LIVING RIVERS
COLORADO RIVERKEEPER®

February 28, 2007

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

Sent Via Fax: 202-208-6950

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

Dear Secretary Kempthorne,

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

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

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

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

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

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

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

1. <u>Accurately Represent the Baseline Issues</u>

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

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

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

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

> "The native fish community in the Colorado River in Grand Canyon was once one of the most unique in the world, supporting eight species that occurred nowhere else. Of the eight native fish species, three (Colorado pikeminnow,

> roundtail chub, and bonytail chub) have been extirpated from Glen and Grand Canyons; one – listed as endangered (razorback sucker) – has not been observed in the system since 1991; one (humpback chub) is listed as endangered; one (flannelmouth sucker) is a candidate for listing; and the remaining two (bluehead sucker and speckled dace) appear to be doing reasonably well in the Grand Canyon although much remains to be learned about their ecology and population dynamics." (2002 Report to Congress, page 23.)

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

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

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

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

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

> "Overall, about 15%–20% of the adult humpback chub are dying each year. If

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

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

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

"[I]t is clear that the restrictions on dam operations since 1991 have not produced the hoped-for restoration and maintenance of this endangered species. During the MLFF, basin hydrology has varied from drought to wet conditions and then back to drought conditions. Through these conditions, the decline of the humpback chub has continued. This trend leads to questions about whether daily, monthly, or even annual patterns of dam operation alone are relevant to native fish recruitment or whether changes in the sediment and thermal regimes of the river imposed by regulation have had the greatest influence on native fishes. Further, the issue of nonnative fishes and their potential to limit recruitment of native fish through predation and competition (although highly suspected by scientists as a significant factor) remains unresolved in Grand Canyon." (P. 208.)

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

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

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

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

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

2. <u>Accurately Assess the Failed History</u>

A. Faulty Flows

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

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

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

> maintenance flows, and elements two through seven of the Reasonable and Prudent Alternative would be part of this recommendation. The SASF has been analyzed as completely as any other alternative in the Draft EIS and would not require any additional analysis." (Biological Opinion, page 42.)

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

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

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

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

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

> "A program of experimental flows will be carried out to include high steady flows in the spring and low steady flows in summer and fall during low water years (releases of approximately 8.23 maf) to verify an effective flow regime and to quantify, to the extent possible, effects on endangered and native fish. Studies of high steady flows in the spring may include studies of habitat building and habitat maintenance flows. Research design and hypotheses to be

> tested will be based on a flow pattern that resembles the natural hydrograph, as described for those seasons in the SASF." (Biological Opinion, page 35.)
>
> "If sufficient progress and good faith effort is occurring towards initiating experimental flows, implementation of experimental flows may occur later in 1997. If the Service believes there is not sufficient progress, Glen Canyon Dam would be operated as SASF flows during spring through fall (April to October) beginning in 1998." (Biological Opinion, page 32.)

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

> "This element has not seen sufficient progress. Other than the controlled BHBF in 1996, there have been minimum efforts to develop experimental flows for native fishes. (Review of Sufficient Progress, May 27, 1999, page 3.)
>
> "This element has not seen sufficient progress. We agree with your assessment that the delay in developing this element is largely attributable to the to the program being part of the adaptive management process, where multiple objectives, research and work assignments compete for time and attention of AMWG members. However, given the documented decline of humpback chub in Grand Canyon, additional delays in developing a program of experimental flows for native fish should not occur. (Review of Sufficient Progress, June 13, 2002, page 3.)

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

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

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

The frustration of FWS and others is far from surprising since there has been only one low and steady flow test carried out, that in the summer of 2000. Worse still, now seven years later, the analysis of this test has yet to be completed. This is very discouraging, as it has been 11 years since the first experimental test flow took place, and it was the 2000

experiment that demonstrated that humpback chub populations "may have benefited from substantial in-stream warming." (USGS Press Release, August 3, 2006.)

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

The winter fluctuating trout suppression flows of 2004 and 2005 were a hastily conceived action in response to new information about declining humpback chub estimates. As pointed out by Korman et al., June 2005, these experimental flows were proven to be ineffective and have been discontinued. Surprisingly, these flows have now been included as one of the four alternatives for the LTEP EIS submitted by AMP in December 2006.

Constrained releases in the fall of 2004 and 2005 were used to test the conservation of sediment (6,500 to 9,000 cfs). This has proved useful to understand that sediment can be retained during low flows, but the experiment has not provided any direct evidence of habitat benefits to endangered fish.

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

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

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

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

B. Failure to Implement Selective Withdrawal

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

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

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

> "Temperature modification has been identified as central issue to be resolved in order to develop a mainstem spawning population of HBC. … Reclamation has been working diligently to accelerate the technical and administrative process necessary for construction of the selective withdrawal structure. … Funding will be requested as a separate appropriation through the Federal budget process under Section 8 of the Colorado River Storage Project Act." (Reclamation Response to FWS Biological Opinion, April, 6, 1995, page 4.)

