riverkeeper (FL)
Sublette Riders Association (WY)
Superior Wilderness Action Network (MN)

Tag-A-Long Expeditions (UT)
Taking Responsibility for the Earth and Environment (VA)
Taxpayers for the Animas River (CO)
Tennessee Clean Water Network (TN)
Tennessee River Revival (TN)
The 21st Paradigm (ID)
Tribal Environmental Watch Alliance (NM)
Tualatin Riverkeeper (OR)
Upper Chattahoochee Riverkeeper (GA)
Upper Neuse Riverkeeper (NC)
Upper Susquehanna Riverkeeper (PA)
Utah Environmental Congress (UT)
Ventura Coastkeeper (CA)
Virginia Forest Watch (VA)
Virginians for Wilderness (VA)
Wabash Riverkeeper (IN)
Waccamaw Riverkeeper (SC)
Wakulla/Aucilla Waterkeeper (FL)
Wasatch Mountain Club (UT)
Water Watch of Oregon
Waterkeeper Alliance (NY)
Waterkeepers Northern California (CA)
Waterkeepers of Austrailia
Western Watersheds Project (UT)
Western Wildlife Conservancy (UT)
Wetlands Action Network (CA)
Wild South (AL)
Wild Wilderness (OR)
Wildcoast (CA)
Wilderness Watch (MT)
Willamette Riverkeeper (OR)
Wolf River Conservancy (TN)
Wyoming Outdoor Council (WY)
Youghiogheny RiverKeeper (PA)

LR Press Release 07/13/04

Federal scientists admit failure of Grand Canyon endangered fish recovery effort
Environmentalist amplify call for new approach

Contact: Owen Lammers 435-259-1063

In a draft paper circulated last week, lead scientists for the federal program overseeing endangered fish recovery in Grand Canyon National Park noted that their principal approach has been a "failure".

For more than ten years dam managers have been emphasizing a specific flow regime from Glen Canyon Dam asserting that it would reverse the decline of the endangered humpback chub. Instead, the declines have averaged about 14 percent annually since the early 1990s the draft paper says.

"While they may still tinker with the details of their paper, the word failure will continue to ring loud and clear," says Owen Lammers, Living Rivers/Colorado Riverkeeper executive director. "We've been arguing for years that the Bureau of Reclamation heed the advice of the Fish and Wildlife Service and implement flows more consistent with the river's natural hydrograph if they want to stop the decline of native fish populations, but instead, even after admitting failure, they want to head further in the wrong direction."

The paper advocates moving away from what has been called Modified Low Fluctuating Flows, which restrict dam operators to water releases between 5,000 and 25,000 cubic feet per second. Restrictions were also place on the hourly rate for increasing and decreasing flows from the dam, not to exceed 4,000 and 1,500 cubic feet per-second per-hour respectively.

Previously, dam operators were free to increase or decrease flows based on electricity demand. The paper argues that upwards of $50 million annually have been lost in hydropower revenues since these flows have been implemented.

"The Bureau of Reclamation wants to say they tried it and it didn't work, but they never actually implemented what was asked of them by the Fish and Wildlife Service to recover the fish," says Lammers. "They now want more variable flows which may restore revenues, but it may be game over for the last remaining humpback chub."

The authors also state their flow regimes have "failed to produce their intended benefits for sediment resources in Grand Canyon." With 95 percent of Grand Canyon's sediment and nutrients trapped behind Glen Canyon Dam, it was hoped that tinkering with flows may help to redistribute sediment to aid in fish recovery.

It was also hoped that efforts to reposition sediment would help to stabilize archeological sites disturbed by dam operations. The paper states that their experience now is that there would be exposure of some cultural sites no matter how the water is managed.

In 1994 the Fish and Wildlife Service recommended that the Bureau of Reclamation not peruse the Modified Low Fluctuating Flows, but what were called Seasonally Adjusted Steady flows. These flows would have caused releases from Glen Canyon Dam to more mimic the Colorado River's flow, which historically has ranged from 500 to more than 100,000 cubic feet per second. But since such flows would have further compromised

hydropower revenue, they were opposed by the Bureau of Reclamation ten years ago, and are absent from the discussion in this new draft paper.

"Nothing that the Bureau of Reclamation had expected to achieve when it began its recovery program a decade ago has worked," adds Lammers. "This latest information adds to the mounting evidence mandating the Bureau of Reclamation to undertake a new Environmental Impact Statement on how and if Glen Canyon Dam should continue to be operated so as to comply with federal environmental laws."

Living Rivers/Colorado Riverkeeper and more than 200 groups from across the country are calling for a new Environmental Impact Statement that evaluates the decommissioning of Glen Canyon Dam as the most effective means to restore the natural process necessary to reverse the decline of endangers species in Grand Canyon.

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EVIDENCE FOR THE FAILURE OF THE MODIFIED LOW FLUCTUATING FLOW ALTERNATIVE (MLFFA) TO BENEFIT MOST ECOLOGICAL RESOURCES IN GRAND CANYON [96k PDF File]

LR in the News 07/15/04

Grand Canyon Endangered Fish Fail to Recover

Environmental Network News

FLAGSTAFF, Arizona, July 15, 2004 (ENS) - Scientists for the federal program overseeing endangered fish recovery and sediment restoration in Grand Canyon National Park have come to the tentative conclusion that their main approach has been a "failure."

In a draft paper dated June 22 and circulated last week, eight scientists analyzed the results of water flow variation policies and control of fish in the Colorado River below Glen Canyon Dam.

Members of the Grand Canyon Technical Working Group concerned about ecology and those concerned about power production both show the "surprising" preference for more variable daily flows, the scientists found.

The Colorado River has cut a cleft across Arizona known as the Grand Canyon (Photos courtesy USGS Grand Canyon Monitoring and Research Center) Authors of the draft paper include four U.S. Geological Survey scientists with the Grand Canyon Monitoring and Research Center in Flagstaff, two members of the Western Area Power Administration, one scientist from the University of Bristish Columbia, and one from Ecometric Research Inc.

Since the early 1990s, dam managers have used a specific flow regime from Glen Canyon Dam known as Modified Low Fluctuating Flows, asserting that it would reverse the decline of an endangered fish known as the humpback chub. Instead, chub declines have averaged about 14 percent annually since the early 1990s, the draft paper says.

Emphasizing that the analysis is "a work in progress," the authors suggest moving away from the regime, which restricts dam operators to water releases between 5,000 and 25,000 cubic feet per second.

Restrictions are also place on the hourly rate for increasing and decreasing flows from the dam, not to exceed 4,000 cubic feet per-second and 1,500 per-hour.

The paper is entitled, "Evidence for the Failure of the Modified Low Fluctuating Flow Alternative (MLFFA) to Benefit Most Ecological Resources in Grand Canyon."

"While they may still tinker with the details of their paper, the word failure will continue to ring loud and clear," says Owen Lammers, Living Rivers/Colorado Riverkeeper executive director.

Lammers sees the points made in the paper as evidence for the correctness of the Living Rivers/Colorado Riverkeeper position.

"We've been arguing for years that the Bureau of Reclamation heed the advice of the Fish and Wildlife Service and implement flows more consistent with the river's natural hydrograph if they want to stop the decline of native fish populations," said Lammers.

Previously, dam operators were free to increase or decrease flows based on electricity demand. The paper states that upwards of $50 million annually in hydropower revenues has been lost since the Modified Low Fluctuating Flow Alternative has been implemented.

The endangered humpback chub found in the Grand Canyon's Colorado River "The Bureau of Reclamation wants to say they tried it and it didn't work, but they never actually implemented what was asked of them by the Fish and Wildlife Service to recover the fish," says Lammers. "They've been promoting more variable flows which may restore revenues, but may be game over for the last remaining humpback chub."

The modified low flow alternative has not succeeded in restoring natural sediments in the canyon, while 95 percent of sediment and nutrients remain trapped behind Glen Canyon Dam. The paper states, "There is currently little debate that ROD flows have failed to produce their intended benefits for sediment resources in Grand Canyon."

In 1994 the Fish and Wildlife Service recommended that the Bureau of Reclamation not pursue the modified low flow alternative, but instead adopt Seasonally Adjusted Steady flows that would have caused releases from Glen Canyon Dam to parallel the Colorado River's natural flow, around 500 to 100,000 cubic feet per second.

But, says Lammers, since such flows would have further compromised hydropower revenue, they were opposed by the Bureau of Reclamation 10 years ago, and are absent from the discussion in the new draft paper.

The Glen Canyon dam on the Colorado above Grand Canyon. (Photo courtesy USGS)
The authors say the modified fluctuating low flow approach "provides an excellent example and warning to practitioners of adaptive management about the difficulties that scientists encounter in trying to determine the ecological impact of a policy change." The authors suggest treating this approach as one of a range of options.

The modified low flow has benefited "the recreational rafting community and trout fishers who care more about catching lots of fish than catching big fish," the paper states, and these stakeholders will want the policy included among future experimental treatments."

But because the strategy is not a "win-win option for all stakeholders," the paper points to the ethical question of who should pay for it.

Currently, power utilities and their ratepayers are subsidizing the modified low fluctuating flows at the cost of some $50 million annually, improving the quality of Grand Canyon for some recreational uses.

"It is one thing to impose such cost to deal with some broad public interest such as protecting an endangered species, but quite another one to impose it for the benefit of particular stakeholders," the authors say.

They urge that the cost issue be addressed "openly and quickly as part of the overall adaptive management planning process, before it leads to a breakdown in the collaboration among stakeholders that has made adaptive management possible in Grand Canyon in the first place."

Living Rivers/Colorado Riverkeeper and more than 200 groups across the country are calling for a new Environmental Impact Statement that evaluates the decommissioning of Glen Canyon Dam to restore the natural process that would reverse the decline of endangered species in Grand Canyon.

LR Press Release 07/16/04

Chasing Water: Lake Powell Launch Ramps Can't Stay Open

For immediate release

Contact: Owen Lammers - (435) 259-1063

Despite a reported $2 million investment in 2003 and a projected $2.8 million this year, Glen Canyon National Recreation Area has had to officially close four of its six boat launching facilities due to declining water levels at Lake Powell reservoir.

Meanwhile, signs at the recreation area's most popular launch ramp, Wahweap Marina, reads "launch at your own risk" as the reservoir has now dropped below the level of the concrete ramp extension completed earlier this year.

"It's going to be an ongoing problem as the reservoir continues to drain due to climate change," says John Weisheit Living Rivers/Colorado Riverkeeper conservation director. "In two years we may be at the end, with the reservoir surface area reduced by 77% and even the two remaining ramps left high and dry."

Publicized as "America's Houseboat Destination", Lake Powell plays host to some of the largest, most luxurious houseboats in the world. But concerns are arising that it may become impossible to launch and retrieve houseboats should levels continue to drop. "It's going to be difficult. Hopefully the park service will work with us to maintain a portion of the (Wahweap) ramp for houseboats," Len Cook, who offers houseboat management services, told the Lake Powell Chronicle this week.

During the past month the Park Service has been looking at old maps and successfully discovered the location of Wahweap's original asphalt launch ramp, which has been submerged for the past three decades. It's hoped that this historic access will be able to serve visitors in the coming months.

Declining reservoir levels and boat ramp closures have hurt Lake Powell marketing efforts. Aramark, the principal concessioner on Lake Powell, is offering to the public special savings up to $1400 that includes $700 in free gasoline for a houseboat rental. Aramark has also offered, to Utah residents, an additional $200 in gasoline to drive to Lake Powell.

"It's amazing the money being invested to keep Lake Powell's houseboat industry alive," adds Weisheit. "But nature may eventually bring it all to a close. We'll know soon enough."

Link to Park Service's launch ramp conditions
Link to Aramark's houseboat specials
Link to the Lake Powell Chronicle

Regional News 07/23/04

How Drought Just Might Bring Water to the Navajo

New York Times by Kirk Johnson
Published: July 23, 2004

WHITE ROCK, N.M. - Once a week, Bennie Yazzie drives half an hour over the bone-rattling dirt roads of the Navajo Nation to get drinking water. It sloshes out a long blue hose at a cost of 3 cents a gallon - except when it doesn't. A few weeks back, the coin-fed meter was broken and no one at the little oasis of White Rock knew how to fix it.

"Another 35 miles on bad road," Mr. Yazzie said of his journey to the next-nearest pump.

The Navajo struggle for water on these unforgiving lands long predates the drought that has settled over the West in the last five years. On a reservation nearly five times the size of Connecticut, more than a third of the residents have no running water for themselves, their gardens or their livestock. So they go to water stations like White Rock, 50 miles from the nearest real town, to shower, wash clothes or socialize, making the best of a situation that would make most Americans shudder with its matter-of-fact adversities.

But in an odd and deeply paradoxical way, the drought itself - and the fundamental ways it is making many Westerners rethink the future - may finally bring running water to the Navajo. The tribal council could vote at any time on a settlement to end a 30-year legal standoff with New Mexico over how to divide the waters of the San Juan River, a major tributary of the Colorado River. Tribal leaders had contended that history and treaty entitled them to the entire flow of the river; the state said the tribe was overreaching.

A preliminary agreement reached late last year - one of the largest Native American water deals in history, gallon for gallon - reduces the tribe's claims and in return provides for a $600 million federal pipeline that would snake south through the reservation, with feeder systems reaching into the communities, called chapters here. The pipe would also take water to the equally thirsty city of Gallup, N.M., just outside the reservation's southeast border.

It all sounds quite neat - a perfect package of interlocked, coinciding interests, which is how supporters of the plan have sold it on the reservation and off. But the vote is expected to be close. Some hard-liners on the council say that the compromise is a surrender and that the Navajo should continue to push for the whole river. Promoting the proposal has also aggravated some very old, unhealed scars and brought voice to anguished questions of Navajo destiny.

Some in the tribe say a deal that benefits Gallup is just too bitter a pill to swallow, given the long history of hostile racial relations there. Old-timers still remember the storefront signs that said "No dogs or Indians."

What brought people together, and subsequently exposed their differences, was the dawning awareness of scarcity. When water in the San Juan was abundant, people involved in the settlement say, the murky question of who had first dibs on the river's flow was not so important. But when the river nearly dried up in 2002 - the drought's worst year here so far - that mind-set abruptly changed. Tribal farmers saw the intake system for their irrigation canals come perilously close to being unusable. Non-Indian farmers feared a "call" of water rights - an emergency legal sorting out, in which the oldest claims gets priority. The Navajo claims, by far the oldest, might win, giving the

tribe the whole river. Knowing precisely who was entitled to what suddenly looked a lot better.

"The settlement is essential for certainty, and the drought has created awareness of the need for certainty," said John R. D'Antonio, New Mexico's state engineer, who is in charge of administering water rules. "It's forced us to go out and be more deliberate; the drought may be a blessing in disguise in that regard."

At the heart of the resolution, negotiators say, are interlocking trade-offs, developed so that - at least in theory - each private interest must support someone else's goals to have its own needs satisfied.

For the Navajo, that means being asked to embrace the idea that the pipeline taking water to people like Mr. Yazzie would also benefit Gallup. Non-Indian farmers, who stand to have their water rights bolstered, and made far more valuable, by having the legal issues finally settled, were asked to become boosters for the Navajo cause. Gallup officials have become enthusiastic backers of Navajo water sovereignty.

"It's a vast sea change in thinking on both sides of the cultural divide between Indian and non-Indian," said Mark Edwards, a consultant to Gallup on the water settlement. "It says that we have a common future, that we have a common direction to go in, that your doing well is important for me to do well."

But that has not made it easy.

Jason John, a hydrologist in the tribe's water management branch, visited dozens of chapters to sell the plan, and he said that in general the closer a community was to Gallup, the more opposition he faced. Gallup, which has about 20,000 residents, and about equal numbers of whites and Indians, is the closest thing to a downtown across much of Navajo country, but many people Mr. John visited said they still feel stigmatized by white-owned businesses, through higher prices or poor service.

"Even though it would mainly benefit the Navajo tribe, there were just some people there who have had a long history with Gallup, and it's understandable," he said. "All they know is what they've lived through, so it's hard for them to go and understand something I'm telling them."

Desperate for water, officials in Gallup have tried hard to smooth out their rough edges. Business groups have been armed with talking points to support the settlement. Other people are closely monitoring negotiations to watch for any hint of language that might offend.

At a recent public meeting in Farmington an engineer from the Gallup water department was describing a water treatment facility proposed for the city. It would skim the water's surface for impurities, and it was called a scalping plant. Mr. Edwards, the city consultant, all but jumped from his seat.

"Please, please," he begged the engineer. "Isn't there anything else you can call it?"

Indian and non-Indian politicians say they also struggle with widespread disbelief that anything will really happen. Congress, in addition to the Navajo Council, must approve the plan, and even under the most optimistic timetable, the pipeline would not be completed until 2016.

The Navajo settlement also has consequences downstream on the Colorado River at Lake Powell, the huge reservoir in Utah that has lost more than half its water since 1999. Under the water-law agreements called the Colorado Compact, all states that share water from the Colorado River and its tributaries get a precise annual allotment. The upper basin states of New Mexico, Utah, Colorado and Wyoming have never used their full shares, and that surplus - along with two decades of wetter than normal precipitation before the drought - is essentially what allowed Powell to be filled. The Navajo settlement, one of many pipeline projects planned around the West to tap the Colorado's flow, would gradually use up New Mexico's allotment on the San Juan, leaving only the minimum legally required amount sent downstream for use by Mexico and the lower basin states of California, Arizona and Nevada - and none left over for Powell to store except in the wettest years.

But the real heart of the deal is not hydrology but human nature.

To get backing for the pipeline plan, for example, the Navajo negotiators compromised many of the tribe's old claims, which date back to 1849 and earlier. Under the agreement, the tribe would get only 55 percent of the water available for use in the San Juan - though even that amount is immense, more water than is allotted to the entire state of Nevada from the Colorado River. In return, the tribe would get the pipeline and other benefits, including a timetable for completion of a big federal irrigation project that was authorized by Congress in 1962.

Some holdouts on the Navajo Council say they are not sure the tribe's long-term interests are being served.

"There's nothing wrong with asking for the entire river," said Irvin M. Keeswood, who represents the Hogback chapter near Farmington. Most Hogback households already have running water. Mr. Keeswood said he was undecided about his vote. "This is a one-time shot for us, so it has to be the best we can get," he said.

Other council delegates argue that the spirit of compromise must be seized, or might be lost forever.

"Like any settlement, you go in with expectations and walk out with something less," said LoRenzo C. Bates, a delegate from Upper Fruitland who supports the plan. "For the Navajo to give up its claim on more than 40 percent of the river, that's a considerable compromise. But the certainty is the thing; we'll have something now that we can says is ours."

For many non-Indians, the give-and-take has been just as difficult. One lawyer who pushed his non-Indian clients to back the settlement said that refusing to negotiate, if it led to a court-ordered settlement, could be disastrous for everyone.

"It was like playing Russian roulette - the stakes were so huge," said Gary Risley, who practices law in Farmington. "The Navajos might win and suck the whole thing up, or we might win and they'd have no water for anything."

Underpinning much of the story of the settlement is the question of the future.

The growth arc of northern New Mexico and the West as a whole, demographers say, is toward an urban future, not the agriculture-based economy on which the Colorado River basin agreements were premised. That growing consensus, and its implication that cities will probably be required to buy out farmers' water rights over time, became a dynamic in the negotiations, water experts like Mr. Risley say, as non-Indian farmers sought certainty that the water they owned could eventually be sold with no legal entanglement or uncertainty about how much water belonged to the Navajo.

Here on the reservation, by contrast, many people say that keeping young people from fleeing to the cities means doing everything possible to make life less of a hardship. Lack of water is only one of many holes in the fabric, residents say. In White Rock, telephone service, mail delivery and reliable electricity are also widely unavailable.

"The older generation was stronger - technology has made us lazy," said Jennifer Juan, an artist who lives four miles from the White Rock water station. Ms. Juan stopped by for a shower on a recent morning with her 8-year-old son, Teton. Showers cost $1.01 each.

Ms. Juan said she once lived in Santa Fe, so she knows how strong the lure of town life can be and how much people take its luxuries for granted.

"It's amazing to think that they can just walk around the corner and take a shower," she said. "How blessed they are that they can do that."

LR in the News 07/25/04

Time to take another look at Glen Canyon Dam

Commentary
Salt Lake Tribune
Sunday, 07/25/2004

by Eleanor Inskip

This drought may be the blessing we need to take a fresh, honest look at the alternatives and the consequences of trying to continue with dams - especially Glen Canyon. And as a result, a fresh, honest look at former Congressman Jim Hansen's outdated ban on studying Glen Canyon Dam's decommissioning, now up for annual reconsideration by Congress.

This winter Lake Powell's principal purpose, water supply, is likely to be tapped for the first time in history. Never before has the reservoir's water storage been a benefit to downstream water users. During its 40-plus years, Lake Powell has lost from 30 to 40 million acre feet of water from evaporation and seepage. This water loss represents a four- to five-year supply for water users below Lake Powell, or more than 20 years of Utah's Colorado River water allocation. As the drought began we had stored only 23 million acre feet and the water supply continues to drop.

Lake Powell exists to satisfy a water accounting formula - a commitment by the states of Utah, Wyoming, Colorado and New Mexico to deliver on average 8.25 million acre feet of water per year to Arizona, Nevada, California and Mexico. Since 1922 this promise, part of the Colorado River Compact, has been met without using the stored water behind Glen Canyon Dam. But now nature is testing this antiquated compact for the first time. And dam or no dam, if nature does not provide the water, we are stuck. The federal government, as the ultimate water master, will likely pro-rate every state's allocations based on what the river is actually delivering, and the 8.25 million acre feet rule that led to Glen Canyon Dam will go the way of Prohibition.

We need to be looking at ways of saving this water. California, Nevada and Arizona are already doing so by instituting water-saving methods and storing Colorado River water in underground aquifers. Ground water storage loses as little as 1 percent without evaporation, as compared to more than 50 percent loss associated with what Lake Powell is finally providing.

And we need to be looking at ways of saving the river itself. We used to think that hydropower and dams were wholly beneficial, causing little damage to the environment. We now know differently. As the World Wildlife Fund reported in its recent study, Rivers at Risk, many of the benefits conferred by dams like hydropower are canceled out by wasteful water use and environmental damage. Dams disrupt the ecological balance of rivers by depleting them of oxygen and nutrients and affecting the migration and reproduction of fish and other freshwater species, the report states.

It's ironic that in addition to prolonging the ban on studying the decommissioning of Glen Canyon Dam, this year's Interior appropriations bill also includes $64 million for the continued removal of dams and the restoration of rivers in Florida. Since 1993 taxpayers have spent $1 billion for Everglades restoration.

We need to ask our legislators, Reps. Matheson, Cannon and Bishop, as well as Sens. Hatch and Bennett to do some house cleaning. Ask them to remove this ban and allow monies to be spent on the study of alternatives, solutions and restoration of the Colorado River.

