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March 18, 2011

Mr. Dennis Kubly
Bureau of Reclamation, Upper Colorado River
Environmental Resources Division
25 South State Street, Room 7218
Salt Lake City, UT 84138
Via e-mail to: protocol@usbr.gov
(801) 524-3715.

Re: Environmental Assessment for a High Flow Experimental Protocol

Dear Dennis,

Living Rivers/Colorado Riverkeeper (LR) and Center for BIological Diversity (CBD) provide the following comments to the Bureau of Reclamation (Reclamation) for a draft Environmental Assessment (EA) for the development and implementation of a protocol for high-flow experimental releases (HFE) from Glen Canyon Dam for years 2011-2020.

The concept of the protocol maintains that HFEs will agitate sand stored in the river channel, and the suspended sediment will then be redeposited in downstream reaches as sandbars and beaches. These beneficial sediment resources provide backwater habitats for wildlife habitat, protect archaeological sites, enhance riparian vegetation, and provide camping opportunities along the Colorado River in Grand Canyon National Park.

LACK OF VIABILITY FROM PREVIOUS HIGH-FLOW EXPERIMENTS

Since 1963, when the reservoir filling period for Lake Powell began, 80% of the sand above Phantom Ranch has been removed by dam releases from Glen Canyon Dam. Most of this removal occurred during a clear water scouring event from Glen Canyon Dam in the spring of 1965, and sanctioned by the Department of the Interior (DOI). This intentional event removed some 16,000,000 metric tons from Marble Canyon alone (an average of 266,667 metric tons per mile).

From 1966 to 2000, the average annual export of sand from Grand Canyon into Lake Mead has been 150,000 metric tons; an estimate of export that continues to this day (GSA, 2008[1]).

The best case scenario of the proposed action includes a very modest gain in sediment of about 50,000 metric tons per year. This means by year 2020, the Grand Canyon will appear as it did in 2008 when excavation of impaired archeology sites were underway. So we are at a loss to understand why this protocol is even being considered, since it is obvious that a bolder experimental plan is in order to reverse the impairment issues that the Adaptive Management Program (AMP) is charged to correct.

It has already been demonstrated by the reviews of past experiments (Chapter One, SCORE Report, 2005[2]) that the ecosystems in Glen, Marble and Grand canyons remain sediment starved, and that fluctuating flows from dam operations will continue to export sediment into Lake Mead. The reviews also recommended that AMP and DOI consider the possibility of conducting more aggressive experiments in the future.

The EA for HFEs as presented is anything but aggressive, and the public should not have to endure an arbitrary waiting period of ten-years before a more aggressive approach is finally implemented. It makes more sense for AMP to take urgent action now to fully restore the natural sediment balance within Grand Canyon's river corridor.

Therefore, we see this HFE protocol as another attempt by AMP to protect limited hydropower revenues at the expense of a priceless ecosystem in a superlative national park. This misguided objective continues to be the greatest impediment to a functional AMP, since we began to observe and participate in this public process ten years ago (LR & CBD scoping comments for LTEP EIS, 2007[3]).

This matter of hydropower protection over Grand Canyon protection is also the complaint of three independent academics who have specifically reviewed the history of AMP in recent years, namely Joseph Fellers[4], Alejandro Camino[5], and Larry Susskind[6].

The approach to solve the loss of sediment in the Park must be absolute and include alternatives that would help to make a proper determination of how to avoid replicating the results of the failed experiments from the past, namely: 1) long-term seasonally

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[1] http://www.riversimulator.org/Resources/Hydrology/WrightGSA2008.pdf

[2] http://www.riversimulator.org/Resources/USGS/ScoreReportChapterOneSedimentUSGS2005.pdf

[3] http://www.livingrivers.org/pdfs/LRletterKempthorneFeb2007.pdf

[4] http://www.riversimulator.org/Resources/GCDAMP/GCDAMPchronicle/FellerGlenCanyonArticle.pdf

[5] http://www.riversimulator.org/Resources/GCDAMP/GCDAMPchronicle/Camacho2008ampGCD.pdf

[6] http://www.riversimulator.org/Resources/GCDAMP/GCDAMPchronicle/aCautionaryTaleColumbiaSusskind2010.pdf

adjusted steady flows, 2) selective temperature withdrawal, 3) mechanical sediment augmentation, and 4) dam decommissioning.