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

C. Failure to Establish a Second Population of Humpback Chub

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

No protocols have been fully developed for locating an appropriate site on the tributary streams for a second population. For example, the habitat conditions required, water quality, consultation with the Havasupai Nation (Havasu Creek), and/or how

modifications to the habitat will be implemented to achieve suitable habitat conditions. Nor have any studies been fully completed, or are past due, on the genetic differences between those near the Little Colorado River and other aggregations, as specifically requested by FWS.

D. Lack of Little Colorado River Management Plan

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

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

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

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

3. <u>Failure of the AMP Administration and Science</u>

A. Address the Lack of Appropriate Leadership

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

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

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

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

> "By definition, the elements of an RPA describe an alternative action, which will avoid the likelihood of jeopardy, as opposed to actions to achieve recovery. The elements of the RPA seem to be focused on recovery. … Recovery actions should be included in the Opinion only as a conservation recommendation." (Reclamation Response to FWS Biological Opinion, April, 6, 1995, pages 2-3.)
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> "We fully recognize our responsibility under Section 7 of the ESA to not only avoid action which will result in jeopardy to listed species, but a Federal agency we are also directed to utilize resources in furtherance of the ESA through carrying out programs for conservation of endangered species." (Reclamation Response to FWS Biological Opinion, April, 6, 1995, page 3.)

This statement is farcical. Were it true:

- The Biological Opinion it refers to would have been completed several years earlier, as Reclamation would not have dragged its feet on completing the original EIS, which commenced in 1989. No, only as a result to an act of Congress, the GCPA itself mandating completion of the EIS, did Reclamation finally, "recognize its responsibility under Section 7 of the ESA."

- Reclamation would not have been quibbling with FWS over if and where such recovery objectives should be contained in an FWS Biological Opinion, or later arguing about subsequent recommendations in FWS's response to Reclamation's insufficient progress to the RPA. No, Reclamation would be embracing FWS advice on how recovery can best be achieved.

- No settlement agreement mandating yet another EIS would have been required to resolve Reclamation's continued failure to comply with Section 7 of the ESA, and no letter such as this would have had to be written outlining the obvious deficiencies with Reclamation's recognition of its responsibilities under the ESA and GCPA.

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

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

B. Cease to Support the Competing Objectives

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

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

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

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

Efforts to find balanced flow regimes that benefits both endangered fish species and hydropower are irrational as the science shows clearly that steady-state water flows are more beneficial to native fish, whereas they compromise hydropower revenues.

Additionally, as the primary source for AMP funding is to come from hydropower revenues, having these interests in the decision-making process regarding recovery management choices, adds further to this conflict of interest.

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

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

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

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

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

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

The National Park Service, which itself once stocked trout in Grand Canyon tributary streams, has abandon this practice altogether, and has even erected weirs in an attempt

to impede trout populations from spawning in these tributary streams.

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

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

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

C. Address the Lack of Scientific Rigor

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

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

Prior to the EIS the Glen Canyon Dam Environmental Studies program was seriously criticized by the National Research Council (NRC) for this same failure to meet accepted methods to assure scientific credibility. An independent review of the current AMP science program would reveal a loss of integrity and standing when the original model was abandoned in favor of what currently exists today in the GCMRC.

At a time when the Grand Canyon is about to lose another native fish species, the AMP has cut back on scientific work, seemingly at the request of the Western Area Power Administration, whose hydropower revenues are used to fund the science. The research for the 2000 Low, Summer Steady Flow (LSSF) represents one of the most blatant examples of how the AMP science program has been affected. First, the experiment was fast tracked, with limited opportunity for outside input or competitive bidding for the monitoring. Pre-experiment flow data was not compiled and therefore the design of the experiment may not have been properly formulated. Scientists did not start collecting data on the river until after the first spike flow occurred. Although the design of the

experiment was released for the competition, the one proposed by the contractor was not accepted. Also, this experimental flow was originally proposed to benefit native fish with relatively low, steady flows in accordance with the Biological Opinion, but the final experiment allowed for less than the recommended time.

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

It's unfortunate that the same weakness observed by the National Research Council in 1999, are still as relevant today:

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

The AMP has run amuck with no clear leadership or direction. It's not that its mission has been unclear, but its structure is functionally incapable of achieving it. Unless these shortcomings are addressed, revising its work plan through a new EIS will only exacerbate, not resolve, these problems. To that end, the AMP must discard AMWG and put in place an advice and decision-making apparatus based primarily on scientific principles. A wholly independent scientific body should be commissioned, that works with the Park Service, FWS and Tribes to achieve the goals of the Grand Canyon Protection Act. Reclamation must no longer play any leadership or advisory role, in the AMP process, merely furnish any necessary information, and follow through on implementing operational changes at Glen Canyon Dam.