The Colorado River is all we've got, and it's not much. Even in a good year, the Colorado River provides just 3 percent of the amount of water that annually flows down the Mississippi River. This water is precious - it is life itself for humans and all the other living creatures in the West. And while damming it up may have been the way of the past, it's not the way of the future.

Eleanor Inskip, author of Glen Canyon Before Lake Powell, is a Colorado River historian and program director at Living Rivers in Moab.

LR in the News 07/25/04

The Colorado's troubled waters
River Basin hasn't been this dry since the late 16th century

By BRENT ISRAELSEN for The Salt Lake Tribune

The Colorado River and its tributaries begin without drama, dripping from snowfields 14,000 feet above sea level. By the time they reach places like the Gates of Lodore in northwestern Colorado and Cataract Canyon in southern Utah, they are raging torrents, scouring the landscape with earsplitting fury before running into giant manmade dams that put an end to the river's fury!

During the past five years, the river has met an even more formidable foe: a prolonged drought.

This "early 21st century drought," as scientists now call it, is believed to be the most severe in more than a century.

Since 1999, annual water inflows to Lake Powell have averaged 7.1 million acre-feet (MAF) well below the 12.4 million acre-feet average during the previous 100 years and less than half the 15.1 MAF volume that was the basis for dividing the river among seven states in 1922. (One MAF equals about 326 billion gallons.)

This year's inflow is forecast at a dismal 5.6 MAF, according to a new report from the U.S. Geological Survey (USGS).

During the past five years, the river's average annual flow into Lake Powell is smaller than it was during the dustbowl years of the Depression, when the flow averaged about 10.2 MAF.

"We're in a nasty midterm drought," says Tom Ryan, hydrologist for the U.S. Bureau of Reclamation, which manages the dams on the Colorado River, the biggest single source of water in the Southwest.

According to tree-ring data, it hasn't been this dry in the Colorado River Basin since the late 16th century--about the time Shakespeare began writing his plays. At that time, the river was running at an annual average of about 8.8 MAF.

"The current drought may be comparable to or more severe than the largest-known drought in 500 years," states a new USGS report.

What the tree-ring and other historical evidence cannot predict, however, is what will happen in the coming years.

"The question is, where are we moving?" says David Meko, associate research professor at the Laboratory of Tree Ring Research at the University of Arizona.

Meko noted that the last prolonged drought in the river basin, in the late 1970s, was followed by an extremely wet period in the early 1980s that forced flood-control releases from Glen Canyon Dam on Lake Powell, which used to fill nearly every year in the 1980s and '90s. The current drought has pulled Lake Powell down to about 42 percent of capacity. Ryan predicts it will take 15 years of normal precipitation to fill the reservoir again, although a wet cycle like that of the early 1980s could fill it in four years.

Farther downstream, Lake Mead behind Hoover Dam in Nevada is down to 51 percent of capacity.

The surfac e of the lake, which supplies 85 percent of Las Vegas' water, has dropped to about 1,125 feet, becoming uncomfortably close to the 12-foot-diameter intake for one of the pipelines that sends water to Sin City.

The upper layer of the lake contains lower-quality water that can overtax water-treatment plants.

To reach deeper and cleaner water, the Southern Nevada Water Authority is spending an unanticipated $6.4 million this summer to install a "sleeve" that would extend the intake downward another 70 feet.

"If the lake were higher, we would not have to pursue this project," said Marc Jensen, the Las Vegas water agency's director of engineering.

Despite the less-than-cheery news about low lake levels and river flows, federal officials say they are far from panic mode.

The reservoirs on the Colorado River are doing what they are designed to do, says Ryan. "People became accustomed to seeing Lake Powell full or near full. I don't think people know that Lake Powell was meant to go down."

Bennett Raley, U.S. Interior Secretary Gale Norton's point man on Western water issues, says the drought is a "serious matter" and a "wake-up call" but not a "crisis."

A few more years of this dryness, however, could test like never before the laws and officials that manage the Colorado River, arguably the most over-allocated in the nation.

"You have to be concerned because you don't know whether you're in the sixth year of a six-year drought or the sixth year of a 15-year drought," says Don Ostler, director of the Upper Colorado River Basin Commission.

Seven states, including Utah, divide the Colorado River, which is governed by interstate compacts, international treaties, several court decrees and federal statutes known collectively as the "Law of the River."

The law has worked reasonably well in recent decades, mainly because there was plenty of water to go around. The upper Colorado River Basin states of Utah, Wyoming, Colorado and New Mexico were using much less than their full share of the river. And abundant precipitation was keeping the river and its reservoirs full of water, providing a "surplus" that allowed the lower basin states of Nevada, Arizona and California to use more than their legal share.

The time of plenty on the river appears to be over.

The upper basin states along with American Indian tribes are planning to increase their take of the river at the same time Lake Powell – the "bank account" that helps the upper basin meet its obligations to the lower basin--is shrinking.

'If the drought continues, Powell could reach its lowest outlet, located at 3,370 feet above sea level, in three years. At that point, only water that flows into the reservoir will be allowed to flow out of it, making contractual water deliveries to the lower basin more difficult. Power generation from Glen Canyon's hydroelectric turbines would come to a virtual standstill, as would motorized boat recreation.

"There is the potential for significant problems, particularly for the lower Colorado River Basin," says Ostler. "That basin has become accustomed to using surplus water. In a drought, you don't have surplus water. That can put them in a bind."

Arizona, which holds the most junior rights on the river, would be hit first, followed by Mexico and Nevada. California, with its senior rights, would be the last to be affected by shortages, although the state only recently has been living within its 4.4 MAF share of the river.

Las Vegas would suffer the most from shortages, because, unlike the other river users, it has no agricultural "buffer" in its 300,000 acre-foot share. Cutbacks would be passed on directly to homeowners and businesses, including the giant casinos and resorts upon which the city has built its economy.

Declaring shortages on the river will not be an easy task for the Interior Department, which would find itself caught in a heated feud between jealous states.

"There are some absolutely intriguing questions about the relationship between the upper basin and the lower basin that we'll answer as time goes on," says Raley. "But unlike prior times, when all the fights were almost always about the future, the drought will be about now.

"We only have so much water and no [interior] secretary can increase that."

But Interior, Congress and the Colorado River states should re-examine the river's limits and adjust the Law of the River accordingly, says Owen Lammers, director of Living Rivers, a Moab-based environmental group.

"We should be preparing for significantly lower flows than were planned for 80 years ago."

LR in the News 07/25/04

Lake Powell is at the heart of the battle over restoring natural flow

Shaun McKinnon The Arizona Republic Jul. 25, 2004 12:00 AM

PAGE - Stranded on a reddish rock shelf 60 feet above the surface of Lake Powell is a string of blue and white plastic floats, the kind that mark water boundaries. No one threw them up there or dropped them from the canyon rim 50 feet above. They just ended up there as the reservoir shrank.

The boats across the bay at Wahweap Marina are docked at water's edge, but the trucks, SUVs and trailers are crammed into an awkward, makeshift parking area, a rocky patch that two years ago was underwater.

Above the marina, the white "bathtub rings" etched into the canyon walls by years of subtle seasonal shifts in lake level look more like ghostly afterimages from a picture long gone, a reminder of how much of itself the reservoir has lost.
The scars chiseled by five years of drought on the Colorado River are impossible to ignore here in the shadow of Glen Canyon Dam, no matter how many boaters or fishermen continue to use the reservoir. To the West's water managers, they are battle scars, proof that the system works. Store water in amounts this vast and the 30 million people tethered to the river can survive the worst of dry spells.

But to others, the reservoir and the dam are ugly symbols of a good idea taken too far. The lake's declining volume - it is at its lowest level since it was first filled in the early 1970s - has revived talk of draining it and decommissioning the dam. At the very least, some conservationists say the conditions here, nearly 700 miles from the river's pristine headwaters, are evidence that the West's growth has come at a destructive cost to its rivers and the environment.

From a windy ridge overlooking Wahweap, John Weisheit sees the ugly symbol. A veteran river guide, Weisheit is the conservation director for Living Rivers, one of the groups arguing that unless Lake Powell is drained and the Glen Canyon Dam taken down, the river and the singular ecosystem it supports through the Grand Canyon will die.

"I've been coming here for 32 years, and it looks like it did when I first started coming," said Weisheit, dressed in faded jeans, a T-shirt and a "Colorado Riverkeeper" cap. His car is littered with books and colorful folders of literature about the Grand Canyon and how it has suffered because of the dam. "Lake Powell is draining, and we might as well get used to it," he said. "This is the way it's going to be. We need to find ways to live without the lake, because our bad water management practices are killing the Grand Canyon. We don't need Glen Canyon Dam. We never did."

Just about every Western water agency and even other environmental groups dispute Weisheit's claim. They insist that there are plans to help restore the Grand Canyon and that without Powell, this drought would have plunged the West into chaos.

What is undeniable is that the Glen Canyon Dam changed the Colorado River and the Grand Canyon in a way that has made them less hospitable for native species.

The debate over those changes has helped frame the broader discussion of how to develop the West's water resources without destroying natural habitat. Urged on by conservation groups, an increasing number of government agencies and courts say the environment should be considered a water user, like a city or a state, and among their solutions is reducing the number of dams.

Lake Powell's role

From his office at the Carl Hayden Visitors Center, Ken Rice commands one of the best views anywhere of the Glen Canyon Dam. A wide window takes in both the downriver side of the dam and a slice of Lake Powell. Rice, who manages operations at the dam for the U.S. Bureau of Reclamation, admits the sight can be distracting.

The lake's low level is obvious from up here. But Rice said he doesn't see failure, even though the bureau's own hydrologists suggest Powell could become so low in as soon as four years that the dam may not be able to release any water downstream.

"It's doing exactly what it was designed to do," he said. "You take us out of the equation and (Lake) Mead would be way down, maybe even too far down to generate power."

Lake Powell was built primarily to store water on behalf of the upper-basin river states, which are required to deliver a minimum amount of water each year to the lower-basin states. In a typical year, the Colorado River would replace the water released to the downriver states from Powell. In a drought year, the lake level falls. Five consecutive dry years have lowered Powell by more than 100 feet.

At least two sets of scientists have run models of the drought-impaired river without Powell in the system. Both concluded the lake is critical to the West's survival. One study said Lake Mead would have fallen to about 9 percent of its capacity by now, which would cut off Las Vegas from 90 percent of its water.

Hydrologists for the Central Arizona Project, which delivers Colorado River water from Phoenix to Tucson, also ran models on a Powell-less West. To start, there would have been no CAP, which was approved in part because Powell was adding new storage.

Over 40 years, the time span since the dam was completed, at least 45 million acre-feet of water, a 100-year supply for nearly 2 million people, would have flowed unused into the Gulf of California. And without Powell, Lake Mead would have fallen low enough to produce West-wide shortages in 2002, according to the model.

That's not reason enough for Weisheit and groups like his and the Glen Canyon Institute. They cite figures about how much water from Powell is lost each year to

evaporation and show evidence that government efforts to restore the downstream ecosystem have failed.

"There are so many holes in the system right now," he said. "Instead of slapping on a Band-Aid, let's start fresh. If this drought, this climate change, gets worse, it doesn't matter how many reservoirs you have, there's not going to be enough water. And even if the lake recovers, the problems will remain."

Page needs Powell

In Page, there is no debate over the value of Lake Powell. Without the lake, there is no Page, which otherwise would sit on a plateau high above the Colorado River. News reports about the lake's low level upset business owners, who say the media have painted an unfairly bleak picture of Powell.

"People who have not come here before or who come once a year are very happy with what they find," said Joan Nevills-Staveley, executive director of the Page-Lake Powell Chamber of Commerce and Visitors Bureau. "This probably is the optimum lake level for camping. We don't want it to stay there," she quickly added, "but a lot of the canyons are now accessible that weren't before."

It's not surprising to get the chamber outlook from the chamber boss, but Nevills-Staveley knows a bit about Lake Powell and the Colorado River. Her father was the first commercial river runner, taking tourists down the San Juan River and the Colorado from Mexican Hat, Utah, to Lees Ferry, beginning in 1938. Nevills-Staveley herself helped start the first concession operations on the lake's upper arm, at Hite Marina, which has closed because of the drought.

From her cramped corner of a narrow storefront office on Page's main drag, Nevills-Staveley tries to reassure people when they call that there's still ample water to boat and fish and that camping and hiking opportunities abound.

She is Page's own encyclopedia at times: "How many motel rooms do we have?" an office worker yells after picking up an incoming call. "Fifteen-hundred-and-one," Nevills-Staveley replies. She scoffs at the drain-the-lake crowd: "It's not a well-thought-out plan," she said. "Most of us thought it was funny, because it is. It's ludicrous.

Then we saw they were serious, and there's been a lot of misinformation since then." When the idea was first floated, "people called and canceled houseboat rentals and river trips through the Grand Canyon," she said. "It was scary. The standard answer here is 'Yes, there is less water, but there is still over 400 feet at the dam.' "

In 1997, a group of Page residents formed Friends of Lake Powell to help counter the anti-dam movement. Paul Ostapuk, an environmental scientist for Salt River Project in Page, said the groups behind the proposal don't have nearly the support they claim.

He also suggests their focus on restoring Glen Canyon ignores the reality of the region. "The lake when it was full only covered 13 percent of Glen Canyon," Ostapuk said. He pulls up a picture on his laptop computer, which he set up in the lobby of a hotel up the

hill from the dam. "It isn't like there was nothing to see. But that's the picture that gets painted. The lake at half-full years ago was a spectacular place to come. The lake now is still a spectacular place."

Managing nature

Above Lake Powell, the Colorado River runs wild and muddy, just as it did when Maj. John Wesley Powell first explored it in 1869. Then, the river was unpredictable, its flow fluctuating wildly with the seasons. It stirred sediment, earning its name - Colorado, or red-colored - from the rusty tinge it took on after carving its way through Utah's canyon lands.

Glen Canyon Dam changed that. Once the water is impounded behind the giant concrete structure, the silt and sediments settle. The water temperature drops as the lake deepens. By the time it passes through the power turbines at the dam, it is cool and clear.

That's not good for the native fish species, which like warm, muddy water, but it's ideal for non-native trout, which like to eat native fish. The population of the endangered humpback chub, a fish that evolved over millennia and lives only in the lower Colorado River, has fallen by nearly 70 percent since 1989, and scientists blame the dam.

Federal officials launched an adaptive management program nearly a decade ago to try to help the fish and other species. A key was to mimic the river's old flow patterns and move sediment. In 1996, then-Interior Secretary and former Arizona Gov. Bruce Babbitt oversaw an engineered flood, which was meant to move sediment and help rebuild beaches and restore fish habitat.

That experiment is now considered largely unsuccessful, but others have followed, including the removal of trout from areas where chub live.

Nikolai Ramsey works for the Grand Canyon Trust, a conservation group working to protect the Colorado River's geologic masterpiece. He is the group's representative on a regional committee that evaluates the adaptive management program.

Ramsey works in Flagstaff, a steep 130-mile drive from the dam, but he shuttles among Flagstaff, Page, Phoenix, Salt Lake City and the Grand Canyon often and has watched the work up close in the Canyon. He still believes it's possible to manage the river for human use and still find ways to protect endangered species and habitat.

"There is some human arrogance on our part in thinking we can manage the river by mimicking natural conditions," he said. "But we can take a shot. Let's push the science as far as we can and have the science drive the management actions. Let's see if we can't have both the conserving of the human values that derive from the dam being there and also the environmental values. We still think that's possible."

He said the idea of removing the dam is not without logic, but the political and practical realities are that it's there "and it does achieve its purposes."

Environmental shifts

Along the receding shorelines of Lake Powell and Lake Mead, biologists are watching the effects of the drought as it reveals long-buried box canyons and takes water back from marshes and inlets. Already, thickets of tamarisk, a fast-spreading invasive tree, have appeared on the upper end of Lake Mead, where water levels have dropped dramatically.

Tamarisk, also known as salt cedar, can kill out native plant species, but it also provides an attractive nesting spot for birds, including the endangered Southwestern willow flycatcher. That happened at Roosevelt Lake northeast of Phoenix, and the lake's operator, Salt River Project, was forced to spend millions of dollars to create a new nesting area for the bird. Without that habitat plan, SRP could not allow those areas of the lake to be inundated with water once lake levels began to rise again, eliminating critical water storage.

"That could happen up there, but we can't really predict it," said Lesley Fitzpatrick, a wildlife biologist for the U.S. Fish and Wildlife Service. "It would depend on how fast the trees grew and how long the water stays low. It happened over a long time at Roosevelt."

Early surveys haven't turned up any flycatchers in either reservoir, but Fitzpatrick said she has seen other changes. Habitat has dried up in some places, forcing birds and other wildlife to move on. In some ways, she said, the ebbing and flowing of the lakes mimic the old river, exposing habitat and then drowning it again later, but "the scale is different and the timing is different."

And that's the point, said Weisheit, the river guide and environmentalist. No amount of tinkering with the dams and the lakes will ever restore the Colorado River to the way it was. The river needs to run freer, even if that means the West has to make do with less water.

"We need to face reality," he said, packing up his car for the return trip to his home in Moab, Utah. "We live in a desert. We need to reduce our water use. As long as Glen Canyon Dam is here, the Grand Canyon is at risk." He watches another carload of tourists pull up and snap pictures.

"People will still come here," he said. "Moab makes as much money as Page, and it's not dependent on a reservoir that is consumptive, expensive and polluting. When the Grand Canyon is dead, do you think people are going to come out here? And who are they going to blame? The whole world is watching." If the drought persists and Lake Powell falls so low that it can't generate power, a level the lake could reach by 2007, then its economic value will be reduced to local recreation, especially if the bureau begins to manipulate water releases to restart the turbines.

The worst-case scenario up and down the river is dead pool, when the lake drops too low to let water out at all. The downriver states could survive on Lake Mead storage, but the river's economy would crash. A dry river would be an environmental catastrophe,

Nikolai Ramsey said, and if the lake didn't recover quickly, natural habitat could be lost for years.

But Ramsey isn't ready to buy the all-or-nothing equation yet. "We're still in a good place where there is human and environmental synergy possible," he said. "When power is lost and flows become less flexible for resource management actions, then we're in trouble. "Then it becomes more dam vs. Grand Canyon."

What keeps him and other river watchers optimistic is that even in a long drought, there's usually a year with normal rain and snow, and normal at this point would buy the Colorado time, maybe enough to keep itself alive

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LR in the News 07/26/04

The next big drought may be more painful

By Brent Israelsen for the Salt Lake Tribune

If history is a guide, this six-year drought should have ended already. Chances are good it will end this year. Or next. But what if it doesn't? How many more years of below-normal precipitation can Utah withstand before the state's economy and way of life begin to suffer? What if this drought is the beginning of an epic change in climate? What happens during the next prolonged drought, 50 years from now, when Utah's population is more than twice its current size? Will there be anything left for fish and wildlife that depend on streams?

These are questions that should keep state water planners and environmentalists restless through these balmy summer nights. For now, though, Utah's chief water czar, D. Larry Anderson, appears to be sleeping just fine -- mainly because he has, as he puts it, a good "cushion." That cushion is the huge volume of water used by Utah's farms and ranches, which accounts for about 80 percent of the state's total developed water supply.

During droughts, agriculture -- which draws water directly from streams and small reservoirs -- takes the hit. Municipal supplies, which are built around large reservoirs with several years of built-in storage, are less susceptible to prolonged dry spells. "There will be some cushion," Anderson says, sporting a "Slow the Flow" T-shirt. "We have plenty of water for the foreseeable future."

The problem is, not all of it is available for drinking. Of the approximately 7.3 million acre-feet of water that flows through the state each year, only about 1.2 million acre-feet can be delivered today for culinary use. Residents consume nearly 1 million acre-feet per year. The rest of the state's water supply goes to agriculture, the Great Salt Lake, evaporation and to states downstream on the Colorado River.

Assuming current population trends and per-capita rates of consumption, culinary water demand is expected to rise to 2 million acre-feet by 2050, leaving a deficit of about 800,000 acre-feet above the deliverable supply of 1.2 million acre-feet. State water officials hope to squeeze about half of that water from people, through conservation. After all, about two-thirds of Utahns' water use is for landscaping, and experts estimate about half of that is wasted. The state hopes to cut Utahns' per-capita water consumption by 25 percent by 2050.

As subdivisions sprout up in once-irrigated fields, another 264,000 acre-feet are expected to become available, as agricultural water rights convert to municipal and industrial rights. After conservation and agricultural conversion make their contributions, Utahns in 2050 still would be short about 136,000 acre-feet.

That deficit, Anderson says, would be made up from any combination of three major new water projects now on the drawing board. Each of them would require enormous public investment at a time when existing water infrastructure, such as delivery systems and treatment plants, need to be expanded or replaced.

The Bear River is considered the next most likely source of water for the Wasatch Front, which hopes to siphon about 150,000 acre-feet a year. The total project would cost about $600 million.

In southwestern Utah, water managers from Washington and Iron counties are eyeing a $400 million pipeline project that would deliver water from Lake Powell, more than 120 miles away. A third, though less likely, project contemplates a 115-mile pipeline that would run from northern Flaming Gorge in Wyoming to the Weber River Basin drainages near Coalville. Estimated to cost about $300 million, the pipeline could deliver about 60,000 acre-feet of water a year to the Wasatch Front.

Environmentalists say the new water-development projects would unnecessarily disrupt ecosystems and landscapes. They argue for more emphasis on conservation, better planning, curbs on growth and a shift in planning.

"During this drought, there's been no discussion about the environment," laments Owen Lammers, director of the Moab-based Living Rivers. "It's been people, people, people. We want to make sure the environment has a seat at the table in managing human demands."

Erica Thoen, of the Salt Lake City-based Utah Rivers Council, criticizes the state's water goal of reducing per-capita daily consumption by 25 percent by 2050 -- as too weak. Utahns, she notes, already have reached much of that goal during this current drought. In Salt Lake City, for example, residents have cut their water use by 18 percent. Today, a Salt Laker consumes about 214 gallons per day -- 10 percent less than the statewide target of 240 gallons four decades from now.

And the city's conservation director, Stephanie Duer, says she believes the city can do even better. A larger sampling of 16 major water agencies around the state suggests that, despite a growing population, total water use in Utah has declined 19 percent

since 2000. So is the state goal too wimpy? State officials defend their conservation goal, which was established well before this six-year drought began, as being achievable and sustainable without being draconian.

"Beyond [25 percent], things get tougher," says Anderson. "The environmental community wants us to do it tomorrow. We can't force it down [residents'] throats." To get more than 25 percent, water agencies would have to increase water rates and cities would have to enact restrictions on landscaping and limit the size of residential building lots, which Anderson says are too large.

He does not believe, however, in the need for government curbs on growth, noting the potential for obtaining more water through conservation and converting more agricultural shares. "We don't think water is a limiting factor," Anderson says.

However, to date the state's plans for providing water to ever-increasing populations have not factored in the possibility of climate change caused by global warming, which many leading scientists say could significantly alter how and when Utah gets its precipitation.