Fifteen years have passed since the Record of Decision was implemented. The system supports less, not more, natural habitat than before. The analysis of the 1995 EIS is flawed and must be revisited with the goal of reversing the degradation that persists. It is not reasonable for Reclamation to spend the next ten-years continuing to fiddle with dam operations with the hope of achieving a different result. It's time for the AMP to finally begin to embrace the fundamental adaptive management principle of "learn by doing," which implies designing a diverse range of experiments that solve problems more effectively in smaller time-frames.

Therefore, this EA should be suspended and replaced by a Programmatic Environmental Impact Statement (PEIS) that takes an ecosystem approach as the priority. The announcement by Interior that an EIS on Glen Canyon Dam operations will commence in April 2011 is no substitute for the much needed PEIS. Past history illustrates that Interior remains unwilling to move beyond nominal operating modifications at Glen Canyon Dam to fully embrace solutions that eliminate the threats to Grand Canyon's river ecosystem.

PERSISTENT DROUGHT AND CLIMATE CHANGE

LR and CBD have already presented Reclamation with comments on the need for taking a harder look at the impacts of climate change and the system imbalance of the Colorado River basin. These comments are provided here, once again, for your review (LR & CBD comments of April 2007[7]).

In 2005 Living Rivers proposed a decommissioning alternative called The One-Dam Solution[8], because the lack of surplus water in the system has compromised the need and purpose of Glen Canyon Dam as predicted by the attorney Northcutt Ely[9] and others in 1954 during congressional testimony.

For this EA, Reclamation is relying on the assumption that there will be sufficient water in Lake Powell to implement HFEs in Grand Canyon for the next ten years. This assumption is speculative, since scientists (Scripps, 2008[10]) and citizen observers (CROSS, 2007[11]) of Colorado River operations have demonstrated that reservoir levels would likely continue to diminish in the next decade and eventually compromise the proposed HFE protocol as presented.

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[7] http://www.livingrivers.org/pdfs/LR_Shortage_DEIS.pdf

[8] http://livingrivers.org/pdfs/TheOne-DamSolution.pdf

[9] http://www.riversimulator.org/Resources/Testimony/ColoradoRiverBoard1954.pdf

[10] http://scrippsnews.ucsd.edu/Releases/?releaseID=876

[11] http://www.onthecolorado.com/cross.cfm

The proposed time-frame in the EA requires re-consultation language in case this experiment is compromised in the next 2-6 years by the operating criteria of Interim Guidelines under conditions of shortage.

Climate change, increased evaporation, dust on snow, and excessive consumption have eliminated surplus water altogether. For example, Reclamation's graphic[12] of the 10-year running average of supply and demand from the last century indicates that available surplus in the system from the completion of Hoover Dam in 1935 to the present has dropped from +8 maf to -1 maf. Independently of the challenges this poses to the proposed alternative, this is a serious problem of functionality for the two largest reservoirs in the United States that are dependent on a river that responds negatively to long-term drying trends.

For example, after the droughts of 1976-1977 and 1988-1989, there was reservoir recovery for Lakes Mead and Powell. Such recovery did not occur after the drought of 2002 - 2004. Reclamation's modeling program, Colorado River Simulation System (CRSS), used for the development of Interim Guidelines under shortages, indicated that reservoir recovery in the basin would begin in water year 2005, but this has not yet occurred (Lake Mead actuals[13]).

Consequently, there may not be sufficient hydraulic head in Lake Powell to provide robust artificial flood flows to maximize sediment storage in Grand Canyon. In fact, it is reasonable to expect the opposite would occur when equalization or balancing flows between Lakes Powell and Mead (Interim Guidelines, 2007[14]) strip whatever sediment gains are expected to occur in the Grand Canyon ecosystem. Frankly, too many uncertainties related to continuing reservoir depletion exist for Reclamation to express any confidence that this protocol will provide Grand Canyon with more habitat by 2020.

Lakes Powell and Mead are roughly 50 percent full at present, which means 25 maf has already been depleted from the system in 10 years (state of system[15]). The annual average water deficit has averaged 2.5 maf per year or 17.5 %. If this trend of decline continues in the next 5 to 6 years, the active pools for hydropower will be exhausted at both reservoirs. Power and revenue generation then stops, which will compromise the achievements hoped for in this 10-year time-frame. We remind Reclamation that cooperating agencies and scientific institutions have announced many times that a system reduction of 10% is manageable, but a system approaching a flow reduction of 20% is not.