4. Must Revise the Proposed Action

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

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

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

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

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

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

5. Issues to be Addressed in the EIS

A. Reformulate the AMP's decision-making structure

To avoid repeating the past failings of the AMP, the EIS must contain an independent review of the AMP's progress to date in fulfilling its charter, strategic plan, the elements of the ROD and the RPA. This should include evaluating all experimentation to determine what baseline knowledge currently exists, and gaps if any need to be filled. All current and former GCMRC employees and consultants should be surveyed to determine their views on the efficiency and rigor of the experimentation to date and the leadership and follow through by GCMRC and the AMWG with regard to scientific findings. The review must address the issue of competing objectives, such as

hydropower generation and exotic trout preservation, which have influenced management actions. How well the current AMP has addressed the 1999 National Research Council findings in *Downstream: Adaptive Management of Glen Canyon Dam and the Colorado River Ecosystem* should also be addressed.

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

B. Consider climate variability and change

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

C. Identify appropriate timeframe

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

D. Focus on native fish recovery

The EIS must identify specific baseline objectives for nonnative fish suppression, sediment and nutrient concentration, temperature gradients and flow characteristics that are believed to stimulate recovery of critical habitat for Grand Canyon native fish. It must then evaluate how each alternative will achieve these objectives for the humpback chub population in the Little Colorado River, the establishment of a second humpback chub population downstream of Glen Canyon Dam, the establishment of razorback sucker habitat, and lastly, habitat for reintroduced bonytail chub, roundtail chub and Colorado pikeminnow.

E. Provide for flows that mimic the natural hydrograph

Flow decisions should be evaluated in accordance with how well they mimic the

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

F. Address sediment augmentation

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

G. Recommend temperature control device for selective withdrawal

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

H. Remove nonnative fish

The EIS should evaluate any and all reasonable mechanisms for nonnative fish suppression as necessary to improve habitat conditions for native fish. The EIS should recommend that all stocking of nonnative trout cease below Glen Canyon Dam and that dam operations not be modified in any way to intentionally benefit nonnative fish habitat.

I. Address potential water quality impacts

With the probability of Lake Powell's conservation pool being exhausted during the timeframe of the proposed action, the potential for significant changes in the chemistry and quality of water flowing into Grand Canyon cannot be ignored. Anaerobic bacteria, hydrogen sulfide, and supersaline and metal-rich sediments are just some of the

existing substances that could find their way through the dam's bypass tubes. The EIS must evaluate what these impacts might be, and how they would be mitigated.

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

The EIS should also address the operational and safety impacts of course sediments flowing through Glen Canyon dam during low reservoir levels.

J. Establish sediment distribution to protect archeological resources

Archeological resources along the river continue to be threatened by the lack of sediment. The terraces of sediment that host hundreds of the cultural sites continue to slough off and move towards the river. As a result, artifacts must be removed, as opposed to being protected in-situ as prescribed by historic preservation legislation. The EIS should mandate that a comprehensive cultural site degradation abatement program be established throughout the entire river corridor in accordance with NPS standards. To the extent high flows are implemented, they should be in a range that greatly exceeds 45,000 cfs, in order to provide the greatest opportunity for distribution of sediment to the affected archeology sites. Many of the sites now suffering the greatest impacts due to erosion are those above the 120,000 cfs terrace, thus flows of this magnitude must also be accommodated. Providing infill for the arroyos in the high benches of the river would be a great asset to the preservation of cultural sites. The benefits of sediment augmentation should also be examined to improve archeological resource stabilization.

K. Consider dam decommissioning

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

L. Identify program funding sources

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

It must also address how funding will be made available for large capital expenses, such as selective withdrawal or sediment augmentation.

M. Establish a scientific baseline and conceptual modeling

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

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

N. Complete a management plan for the Little Colorado River

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

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

CONCLUSION

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

The launching of a new EIS process on Glen Canyon Dam operations affords an excellent opportunity to deliver to reverse this trend. Unfortunately, the Long-Term Experimental Plan proposed action illustrates that Reclamation is not yet serious about seizing this opportunity, but merely going through the motions in an effort to comply with the settlement agreement.

Grand Canyon National Park, and all those who cherish it, deserve better. The future of Grand Canyon is at a critical decision point. We hope as its principle steward, you will

take the corrective actions outlined above so that a truly valuable EIS process can get underway, and the Colorado River ecosystem through Grand Canyon can finally get on the road to recovery.

Sincerely yours,

John Weisheit, Conservation Director
Living Rivers & Colorado Riverkeeper

Michelle Harrington, Rivers Program Director
Center for Biological Diversity