"We've got to get away from historic planning and look at new hydrologic realities of a shrinking snowpack and changing seasonality of runoff," says Fred Wagner, a Utah State University professor emeritus and expert on global warming. "It is potentially a serious problem that needs serious analysis."

Global warming notwithstanding, the current drought has given water officials plenty of pause. "Long-term drought cycles of many years should be expected," says Richard Bay, chief engineer of the Jordan Valley Water Conservancy District. "We'll make it through this [drought] quite nicely. "The next time this occurs, with an increased population, that will be the true test."

Water consumption in Utah is down, but is it enough?

LR in the News 07/26/04

Glen Canyon Dam flow regime a 'failure,' report says

April Reese, Greenwire Southwest correspondent

A 13-year-old experiment aimed at improving ecological conditions in the Colorado River watershed below Glen Canyon Dam is failing and needs a management overhaul, according to a draft report by a group of scientists that monitors the dam's environmental effects.

Since 1991, Glen Canyon Dam has operated under "modified low fluctuating flows" (MLFF), intended to help recover the endangered humpback chub and other species

downstream in Grand Canyon National Park without scaling back power production or recreational activities such as rafting.

MLFF involves daily variations in flow. For example, on weekdays in July, daily fluctuations vary from 10,500 cubic feet per second (cfs) during the late evening and early morning off-peak hours to 18,500 cfs during peak times in the late afternoon and early evening. Still, the MLFF is a highly regulated version of the river's historic flows, which seasonally ranged from as little as 500 cfs to as much as 100,000 cfs.

Under the current flow regime, the endangered humpback chub, which once thrived throughout the Colorado River Basin but now occupies only the lower basin in the Little Colorado River, continues to spiral toward extinction, declining by an average of 14 percent each year, according to the draft report.

"One of the justifications for the MLFF policy was apparently an assumption or prediction that MLFF would have beneficial ecological effects relative to the more violent diurnal flow variations that preceded it," the report says. "We show that no such beneficial effects are evident in the ecological system (except to abundance of exotic trout), and in fact the move to MLFF is correlated with a relatively sharp decline in humpback chub recruitment."

Hydropower production has also declined under the low fluctuating flows, the report notes. The Western Area Power Administration, which sells power from Glen Canyon Dam, has had to cut its electricity generation by roughly 25 to 30 percent, or 400 to 440 megawatts, in recent years. To make up the difference and meet power contract commitments, WAPA purchases power from other producers -- an expensive stopgap measure.

In fact, the only beneficiaries of the modified low fluctuating flow regime have been exotic trout that eat endangered chub and the rafting industry, the report concludes.

"At present, power utilities and their ratepayers are essentially subsidizing, at considerable cost, improvement in the quality of Grand Canyon for some recreational uses," the report reads. "It is one thing to impose such costs to deal with some broad public interest such as protecting an endangered species, but quite another one to impose it for the benefit of particular stakeholders."

The issue of flows from the dam needs to be addressed "openly and quickly" before it "leads to a breakdown in the collaboration among stakeholders that has made adaptive management possible in Grand Canyon in the first place," the authors warn.

Management of Glen Canyon Dam and the Colorado River's resources in the park is overseen by a diverse group of stakeholders called the Adaptive Management Work Group, which monitors how well policies are working and suggests changes in course when necessary. Participants range from Bureau of Reclamation officials to fisheries biologists, environmentalists, hydropower interests and American Indian tribal representatives. The stakeholders periodically examine the latest scientific information

on the river and make management recommendations to the Interior secretary, who decides whether to implement them.

The draft report, written by the technical arm of the group that advises the stakeholders on scientific matters, suggests that a switch to a more variable flow pattern may benefit both ecological resources and power production in the Grand Canyon.

Carolyn Hinkley, a spokeswoman for the Western Area Power Administration, agrees. "It has cost us $50 million a year more with the modified low flows," Hinkley said. "When we have fluctuating flows, it does allow us to meet demand more easily."

Experimental flows over the past two winters that have increased daily fluctuations in an attempt to reduce the exotic trout have enhanced power production, Hinkley said.

But others contend dam managers should embrace more variable flows that mirror natural, seasonal fluctuations. These "seasonally adjusted steady flows," which were recommended by the Fish and Wildlife Service a decade ago, would attempt to mimic the Colorado River's highly dynamic natural flow, advocates of such measures say.

But mimicking the river's historic low-flows would result in drastically reduced power production and revenues for WAPA, said Owen Lammers, executive director of Living Rivers, an advocacy group based in Moab, Utah. Lammers and other critics of current management practices charge that WAPA has too much influence over management decisions, a charge the agency dismisses.

"We have one vote just like any of the other representatives on that group," said Hinkley, the WAPA spokeswoman. "It takes two-thirds of the group to decide on what direction to take."

The ecosystem's needs are not the only factors to be considered, stakeholders point out. Through the adaptive management work group, they must also weigh the needs of boaters and other recreationists, American Indian tribes, irrigators and cities that depend on the dam for hydroelectric power and its reservoir, Lake Powell, for water supplies.

Lammers said the draft report provides further evidence that BuRec, which operates the dam, needs to consider a new approach for dam operations. "There's been an abundance of new information that reinforces that we need to take a much different look at what's needed to recover the resources in Grand Canyon," he said. "Right now, they're operating without a net."

Living Rivers and about 200 other environmental groups have asked BuRec to draft a new environmental impact statement that would examine both seasonally adjusted steady flows and the decommissioning of Glen Canyon Dam, either of which they say could reverse the decline of the humpback chub.

Hinkley said WAPA and other stakeholders are meeting to sort out an experimental flow regime to address the concerns laid out in the draft report.

EVIDENCE FOR THE FAILURE OF THE MODIFIED LOW FLUCTUATING FLOW ALTERNATIVE (MLFFA) TO BENEFIT MOST ECOLOGICAL RESOURCES IN GRAND CANYON [96k PDF File]

LR in the News 08/01/04

Odds seem long, time short for Canyon chub

By Mitch Tobin
ARIZONA DAILY STAR

LITTLE COLORADO RIVER - Pitted against a 710-foot dam, blue-ribbon trout fishery and the water demands of 25 million people, humpback chub are swimming upstream to survive.

The prehistoric-looking minnows once numbered around 100,000 in the Grand Canyon. But today - four decades after Glen Canyon Dam transformed the Colorado River from warm, muddy and variable to cold, clear and calculated - the population is down to about 3,000.

"It's as if you took a rhino or an elephant out of the African heat and tried to raise them in Alaska," said David Haskell, who ended his 33 years with the federal government as science director of Grand Canyon National Park from 1994 to 1999.

Tens of millions of dollars already have been spent to help the chub. An even bigger bill may be coming as officials consider retrofitting the dam or altering its releases, now regulated more by the Sun Belt's demand for air conditioning than nature's ebb and flow. Even if society doesn't fully accept the ethical, aesthetic, ecological and educational rationales for saving rare creatures like the chub, the strict Endangered Species Act could make the spending mandatory.

The radical change to the Colorado let rainbow trout thrive below the dam and helped many of the river's other introduced fish species, some of which feast on the natives. But the frigid water has made it virtually impossible for chub to spawn in the Colorado, forcing them to swim up the last 10 miles of a tributary, the Little Colorado, to reproduce.

Just since 1989, the estimated number of chub in the Grand Canyon has fallen by two-thirds, drawing the fish further down a path to oblivion already blazed by the bonytail chub, roundtail chub, razorback suckers and Colorado squawfish.

"The population may be so small now that it's ecologically extinct and can't come back," said Chuck Minckley, a U.S. Fish and Wildlife Service biologist whose doctorate examined the chub's history since 1908.

Environmentalists have long dreamed of decommissioning the dam that created Lake Powell, with radical factions fantasizing about blowing it up and the mainstream arguing it will back up with sediment anyhow and be vulnerable to collapse.

Activists vow they'll sue by year's end to force a new study of how and whether to operate the dam - a linchpin of the plumbing system that feeds Tucson and Phoenix via the 336-mile Central Arizona Project canal, plus Las Vegas and Southern California.

The first environmental impact statement, finished in 1995 after 50,000 public comments, was funded by $104 million in hydropower revenues.

With record drought gripping the Colorado's basin - Lake Powell hasn't been this low since it was filling in the 1970s - federal officials say the reservoir is more valuable than ever.

"If we did not have the Glen Canyon Dam, Arizona would be in a serious crisis today," Interior Secretary Gale Norton said in Phoenix last week. "You don't survive a long-term drought unless you have storage."

The Bureau of Reclamation, overseen by Norton, won't even consider damning the dam, but is again contemplating a major modification to the upstream face that would let warmer water pass through its turbines - and cost up to $160 million.

It wouldn't be the first time the chub altered how the dam is run. In 1996, former Arizona Gov. and then-Interior Secretary Bruce Babbitt opened its 8-foot- wide floodgates with much fanfare to re-create spring floods. Weeks later, the experiment was hailed as a success in creating beaches for boaters and backwaters for chub. But researchers now say whatever gains were made were fleeting. Sand bars washed away within a year.

More experimental floods in the spring of 2000, followed by low flows all summer, forced the dam to cut power generation when it's most lucrative, hitting energy buyers with $21 million in extra costs, according to the Colorado River Energy Distributors Association.

Falling water spinning blades of turbines lets Glen Canyon Dam produce 1,300 megawatts at full capacity and power 3 million homes. Cutting that supply means utilities must find more costly substitutes, said LaVerne Kyriss of the Western Area Power Administration, which markets the dam's energy.

Environmentalists counter that the dam's power supply could be offset if 10 million homes replaced two standard light bulbs with energy-saving compact fluorescents.

A river transformed

Before the government's 20th-century dam-building campaign, the Colorado's flow was as uneven and mercurial as the topography and climate of its 244,000-square-mile basin, which extends from sand dunes in Mexico to the glaciers of Wyoming's Wind River Range.

In spring, the river could roar with turbid snowmelt at 100,000 cubic feet per second, only to shrink to a trickle of 3,000 cfs in summer. Water temperatures ranged from near freezing to more than 80 degrees.

Today, just below the dam, the Colorado is a nearly constant 46 degrees because water is drawn through turbines from hundreds of feet below the surface, where sunlight can't penetrate. Rafters who fall overboard may flirt with hypothermia in July. Young chub that survive the thermal shock are often paralyzed and vulnerable.

Though fickle in its flow, the Colorado has become the lifeline of the Southwest. Starting with Hoover Dam in the Great Depression, colossal dams and aqueducts were built to capture floods and survive the droughts. The Sierra Club and its leader, David Brower, blocked plans in the 1960s to plug the river in the Grand Canyon, but only after they had accepted Glen Canyon in exchange for the government's scrapping a dam that would have submerged part of Dinosaur National Monument in Colorado.

Brower carried regrets to his grave. And for people like former Tucsonan Dave Foreman, a disenchanted D.C. lobbyist for the Wilderness Society, the 5.4 million cubic yards of concrete epitomized the perils of political compromise. On the 1981 spring equinox, Foreman and other founders of Earth First staged their first protest.

Egged on by Tucsonan Edward Abbey, whose novel "The Monkey Wrench Gang" depicts a band of saboteurs plotting to blow up the dam, they unfurled a 300-foot, black-plastic banner down the dam's ivory face, making it look as if they'd cracked their concrete demon.

Even before the dam, chub had to compete with non-native fish introduced as early as the late 1800s, sometimes by the agencies now struggling to recover the endangered fish.

The rainbow trout fishery at Lees Ferry, which would disappear if the dam did, now attracts anglers from around the globe, provides hundreds of jobs and brings in $20 million per year, said Terry Gunn, co-owner of Lees Ferry Anglers and the adjoining Cliff Dwellers Lodge.

"Every dollar is important to this (economically depressed) area," he said.

Brown trout prey on chub, he said, but the impact of rainbow trout is overblown since they're insect-eaters and studies have found other fish in the stomachs of fewer than 1 in 100 rainbows.

Recent experimental flows and limited removal of non-native fish have been both costly and ineffective, he said. "We're all in favor of the recovery of the humpback chub. But, so far, they haven't done anything to really help the chub."

Little Colorado sole nursery

Because the Colorado's main stem is so cold and clear - giving sight-based predators a leg up on their prey - the Little Colorado has become the sole maternity ward for the

Grand Canyon's chub. The LCR, as it's known, starts on 11,403-foot Mount Baldy in the White Mountains, then snakes to the northwest, often as a trickle, before reaching the Painted Desert and Navajo Reservation.

Near the confluence with the Colorado, the river glistens like one of the turquoise necklaces fashioned thousands of feet above on windswept plateaus dotted with hogans and sagebrush. Up close, the river looks more like skim milk and the shores are encrusted with a white ring. The dissolved minerals also emerge from solution to form small dams and falls in a process similar to the creation of stalactites and stalagmites.

You could drink the water in an emergency, river rats say, but soon you'd be losing as much fluid in diarrhea. So the researchers who arrive here by helicopter bring their own water, along with a half-ton of other supplies, to support their 12-day surveys.

Biologists set about 20 hoop nets a day. They return the following morning to measure the fish, record their reproductive status and use syringes to inject half-inch, $4 transmitters similar to the microchips used to reunite pets with their owners. Scientists can infer population trends and growth rates by continually recapturing the fish because each tag, when passed through a special wand, emits a unique 12-character code.

"That's his social security number," said Dennis Stone, a Fish and Wildlife biologist who has spent up to 120 days a year in the Canyon.

In 1993, Stone saw the LCR at 20,000 cubic feet per second. Three months ago, the 70 degree river was at its base flow of 240 cfs, fed entirely by Blue Springs.

"If Blue Springs ever dries up, these fish are toast," he said.

Below Lower Atomizer Falls, Stone swims across the river to check nets, a wad of tobacco between cheek and gum, only his bespectacled head visible. The call of canyon wrens cascades from red spires along with the slanted sunlight, creating a setting so sublime as to appear unreal, like a 19th-century, Romantic-era landscape painting.

On the shore, the smell is almost marine, the mud sometimes becomes quicksand and the thick ribbon of riparian vegetation - mesquite, acacia, cattails and salt cedar - lashes the researchers' shins. Atop a sand terrace, volunteer Bill Pine and biologist Josh David pluck captured fish from a plastic bucket, struggling to hold the muscle-bound creatures in their hands.

"This is a fish made to run the rapids," said Pine, a scientist at the Mote Center for Fisheries Enhancement in Sarasota, Fla. "It's a body shape built for speed, and it's highly evolved for this river."

Embedded scales make the chub feel leathery, and its nostrils have flaps to keep out sediment. Its big, sickle-shaped tail, like a tuna's, propels it through swift water. The namesake hump is thought to act like a rudder and help keep it near the bottom of the river.

"They're about as charismatic as a fish gets," David said.

The LCR's chub have become one of the nation's most intensively studied fish populations, but much of their biology remains shrouded in mystery. Some scientists, however, fear repeated handling of the chub could be hurting them.

David suspects young chub may be eaten while in the nets. He'd like to use underwater cameras to examine that, plus the escape rate from nets and spawning behavior, which has never been observed directly.

"Know anyone with $15,000 for a chub study?" he asked.

Search for warmer water

Federal officials will need a lot more than that to make Glen Canyon Dam chub-friendly.

The proposed temperature- control devices - derided by critics as band-aids - would draw water from closer to Lake Powell's sunny surface, instead of the reservoir's chilly depths.

Getting Congress to fund the project will be a challenge, but it could be operational as soon as 2007, said Dennis Kubly of the Bureau of Reclamation.

Fitting just two of the dam's eight penstocks, at a cost of $20 million each, would probably gain the most bang for the buck, Kubly said. The trick, scientists and federal officials agree, is to warm the releases enough to help the chub, but not so much that its non-native predators benefit even more.

Similar technology is already used at Flaming Gorge Dam in Wyoming, Shasta Dam in California and some five dozen other sites Reclamation studied.

"In almost every example, the outcome has been positive," Kubly said.

The devices won't, however, do anything to stop the dam from trapping 95 percent of the Colorado's sediment.

Replicating the natural system would require adding up to 10 million tons of silt per year, the 1995 environmental study said. Proposals have been floated to use trucks, barges or a slurry pipeline that would have cost $50 million to build in 1995 and $10 million per year to run.

Environmentalists say the sediment is crucial not only for chub, but the rest of the Grand Canyon ecosystem. But the cost would be astronomical, requiring four tandem-trucks to dump silt every minute, in perpetuity, said Owen Lammers, executive director of the Moab, Utah-based Living Rivers.

"When you look at trying to restore the natural process in the Grand Canyon, the cheapest way to do it is decommissioning the dam," he said.

Lammers and other dam foes say Lake Powell's storage could be handled upstream in existing reservoirs, thus saving billions of gallons lost to evaporation behind Glen Canyon Dam.

"We only need it because we're incredibly an overconsumptive basin in terms of water use," he said. "We've been used to living high on the hog, and what it's gotten us is a destroyed Grand Canyon."

Contact Mitch Tobin at 573-4185 or mtobin@azstarnet.com.

LR in the News 08/01/04

Let the Colorado run again

The Denver Post, Sunday, August 1

Writers on the Range by John Weisheit

As our rafts bounced through what was supposed to be the last rapid on the Colorado River before its transition to the slack water of Lake Powell, we were surprised to hear the rumble of whitewater downstream.

The half-mile-long Imperial Rapid, submerged for three decades, had re-surfaced. The natural draining of the nation's second-largest reservoir was underway, but how far would it go?

Climate change in the region has lowered the reservoir 120 feet over the past five years. This drop should have been sufficient to expose half the remaining 21 rapids that were also submerged by the reservoir, yet only Imperial has come out so far. A look around from the raft revealed the problem: We were floating over a massive slab of sediment that had built up in the decades since Glen Canyon Dam was finished.

The remainder of our descent was through a ditch framed by gray cliffs of sand rising 25 feet on either side, with dump-truck-sized chunks calving off like icebergs.

The ditch widened as we caught up with the slack water of the reservoir, now 30 miles below Imperial Rapid but still 140 miles from Glen Canyon Dam.

Although Lake Powell reservoir is just 40 percent full and has lost 50 percent of its surface area, it has dropped only 20 percent in elevation. The reservoir is still 445 feet deep near the dam. It's like a wide funnel: There's more water stored at the top. But scientists predict it will fall more rapidly if present climatic conditions persist.

The reservoir's elevation could also drop three times faster over the next three years than it has over the past five. If that happens, it would cause hydroelectric power production at the dam to cease in 2006. By 2007, a condition known as "dead pool"

would be created, which means the dam would basically become useless as a power generator. The reservoir, however, would still stretch 104 miles upstream, contain approximately 2 million acre- feet of water and sediment, and rest 234 feet above the original river bed at Glen Canyon Dam.

Still submerged would be most of Glen Canyon's 125 signature side canyons, which inspired the canyon's pre-dam river runners along with the mounting numbers of present-day advocates for Glen Canyon's restoration. Nature's crash course in water scarcity is helping to amplify the mounting economic and environmental liabilities associated with Glen Canyon Dam and Lake Powell, raising the prospect of decommissioning the dam and uncovering the remainder of the canyon.

Glen Canyon Dam was completed in 1963, as a water-storage facility for downstream users. Because of other storage facilities built in the basin, principally Lake Mead behind Hoover Dam, it will be this winter before Lake Powell's storage will, for the first time, actually contribute to downstream water use.

Over the years, Lake Powell will have lost 40 million acre-feet of water from evaporation and seepage, while providing only 23 million acre-feet in storage. This lost water represents nearly three years of the entire annual flow of the Colorado River. It's not surprising that people are looking for more efficient ways to save this valuable water. California, Nevada and Arizona are already doing so by storing Colorado River water in underground aquifers. They lose as little as 1 percent of the water to the environment, compared to the more than 60 percent of water that is lost at Lake Powell.

Concern is also mounting over the damage Glen Canyon Dam is causing to the downstream ecosystem in Grand Canyon National Park. Four of the Canyon's eight native fish are already gone, as are otters, muskrats and a host of birds, insects and reptiles. Despite more than $200 million invested in efforts to mitigate the dam's impacts, biologists say these declines will continue.

As the drought continues, a growing number of scientists are questioning whether there will ever be enough water to fill Lake Powell. But I have a different question: Once the reservoir dies a natural death, shouldn't we finish the job and let the river run again?

John Weisheit is conservation director for Living Rivers.

LR Press Release 08/09/04

Solution Proposed for Failing Federal Program to Save Grand Canyon.

Contact: Owen Lammers - (435) 259-1063

(Phoenix) Living Rivers/Colorado Riverkeper, the lead advocate for protection of the Colorado River, called for immediate action to address the main impediments to failing federal efforts to recover endangered native fish in Grand Canyon National Park.

At the semi-annual meeting beginning today of the Glen Canyon Dam Adaptive Management Working Group (AMWG), Living Rivers/Colorado Riverkeeper presented a letter emphasizing that the continued decline of critical resources including endangered species in Grand Canyon's Colorado River is a result of the program's lack of effective management strategies needed to comply with the Grand Canyon Protection Act.

"It's so simple. All they have to do is follow their own charter," says Dave Haskell, former science director for Grand Canyon National Park and now policy director for Living Rivers/Colorado Riverkeeper. "But they merely focus on implementing increasingly complex research projects that continue to fail to achieve the stated program goals."

Since established in 1996, the AMWG has spent more than $100 million on efforts to change the operations of Glen Canyon Dam, but has failed in its principle objective, recovery of endangered, native fish. Since the program began, the razorback sucker has disappeared from Grand Canyon, while the humpback chub has declined 14 percent per year to as few as 1,000 adult fish.

This week's meeting has been extended an extra day to discuss future strategy, and follows an unprecedented three-day retreat held last month in an attempt to fix the ailing program.

"Any strategy must define what constitutes program success, and there in lies the problem," adds Haskell who is attending the meetings. "The stated goals are lofty but there is no clearly defined strategy to attain them. They state that it may not be possible to mitigate some of the impacts caused by the dam, but they do not indicate which ones. It will be impossible to determine when the program has actually met the goals."

Living Rivers/Colorado Riverkeeper is requesting that not only does AMWG make its goals clear to the public, but that it execute its authority to implement a range of activities which its science has determined are needed to recover Grand Canyon's deteriorating river ecosystem: Annual inputs of large amounts of nutrient laden sediment, seasonal variability of water flows that creates the dynamic physical environment, and seasonal variability of water temperature. "The very foundation of National Park System natural resource stewardship is the protection of ecosystem processes, for it is these processes that sustain the diversity, abundance and distribution of native species.... The success of this AMP [Adaptive Management Program] must be measured by how well it protects and enhances these critical ecosystem processes." the letter states.

The letter further points out that the AMWG charter allows it far reaching authority "...if needed, [AMWG can] develop recommendations for modifying the Glen Canyon Dam Environmental Impact Assessment Record of Decision, associated [dam] operating criteria, and other resource management actions pursuant to the Grand Canyon Protection Act."

"There's no question that the AMWG has greater authority to restore the natural integrity of Grand Canyon's famed river ecosystem, the question is, will they use it," says Haskell.