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[12] http://www.riversimulator.org/Resources/Graphs/CoRiverBasinSupplyAndUseUSBR.jpg

[13] http://www.riversimulator.com/Resources/Graphs/ActualMead.jpg

[14] http://www.riversimulator.org/Resources/USBR/Shortage/RODshortage2007.pdf

[15] http://www.riversimulator.org/Resources/Graphs/StateOfSystemApril2010USBR.jpg

For example, the Upper Colorado River Commission expressed their concern about the consequences of an 18% flow reduction in a letter[16] written in 2004. This letter stated, "The worst case scenario (1953-1964 hydrology added to the current drought) shows that Lake Powell can deliver a minimum objective release of 8.23 maf per year through the 20 year period of analysis, but at severe costs. This hydrology predicts the Powell water surface elevation to fall below the minimum power pool elevation of 3490 feet by 2006 and to remain or fall below power pool in 10 of the next 17 years. It also indicates on three occasions the water surface is just at or near the dead pool elevation of 3370 feet."

Dendrochronology offers another example: the drought of 1566 to 1590 (Meko, xls[17]), which averaged 13 maf for 25-years. This equates to a total system loss of 50 maf, or the combined storage capacity of Lakes Mead and Powell (without including the loss of reservoir evaporation at Lake Powell).

Reclamation possesses software that has the ability to perform various simulations on dam operations in the Colorado River Basin, yet Reclamation has never provided the public with a demonstration of how the Colorado River system would perform under a suite of scenarios, such as: 1) worse-case scenario, 2) severe and sustained drought, 3) lower basin Compact call, and 4) long-term drying as a result of climate change.

Instead the public hears claims from Reclamation that "the system is performing as designed (Commissioner Keys, 2006)," or "We have proven Marc Reisner wrong (Commissioner Connors, 2010)." LR and CBD request that Reclamation deploy its planning resources to analyze a suite of scenarios that actually reflect what the river has delivered in the past and what climate change studies predict for the future.

In so doing, the agencies of the Department of Interior (DOI) should fulfill the mandates in Secretarial Orders (Kempthorne[18] & Salazar[19]) to provide an analysis of climate change impacts for the Colorado River. The "Basin Study"[20] (a supply and demand analysis) presently under development, is unlikely to deliver the comprehensive suite of shortage scenarios, since the study is not guided by the guidelines of the National Environmental Policy Act (NEPA).

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[16] http://www.riversimulator.org/Resources/UCRC/LakePowellMinimumPowerPoolOstler2004.pdf

[17] http://www.riversimulator.org/Resources/ClimateData/Meko762-2005.xls

[18] http://www.riversimulator.org/Resources/USBR/KempthorneSecOrderClimateChange.pdf

[19] http://www.riversimulator.org/Resources/USBR/SecOrder3289.pdf

[20] http://www.usbr.gov/lc/region/programs/crbstudy.html

Furthermore, Secretarial Order 3305 (scientific integrity[21]) compels Reclamation to provide such a suite for Colorado River managers. And should Reclamation indeed comply, the proposed HFE protocol may require re-consultation as early as 2012.

HYDROPOWER

The floor elevation of the active pool for hydropower production at Lake Powell is 3,490 feet and at Lake Mead it is 1,050 feet. As of January 2011 the active storage in Lake Powell is 10.4 maf and at Lake Mead 2.8 maf. Combined the active storage for hydropower in both reservoirs is 13.2 maf. If the basin suffers from another series of severe drought years, such as what occurred in water years 2002-2004, the active pool for power generation in both reservoirs would be compromised.

The discussion of hydropower production from Glen Canyon Dam in the administrative record of AMP is repeatedly and misleadingly lauded as a resource that is essential for grid reliability, and as a resource that is renewable and environmentally friendly. If hydropower production ceases when the active pool at Powell is emptied, the resource can hardly be considered reliable and renewable. Since ecosystem impairment in Grand Canyon exists and greenhouse gases[22] (organic decay) are emitted from the reservoir, to make the statement that hydropower is environmentally friendly is completely absurd.