More than 200 organizations have joined Living Rivers/Colorado Riverkeeper in demanding that AMWG exercise its mandate and undertake a new environmental impact statement on the operations of Glen Canyon Dam, including evaluating the dam's decommissioning as one alternative for meeting Grand Canyon Protection Act goals.

Living Rivers' August, 9 2004 letter to Michael Gabadlon, Deputy Director of Operations, U.S. Bureau of Reclamation.

Glen Canyon Dam flow regime a 'failure,' report says

Grand Canyon Protection Act

Glen Canyon Dam Adaptive Management Program

Adaptive Management Working Group Charter

LR Letter 08/09/04

Demanding BuRec action to correct failing federal program to recover Grand Canyon native fish.

Michael Gabaldon
Deputy Director of Operations
U.S. Bureau of Reclamation
Department of the Interior
1849 C Street, NW
Washington D.C. 20240

RE: Comments Relative to the Reporting Requirements and Congressionally Mandated Goals of the Glen Canyon Dam Adaptive Management Program.

The Glen Canyon Dam Adaptive Management Program (AMP) has been in operation for nearly eight years, and a comprehensive research and monitoring program has been functioning for over 15 years. Progress in understanding the ecological processes that drive the aquatic ecosystem of the Colorado River in the Grand Canyon has been reported and is generally considered to be meeting the science program goals as stated in the EIS ROD and AMP Charter. In contrast, the relative success of the AMP in using this information to achieve the goals of the Grand Canyon Protection Act (GCPA) has been poorly and inconsistently reported. The GCPA requires the AMP to submit an annual report to Congress and the Governors of the basin states. As defined by item E of the AMP Charter, the AMWG is to "review and provide input on the report required in Section 1804 (2) of the Act …. The report will include discussion of dam operations, the operation of the AMP, status of resources, and measures taken to protect, mitigate, and improve the resources defined in the Act." To date, only a single report combining the

information for water years 1999-2001 has been submitted. Progress in mitigating the adverse impacts to Grand Canyon resources during 2002 and 2003 has yet to be reported. The AMP is obligated to ensure that Congress and the public are kept up to date as to whether this program is succeeding. Duties, Section F of the AMP Charter charges the AMWG to "Annually review long-term monitoring data to determine the status of resources and whether the AMP Strategic Plan goals and objectives are being met. More importantly, the AMWG is directed to "if needed, develop recommendations for modifying the GCDEIS ROD, associated operating criteria, and other resource management actions pursuant to the Grand Canyon Protection Act.

The science program has identified the key ecosystem processes that create and maintain the ecological integrity of the Colorado River in the Grand Canyon. There are: Annual inputs of large amounts of nutrient laden sediment, seasonal variability of water flows that creates the dynamic physical environment, and seasonal variability of water temperature. The very foundation of National Park System natural resource stewardship is the protection of ecosystem processes, for it is these processes that sustain the diversity, abundance and distribution of native species. The National Park System was created by Congress to protect the health and diversity of our nation's unique natural and cultural heritage. The success of this AMP must be measured by how well it protects and enhances these critical ecosystem processes.

The single report submitted to date clearly indicated that none of the dam related impacts to key ecological processes or other affected resources such as the Humpback Chub had been successfully mitigated. In fact, many of these components and critical resources were in a state of decline. It is unclear how the AMWG defines success. The minutes of your recent retreat indicate this unfortunate ambiguity, as one participant asked, "How do we get to the end" Although the ROD provides for the AMP to operate "indefinitely". Fiscal responsibility alone requires that at some point either the goals are achieved, or its admitted that they can't be achieved. It's critical that the AMWG review how it defines program success, and does so in terms of the conditions of Grand Canyon resources.

In summary, considering the continued decline of the ecosystem taking place in Grand Canyon National Park, it is imperative that the AMWG rededicate itself to achieving the goals of the GCPA, or recommend a new program that can. The AMWG must clearly define success in terms of the condition of Grand Canyon resources, meet the reporting requirements of the GCPA, clearly articulate the success or failure of adaptive management actions in these reports, and immediately request a Supplemental EIS and a new ROD that will enhance the AMWG's ability to achieve the success contemplated by the GCPA.

Living Rivers/Colorado Riverkeeper and our supporting groups from across the country look forward to hearing from you as to how and when the AMWG will address these matters.

Sincerely,

David Haskell
Policy Director, Living Rivers

LR in the News 08/11/04

Lake Powell a liability to water management

Arizona Republic OpEd

Rather than grousing about a name change for Lake Powell proposed by a handful of Colorado residents, I suggest that The Republic move on from opining on this trivia to discussing the hard facts regarding the detrimental effects Lake Powell will have on the availability of water in the future ("It's a lake, dammit," Editorial, Aug. 1).

Undisputable scientific data now point strongly to the fact that Lake Powell has become a water-management liability, and the situation is only going to get worse. The average annual flow of the Colorado River up until 1990 was 12 million acre-feet. During the past decade the flow has dropped to 10 million acre-feet. The Department of Energy estimates that the long-term climate change will reduce the flow to less than 7 million acre-feet by 2050.

The upper basin states are now using 5 million acre-feet of this water and the lower basin states and Mexico are using 8.25 million. There is now an annual deficit of 3.25 million acre-feet. To make matters worse, Powell loses a half-million acre-feet each year to evaporation, increasing the deficit to 3.75 million acre-feet a year. There are only 9.5 million acre-feet of water left in Powell.

In the very short term, use of this water will delay the crises, but there will not be enough water to fill the reservoir again. In order to maximize the availability of any future excess water, it should be stored in underground aquifers that eliminate evaporation. The governor should be praised for supporting this innovative concept.

David Haskell, Camp Verde
The writer is policy director, Living Rivers Arizona office.

LR in the News 08/14/04

Pressure to restore river corridor intensifies
April Reese, Greenwire Southwest correspondent

Environmentalists monitoring an 8-year-old federal program to restore the Grand Canyon below Glen Canyon Dam this week called on the government to better define

its strategies, conduct more on-the-ground restoration and revise the environmental impact statement (EIS) governing the effort.

In a letter to the Glen Canyon Dam Adaptive Management Work Group, the nonprofit group Living Rivers ticked off a litany of complaints about the restoration program and urged its managers to rethink its strategy for the lower canyon. The work group is comprised of 26 stakeholders with some management responsibility for Grand Canyon National Park's river corridor.

The restoration program was enacted by the Clinton administration to meet provisions of the Grand Canyon Protection Act, which directed the Interior Department to "protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established."

Participants in the work group range from Bureau of Reclamation officials to independent fisheries biologists, environmentalists, hydropower interests and tribal representatives. The stakeholders periodically examine the latest scientific information on the river and make management recommendations to the Interior secretary, who decides whether to implement them.

The letter, written by Living Rivers policy director Dave Haskell, a former director of Grand Canyon National Park's Science Center, charges the work group with failing to review the latest scientific data on the canyon's resources. The program's charter instructs the work group to annually evaluate monitoring data to assess conditions in the canyon and to determine if the program's objectives are being met, Haskell noted.

The letter states that scientists have identified three critical actions that are necessary to restore pristine conditions in the Grand Canyon: annual inputs of large amounts of sediment, seasonal variability of water flows and seasonal variability of water temperature.

Living Rivers and about 200 other environmental groups have asked BuRec to examine a range of alternatives to meet those goals, including the decommissioning of Glen Canyon Dam. But so far no serious consideration has been given to that proposal, critics say.

Living Rivers maintains that other attempts to improve conditions in the canyon have largely failed and that a new EIS should be drafted to address new and emerging concerns, including the dam itself. Haskell urged the group to exercise its authority to recommend undertaking a new review.

"Considering the continued decline of the ecosystem taking place in Grand Canyon National Park, it is imperative that the AMWG rededicate itself to achieving the goals of the Grand Canyon Protection Act, or recommend a new program that can," Haskell wrote.

"Any strategy must define what constitutes program success, and therein lies the problem," added Haskell, who delivered the letter to the work group at its meeting in

Phoenix this week. "The stated goals are lofty, but there is no clearly defined strategy to attain them."

The letter is the latest in a series of critical missives from groups unhappy with the program's progress. But environmentalists are not alone in their complaints.

Last month, the working group's own scientists raised questions in a report about the effectiveness of the Colorado River flow regime adopted by the group (Greenwire, July 26). According to the report, the endangered humpback chub, which inhabits a small area of the canyon near the confluence of the Colorado and Little Colorado rivers, is declining at an average rate of 14 percent despite efforts to help the fish. The science advisers recommended a 24-month review of the program, beginning in October.

BuRec spokesman Barry Wirth, who attended the meeting of the adaptive management work group this week, urged patience. Recovery of the Grand Canyon ecosystem will be a long process involving plenty of trial and error, he said.

"We've committed substantial resources in working on these issues," including recovery of the humpback chub and sediment replenishment, he said, citing as examples several projects to control trout, which compete with the chub.

BuRec contends that the experimental nature of the program has allowed managers to better understand the ecological dynamics of the Grand Canyon -- an essential step in improving conditions there.

Experimental flows, while unsuccessful in replenishing beaches over the long-term, nevertheless produced valuable data that can be used to improve the next round of experimental flows. And the new effort to remove non-native fish from the river may be helping the chub, although the results of that experiment will not be known for another year or two (Greenwire, March 8).

Wirth also emphasized that the work group includes 26 representatives from a range of interests, all of whom have a say in management of the canyon. "It's a diverse effort, and I think the reality is a substantial amount of effort has gone into addressing these issues," he said.

As the work group continues to wrangle with its mission, environmentalists are also urging Congress to kill a long-standing rider to BuRec's appropriations bill that prohibits expenditures on studies for decommissioning Glen Canyon Dam. The provision was first added to the agency's spending bill in 1996, and it remains in this year's House-approved bill for fiscal year 2005.

"What's wrong with allowing science to look at this?" asked Owen Lammers, executive director of Living Rivers. "Isn't that what the adaptive management program is all about?"

LR in the News 08/16/04

Colorado River 'at critical juncture'

By Michael Gardner San Diego Union Tribune August 16, 2004

SACRAMENTO - Struggling Utah farmers sacrificed water to save a school on the verge of shutting down because its well ran dry. Montana ranchers are selling off their herds. In Arizona, the Marines pitched in to help build watering holes to keep rare sheep from dying of thirst.

A persistent drought has upset lives and livelihoods from Montana to New Mexico, drawing comparisons to the Dust Bowl days. Fields have been left unplanted. Homeowners are being paid to tear out lawns. Hydropower generation is threatened. Ducks are disappearing and forests are becoming kindling.

"The drought threatens to change the very fabric of Montana's rural communities and landscape, placing the birthright of descendants of pioneer families on the auction block," Gov. Judy Martz said in a recent speech.

Although Mother Nature has punished the West for several years in a row, the developing crisis also can be traced to other factors: growth, resistance to tough conservation, global warming and an overly optimistic estimate of the Colorado River's ability to deliver water.

The spine of the West - fused by the Colorado River and the Rockies - has been hit the hardest. Although supplies of water have been squeezed along the coast, from Seattle to San Diego, the pain there is not as widespread or as deep.

Urban water purveyors across California, while nervous, say there is no need for rationing this year because of average-sized snowpacks in the north and adequate storage.

For now, climate experts can offer only hope that relief will arrive.

"I don't think we can discount the possibility of a recovery, but the likelihood is one out of four, maybe one out of five, for a really wet year," said Dan Cayan, a climatologist at Scripps Institution of Oceanography in La Jolla.

Scarier still is this emerging question: What if stubborn dry spells are the norm and the traditional cycle of normal-to-wet bounty is the exception? Tree ring records and other data suggest the West may be in for longer, drier periods in the coming decades, some experts say.

Scramble for water

This latest string of dry years has hit states dependent on the Colorado River basin, at one time a seemingly eternal well for 25 million people, millions of acres of farmland and an assortment of endangered and other animals.

Lakes Powell and Mead, the two massive reservoirs that catch the Colorado, are less than half full, exposing long-submerged landscapes to direct sunlight for the first time in decades. It could take a 10-year run of average rain and snow to refill the reservoirs.

Lake Powell, which straddles the Utah-Arizona border, is at a historic low level. Nevada's Lake Mead has been lower only twice before, counting the period when Lake Powell was filled for the first time.

"We are at a critical juncture in the history of the Colorado River, a river we all depend on for our lives," said Jack August, an Arizona historian who studies water trends.

California draws enough water out of the Colorado for more than 1 million households a year. Seventy percent of San Diego County's drinking water comes from the river.

The frantic hunt for more supplies has states pondering expensive options. Colorado and Nevada are scouting pipeline routes to ship water to parched regions. Some farmers may be paid far more than their crops are worth to leave fields unplanted. Las Vegas home builders have been banned from planting grass in front yards.

California plans to increase the size of a handful of reservoirs, but squabbles over who should pay for the work have slowed progress.

Shrinking Colorado River flows sent Metropolitan Water District, the Los Angeles-based wholesaler for most of Southern California, scurrying to secure more water from Lake Oroville, north of Sacramento.

In Colorado, reservoirs remain about half full. New Mexico's largest lake, Elephant Butte, is critically low. In Oregon, southeastern farmlands are in dire straits. Wyoming's thirst is the worst it's been in 110 years.

"My cattle are gone," lamented Montana rancher Bob Redfield, forced to sell 100 head because there was no water for hay.

Said Utah farmer Charlie Holmgren: "We always thought we were invincible." That mood has darkened with each day of blue skies. His water source, Bear Lake, "is pretty well gone."

"It will force some people out of agriculture in this valley," Holmgren said. "We're hanging on - this year."

Farther south, farmers in Blanding, Utah, decided to put classrooms before crops. When the school's well ran dry, they gave up water to keep kids from being bused out of town, Mayor Toni Turk said. Power generators and water purveyors grow more nervous as Lake Powell evaporates.

The coal-fired Navajo Generating Station in northern Arizona may be forced to spend millions to extend a water line that draws cooling water from Lake Powell.

"Without that water, a major coal-fired plant goes down," warned Sid Wilson, general manager of the Central Arizona Project, the state's major water supplier.

The facility generates the power to pump water throughout Arizona and helps keep the lights on in Los Angeles, Las Vegas and Tucson.

The Western Area Power Administration, which delivers energy to 15 states, has for the first time formed a drought emergency planning team. It has spent $500 million over the past few years on outside power, much of it in response to drought-imposed limits on hydropower generation.

Outside Las Vegas, Lake Mead, which stores water for Southern California households and Imperial Valley farms, is circled by bathtub rings. If the lake's level continues to drop, even power out of mighty Hoover Dam could be at risk.

Recreation tourism, a large part of the West's economy, may suffer if the drought persists. Rivers without rapids are no fun to run and shriveled streams are no lure to fish.

"If you own a vacation cabin in Bear Lake you used to have waterfront property. Now you have beachfront property," said Larry Anderson, Utah's director of water resources.

In California, docked boats already have been ordered out of Folsom Lake. In Page, Ariz., the National Park Service has spent $5 million to extend boat ramps to Lake Powell and its 145 miles of shore. Ramps are open, but "launch at own risk" signs are posted in some spots.

Looking on the sunny side, National Parks Service official Char Obergh said, "I don't say it's bad. The lake looks different. People who have never been here don't realize it's low."

Wildlife concerns

Wildlife is suffering, too. Resource managers are working to save bighorn sheep in the Cabeza Prieta refuge in Arizona, prairie chicken along the eastern plains of New Mexico and silvery minnow in the Middle Rio Grande.

"The effects are going to be tougher on wildlife than I've ever seen," said Dale Hall, southwest regional director for the U.S. Fish and Wildlife Service. Conservation groups report dramatic reductions in the number of fish and ducks in some areas. The Dolores River, which runs 250 miles through Colorado and Utah, has lost 75 percent of its trout.

Anxious federal fish and wildlife officials are mapping plans to net rare fish and hold them in captivity, a distasteful but perhaps necessary step to preserve some species.

Duck numbers are down 11 percent nationally, pressuring officials to scale back season and bag limits.

Water development has almost always clashed with the environment. If the drought deepens, so, too, will that rift.

In Las Vegas, for example, plans to drill wells could deplete groundwater needed for a nature refuge. Environmentalists worry about Metropolitan Water District's bid to acquire more water from Northern California.

"The big question is how much water can you divert without the environment going to hell," said Tom Graff, an attorney with Environmental Defense, a nonprofit organization.

MWD officials insist there are adequate safeguards for fish and wildlife.

Elsewhere, bark beetles have overrun trees weakened by drought. Subsequent infernos devour forests and the firefight consumes billions of gallons of water.

"The precious water we did have was being used to put out fires" during a miserable 2002, said Dawn Taylor Owens of the Colorado Department of Water Resources.

Pressured by shortages and the U.S. Interior Department, water managers along the Colorado River basin for the first time are scrambling to map emergency responses. They are negotiating deals to clear historic legal and political barriers to water sharing and storage. Farmers across the West will likely be pressured to sell more of their water.

Closed-door talks have been "animated" and "at times, intense," said Bennett Raley, the Bush administration's lead negotiator on water issues. "The history of the Colorado River is, if the states fail to solve issues, the federal government steps in."

Environmentalists and water managers say the drought is more than just a lack of rain and snow over the past five years. Some cities were slow to impose restrictions. Financial woes and environmental foes have stalled storage projects. And experts say pollution may be accelerating a warming trend, reducing the number and intensity of storms.

Yet lingering dry spells are nothing new. Some believe the West has been blind to the Colorado's limits, relying on overly optimistic projections for more than 80 years. Original calculations done in 1922 to divide the river were based on a wet year.

"Demand is far more than the river can deliver," said Owen Lammers, executive director of Living Rivers, a Utah environmental group.

Population pressures

Growth is exploding in areas more suited for saguaros than subdivisions.

Nevada's population increased from 500,000 in 1970 to nearly 2 million in 2000. During that same period, Arizona grew from 1.8 million to 5.1 million people, Utah increased from 1 million to 2.2 million residents and Colorado's population nearly doubled, topping 4.3 million.

Sprawl also has exacerbated problems in California. As more families migrated to inland from the coast or to the Central Valley from San Jose, outdoor water use has skyrocketed to keep lawns lush and pools filled.

There are nearly 36 million Californians, compared with 20 million three decades ago. Riverside County's population more than tripled to 1.5 million during that period. San Bernardino County had 700,000 residents in 1970. Now it has 1.7 million.

Previous droughts have inflicted harsh lessons on the Southern California, forcing strict conservation. Residents use less water today than they did in 1990, according to the Metropolitan Water District. The MWD also spent $2 billion to build an 800,000 acre-foot reservoir near Hemet in Riverside County that could supply more than 1 million households if needed.

"Conservation has become a way of life," said Dennis Underwood, an MWD vice president.

The past winter and spring delivered some relief in a few states, but not enough snow fell to refill depleted lakes and groundwater basins. A warm spring accelerated the melting of snow, making it difficult in some areas to capture flows.

California's outlook remains tenuous after a hot, dry spring. The state's fortunes seemed to be looking up in February, said Maurice Roos, California's chief hydrologist.

"Things looked pretty bright," he said. "Then the bottom fell out."

River News 09/01/04

NPS Press Release on Navajo Generating Station

National Park Service
U.S. Department of the Interior
Glen Canyon National Recreation Area
691 Scenic View Dr.
P.O. Box 1507
Page, Arizona 86040
(928) 608-6208 -- Phone
(928) 608-6204 -- Fax

GLEN CANYON - NEWS RELEASE
For Immediate Release
Char Obergh
September 1, 2004

GLEN CANYON NATIONAL RECREATION AREA (GLCA) ANNOUNCES OPPORTUNITY FOR PUBLIC INPUT FOR NAVAJO GENERATING STATION (NGS) WATER INTAKE MAINTENANCE PROJECT

PAGE, AZ The National park Service has initiated work on an environmental assessment for the installation of new water intake facilities for NGS on the grounds of the existing pump house facility. The current facility is located adjacent to Lake Powell at an elevation of 3,734 above sea level on land leased to Salt River Project (SRP) by the Navajo Nation.

The purpose of the project is to ensure the future availability of cooling water for NGS operations due to the continuing decrease of water surface elevation of Lake Powell associated with the ongoing drought. The full pool elevation of Lake Powell is 3,700 feet above sea level. Current projections indicate that lake surface elevation could fall below the existing NGS water intake elevation of 3,470 feet above sea level by 2009. If severe drought conditions persist, these reduced lake levels could be reached as early as 2006

The work will include slant drilling through sandstone bedrock of five new 54-inch diameter holes in which new water intake pipes and submersible pumps will be installed to withdraw lake water at an approximate elevation of 3,350 feet above sea level. The new intake structures will require Salt River Project to obtain a new easement within the boundary of the GLCA prior to construction.

Borings from the drilling will be transported by truck to land applied at a large ash disposal site on NGS grounds. The proposed modified water intake structure will not change the annual volume or the seasonal pattern of water withdrawals from those already being made by NGS.

This notice is an opportunity for the public to identify any issues or concerns they may have regarding this project. All comments are due by September 24, 2004, and should be mailed to :

EcoPlan Associates, Inc., 701 W. Southern Avenue, Suite 203, Mesa, Arizona 85210 or email dsmith@ecoplanaz.com or 480.733.6666; fax 480.733.6661

-NPS-

GLCA 2004-30

Additional Information:

Living Rivers/Colorado Riverkeeper

September 1, 2004, National Park Service News Release on Navajo Generating Station

Navajo Generating Station

Glen Canyon National Recreation Area

Letter from the Environmental Planner at EcoPlan Arizona

Map of NGS pumping plant

Comment letter from Living Rivers to EcoPlan Arizona

LR Press Release 09/01/04

Lake Powell Draining: Water Intake Tubes for Coal Plant to be extended

Contact: John Weisheit - (435) 259-1063

Today it was announced a major coal-fired power plant adjacent to Lake Powell reservoir may be left high and dry by rapidly falling reservoir levels, unless it receives approval from the National Park Service to begin a major extension of its water intake infrastructure.

Environmental clearance is being sought to extend the water intake tubes for the Navajo Generating Station 120 feet to the near-natural elevation of the Colorado River. What the National Park services is calling a "maintenance project." involves five 54-inch-diameter holes being bored 150 feet through Navajo sandstone for the installation of pipes and submersible pumps to move 17 million gallons of cooling water per day from Lake Powell to the power plant.

"This is not maintenance, but a multi-million dollar undertaking in an effort to preserve outdated and terribly polluting technologies," says John Weisheit, conservation director for Living Rivers/Colorado Riverkeeper. "We must prepare for the end of Lake Powell by investing resources into more appropriate energy paths such as conservation or solar and wind, not trying to prolong dirty coal and dams."

Due to climatic changes over the past five years, Lake Powell's water level has fallen 127 feet to 3573 feet above sea level, and is now declining at a rate of 21 inches per week. It is projected that absent a major change in rainfall patterns, that Navajo Generating Station's power plant intakes will be exposed as early as 2006. The hydroelectric power plant at Glen Canyon Dam will suffer a similar fate, but will have to be shut down as lowering its intakes is not technically feasible.

The Navajo Nation has benefited little from power from either Navajo Generating Station or Glen Canyon Dam over the past four decades, as many homes still do not have electricity. Small photo-voltaic power stations and wind turbines are now being used to provide energy to individual homes on the reservation.

"Our prayers continue to be answered," says Thomas Morris Jr. a Navajo medicineman working for decommissioning Glen Canyon Dam. "Let the power plant fall idle, as it has brought nothing but asthma and other illnesses to our people in exchange for a few jobs. We must follow nature's lead, and the revival of the Colorado through our land, not the past mistakes."

Navajo Generating Station was completed in 1974 to provide the electricity necessary to pump Colorado River water from Lake Havasu reservoir to Phoenix and Tucson through the Central Arizona Project. It was built as a substitute for dams proposed in Grand Canyon National Park that were defeated by public opposition in the 1960s. The Bureau of Reclamation is the largest shareholder in the Navajo Generation Station at 24.3%. Other partners include Salt River Project, Los Angeles Dept. of Water & Power, Arizona Public Service Company, Nevada Power, Tucson Electric Power.

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Additional Information:

Living Rivers/Colorado Riverkeeper

September 1, 2004, National Park Service News Release on Navajo Generating Station

Navajo Generating Station

Glen Canyon National Recreation Area

Letter from the Environmental Planner at EcoPlan Arizona

Map of NGS pumping plant

Comment letter from Living Rivers to EcoPlan Arizona

LR in the News 09/01/04

Conservationists protest Utah lease offers

By Dan Nailen for The Salt Lake Tribune

The federal government set a record with its June oil and gas lease auction in Utah, offering 281,000 acres of Utah lands for development as part of the Bush administration's push toward more domestic energy production.

Records are made to be broken, though.

The next quarterly lease auction slated for Sept. 8 easily outpaces the June sale, with 362,665 acres spread across 223 parcels. Among the leases up for purchase, all or portions of 21 of the parcels - 19,338 acres in all - contain wilderness characteristics, according to the Bureau of Land Management, inspiring howls from conservationists both inside and outside of Utah.

"The Bush administration is once again exploiting wilderness-quality public lands for private gain," said Rep. Maurice Hinchey, D-NY., lead sponsor of America's Redrock Wilderness Act, a bill aimed at designating 9.1 million acres of Utah BLM land as wilderness. "The BLM should not be sacrificing the nation's natural heritage for short-term profit when it has acknowledged that some of these lands have wilderness characteristics."

The Outdoor Industry Association, National Outdoor Leadership School and Trout Unlimited all filed protests of different aspects of the upcoming lease sale.

The BLM did defer sales on 30 parcels of wilderness-quality land, including areas near Fisher Towers, Desolation Canyon, Jack Canyon, Labyrinth Canyon and White River. At the same time, many of the leases being offered in Utah are in areas seldom explored in the past, including parts of Juab, Millard, Sanpete and Sevier counties.

"The underlying, driving force is clearly the economics of oil and gas, with oil [prices] hitting record highs and the gas demand outstripping our ability to produce," said Kent Hoffman, who directs the BLM's mineral programs in Utah.

Hoffman noted that the record amount of acreage involved in the auction is due in large part to the Forest Service playing catch-up with a backlog of Forest Service land nominated by oil and gas industry entities for exploration.

"On this particular sale, the Forest Service gave us over 100,000 acres," Hoffman said. "On prior sales, they've been probably 25 percent of that or less. Even less than that. Sometimes nothing."

Plans for auctioning leases on Forest Service land near Strawberry Reservoir raised a red flag for members of Trout Unlimited, a group dedicated to preserving and restoring fish habitat. In a protest letter to the BLM, Paul Dremann, the vice president for conservation of Utah's Trout Unlimited chapter, outlined the millions of dollars spent through the years in restoring the Strawberry Reservoir fishery and expressed concern that oil and gas exploration nearby "has a high potential of severely impacting" the fishery.

"We've been working for so darn many years on fishery restoration there that we kind of feel like we kind of have ownership in helping that restoration," Dremann said Monday. "So this has been kind of discouraging."

Also of particular concern to conservationists are available leases along the Green River and along the southern parts of eastern Utah's Book Cliffs. While BLM officials note that available tracts along the Green River have "no surface occupancy"

stipulations - meaning there could be no roads or drill pads within a half-mile of the river - people like John Weisheit, co-founder of the Colorado River Plateau River Guides organization for outfitter employees, say that's not good enough.

"You can still hear it," Weisheit said, describing similar "no surface occupancy" projects, noting that on trips down Montezuma Creek, the sound of nearby drilling projects is easily heard in the middle of the night. "And if there's any lights at all, you can still see them."

Weisheit is worried that opening up areas along Utah's most scenic rivers to drilling will only provide minimal oil or gas, while adversely affecting the livelihoods of guides and outfitters forever.

"What's the point of doing a river trip if you have to hear and smell and see all this oil development?" Weisheit said. "Our point is, is nothing sacred? Do we have to drill every inch?"

The BLM's Hoffman notes that of the 18 million acres of Utah land available for oil and gas exploration, only four million are currently spoken for - a far cry from a one-time high of 16 million acres under lease. With the current drive for domestic energy production, he said, the industry will no doubt keep driving the acreage under consideration for drilling higher and higher.

"The industry is clearly in the mode of trying to increase their lease space so that they have opportunities to explore," Hoffman said. "That is the underlying, driving force for all of this stuff."

LR in the News 09/09/04

On the range, gas trumps wildlife
http://www.csmonitor.com/2004/0909/p13s02-sten.html

Mark Clayton Staff writer of The Christian Science Monitor 09/09/2004

At Sand Wash, Utah, a dusty slice of back country 45 miles from the nearest paved road, river-raft guide John Weisheit lectures tourists about the history of the Green River and the wilderness experience that will soon unfold for them.

Climbing into rafts, they float on chocolate waters, following the path of 19th century explorer John Wesley Powell, beneath the cliffs of Desolation Canyon. No car engines or cellphones mar this trip far away from it all.

But soon, Mr. Weisheit says he may chop all wilderness references from his little lecture. They'll ring hollow, he says, if Sand Wash, a onetime crossing for pioneers and cattle, echoes instead with the sounds of diesel engines and drilling rigs exploring for oil and gas.

Wednesday, in the biggest sale of its kind in Utah history, the federal Bureau of Land Management (BLM) offered at auction oil- and gas-exploration leases on more than 360,000 acres of rugged back country - including UT-201, a 120-acre chunk of Green River flood plain that abuts Sand Wash, and another 16,000 acres a few miles away.

Not long ago such remote regions seemed on track to one day become officially protected wilderness areas. Now they're part of a huge debate over the proper use of public lands in the United States. At issue: When does energy security trump wilderness protection?

No one claims the oil and gas from public lands will free the nation from dependence on foreign oil. The amount of oil in the Rocky Mountain West is negligible - less than a year's supply for the nation. But the region's gas could supply the nation for a few years and, by lowering prices, save consumers billions of dollars. So should the US encourage such energy development wherever it's economically viable? Or, in the case of wilderness, does some higher standard apply?

To hear the White House and the oil and gas industry tell it, gaining access to public lands is a key to greater energy self-sufficiency.

"Basically, we've taken large chunks of the country and put it off-limits to any kind of exploration or development," said Vice President Dick Cheney at a town hall meeting in Hot Springs, Ark. "We don't drill off the East Coast, we don't drill off the West Coast.... Large parts of the Rocky Mountain West are off-limits."

Some 29 percent of the Rocky Mountain area's gas reserves are "effectively off limits" because of conditions that limit drilling, estimates a 2003 report done for the US Department of Energy by the National Petroleum Council, an industry lobby group. If such restrictions were removed nationwide, that easier access to public lands could save consumers $300 billion over 20 years, the report says, thanks to lower natural gas prices.

But such figures almost certainly overstate the case, energy analysts and environmentalists counter.

For example, domestic energy production is apparently not being held up by a lack of oil and gas leases. Since 1982, the US has leased or offered for lease 229 million acres of public land for oil and gas development across 12 Western states, according to a new report by the Environmental Working Group (EWG), a Washington-based environmental organization. That represents nearly 9 of every 10 BLM acres and covers an area bigger than Colorado, New Mexico, and Arizona combined.

That doesn't leave much to exploit. In the five richest geological basins in Montana, Wyoming, Colorado, Utah, and New Mexico, only 15 percent of the oil and 12 percent of the gas reserves on federal lands are off-limits, according to a 2003 joint study by the US departments of Energy, Interior, and Agriculture.

Drilling for gas is already on the upswing in the region. Five Rocky Mountain states saw drilling activity in August rise to their highest levels in a decade. Wyoming had 84 rigs

operating versus an annual average of 38 over the past decade - 121 percent higher. For Utah, the 22 rigs operating are 76 percent higher than the average over a decade. For New Mexico, it's 30 percent; Montana, 166 percent; and Colorado, 171 percent.

Yet the energy produced from public lands is minuscule. Interior Department records show that only enough oil was produced between 1989 and 2003 to supply the nation for 53 days and enough natural gas for 221 days at current rates of consumption, the EWG report adds.

"These numbers put a hole in the argument you hear all the time from the oil industry and their allies that, 'If we could only get access, we could reduce our dependency on foreign oil,' " says Dusty Horwitt, coauthor of the EWG report. "In fact, they've had almost unfettered access, but dependence on foreign oil has increased significantly."

Nor are energy companies knocking each other down to drill more. EWG analysts say BLM's data show about 13 percent of public land is leased and 4 percent currently producing oil or gas. The US Department of the Interior, which oversees the BLM, reports smaller totals: 8 percent and 1 percent, respectively.

"You need to remember we are not talking about significant quantities of oil - or natural gas, for that matter," says Gal Luft, executive director of the Institute for the Analysis of Global Security in Washington, which focuses on energy security. "Tactically it may sound like a lot, but strategically it is not a lot of oil or gas."

But the federal study, which estimated there were 123 trillion cubic feet of "technically recoverable" natural gas in areas already open to leasing - enough to fuel the nation's needs for about six years at current consumption rates - may be too rosy.

Such numbers overstate the case because only about half of technically recoverable gas is likely to be found, says Michael Lynch, president of Strategic Energy & Economic Research in Winchester, Mass. "It will help on the margins - and of course the industry would rather have it than not," Mr. Lynch says. "But any notion that you're going to change the US energy balance significantly is an exaggeration."

Despite this, the federal government is pushing to open more public land anyway. A series of land-use decisions and proposals over the past four years shows the US is gearing up to make an average of 12.7 million acres a year available to oil and gas drilling, says the EWG report.

"We're not challenging the vast majority of these proposed leases," says Liz Thomas of the Southern Utah Wilderness Alliance, an environmental organization, in Moab, Utah. "What we oppose is leasing these very remote places." Her group has been trying to block energy exploration on what she calls "wilderness quality" lands.

No land is being stripped of protections, says Rebecca Watson, assistant secretary for Land and Minerals Management at the Department of the Interior. She concedes, however, that in some areas where seasonal drilling prohibitions intended to protect wildlife overlap, these will be adjusted to give companies time to get in to drill for oil and gas.

"Nobody's advocating going into wilderness areas or parks," Ms. Watson says. "We're simply asking: 'Are all those constraints necessary, or are there other ways to protect these lands?' "

In fact, the BLM in Utah set aside from Wednesday's auction tens of thousands of acres of land that might otherwise have been leased - much of it for further environmental review, officials say.

Rather than a lack of land to lease, the real obstacle may be the leasing stipulations and conditions placed on exploration and development - conditions environmentalists say are vital, but oil men decry.

"The problem for us wasn't getting leases; the problem was being able to drill and develop those leases," says Geoff Ice, exploration manager at Rosewood Resources Inc. His Dallas oil and gas company has been working with three other companies for several years to get the necessary environmental approvals to drill on an 80,000-acre parcel near the Book Cliffs region of Utah. "It's just been ridiculous things holding us up. We got to the point where we're not as active in Utah anymore. We just got tired of fighting it."

Even so, environmentalists aren't optimistic such lands will be protected. The Book Cliffs region of Utah - a 250-mile-long escarpment with cliffs 2,000 feet high - is the longest such continuous formation in the world and serves as home to mountain lions, bald eagles, and peregrine falcons. But it sits on the edge of a zone of major oil and gas production. Back at the Green River, environmentalists worry scores of wells could be operating within a few miles of historic Sand Wash within a few years.

"Despite talking about protecting these lands, all the BLM has done is open them to oil and gas," says Nada Culver, a Wilderness Society attorney based in Denver. "They went through the full analysis for thousands of acres that met all the legal requirements for wilderness - but now they're not going to designate them wilderness, they're going to drill on them."

Who owns the land?

* The United States government owns nearly a third of US land, but the share varies widely by state - from a high of 88 percent in Nevada to a low of 0.4 percent in New York.

* Throw in the amount owned by states and government holdings account for 40 percent of US land.

* In China, the state owns all the land. Reformers leased it to farmers in the '80s. But as the economy boomed, local officials began taking it back for roads, dams, and other projects. More than 30 million have lost their farms.

Sources: National Wilderness Institute; Los Angeles Times

Regional News 09/11/04

Interior Secretary Norton in Moab to Sign Three Rivers Mining Withdrawal

Click here to read this story by Jeannine Wait of the *Moab Times-Independent*

Photo caption: John Weisheit of Living Rivers and Secretary of Interior Gale Norton discussing Colorado River issues at the BLM's Big Bend campground near the Colorado River on Highway 128 (The River Road above Moab, Utah). Photo by Liz Thomas.

LR Press Release 09/14/04

Release of Flaming Gorge Dam Draft EIS

September 14, 2004
For immediate release
Contact: John Weisheit - (435) 259-1063

Comprehensive basin-wide plan needed to avoid extinction

The Bureau of Reclamation (BuRec) announced the completion of a draft plan to halt the path toward extinction of four native caused by the operation of Flaming Gorge Dam on the Green River in Utah. After more than three years of delay, the draft environmental impact statement calls for modifying dam operations to mimic the conditions of a natural river, as BuRec has implemented elsewhere on the Colorado watershed.
"This is the same failed strategy that BuRec applied to Glen Canyon Dam to help restore native fish in Grand Canyon, yet the agency provides no rationale as to why it will work any better at Flaming Gorge Dam," says John Weisheit, conservation director of Living Rivers and Colorado Riverkeeper from Moab, Utah.

Flaming Gorge Dam, located near the Utah and Wyoming border on the Green River, is a water storage and hydroelectric facility that can store 3.8 million acre-feet of water for downstream consumption. The facility became fully operational in 1964. The Green

River is the major tributary of the Colorado River. The native fish became endangered because high dams, such as Flaming Gorge and Glen Canyon, have altered the natural river conditions that native fish require to reproduce and reach adulthood, namely water temperature, seasonal flow, the suspension of sediment and nutrients, and the ability to migrate freely through the tributary streams.

Before the dams and diversions of the Colorado River system, the native fish thrived in vast numbers for millions of years throughout the Colorado and its tributaries. "There is no way we are going to protect these endangered species through a piecemeal approach to dam operations." adds John Weisheit. "We must work toward the restoration of habitat throughout their entire historical range, which necessitates a comprehensive EIS to address the operations of all dams throughout the basin."

The draft EIS for Flaming Gorge Dam fails to analyze the significant problems associated with the vast plumbing system of dams and diversions on the rivers of the Colorado basin. These issues include the inefficiency of having too much storage in the system and the consequent water losses due to evaporation. Today the Colorado River system has the ability to store over 60 million acre-feet of water. On average the Colorado River produces 14 million acre-feet of water and the total annual loss due to reservoir evaporation alone amounts to 2 million acre-feet per year.

In the last decade, state water management agencies have initiated programs to store Colorado River water in depleted underground aquifers near cities and farms. Such programs offer a reasonable and prudent alternative to reservoir storage, which would in turn provide more water for humans and help to restore river habitat for the endangered fish.

The Colorado, Green and San Juan rivers carry incredible amounts of sediment into the reservoirs of the basin. Sediment loads during the 20th century were estimated to vary from 45 to 180 million tons annually. The problems associated with sediment accumulation in reservoirs was acknowledged by the Bureau 100 years ago, but the agency has never provided a systematic program to solve the impending problem. Sediment impairs the ability of a reservoir to store water as space is displaced by sediment fill. Impaired reservoir storage also impacts the ability to safely bypass waters around dams during big floods.

These will be key topics that Living Rives and other groups will reiterate at public meetings planned for October 12 - 21 in Utah cities that include, Moab, Salt Lake City, Dutch John and Vernal; a meeting in Wyoming at Rock Springs is also scheduled. Written comments from the public on the draft EIS are due November 15, 2004.

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Link to Living Rivers' comments of November 15, 2004, DEIS Flaming Gorge Dam EIS

Link to BuRec press release

Link to the Flaming Gorge Dam DEIS

Link to Living Rivers' scoping comments of July 2000, Flaming Gorge Dam EIS

Biological Opinion from US Fish and Wildlife Service

LR in the News 09/15/04

Flaming Gorge may alter flows, temperatures for native species
Endangered: Dam seeks to revive fish

By Joe Baird for The Salt Lake Tribune

Native fish have been missing their spawning cues and pools for so many years along the Green River that four species are now endangered.

Last week, the Bureau of Reclamation released a proposal to address the problem, essentially by modifying the water flows and temperatures at Flaming Gorge Dam to more closely mimic seasonal water conditions that existed downstream before the dam was built in the 1960s.

By doing so, bureau environmental specialist Beverly Heffernan says the razorback sucker, humpback chub, Colorado pikeminnow and bonytail can be revived - both through higher spring flows that will signal the spawning season and the creation of sand bars and side channels where eggs will be better protected from predators.

"What we're trying to do is provide a more natural flow to the river while continuing to meet our obligations to provide a storage reservoir and hydroelectric power under the Colorado River Storage Act," said Heffernan, who is based in the bureau's Provo office.

But the draft environmental impact statement - now in the public comment period - has been panned by environmentalists. Fishing guides who operate in the trout-rich waters below the dam also have expressed concerns.

For John Weisheit, conservation director of Moab-based Living Rivers, the issue is one of shortsightedness. Contending that this same proposal has failed elsewhere, he calls for a whole new assessment of the Colorado River system - of which the Green is a main tributary.

"The needs of the fish, the environment, the national parks were never addressed when decisions were made about how to allocate water from the Colorado River and its main tributaries, so we have these big problems now," said Weisheit. "The problem with this is, it doesn't work. They tried experimental flows in the Grand Canyon and at Glen Canyon Dam, and there is no record of success."

Weisheit says what's needed is "a big picture" review of the Colorado system, which he predicts will eventually result in the dismantling of dams such as Flaming Gorge and Glen Canyon because of decades-long sediment buildup in the reservoirs.

Heffernan says that issue is beyond the scope of her agency's charge.

"Decommissioning is not an option," she said. "The question isn't a matter of doing everything you can to save all of the fish; it's helping the fish survive under the mission we are given. What this [environmental statement] tells us is that we can achieve the flows and temperatures recommended without harming any of the other resources or purposes of the dam."

Among the resources below the dam is one of the nation's most acclaimed trout fishing areas. And at least one outfitter has conflicting emotions about the bureau's proposal.

"It all depends on how radically they alter the stream flows," said Dennis Breer, who owns a fly fishing guide service in Dutch John. "I've been involved with this process since 1990, when they began experimenting with the flows, and we saw some strange things happen. We've also seen in some cases that what's good for the native species is also good for the trout. But every time they move [the water flow] up and down it impacts the trout. So what we're concerned about is the extremes."

Heffernan says those concerns will be addressed.

"Under some circumstances the water could be too warm for the trout," she said. "We're working with [the Utah Division of Wildlife Resources] to further analyze these areas."

jbaird@sltrib.com

Flaming Gorge public hearings

All meetings begin at 6 p.m.

Oct. 12: Moab, Ramada Inn, 182 S. Main St.

Oct. 13: Salt Lake City, Downtown Marriott, 75 S. West Temple

Oct. 19: Rock Springs, Wyo., Holiday Inn, 1675 Sunset Drive

Oct. 20: Dutch John, Conference Hall, South Boulevard

Oct. 21: Vernal, Western Park Convention Center, 300 East and 200 South

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LR in the News 09/17/04

BuRec proposes boosting Flaming Gorge Dam flows to aid fish

Sept. 17 - April Reese, Greenwire reporter

The Bureau of Reclamation has proposed releasing more water from Utah's Flaming Gorge Dam to reverse the decline of four species of endangered fish on the Green River. But the proposal, included in a draft environmental impact statement last week, will not be enough to recover the fish, environmentalists contend.

The 40-year-old dam, authorized by Congress as part of the Colorado River Storage project in 1956, was built to create a 91-mile-long reservoir for water users in the upper Colorado River Basin. As the largest dam on the Green River, Flaming Gorge also provides vast quantities of hydropower, roughly 217 million kilowatt hours (kWh) in 2002.

Federal wildlife biologists began to suspect the dam was harming native downstream fish as far back as the 1980s, and in 1992 the Fish and Wildlife Service issued a biological opinion stating that the dam was aiding the decline of four endangered fish: the razorback sucker, Colorado pikeminnow, humpback chub and bonytail.

That prompted BuRec, which operates the dam, to study how changing the dam's operation might reduce harm to fish (Land Letter, June 12, 2003). FWS followed with an updated biological opinion in 2000, including flow recommendations for Flaming Gorge. That biological opinion provided the basis for the draft EIS.

The new proposal calls for releasing as much as 8,600 cubic feet of water per second (cfs) from the dam during years with abundant water supply and 4,600 cfs during dry years. Under current operations, reservoir releases range from 800 to 4,600 cfs.

BuRec and FWS are hoping that an increase in flows will help create sandbars and side channels, which serve as nurseries for the fish, and otherwise improve habitat. The plan also calls for the warming of water released from the deepest parts of the reservoir to more closely mimic ambient river temperatures. Dam operators will tweak an existing "temperature control device" to warm the flows, officials said.

"Our proposal is to re-operate the dam to help the fish but maintain the other authorized purposes," such as water storage, power generation and recreation, said Beverly Heffernan, an environmental specialist at BuRec's Provo, Utah, office. Operating the dam to simulate natural flows should not have a significant effect on power generation, Heffernan said.

Larry Crist, a fisheries biologist with FWS's Utah office who helped write the 2000 biological opinion, said the draft EIS does a good job of incorporating FWS's recommendations. "It will provide a way of operating that allows for the recommendations to be met," Crist said.

Unlike some dams, Flaming Gorge does not cut off endangered fish from historical spawning grounds, he said. Most of the habitat for the endangered fish is downstream of the dam.

But John Weisheit, conservation director for Living Rivers, a Moab, Utah-based environmental group, questioned whether increasing releases from the dam will help the fish. Similar efforts at Glen Canyon Dam to aid endangered humpback chub in the Grand Canyon have not been successful, he said (Land Letter, Nov. 20, 2003).

"They're just slapping a bunch of Band-Aids on a bunch of gaping wounds," Weisheit said. "From the top of the [Colorado River] drainage to the bottom, it's the same thing: The temperatures are wrong and the flows are wrong. We're not working with the river; we're forcing the river to work for us."