The departments of Interior and Energy must therefore either, one, solve the replacement power problem at Glen Canyon Dam, or two, instruct the AMP to request Congress to forgive the remaining debt to the U.S. Treasury associated with Glen Canyon Dam's construction. The AMP should then use whatever power revenues can be generated in the basin to exclusively mitigate the environmental problems that dam construction and trans-basin diversions are causing to citizens and critical habitat.

THE SEDIMENT & NUTRIENT DEFICIT IN GRAND CANYON MUST BE ADDRESSED WITHOUT ANYMORE DELAY

The Colorado River is about entrained sediment and organic detritus as much as it is about flowing water. By volume the Colorado River transports more sediment than any river in North America and, despite this turbidity, the ecosystem supported a robust and long-living native fish population that has endured for millions of years. It is obvious that the sand and nutrients from the ephemeral and perennial side streams flowing into the Grand Canyon is what keeps the native ecosystem in Grand Canyon alive, and not the clear, cold water tailrace that emanates from Glen Canyon Dam.

Before Glen Canyon Dam, the Grand Canyon ecosystem had an entire watershed to depend on for nutrients and sand to feed and shelter the native species. Today the sand

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[21] http://www.riversimulator.org/Resources/GCDAMP/GCDAMPchronicle/SectarialOrder3305ScienceIntregrity.pdf

[22] http://www.riversimulator.org/Resources/NGO/GreenhouseGasEmissionsFreshwaterReservoirs2010.pdf

and nutrients are stalled in the upper arms of Lake Powell where it accumulates in massive deltaic deposits. The organics decompose at depth and are transformed into detrimental gases, such as methane and hydrogen sulfide.

Consequently, the amounts of sediment and detritus from the side canyons are evolutionarily inadequate for the plant and animal kingdoms to thrive along the main stem, especially above the mouth of the Little Colorado River in Marble Canyon.

The desired future goal to provide a main stem population of humpback chub and to reintroduce extirpated species is not possible without more aggressive approaches as mentioned in the above paragraphs. We realize that administrative and engineering adaptations such as steady flows and sediment augmentation are considered too expensive, and may even prove to be ineffective, but without fully testing the alternatives, AMP will never be able to make a proper and final determination.

If the federal government is unwilling to implement the administrative and engineering mitigation schemes to restore the biological integrity of Grand Canyon, then AMP must surrender to the ability of the Colorado River to provide these ecological services and decommission Glen Canyon Dam. The Compact Point can be transferred from Lee's Ferry to Hoover Dam without causing any harm to the water delivery requirements of the Upper Basin.

CONCLUSION: THE NEED FOR A PROGRAMMATIC BASIN-WIDE ENVIRONMENTAL IMPACT STATEMENT

We request that a basin-wide Programmatic Environmental Impact Statement be initiated in order to address the cumulative impacts more broadly and more effectively. This would also eliminate the redundant and duplicate analyses of the flawed 1995 EIS. We also recommend the PEIS take the ecosystem approach, because the end product will improve water quantity and quality for people.

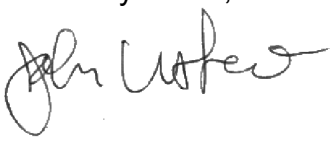
The PEIS should take a harder and more ambitious look at how water shortages, a Compact call, system inefficiency, trans-basin diversions, and mining operations (uranium, oil and gas, tar sands, oil shale) will compromise the restoration goals of the Grand Canyon Protection Act. The PEIS should consider decommissioning Glen Canyon Dam and study a sediment removal program for all Colorado River reservoirs, with priority given to Lake Mead.

The advantage of decommissioning Glen Canyon Dam would be the nearly immediate restoration of Grand Canyon National Park and the reconnection of the tributaries to the main stem Colorado. It will also incite the development of aquifer storage and recovery programs as an alternative to massive surface water storage in desert climes of high evaporation.

The status quo management of the Colorado River is a train wreck waiting to happen and it is imperative that the states and DOI provide the necessary leadership to make the Colorado River the resilient river system it deserves to be.

Since the end of World War II, the administrative record makes it very clear that huge managerial adjustments were necessary in order to avoid legal conflicts and shortages down the road. These warnings have essentially been ignored. The situation is not much different today, but the stakes are considerably higher. If the states and DOI continue to perform under “business as usual” in the next two decades, not only will the Grand Canyon continue to perish, but so will the basin’s water users.

Sincerely Yours,



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