Living Rivers is pushing for a more comprehensive EIS to evaluate what can be done to recover endangered fish throughout the Colorado River Basin while addressing human water needs.

"There is no way we are going to protect these endangered species through a piecemeal approach to dam operations," Weisheit said. "We should be looking at this more holistically. Which dams should we get rid of to help endangered fish and minimize evaporation loss? Why aren't we storing this water in places like aquifers where it won't be evaporated?"

But in the case of Flaming Gorge Dam, higher flows already have a proven track record of making a positive difference for fish, Heffernan said. Working under an earlier 1992 biological opinion that called for experimental increases in flows, BuRec saw improvements in fish habitat, she said. That experiment is what led FWS and BuRec to try releasing more water from the dam, she added.

Environmentalists had asked the bureau to include decommissioning the dam in its list of alternatives in the EIS, but the agency decided not to consider that option, citing its mandates under the Colorado River Storage Project and the Flaming Gorge National Recreation Area acts.

"Congress, in its wisdom, directed us to build the dam, and we did," Heffernan said. "We were authorized to build the dam, and to operate it. We don't have the authority to decommission the dam. That would take an act of Congress."

Furthermore, public comments on the draft EIS "overwhelmingly" opposed decommissioning, she said. "There are a lot of people who use the reservoir and the river for recreation, and they would like to see that maintained."

Crist said removing or breaching the dam is not necessary to improve conditions for endangered fish. "I think it's still possible to have the dam and recover the fish," he said. "The other way [decommissioning the dam] would work too. But I think it's possible to have the benefits of the dam and help the fish."

The higher flows are part of a larger recovery effort that includes controlling non-native fish that compete with endangered species and restoring habitat, Crist said.

If the new proposal is approved, BuRec and FWS will monitor the effects of the increased flows and temperatures and revise dam operations if necessary, Heffernan added.

"We acknowledge we don't have all the answers yet, but this is based on the best available science," she said. "This is really just part of an ongoing effort. It will take a number of years to get some good data to determine whether it's working or not."

The bureau will hold a series of public hearings on the draft EIS in Utah and Wyoming in October, Heffernan said.

LR Letter 09/23/04

Comments: Living Rivers to EcoPlan Associates

From: Living Rivers
Colorado Riverkeeper
PO Box 466
Moab, UT 84532
435.259.1063
September 23, 2004

To: Mr. Don Smith
EcoPlan Associates, Inc.
701 W. Southern Avenue
Suite 203
Mesa, AZ 85210

VIA EMAIL: dsmith@ecoplanaz.com

RE: Environmental Assessment (EA) for proposed water intake structures at Navajo Generation Station near Page, Arizona.

Dear Mr. Smith:

Thank you for allowing Living Rivers and Colorado Riverkeeper this opportunity to provide public comments for the proposed construction of water intake structures at Navajo Generation Station (NGS). This facility is administratively managed by Salt River Project (SRP). The facility adjoins lands administered by the National Park Service and the tribal government of the Navajo Nation.

Concerns for better due process

We are very dissatisfied in the minimalist approach concerning due process for this environmental assessment. We feel that the general public was not adequately informed about this EA and hope that public notification from the National Park Service and the Salt River Project will improve in the future, and will also include more

accessibility to information. For example, this would include more contact information with the administrative agencies, and include resource information for public dissemination through the Worldwide Web and local public libraries.

We therefore ask formally that the process for gathering public comments be extended for 30 days and that measures are taken to better engage the public within this 30-day extension.

Concerns about SRP energy policy

The need and purpose for this proposed construction project is the result of climate change. Climate change has produced an unprecedented, but not unexpected, drought in the Colorado River basin. The average Colorado River flow has been reduced by 50 percent in the last six years. Climate change occurs naturally, but it is now accepted that humans do impact climate through the consumption of fossil fuels, which increases the temperature of the atmosphere and the surface of the oceans. NGS burns fossil fuel and thus contributes to the degradation of the world's climate. The management of NGS must be aggressive and accountable in their policies concerning a positive transition from burning fossil fuels to providing alternative energy programs that will eliminate toxic pollution and greenhouse gases from the atmosphere.

This would also include eliminating impacts from fossil fuel consumption and how it affects local and regional residents as it relates to known health problems such as asthma and exposure to toxic heavy metals such as mercury.

We ask that SRP conduct public meetings and to specifically consult with all regional stakeholders with the purpose of developing a progressive policy for providing an alternative to fossil fuel consumption that will protect the atmosphere from further degradation and to improve human health.

Concerns about water rights

The contract for the water rights at NGS is to be renewed in 2009. It would be reasonable and prudent that SRP first secure their water rights before investing a significant amount of money to finance this proposed construction project.

Concerns about bore drilling

The diameter and quantity of the drilling bores appears excessive. Please explain why five bores must be drilled and why at 54 inches in diameter?

Impacts to Traditional Cultural Properties and critical wildlife habitat

It is not clear that new lands are to be developed for the pumping station, service roads or waste facilities for this proposed construction project. We ask that the specialists at the National Park Service and Navajo Nation be consulted and provide clearance for this project's proposal as it relates to the cultural resources of the First Nations in the region of the Colorado Plateau.

We also ask that the US Fish and Wildlife Service be consulted concerning impacts to threatened and endangered species. This would include the potential mortality the intake structures would pose to endangered fish species.

Concerns for the geologic integrity of the host rock

There is considerable spalling of rock that is naturally occurring along the margins of the reservoir due to drought-diminished reservoir levels. We are assuming that the strength of the host rock of Lake Powell reservoir has weakened due to decades of water saturation from the reservoir. We would ask that if construction does proceed at NGS that the core samples from the drilling operations be analyzed by a professional consultant to determine how much structural integrity in the host rock has been lost. We believe this knowledge can be extrapolated for the structural integrity of man-made structures such as Glen Canyon Dam, and natural features that are federally protected, such as Rainbow Bridge.

Impacts from sediment storage in Lake Powell reservoir

The NGS facility is located downstream of Navajo Canyon, which is a large tributary drainage that erodes considerable amounts of soft Mesozoic shale and sandstone into Lake Powell reservoir. A sediment study should be conducted to determine when sediment from Navajo Canyon would impact the water intake structures at NGS.

This would also include the sediment accumulation due to natural turbidity flows along the inundated river channel of the Colorado River. This information on sediment fill should be shared with the National Park Service and with Bureau of Reclamation to provide to them better information in the management of their facilities. Especially as it relates to safety at Glen Canyon Dam.

Impacts to visitors at Glen Canyon National Recreation Area

The impacts to noise levels, the view shed and light pollution should also be addressed at the pumping station. Visitors and campers to Glen Canyon National Recreation Area would appreciate that such impacts be eliminated.

Thank you for this opportunity to provide comments and questions. Please do not hesitate to contact us should you require further assistance.

Sincerely yours,

John Weisheit Conservation Director

Cc: Ms. Barbara Wilson Environmental Specialist Glen Canyon National Recreation Area

LR in the News 09/28/04

Norton Excels as Water Spin Doctor

September 28, 2004
By David Haskell for My Turn/Arizona Republic OpEd

The recent editorial by Secretary of Interior Gail Norton followed the format frequently used by administration "spin doctors". It starts with a positive title, "Water Use Takes Wisdom". If the title rings true there is an implication that the messages to follow are also true. Unfortunately this is rarely the case. This ploy was also used by Norton to tout the Administrations Clear Sky Act, legislation that substantially damaged decades of past Congressional progress in cleaning up sources of air pollution. Examination of the points made by Norton in this article reveals the lack of timely leadership and wisdom associated with her Colorado River management policies.

Her first message was that Arizona is not in a water crisis. The entire Southwest is in a water crisis and the quicker we realize this fact the better chance we have in avoiding the most serious consequences. Most long-range weather pattern experts predict that we are in the 6th year of a multi-decade severe draught. Substantial water conservation measures and actual reductions in use throughout the basin are needed to reduce future impacts on the economy and natural resources. This is particularly true for cities that depend on Colorado River water.

The presence of Lake Powell will certainly not prevent a crisis. Reservoirs do not create water they only store it during years when flows exceed the total annual use. The 1922 Colorado River Compact allocated 15 million acre feet of water to be used by the seven basin states. Even though Colorado River flows were at historically high levels during recent decades, the average annual flow has only been 13 MAF. If the draught experts are correct this flow will be reduced to about 9.5 MAF by 2050. It is clearly evident that from now on there will be little excess water to be stored by these reservoirs, and the 500,000 acre feet of water lost by Lake Powell each year from evaporation will make the situation even worse. In future years Lake Mead will provide all of the storage needed in the lower basin.

Perhaps Norton’s least wise policy has been to declare that there is "surplus water" in the Colorado River system. Declaring a surplus each year allows the states to continue to use their inflated Compact allocation even though the river has not delivered that amount of water for nearly a decade. The severity of the current situation could have been reduced if Norton had declared a shortage three years ago, requiring a reduction in water use before a crisis occurred. Actually achieving significant reductions in water use in the seven basin states will take several years. Waiting until we run out of water before starting to initiate cutbacks can only result in the chaos of hastily implemented mandated emergency measures.

Norton implies that the Gila River water adjudication process will somehow result in helping the draught situation. Regardless of which entity ends up with legal rights to the CAP allocation, this process will not increase Arizona's Colorado River allocation or conserve water. The Salt River Project managers have been reducing CAP water deliveries for agricultural purposes for the past three years. This is a very prudent action. Further reductions in use should be implemented and water saved stored in underground aquifers.

Secretary Norton did make one important point, "water is the Southwest's most precious resource, and we must work together…. to wisely use and manage the Colorado River". Unfortunately, we have seen little evidence of "wise" leadership from this Secretary of the Interior.

David Haskell
Policy Director, Living Rivers

Living Rivers is a river advocacy group based in Moab, Utah with an office in Camp Verde, Arizona

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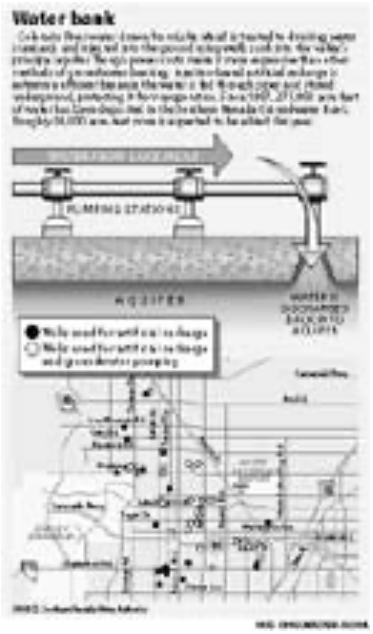
Regional News 10/10/04

Artificial recharge of aquifer at Las Vegas



Sunday, October 10, 2004 Copyright © Las Vegas Review-Journal
Valley has two water savings accounts

Local providers have been socking away water since 1987
By HENRY BREAN

J.C. Davis, spokesman for the Southern Nevada Water Authority, stands next to a well at the water authority's North Well Field on Valley View Drive. The pumps draw groundwater to supplement what the valley gets from the Colorado River.

It's a warm fall day, neck deep in the worst drought on record, and the pumps are churning at the Southern Nevada Water Authority's North Well Field on Valley View Drive.

At the moment, and throughout the hottest part of the year when water use is at its peak, the pumps are being used to draw groundwater to supplement what the valley gets from the Colorado River.

Soon, however, that flow will be reversed, and over the next six months or so several billion gallons of treated drinking water from Lake Mead will be pumped directly into the ground.

That may sound like a reckless waste, but it's really the opposite.

Since 1987, local water providers have socked away 275,000 acre-feet of water using a process called artificial recharge. About 13,000 acre-feet was injected into the ground during the first three months of this year. Another 17,000 acre-feet is due to be pumped down by year's end.

An acre-foot is 325,851 gallons, roughly the amount of water consumed by the average Las Vegas Valley household every 17 months.

"A lot of the public is not even aware that we've been squirreling away water for years," said J.C. Davis, spokesman for the water authority. "It's important they understand that we aren't operating without a net."

It is called the Southern Nevada Groundwater Bank, but local water officials didn't invent it. They only gave it a name.

The storage area itself has been here far longer than people have, trapping melted snow from the past 10,000 winters in a 1,000-square-mile matrix of dirt and rock generally found 500 to 1,200 feet below the surface.

Now the valley's principal aquifer is being used much like a common savings account.

Each year, Nevada is allowed to consume 300,000 acre-feet of water from the Colorado, minus any surplus water that might be available during wet years. Any portion of the 300,000 acre-feet that isn't used goes into the bank, so the less water the valley consumes, the more it can save.

"It's a two-for," said Pat Mulroy, water authority general manager. "The community creates a drought cushion for itself by conserving.

"There in that bank is the water we might need in a protracted drought."

And in the use-it-or-lose-it world of water law, artificial recharge allows Nevada to get the full benefit from its comparatively meager share of the river, even when the water is not immediately needed to meet demand.

The practice is nothing new. Artificial recharge has been around for thousands of years, helping humans grow crops and survive in arid climates from ancient Persia to 1930s California.

Arizona, a state almost entirely dependent on its groundwater supplies, began large-scale banking 10 years ago and has put away more than 1.8 million acre-feet so far.

Artificial recharge also is used to stabilize and replenish areas where groundwater has been overpumped, causing the earth to subside and wells to fail. Over the past three

years, the Las Vegas Valley Groundwater Management Program has injected more than 7,000 acre-feet of water into selected parts of the valley for just that purpose.

"Most people forget that aquifers are finite, and it takes a long time to replenish them. Nature does that very, very slowly," said Tom Harbour, water planning supervisor for the Central Arizona Project. "With artificial recharge, we're kind of helping nature along."

The water authority and its member agencies operate the largest injection-based artificial recharge system in the world.

The system employs 77 wells, most of them in the northwest part of the valley. Some of the wells are used both to put water into the ground in the fall, winter and spring and take water out in the summer.

On paper, the water authority has yet to make a withdrawal from its bank, though technically at least some of the water put in has been pumped out again by the roughly 9,000 residential and commercial groundwater wells throughout the valley.

"I don't think we'll need to tap the bank for some time. I hope that's the case," said Kay Brothers, the water authority's deputy general manager for engineering and operations.

When the valley is forced to use its bank -- if, for example, the drought reduces the state's Colorado River allocation or local water use surpasses supply before new resources can be tapped elsewhere in the state -- there should be enough water put away to supplement what we get from Lake Mead for at least a decade, Brothers said.

Then there is Nevada's other water savings account, one forged not by pumps but by policy.

Through a cooperative agreement struck in 2001, the water authority has secured 110,000 acre-feet of credits in Arizona's groundwater bank.

Nevada hasn't had to tap that bank either, but when it does, the only thing flowing from Nevada to Arizona will be money.

Cashing in the credits works like this: Arizona surrenders some of its 2.8 million acre-foot Colorado River allocation to Nevada, which pulls the water from Lake Mead. If necessary, Arizona replaces that water by tapping its groundwater reserves or paying farmers not to irrigate some of their crops. Nevada pays Arizona for any costs associated with pumping and delivering the groundwater Arizona needs to replace the Colorado River water it has given up.

Unlike Nevada's injection-based system of artificial recharge, Arizona benefits from permeable soils that allow the use of spreading basins, which Harbour described as "very, very leaky ponds" that can let up to 7 feet of water seep into the ground each day.

The state also channels water into normally dry streambeds with similar results.

The Central Arizona Project, which channels water 350 miles from the Colorado River to Phoenix, Tucson and farms in between, has five spreading basins in operation, one

under construction and another in the design and permitting phase. Water also is banked by the Salt River Project and the Arizona Water Banking Authority.

The agreement between Nevada and Arizona allows the Silver State to bank a total of 1.25 million acre-feet in Arizona through 2050. So far, though, little progress has been made toward that goal because Arizona must first satisfy its own water needs before it can start setting aside water for another state.

Larry Dozier, deputy general manager of the Central Arizona Project, said that by 2016 officials in Arizona hope to have met most of that state's water storage targets and have close to 1 million acre-feet set aside for Nevada.

"The darned river hasn't cooperated," Dozier said. "It got dry, and there hasn't been a lot of surplus water."

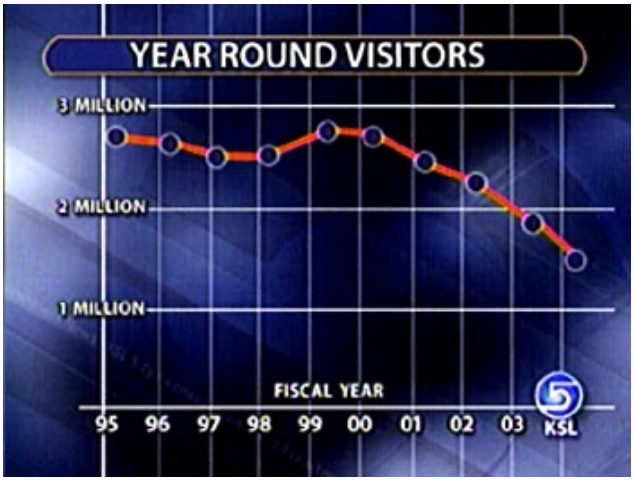
The two states are now discussing a way around that. "What we're talking to Arizona about is firming up the 1.2 million acre-feet," Mulroy said.

In effect, the plan being discussed involves Arizona extending Nevada a line of credit.

"We would let them take their water out before they put it in," said Dozier, who sees the idea as a way of building the kind of cooperative spirit long absent from Western water politics. "Our answer is, we think we have the capability to do it, and it's good to have friends when there is a drought on the river."

Dozier added that a number of "policy and political implications" will have to be addressed, but he thinks some kind of agreement could be reached by the end of the year.

Regional News 10/20/04



Lake Powell services closing for the winter

Lack of visitors, chance to renovate led to the decision
By Ray Grass Deseret Morning News

For the first time since Lake Powell was a mere puddle, the lodges and restaurants, lakewide, will close for the winter season.

Even though Lake Powell is 130 feet below "full-pool," it's the lack of visitors that's forcing the closure.

It was announced late Tuesday that Lake Powell marinas will shift into a seasonal winter schedule.

"We will close down all lodging and restaurants on Nov. 15 and they will remain closed until March 14," said Steve Ward, director of public relations for ARAMARK. "There will be limited service with respect to boat rentals, tours and fuel."

ARAMARK, which owns concessionaire rights to five marinas on the shores of the lake, has been in negotiations for three months with the National Park Service to initiate the closure.

The park service gave its approval last week and since then ARAMARK management has been working through details involved in the closing.

Those individuals with room reservations at the lakeside properties, mainly Wahweap and Bullfrog, will be relocated to Page, Ariz., the city a few miles south of Wahweap.

Those calling the marinas for reservations will be offered room options in Page.

"This is not something that has resulted from the low lake level," Ward said. "We've been experiencing a drop in visitation since 1999. And it didn't happen just at Lake Powell. Other parks, such as the Grand Canyon, have experienced the same slowdown. With lower visitation we've had to reduce staff."

"Last year we did not have the staff to take care of all the tourists and do the season maintenance that was required. This winter we want to renovate three buildings, more than 100 rooms and 60 houseboats. This winter the staff will concentrate on those projects."

When the lake first started to fill, Wahweap would close when temperatures began to cool. At the time it was the only marina on the lake offering restaurant and lodging facilities.

A few years later, however, marinas went to year-round operation and have remained open since.

Uplake, at Bullfrog, the Defiance House Lodge and gift shop, the Bullfrog marina store and the fuel dock at Halls Crossing will close Nov. 1.

Wahweap lodging, the Rainbow Room restaurant and gift shop, and the store at Dangling Roper will close Nov. 15. All will reopen on March 14.

The onshore facilities at Hite will not reopen until May 1.

What will remain open are:

* At Bullfrog, the on-water convenience store, service station, fuel dock and trailer units.

* At Hite, the campground, trailers and an on-call status for essential groceries and supplies.

* At Hite, the pay-at-the-pump fuel station.

* At Dangling Rope, the fuel dock.

* And at Wahweap, the boat tours, campgrounds, limited boat rentals, the marina store and fuel.

"Like most national parks, Lake Powell is considered a seasonal destination by most visitors," according to Dale McFarland, district manager, Lake Powell Resorts & Marinas. "Our guests will be best served if we use the winter months to prepare for the peak season. "

Currently, the lake level is down about 130 feet from "full-pool."

Boat owners are being told they can launch at Wahweap and Bullfrog ramps at their own risk, and that the best ramp is at Halls Crossing. The public ramps at Antelope Point and the Stateline are closed.

For more information about the winter 2004-05 seasonal schedule, you may log on to www.lakepowell.com or call call 1-800-945-LAKE.

E-mail: grass@desnews.com

Regional News 10/20/04

Coachella Valley aquifer recharge program

Balancing growth and water supply Summit called to vet ideas to avoid possible shortage of high-quality water

By Benjamin Spillman The Desert Sun October 20th, 2004

Every year, the aquifer under the Coachella Valley is "overdrafted" by enough water to serve 300,000 households.

That means that though the underground water supply is vast, users are taking out much more water than goes back in.

"We are living on borrowed time," said Mark Beuhler, assistant general manager of Coachella Valley Water District.

That, one estimate says, could mean an end to the "high-quality" water supply in less than 80 years. Or, it could mean ground collapsing into an emptier aquifer.
To combat these possibilities, more restrictive water rules, pipelines that would tap Colorado River and Northern California water supplies and increased scrutiny of homeowners' landscaping could all be in the Coachella Valley's future.

Water stewards and community leaders in the desert region known for cheap water, abundant golf and lush lawns will meet today in Indian Wells for a discussion of what steps to take to maintain the water supply that built a multi-billion tourism and agriculture industry in the area.

The water symposium, sponsored by the water district, will include leaders of area water districts and communities, farmers, golf course operators and environmentalists.

That this diverse collection of groups, often at odds over water management, is coming together at the symposium shows there is increasing focus on ensuring the valley's long-term water future.

A 35-year water plan

The water district has already embarked on a 35-year, $250 million to $300 million water management plan it says will reverse the ongoing overdraft, now estimated to be about 150,000 acre-feet annually. An acre-foot is enough water to supply up to two households for a year.

The water plan aims to reduce overall water consumption in the Coachella Valley by about 7 percent. It also calls on increasing the annual imported water supply from about the current 400,000 to about 560,000 acre-feet.

It suggests dividing water conservation among domestic users and typical businesses, farms and golf courses. Under the plan, domestic users will use 10 percent less water by 2010, golf courses will use 5 percent less by 2010 and farmers will use 7 percent less by 2015.

The imported water, which will come from Northern California via the State Water Project and the Colorado River via the Coachella Canal and the Colorado River aqueduct, will be used to recharge the underground water supply.

Collapsing ground?

The aquifer has shrunk an estimated 5 million acre-feet since 1936 and is estimated to have a 30 million-acre-foot capacity, Beuhler said.

But despite the massive size of the aquifer, he said implementing the water management plan is important to avoid future problems like ground subsidence.

Beuhler said there have already been isolated instances of subsidence, a phenomena that occurs when the ground collapses into an emptied aquifer, around the valley.

He said by the time the problem is widespread it could be too late to solve it.

"Everything sinks, the buildings, their foundations can crack," Beuhler said. "It is not a significant problem yet but it is coming."

Not just quantity, quality

Although CVWD aims to avert problems associated with the aquifer overdraft, the water management plan has been criticized, in part, for not taking water quality into account.

For example, the Agua Caliente Band of Cahuilla Indians are wary of the plan to recharge the high-quality ground water, the result of thousands of years of snowmelt from the mountains and rainfall, with lower quality water from the Colorado River.

River water has more salt and other contaminants. The tribe, which has its own water rights, estimated in 2002 that under CVWD's plan the "high-quality" groundwater supply would be gone in 80 years.

Beuhler said that estimate though, was a "gross oversimplification," though he conceded that Colorado River water has more salinity than local groundwater. All over Southern California, water users, including those in Los Angeles, use water from the Colorado River.

Nonetheless, in a letter to CVWD, the tribe recommended using Northern California water from the State Water Project to recharge the aquifer.

But that could require building a costly pipeline toward Beaumont or Yucca Valley, the closest physical connections to the Northern California water.

Golf course questions

Others suggested further strengthening conservation measures and increasing the cost of water for golf courses and other large users.

"There is no respect for water," said Joan Taylor, president of the Palm Springs branch of the Sierra Club. "It shouldn't be so cheap that they can squander it on golf courses."

Taylor said golf courses should rely more on recycled and imported water, not ground water. Currently, about 72 of the valley's approximately 115 golf courses rely on groundwater.

Robert White, vice president of the Hi-Lo Desert Golf Superintendents Association said the golf community has already reduced water consumption on courses by 11 percent in the last three years.

Many local golf courses are converting to irrigation systems that read the weather and there is research into hybrid grasses that use up to 21 percent less water, White said.

"We are just very, very careful with the amount of water," said White.

He said much of the wasted water in streets comes from homeowners who over-water lawns.

Bermuda or creosote?

Steve Robbins, general manager of CVWD said convincing homeowners to convert from lawns to desert landscaping is another important water management goal.

The district may consider offering incentives to remove grass, Robbins said. Las Vegas, for example, has paid homeowners as much as $1 for every square foot of turf they remove.

"That becomes very, very expensive water," Robbins said.

So far CVWD has focused on educational campaigns to alert homeowners to "lush and efficient" desert foliage. It is also promoting a landscaping ordinance that would reduce the amount of water available to new developments by 25 percent.

But many homeowners in the desert are accustomed to keeping lush, green lawns.

"I believe (lawns) should have grass," said Rick Sullivan, of Palm Desert.

Sullivan recently watered a patch of grass at his Palm Desert Country Club home.

He said without grass, the area would resemble more isolated desert communities like Lake Havasu City, Ariz., where he also has a home.

"It’s green, it gives off oxygen, it’s pretty," he said of the benefits of maintaining a grassy lawn.

Landscaper Karen Lien, also of Palm Desert, said desert homeowners with roots in wetter climates seem to prefer grass to desert landscaping.

"They want a tropical looking courtyard," Lien said. "They don’t care about water, at all."

Benjamin Spillman can be reached at 760-778-4643 or by e-mail .

Aquifer facts

*Since 1936, the 30 million-acre-foot aquifer has diminished by 5 million acre feet. Every year, the aquifer is overdrafted by 150,000 acre-feet. That’s enough to supply service to 300,000 households.

*Water plans calls for households to reduce use by 10 percent and for golf courses to reduce use by 5 percent.

*Another way to re-charge the aquifer is to pipe in water from rivers or water sources elsewhere.

WATER-SAVING TIPS

*When planning a garden, plant items with similar watering needs together and chose water-efficient plants, including local, native vegetation.

*Integrate rocks, bricks and gravel into landscaping.

*Lawns with grass should be watered before sunrise or after sunset to maximize water absorption into the soil and minimize loss due to evaporation.

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Coachella Begins Groundwater Recharge New facility can recharge Valley's aquifer with up to 40,000 acre-feet annually. By: Compiled by staff Published: Jun 18, 2009 The same amount of water used by approximately 40,000 desert households each year will be pumped back into the ground over the next 12 months thanks to a new project by the Coachella Valley Water District. CVWD recently began replenishing groundwater in the east valley at its newest recharge facility in south La Quinta. The new facility can recharge the Coachella Valley's aquifer with up to 40,000 acre-feet of water annually. One acre-foot is 325,851 gallons.

"With this latest project, CVWD responds to the statewide water crisis and takes another step towards protecting our local water resources," says General Manager-Chief Engineer Steve Robbins.

Every year, the Coachella Valley uses almost 400,000 acre-feet of groundwater, but on average only 63,000 acre-feet is replenished naturally through rain or snow melt. Over time excess pumping depletes the aquifer, threatens water supplies to the local population and compromises future growth in the valley.

To replenish groundwater, the new facility uses Colorado River water delivered to the valley via the Coachella Canal, across 120 miles to Lake Cahuilla in La Quinta. The water then travels along existing irrigation pipes, is pumped into 39 recharge basins and left to percolate into the ground.

Extensive scientific modeling and a pilot program were conducted by CVWD over the past decade to locate sites in the east valley that would most impact the aquifer level. In 30 years, the groundwater level in the eastern Coachella Valley will be an estimated 25-105 feet higher than it would have been had CVWD not built the new recharge facility.

"Recharge at this new facility will help reverse two decades of groundwater depletion in the La Quinta-Indio area," says Robbins.

As a responsible steward of the Coachella Valley's groundwater resources, CVWD now operates four groundwater recharge facilities that replenish water back into the ground. Combined, these sites have recharged over 2.2 million acre-feet of water since 1973. Two facilities at Windy Point and Mission Creek are jointly operated with Desert Water Agency in Palm Springs using water from the agencies' entitlements to the State Water Project.

Because the aquifer lies below the entire valley, recharge benefits all local residents and businesses. By replenishing the aquifer, CVWD ensures that a reliable supply of groundwater will continue to be available, across the entire valley, now and for future generations.

CVWD recharge programs are partially funded by fees charged to large water users that pump more than 25 acre-feet of groundwater per year, such as farms, golf courses and Home Owners Associations.

The Coachella Valley Water District serves over 106,000 residential and business customers across 1,000 square miles, primarily in Riverside County, but also in portions of Imperial and San Diego counties.

LR Letter 11/15/04

Comments: DEIS Flaming Gorge Dam

Mr. Peter Crookston
Bureau of Reclamation
Provo Area Office
302 East 1860 South
Provo, Utah 84606

RE: Comments on Draft Environmental Impact Statement on operations at Flaming Gorge Dam

Dear Mr. Crookston,

Living Rivers and Colorado Riverkeeper submit the following comments on the Draft Environmental Impact Statement (DEIS) for the re-operation of Flaming Gorge Dam to benefit endangered fish, as released on September 7, 2004.

While the four-year effort to produce this document has proved useful in generating a better understanding of the challenges facing the recovery of endangered fish below Flaming Gorge Dam, the analysis is not yet sufficient to support the proposed action. The water supply and hydrograph assumptions do not correlate with present trends. The role of endangered fish recovery relative to other operational objectives has yet to be properly clarified. The proposed action fails to address the pitfalls in the structure and mandate associated with the proposed Adaptive Management Program as experienced with Reclamation's recovery efforts for endangered fish at Grand Canyon. The DEIS did not properly review the merits of recovery efforts through a dam decommissioning alternative. Lastly, as noted in our scoping comments of July, 2000, Colorado River endangered fish recovery should be tiered to a programmatic EIS that evaluates recovery needs and barriers throughout the historic range of these endangered fish species. We hope these matters will be properly addressed prior to completion of the Final EIS (FEIS).

1. Water availability

The DEIS failed to sufficiently address how long-term water availability will impact fish recovery in the lower Green River, and as a result did not sufficiently demonstrate whether the proposed recovery efforts can be successful in this limited stretch of river.

Flow scenarios did not take into consideration the prospect of how climate change will affect river flows. The present drought has demonstrated that flows may be significantly

lower than forecasted as precipitation patterns for the Green River watershed may be changing. The Department of Energy has forecasted how western rivers as a whole may experience a 30 percent reduction in flows over the next 50 years due to climate change.

2. Action Alternative is not consistent with the natural hydrograph

The DEIS acknowledges the recommendation to manage the recovery of endangered fish species on a dam-controlled river by mimicking the historic natural hydrograph and thermograph, as much as possible. We believe that the flow recommendations of the DEIS departs from this prescribed treatment. We believe the spring peak flow of the Action Alternative is much reduced and therefore diminishes the success in achieving the goal to recover endangered fish. We also believe that the Action Alternative's base flow, from the summer to winter season, is higher than the historic hydrograph and too does not reflect compliance with the biological data.

Furthermore, instead of timing releases from Flaming Gorge Dam with the natural flow of the Green River, the flow recommendation of the Action Alternative is timed to meet the natural hydrograph of the Yampa River, a tributary of the Green River downstream of the dam. We believe this too diminishes the recovery of endangered fish in the Green River, especially in Reach One (Flaming Gorge Dam to the confluence with the Yampa River).

We believe the DEIS overlooked the benefits associated with the Run of the River Alternative, as suggested by the National Park Service. We encourage Reclamation to scrutinize further the possibilities of implementing such an action plan. We believe strongly that matching the historic attributes of the river is what will eventually provide a greater measure of success in the recovery of endangered fish species, until which time the dam can and will be successfully decommissioned, as is enevitable.

3. Clarify the priority of satisfying the Endangered Species Act

The DEIS sometimes refers to the recovery of endangered fish as distinct from the authorized purposes of Flaming Gorge Dam (Sec.1.1). At other times the DEIS implies that the authorized purpose of Flaming Gorge Dam does include the improvement of critical habitat for fish and wildlife. The FEIS must make clear that fish recovery is paramount as the Bureau of Reclamation must comply with the Endangered Species Act first and foremost, then allow for other dam operational benefits to be pursued accordingly.

4. Adaptive Management Program protocols

The DEIS indicates that the Action Alternative includes the implementation of an Adaptive Management Program concerning the future operations at Flaming Gorge Dam. This program will consist of the Flaming Gorge Working Group and a Technical Working Group. The purpose of the Flaming Gorge Working Group is to provide a check and balance system for the purposes that authorized Flaming Gorge Dam, including the

recovery of endangered fish. The purpose of the Technical Working Group is to provide scientific expertise for the program.

Such a program has been underway for nearly ten years at Glen Canyon Dam, but the results have been disastrous. One more species has gone extinct, the Razorback Sucker, and the Humpback Chub has declined to nearly irreversible numbers. This has occurred for the lack of: a) a clear mandate for independent, peer-reviewed science that is removed from politics, b) to guide the decision making process by placing fish recovery at a priority below power generation, c) not ensuring there are sufficient funds to operate the program.

Reclamation must identify how the Flaming Gorge Dam Adaptive Management Program will avoid the pitfalls that have plagued the program at Grand Canyon.

Reclamation must also outline how this program will address uncertainties associated with the operations at Flaming Gorge Dam, and how future supplemental National Environmental Policy Act compliance will be required.

We believe that such uncertainties could include, but not limited to: progressive global warming, extended and prolonged drought, extreme flood events, higher sediment transport, increased human consumption, modifying selective withdrawal (temperature control), and the control and removal of exotic fish.

This should also include a call by the Lower Basin to deliver the minimal annual requirement of 8.23 million acre-feet at the Compact Point (Lee's Ferry, Arizona). As well as dam operations that further compromise the ecosystem values that authorized the creation of Dinosaur National Monument, Ouray National Wildlife Refuge, and Canyonlands National Park.

We also believe that another management decision of the immediate future should include a fish passage at the Tusher Wash Diversion Dam near Green River, Utah. This would include a device that prevents mortality of endangered fish from entrapment in the irrigation and hydropower projects associated with this diversion dam.

Therefore, we do expect that the working groups and the general public will have comprehensive access to all information that pertains to the operations of the Green River and Flaming Gorge Dam. This should be accomplished through the web pages of the Bureau of Reclamation and through a regular newsletter that is mailed to all interested parties.

For the agencies, scientists and the general public to be well informed, it is imperative that all program information is made available promptly and that this information is disseminated liberally and is not discretionary. It is also imperative that adequate time be allowed for the public to process this information in a timely manner so as to maximize public outreach opportunities in the NEPA decision making process.

5. The Decommissioning Alternative

The DEIS dismissed the decommissioning alternative without sufficient justification or analysis, other than to say, "[decommissioning] does not meet the purpose and need for the proposed action." The principle objective in fish recovery programs is to restore natural processes, which include seasonal flows, temperature, sediment, nutrients and migration.

Decommissioning Flaming Gorge Dam can best meet these objectives and thus should be thoroughly evaluated. While the dam makes some contributions to water storage, power generation and recreation, these contributions are not significant regionally, and are replaceable, whereas the endangered fish are not.

The DEIS also did not fully evaluate the potential for dam failure, and the impacts this may have on endangered fish recovery, as well as other downstream impacts to Dinosaur National Monument and Canyonlands National Park.

6. Basin-wide concerns

Reclamation continues to address fish recovery in the Colorado River watershed in a piecemeal fashion without consideration of the natural species' range, or macro-social and environmental changes that may be affecting the watershed. It's critical for Reclamation to develop a programmatic EIS involving all the recovery needs of endangered fish species in the watershed and the best approaches to resolve them.

We believe the overarching problems that must be thoroughly studied in such a system wide, programmatic approach would include, but not limited to:

• Diminished water supply and water quality • Increased water demand • Over allocation of water rights • Quantifying the water rights of the First Nations • Impacts to national wildlife refuges, parks and monuments (including the international biosphere at the Colorado River delta) • Removal of exotic species • Sedimentation in the reservoirs • Dam safety • Modernizing the Law of the River • Alternative energy production and conservation • Water storage and conservation alternatives

We believe such a study would show conclusively that the Colorado River system would benefit by having some of its infrastructure removed and that alternative storage strategies, such as the artificial recharge in depleted aquifers, can provide:

• Increased habitat for endangered species • Restore the natural attributes of the river and its tributaries • Reduce water loss from evaporation • Reduce salinity • Provide protection from extended drought • Eliminate the consequences of high dam failure • Prompt a sediment management plan

7. Closing statement

Thank you for this opportunity to comment on the DEIS for Flaming Gorge Dam. We encourage the Bureau of Reclamation to proceed in producing a Final Environmental Impact Statement and we look forward to the subsequent Record of Decision. Please feel free to contact us at any time should you require any additional information or assistance from us.

Sincerely yours,

John Weisheit
Living Rivers, conservation director
Colorado Riverkeeper

LR Letter 11/16/04

Comments: Supplemental EA for experimental flows in Grand Canyon

November 16, 2004
Mr. Dennis Kubly
Bureau of Reclamation, Upper Colorado Region
125 South State Street, Room 6107
Salt Lake City, Utah 84138-1102

Re: Draft Supplemental Environmental Assessment. Proposed Experimental Actions For Water Years 2005–2006, Colorado River, Arizona, in Glen Canyon National Recreation Area and Grand Canyon National Park.

Dear Mr. Kubly,

Living Rivers and Colorado Riverkeeper submit the following comments on the Supplemental Environmental Assessment (EA) concerning proposed experimental releases from Glen Canyon Dam to conserve sediment and to disadvantage non-native fish at Grand Canyon National Park, as released on November 5, 2004.

1. Introduction

Living Rivers is keenly aware of the rapidly declining Humpback Chub population, as well as other Grand Canyon native fish species, caused by the operations of Glen Canyon Dam. This also includes the acute reduction in stored fine sediments, which are needed to provide rearing habitat for endangered fish, to preserve the cultural heritage of the First Nations and to provide camping beaches for visitors in Grand Canyon National Park.

While the purpose of this EA is in response to modify the operations of Glen Canyon Dam to conserve both sediment and endangered fish and to test methods to mitigate such impacts, the proposed actions, especially as they pertain to sediment retention and habitat-building, are fundamentally flawed. Of critical concern to us is how the EA does not evaluate any alternatives for increasing the sediment load below Glen Canyon Dam, as the dam is entirely responsible for blocking 95 percent of historic sediment load from ever entering the river ecosystem in Grand Canyon.

To adequately address the problems associated with sediment retention and augmentation, as well as the problems associated with non-native trout species,

necessitates a Supplemental Environmental Impact Statement (EIS) and not the cursory analysis undertaken in this EA. Such an EIS must fully evaluate the decommissioning of Glen Canyon Dam in addition to other appropriate alternatives to meet sediment needs and to disadvantage non-native trout populations in Grand Canyon.

We believe the need for a Supplemental EIS stems far beyond the above and includes a host of other issues affecting the dramatic decline in Grand Canyon Humpback Chub populations. This would include water temperature, water quality, historic seasonal flows, nutrients for the food web and the ability to migrate in response to the environmental needs of endangered fish. The reduction in adult Humpback Chub population constitutes significant and new information to that which was evaluated in the 1994 Fish and Wildlife Service Biological Opinion and the 1996 Final EIS on Glen Canyon Dam operations.

Lastly, the public process for this proposed action has been wholly unsatisfactory once again, as when the initial EA was first presented in October of 2002. The Bureau of Reclamation (Reclamation) and its Adaptive Management Program (AMP) for Glen Canyon Dam must overhaul its procedures for public participation.

2. Insufficient sediment to justify further experimentation outside of augmentation

The EA focuses on utilizing experimental flows from Glen Canyon Dam to manage sediment for the benefit of Humpback Chub populations. However, the abundance of study and experimentation done previously has already demonstrated conclusively that in the long-term, little to nothing will be gained from the proposed action. The sediment conserved during this experiment will return to the river and flow downstream to Lake Mead. The resources of Reclamation and the AMP would be better invested in aggressively pursuing alternatives that stand a greater likelihood of achieving this goal.

Ninety five percent of the historic sediment load for Grand Canyon native fish remains trapped in Lake Powell. In theoretical optimum conditions, such experiments, as proposed in the EA, could manage only five percent of the sediment that would exist in natural conditions. This five percent has already proven insufficient to meet the sediment and nutrient requirements to recover native fish. Sediment is a key missing component for advancing the recovery of native fish in Grand Canyon (Rubin, et. al., EOS v83, n25, 2002). The proposed action focuses solely on flood releases to store this minimal amount of sediment on the margins of the river, while at the same time failing to demonstrate any long-term availability of sufficient sediment to aid recovery in the future. Reclamation must therefore address through an EIS process methods to augment sediment into the system.

3. Climate change and the associated effects on long-term habitat improvement

The EA ignores climatic factors that will affect the proposed experimental releases. The Colorado River watershed is experiencing much lower flows than were anticipated when such spike flows for sediment conservation were first conceived in the original EIS. The US Geological Survey (USGS) has reconstructed the historic climate conditions for the Colorado River basin. Their findings indicate that a sustained and severe drought could

lie before us and that such a climate regime would affect resource management challenges (Webb et. al. 2004) (Meko et. al. 2004). Furthermore, the Department of Energy projects that the Colorado and other Western rivers will see a 30 percent decline in flows over the next fifty years due to climate change (Accelerated Climate Prediction Initiative 2002).

This is already proving to be a problem for the proposed action. Sediment conservation strategies require a sufficient amount of water in Lake Powell to generate optimum flood flows. USGS scientists have stated that the ideal flood magnitude for sediment conservation in Grand Canyon should be 60,000 cfs (Weile 2003). At present the spillway portals, which must be utilized to achieve this target, are perched above the current reservoir level. The EA ignores this and now suggests that the maximum flow for this experimental release need only be 41,000 cfs. It is quite possible that this flood magnitude will not prove sufficient in 2004, much less in subsequent years should river flows remain below that necessary to refill the reservoir.

4. Timing of spike flows and sediment deposition will provide no benefits to native fish rearing

Under ideal circumstances sediment inflows from the Paria River would be better conserved through dam releases at low flow, with the spike flow commencing in conjunction with the natural rearing of Humpback Chub in the spring and summer. Past experiments have already demonstrated that much of the habitat building from spike flows disappears within six months after the spike. Since the proposed action would occur six to seven months in advance of the Humpback Chub's ability to benefit from it, there is no justification to time such flows so far in advance. To be of any benefit such spike flows should be timed to coincide with the natural high flows entering Lake Powell.

5. Proposed flows ignore Fish and Wildlife Service opinion for the recovery of Humpback Chub

The EA of 2002 stated that the present flow regime from Glen Canyon Dam (Modified Low Fluctuating Flow or MLFF) has failed to benefit the habitat of the Humpback Chub. This conclusion resulted from data provided by the Grand Canyon Monitoring and Research Center (Coggins and Walters 2001), which found that a dramatic reduction in the Humpback Chub population has occurred since this flow regime was implemented.

This flow regime was selected as the preferred alternative by the Secretary of Interior despite objections by the Fish and Wildlife Service (FWS) in its 1994 Biological Opinion. That opinion specifically stated that the MLFF alternative would "likely destroy or adversely modify designated critical habitat." FWS recommended the alternative known as the Seasonally Adjusted Steady Flow (SASF). FWS, in conjunction with the Department of Biological Sciences at Northern Arizona University, reiterated these recommendations in their September, 2002 report, Monitoring and Research: The Aquatic Food Base in the Colorado River, Arizona during 1991-2001 (Benenati, et. al., 2002). This report states, "We recommend a decade of Seasonally Steady Flow 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."

The proposed experimental releases outlined in the EA will continue to conflict with these recommendations in two ways. First, as noted above, the habitat-building releases do not occur at the preferred time-period of the annual, historic snowmelt, to which these native fish are naturally attuned. Second, the prescribed fluctuating flows for non-native fish suppression would disrupt the food supply for the native fish species and transport sediment out of the Grand Canyon river system.

Additionally, the EA does not sufficiently analyze the impacts to other habitats with their associated species caused by experimental releases inconsistent with the river's natural hydrograph.

6. Water quality

As the reservoir is now only 38 percent full, the potential exists for water quality problems to materialize during the experimental release, which were not addressed in the EA and must be prior to any experimentation. The reservoir water extracted at the depth near the river outlet works may be high in sodium, phosphorus, nitrogen, hydrogen sulfide, dissolved oxygen and heavy metals. We are curious how Reclamation and US Geological Survey will monitor the water quality should this experiment proceed, and will these chemicals impair the food web and habitat of the endangered fish of Grand Canyon?

7. Public review process

Reclamation did not fully comply with the spirit of the public review process as outlined by NEPA and the AMP Charter. Two weeks notice was given to submit comments for this Supplemental EA and to our knowledge no public meetings were scheduled or noticed.

The AMP is charged to fully involve the public in all its activities. Similar insufficient outreach occurred during the EA in 2002 and we voiced our dissatisfaction then, asking Reclamation to assert greater diligence in the future. Once again we are compelled to remind Reclamation that public participation must include ample time for citizens to learn about, and to become engaged in, all activities pertaining to the operations of Glen Canyon Dam and its associated impacts to Grand Canyon National Park.

8. Supplemental EIS needed

The proposed actions in this EA, either separately or in combination with other actions contemplated by Reclamation and the AMP, are not seriously addressing the precipitous decline of endangered Humpback Chub in Grand Canyon National Park. This decline, described by key investigators including Lew Coggins, Carl Walters and others, while not surprising considering the lack of management activities given on behalf of the Chub, was not anticipated when the Record of Decision was signed. Therefore, under National Environmental Policy Act (NEPA) regulations found at 40 CFR 1502.9(c)(1)(ii), these new data represent "significant new circumstances or information relevant to

environmental concerns," triggering a requirement to prepare a Supplemental EIS (SEIS) to the 1996 Glen Canyon Dam EIS.

The Bureau of Reclamation, the National Park Service and other agencies are likely in violation of the Endangered Species Act and the Grand Canyon Protection Act for failing to ensure protection and recovery of the Humpback Chub population in Grand Canyon National Park. Reclamation, in conjunction with National Park Service and other relevant agencies, should immediately begin work on such an EIS for the full recovery of the Humpback Chub populations in Grand Canyon National Park. Such an EIS must address all issues affecting the Humpback Chub. This would include water temperature, water quality, seasonal flow, a healthy food web, sediment and nutrient loads and impacts from non-native fish. Most importantly the EIS must evaluate the decommissioning of Glen Canyon Dam as one of the alternatives to meet Humpback Chub recovery objectives.

9. Conclusion

Living Rivers and Colorado Riverkeeper finds this EA and the experiment proposed to be a waste of public resources. The crisis facing the Humpback Chub in Grand Canyon is quite serious, but it has yet to be taken seriously by Reclamation and the AMP. We believe the AMP process favors power and water resources, which are replaceable, over endangered species, which are not replaceable. The proposed habitat-building experiment is unlikely to materialize any benefits due to general lack of sediment in the system. Even if such sediment were available, it would not be distributed in a timeframe to benefit the Humpback Chub. Regardless, such sediment would be insufficient to mitigate the loss of 95 percent of sediment and nutrients now trapped behind Glen Canyon Dam.

This EA further demonstrates Reclamation's and the AMP's unwillingness to follow the recommendations of FWS, and as a result, will lead to the further declines in the Humpback Chub populations in Grand Canyon National Park. Reclamation must abandon this EA and proposed experimentation and conduct a full EIS on new operating regimes for Glen Canyon Dam, including decommissioning, to fully recover endangered fish habitat in Grand Canyon National Park.

Thank you for the opportunity to submit these comments and recommendations.

Sincerely,

John Weisheit
Living Rivers, conservation director
Colorado Riverkeeper

Biological Opinion: Glen Canyon Dam. US Fish and Wildlife Service

LR in the News 12/02/04

Glen Canyon Dam test flow raises questions about future management

LAND LETTER Thursday, December 2, 2004
COLORADO RIVER

April Reese, Land Letter Southwest reporter

GLEN CANYON DAM, ARIZ. -- Eight years after an experimental flood aimed at boosting the faltering ecosystem in Grand Canyon National Park, dam operators have opened the bypass tubes once again. But whether or not the experiment fares better than its failed predecessor, Grand Canyon stewards say it will undoubtedly raise difficult questions about how the dam should be managed in the future.

Beginning Nov. 21, the Bureau of Reclamation, which operates Glen Canyon Dam, unleashed 224,000 acre-feet of water through four giant bypass tubes over 90 hours. Scientists and dam managers hope the high flows, rushing down the canyon at 41,000 cubic feet per second (cfs), will stir up sediment flowing in from tributaries downstream from the dam and deposit sand in the Grand Canyon's river channel, building beaches and sandbars to help endangered fish and provide camping areas for rafting expeditions.

"This is amazing," said Sam Spiller, lower Colorado River coordinator with the Fish and Wildlife Service, watching cylindrical torrents of water blast through four bypass tubes at the base of the dam. "Even during a drought season, we're going to go ahead and take advantage of the sediment."

The experiment was initially scheduled for January, but dam managers decided to release the high flows in November to capitalize on recent storms that have swelled the Colorado River's tributaries with sediment in recent weeks.

"The sediments have come down from these storm events," Spiller said. "The question is, can we put these sediments up [on the banks] and restore some of our beach habitat?"

The deposition of sediment creates pools and ripples that provide important habitat for the humpback chub, one of four endangered fish that persist in the Colorado River, and encourage willow growth, which supports southwestern willow flycatchers, an endangered bird.

"The sediment, sand, mud and silt play an important role in the ecosystem," said Chip Groat, director of the U.S. Geological Survey.

An earlier 45,000 cfs test flow in 1996 failed to keep deposited sediment in the system long enough to benefit the ecosystem, largely because the release was too long, eventually scouring the beaches and sandbars it had built, scientists said.

"If there's too much [water], the sediment just erodes -- it goes down to Lake Mead," said Denny Fenn, director of the Geological Survey's Southwest Biological Science Center.

The test flow was the result of a proposal from the Glen Canyon Dam Adaptive Management Work Group, which makes recommendations on dam management and protection of downstream resources, as required under the Grand Canyon Protection Act. The group is comprised of hydropower interests, environmentalists, Park Service officials and other stakeholders.

The release dropped the level of Lake Powell, now down to about 375 feet, by 2-and-a-half feet. But the water sent downstream will go to meet delivery obligations under the Colorado River Compact, which divvies up the river's water among seven western states. Releases from the dam will be lowered in the coming months to offset the high flows sent downstream during the experiment, Bureau of Reclamation officials said.

The Western Area Power Administration, which generates power from the dam, estimates that it lost almost $2 million during the test flow, which bypassed water around the power plant. But the loss of power generation will be made up for during fluctuating flows over the next few months, said Clayton Palmer, who represents WAPA in the working group.

While the long-term effect of the experiment will not be known for at least a year, preliminary measurements suggest the flows have deposited sediment onto beaches and sandbars. But it remains to be seen whether enough sediment has been loaded into the river to offset the constant erosion that occurs during normal releases from the dam, said Scott Wright, a hydrologist with the Grand Canyon Monitoring and Research Center.

"What we've seen in the past is there's consistent erosion of sand in the canyon under normal power plant operations," he said. "The question is whether ... we can overcome the erosion that happens during regular plant operations."

Scientists are taking a trip down the river this week to examine the new sandbars, he said. "I think they will be there, but there's also a question of how long the sandbars will last." Monitoring will continue over the next year and a half.

A changed ecosystem

Even if the test flow proves to be a long-term success, the Grand Canyon ecosystem faces a myriad of other problems, scientists note. The water in the river is cooler than it was historically, because most of the water that flows downstream has languished in the deep, cool reservoir behind the dam before being released. And while dam managers have altered flows to help the ecosystem, the river no longer rages and whimpers the way it did historically (Land Letter, Dec. 11, 2003).

Those changes, along with the invasion of exotic fish, are largely responsible for the extinction of four species of native fish and for the endangered status of the four

remaining native fish species in the Grand Canyon, including the humpback chub (Land Letter, Oct. 30, 2003).

Today, the Colorado River, named for its historic reddish hue, is a very different river. "It's clear, it's cold, it's got a lot of trout, which compete with the native fish, and the flow regime is drastically different from what it used to be," Wright said.

And while the test flow may have helped carry sediment loaded into the river by its major tributaries, most of the sand that would flow downstream is trapped by the dam. Managers estimate that 92 percent of the sediment that would be carried downstream by an undammed river is settling behind Glen Canyon Dam -- a growing underwater sandbox that also limits water storage capacity.

Some environmental groups question whether such experiments will be enough to recover the ecosystem in the Grand Canyon.

"The proposed habitat-building experiment is unlikely to materialize any benefits due to general lack of sediment in the system," wrote John Weisheit of Living Rivers in a letter to dam managers. "Even if such sediment were available, it would not be distributed in a timeframe to benefit the humpback chub."

But Nikolai Ramsey, who represents Grand Canyon Trust in the working group, said he hopes the test flow will have a positive ecological effect. "This experiment is a watershed event," Ramsey said. "It's possible that many resources will benefit -- so much is tied to sediment."

What next?

If the test flow is effective, such flows would need to be replicated on a regular basis to help the ecosystem recover over the long-term, scientists say. But working group members disagree on whether the law allows for regular bypasses of the power plant. WAPA believes it does not; environmental groups insist that it does.

"The issue is, can you conduct those kind of flows on a regular basis and conform to the law?" Palmer asked. "The 1968 Colorado River Basin Act doesn't allow bypasses of the power plant, unless it's hydrologically necessary. ... That is going to be a problem. So we're not advocating at this point that [high flows] be conducted on a regular basis."

But if the test flow demonstrates that regular high flows are what the ecosystem needs, managers should adjust dam management accordingly, Ramsey argued. "If this experiment works, why shouldn't we do this every year?" he asked.

On the other hand, if the experiment fails, managers are left with another difficult dilemma.

"During the eight years of adaptive management, we tried various things, and the resources continued to decline," Ramsey said. "If this doesn't work, it's going to be highly suggestive that the Grand Canyon resources will not be able to be restored to

any kind of health with the dam still there. So if this experiment doesn't work, what do we have left?"

There is at least one option that has not yet been tried. Dam managers have suggested building a sediment slurry pipeline that would deliver sediment from behind the dam into the river on the other side. But some working group members contend that would be expensive and may not work. Scientists are currently doing a feasibility study on the pipeline proposal.

Another option might be to try the high test flow again when more sediment is coming into the Colorado River from its tributaries, Wright said.

"What's left are very difficult and expensive alternatives," Palmer said.

One solution the working group will not discuss, Ramsey said, is decommissioning the dam, an option that Living Rivers and a handful of other groups have been pushing for several years. The working group's approach has been to restore the Grand Canyon's resources to the greatest extent possible while maintaining the human benefits from the dam. But with little left to try, that unacknowledged "gorilla in the room" may become increasingly difficult to ignore, Ramsey said.

"The dam has generated significant benefits, but if its existence is tied to the Grand Canyon's demise, well it's just not worth it," he said. "If we learn that there's nothing we can do, I think we'll inevitably be on the side that we'll have to look at removing the dam. Those are strong words, but I think this experiment will have those kinds of implications for a lot of us."

LR in the News 12/19/04

Colorado Compact: Ageless or dried up?

12/19/2004 12:57:57 AM

Water storage revisited: As Western officials tout the system for weathering the drought, critics say increasing demand makes it untenable

By Joe Baird
The Salt Lake Tribune

LAS VEGAS - The refrains were uttered again and again during a yearly gathering of Western water officials here last week: The Colorado River Compact is working. The historical seven-state agreement, signed in 1922, will survive the current drought. The half-full reservoirs are a sign of success, not failure.
Whether their tone was defensive or simply reassuring, Colorado Compact supporters felt compelled to speak up for a system that is being tested as never before. The worst

drought in 100 years has placed unprecedented strains on water users in both the upper and lower parts of the Colorado River Basin. Planners are now on a crisis footing, and reduced allocations are in the offing. The real hunkering down may be yet to come.

Critics call the compact, and particularly a reservoir system anchored by Lake Powell and Lake Mead, an anachronism, a relic of wetter, headier times that has been overtaken by the West's rapid urban growth.

But without the compact, which allocates 15 million acre-feet of water annually among Utah, Wyoming, Colorado, New Mexico, Nevada, Arizona and Colorado - plus 1.5 million acre-feet for Mexico - advocates argue that the current situation could be a lot more dire than it is. "During this early 21st century drought, this system has continued to provide resources," Colorado Supreme Court Justice Gregory Hobbs told members of the Colorado River Water Users Association. "Even with severely ranging characteristics, in high-flow years and low-flow years, it has worked. And it has proven vital."

The current drought, now in its sixth year, "is our wake-up call in the Colorado River Basin," acknowledged Steven Griles, deputy secretary of the Interior. "But there are lots of signs that the [compact] states will meet the challenge."

Colorado River Compact detractors call such talk wishful thinking. The template has changed, they say. And water officials have been slow to adjust to what they call a new reality for the Colorado and its water storage assets.

David Haskell, policy director for the environmental group Living Rivers, believes the original compact was signed and allocations made under incorrect assumptions. Tree-ring science, he says, now shows that the 1900s was one of the wettest centuries on record, and that the 1980s - when Lake Powell was filled - was the wettest decade in that wet century. As a result, the compact states have been living large, artificially.

"Saying the compact is working is like sitting in a room full of food and never being hungry," Haskell said. "But now they're down to their last few hamburgers and everything is changing.

"What we've got now is a whole lot of demand and less supply," he added. "It worked up until now because it was an extremely wet century and the '80s was an extremely wet decade. Were it not for that decade, Lake Powell would never have been more than half-full. It would be empty now. What you've seen is a system that has been working under very beneficial circumstances."

Water officials beg to differ. The compact states have weathered the drought very well, they say. And regardless of history, a Lake Powell now 130 feet below capacity is still providing users with both power and water. The compact system predicted periods of drought and shortage. The system is working exactly as it was intended to.

If anything, compact state participants say they are getting better at their jobs, and they cite a number of recent developments as evidence:

* A landmark deal struck last week in which Arizona agreed to sell Nevada 1.25 million acre-feet of its share of Colorado River water for $330 million over the next 15 years.

* California's commitment two years ago to live within its annual 4.4 million acre-feet allotment of Colorado water.

* An adaptive management plan for Glen Canyon that calls for the removal of non-native fish species, such as trout, while at the same time rehabilitating native species, such as the Humpback Chub.

* Last month's experimental test flow at Glen Canyon, designed to return sediment to the Grand Canyon, restoring beaches and creating backwater habitat for native fish species.

"In the last four years we've seen some remarkable practices," said undersecretary Griles.

But again, compact critics, such as Haskell, wonder which century Western water officials are living in.

"The question now is, how do we plan for the future now that we know what kind of water deliveries are likely?" he said, citing projections that show a future average annual allotment of 13.5 million acre-feet - or 3 million less than is allocated now, when one includes Mexico's annual share of Colorado water.

Living Rivers, like the Glen Canyon Institute and other environmental groups, is calling for the decommissioning of Glen Canyon, moving a portion of that water into the more efficient Lake Mead and using underground aquifers - as Arizona does now - to bank the rest. "We've got far more underground storage capacity than storage capacity in the Colorado River system," said Haskell. "Powell has outlived its utility and become a liability. You can't deny that Lake Powell hasn't delivered during the drought, but that's really the wrong question. It's not a sustainable system."

But that has been, and continues to be a catastrophic alternative to Western water officials, who consider Powell and Mead the linchpins of the entire Colorado River Basin. Pulling the plug on Powell would invite economic disaster, they say. "These dams were built to fluctuate," said Colorado justice Hobbs. "The reality is, without the Colorado River Compact, our water storage problems would be much worse than they are right now."

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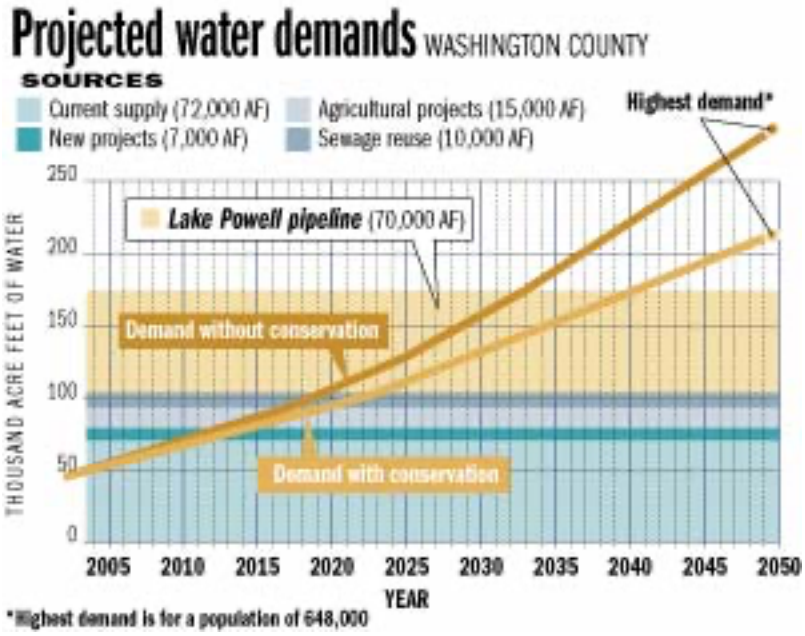
Regional News 12/21/04

St. George Pipeline

Dixie likely to need a pipeline
Arid county could grow to 648,000 people by 2035

By Joe Bauman



Deseret Morning News Washington County's population is skyrocketing, leading to projections that by 2050 — and perhaps as soon as 2035 — as many as 648,000 people will live in Utah's arid southwest.

When that happens, said Ron Thompson, director of the Washington County Water Conservation District, the county will have to supply about 210,000 acre-feet of water to serve those residents. At present, developed water supply is only 72,000 acre-feet, he said Monday during a meeting of the governor's Water Delivery Financing Task Force.

Gov. Olene Walker organized the group to devise recommendations about two big water projects, the Bear River Project and a pipeline from Lake Powell to supply Washington County, mostly St. George. (A spur pipeline to Cedar City is possible, too.)

Projections about the number of people who would be served by the Bear River Project are still being formulated and should be released soon. But amazing predictions already are on the record for booming Washington County.

"Our county has gone from just under 90,000 in 1990 to today, just under 116,000 people," Thompson said.

One steadily rising curve, the one that Thompson believes is more realistic, shows the 648,000 level by 2035; another, based on state projections, shows that many people by 2050.

Complicating the picture is that the 210,000 acre-feet projection is based on Washington County's managing to conserve an enormous amount of water. Without that conservation, according to Thompson, the need would be another 80,000 acre-feet.

Either way, the huge water demand can't be met without the pipeline, according to a chart Thompson released. It shows the lion's share of new potential water, 70,000 acre-feet, will come from a Lake Powell pipeline.

The 120-mile pipeline and its Fort Pearce Reservoir would cost $370 million in today's dollars. Assuming they would be built in 2018, and adjusting for expected inflation, Thompson said the cost at that time would be $593 million.

"The route for the pipeline essentially follows the state highway system," he said.

The problem with that is the highway not only goes through two counties, it also dips into Arizona and back to Utah.

Along the way, U.S. 89 climbs through rugged terrain called the Cock's Comb, south of Paria, Kane County. The site is 3,000 feet higher than St. George, necessitating a pumping station for the pipeline. From the Cock's Comb, the water flows downhill. Thompson expects the revenue from hydroelectric power would pay for the pipeline's operations and maintenance.

However, that doesn't cover the construction costs. Even if water users repaid most or all of the construction cost, state funding may be needed if the project is to be built.

With two states, a pair of counties and a huge initial expense, a regional project involving the state of Utah may be the way to build the project, according to Thompson.

"This cannot be accomplished without a strong state-local partnership," he added.

Larry Anderson, director of the Utah Division of Water Resources, said 1,370,000 acre-feet of Upper Colorado River Basin water belongs to Utah. About 1 million acre-feet is used today. Some of the remaining amount — perhaps as much as 200,000 acre-feet — is water Indian tribes are entitled to.

That leaves 74,000 acre-feet in the Colorado River system. In order to take water out of Lake Powell for a St. George pipeline, the state may have to pay the federal government for storing the water in that reservoir.

State treasurer Ed Alter wondered if an incremental approach, such as acquiring rights of way and reservoir sites, might be the best approach for large water projects.

"The way to make these feasible is not to put them off for 15 years but to start eating the elephant in small bites," he said. "I'd like to see the state plan to get involved and accumulate resources."

Otherwise, he warned, prices could "escalate on us" until the cost becomes almost insurmountable.

"Environmental work needs to get started now," said Thompson.

Rep. Ron Bigelow, R-West Valley, noted the Legislature faces many other funding demands.

"Every time we do the budget, the question is where do we spend the funds," he said in an interview after the meeting. "There are always many needs."

Transportation needs are high on the state's considerations and there are the normal funding requirements. "And now you throw in water" projects, he said. "The task of the Legislature is to identify priorities and determine which of the priorities gets funding."

Bigelow said he has questions about whether big water projects can be funded within the next couple of years.

Merritt Frey, executive director of the Utah Rivers Council, who attended the meeting as an observer, said conservation should be stressed in Washington County.

"St. George has an incredibly high per-capita water use, compared with the rest of the state, which is already pretty high," she said. "So we would say conserving should be the first order of business down in St. George."

Frey said southwestern Utah could do much more to save water.

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LR in the News 12/24/04

Canyon river runner numbers may increase

Ananda Shorey
Associated Press
Dec. 24, 2004 12:00 AM

More river runners may soon be challenging the rapids of the Colorado River through the depths of the Grand Canyon, under a proposal by the National Park Service.

The agency wants to increase the total yearly passengers by 3,856 - from 22,461 to 26,317 - as part of a revised Colorado River management plan.

A panel of scientists, geologists, professors and consultants is considering increasing the passenger totals, while reducing the number and length of trips, as well as group sizes for some areas.

Some launches also may be shifted into non-peak seasons. The number of months that non-motor boats use the river could increase from three to six months.

"People will still have plenty of opportunities to go down the river, but there will be some changes in the way the system operates," said Rick Ernenwein, who is heading up the plan.

The public has until Jan. 7 to comment on 13 alternative plans for the 277 miles of Colorado River from Lees Ferry, south of Lake Powell, through the Grand Canyon to the edge of Lake Mead. A group of experts will then analyze the comments before submitting a final environmental impact statement.

A final environmental statement could be completed by spring, Ernenwein said.

Once the regional director of the Park Service approves a plan, some parts could be implemented immediately, Ernenwein said. Others could take a year or longer.

Eight alternatives are being considered for the river from Lees Ferry to Diamond Creek, through the heart of Grand Canyon National Park. This is the section where the majority of river trips are conducted.

On another section of the river stretching from Diamond Creek to Lake Mead, the Park Service wants to lower pontoon boat use and cap the number of passengers at 150 daily.

The park wants to increase the overall operations in this area while reducing the group sizes. It would also like to eliminate peak use by spreading trips out. Five alternatives are being studied.

Experts began discussing in January 2003 on whether to alter the number of recreational and commercial river runners allowed to use the Grand Canyon.

A panel of experts then came up with suggestions about how to better manage the corridor.

The main purpose of the 10-year plan is to protect the natural and cultural resources while allowing as many people as possible to enjoy the area, Ernenwein said.

"If we don't protect the resources in the river corridor, it will change the type of experience people have," Ernenwein said.

Some environmentalists are critical of the Park Service's plan. David Haskell, policy director for Living Rivers, a group that promotes river restoration, said it doesn't go far enough.

"We feel like the Park Service has fallen short, in particular in not addressing the group size of commercial groups," Haskell said.

Besides further decreasing the commercial group sizes, Haskell said the Park Service needs to phase out or stop allowing motorized boats on the river.

"It's a money issue rather than a resource-protection issue," Haskell said.
