

Glen Canyon Dam Adaptive Management Work Group  
August 30-31, 2005

**Conducting:** Michael Gabaldón, Secretary's Designee  
**Facilitator:** Mary Orton

**Date:** August 30, 2005  
**Convened:** 10:05 a.m.

**Committee Members:**

Carleton Albert, Jr., Pueblo of Zuni  
Darryl Beckmann, USBR  
Steven Begay, Navajo Nation  
Amy Heuslein, BIA  
Rod Kuharich, State of Colorado  
Phillip S. Lehr, Colorado River Comm./NV

Max Oelxchlaeger, Grand Canyon Wildlands Council  
Clayton Palmer, WAPA  
André Potochnik, GCRG  
Ted Rampton, UAMPS  
Sam Spiller, USFWS  
Bruce Taubert, AGFD

**Committee Members Absent:**

Joe Alston, NPS  
D. Larry Anderson, UDWR  
John R. D'Antonio, NM Interstate Stream Comm.  
Brenda Drye, Southern Paiute Consortium  
Loretta Jackson, Hualapai Tribe  
Leslie James, CREDA

Leigh Kuwanwisiwma, The Hopi Tribe  
Nikolai Ramsey, Grand Canyon Trust  
John Shields, WY State Engineers Office  
Mark Steffen, Federation of Fly Fishers  
Bill Werner, ADWR

**Alternates Present:**

Jeffrey Cross  
Robert King  
Don Ostler  
Kerry Christensen  
William Davis  
Mike Yeatts  
Rick Johnson  
Tim Steffen

**For:**

Joe Alston, NPS  
D. Larry Anderson, UDWR  
John R. D'Antonio, NM Interstate Stream Comm.  
Loretta Jackson, Hualapai Tribe  
Leslie James, CREDA  
Leigh Kuwanwisiwma, The Hopi Tribe  
Nikolai Ramsey, Grand Canyon Trust  
Mark Steffen, Federation of Fly Fishers

**Interested Persons:**

Mary Barger, WAPA  
Christine Beard, GCMRC  
Jim Berkley, graduate student  
Gary Burton, WAPA  
Mike Childs, AGFD  
Holly Cheong, So. Nevada Water Authority  
Tara Conrad, Office of the AS-WS DOI  
Wayne Cook, former AMWG alternate  
Jonathan Damp, Pueblo of Zuni  
Kurt Dongoske, CREDA  
Helen Fairley, GCMRC  
Dennis Fenn, USGS  
Dave and Pam Garrett, M<sup>3</sup>Research  
Norm Henderson, NPS  
Doug Hendrix, USBR  
Pamela Hyde  
Chris Kincaid, GLCA Nat'l Recreation Area

J.D. Kite, GCMRC  
Glen Knowles, USFWS  
Dennis Kubly, USBR  
Paul Li, IEDA  
Ken McMullen, GRCA  
Ted Melis, GCRM  
Mary Orton, The Mary Orton Company  
Bill Persons, AGFD  
Barbara Ralston, GCMRC  
Ken Rice, USBR Glen Canyon Dam  
Tom Ryan, USBR  
D. Randolph Seaholm, CWCB  
Pam Sponholtz, UWFWS  
Melinda Trembl, private research consultant  
Brad Warren, WAPA  
John Weisheit, Living Rivers

Meeting Recorder: Linda Whetton, USBR

**Introductions and Administrative Items.** The Secretary's Designee, Mike Gabaldón, welcomed the members, alternates, and members of the public. He introduced Ms. Tara Conrad who works in the Assistant Secretary-Water and Science (AS-WS) Office in Washington, D.C., and who is working with the Department's adaptive management initiative.

**Approval of March 2-3, 2005, Meeting Minutes.** Pending a few minor edits, the minutes were approved without objection. Bill Persons requested action items be sent out and tracked. He asked for an update on AGFD's concern on the Federal procurement process. Mike said that issue would be addressed shortly.

**Action Item:** Mary Orton will develop an ongoing list of action Items for future meetings.

### **Legislative Updates**

**Energy Bill.** Dennis Kubly said the President signed the Energy Policy Act of 2005 on August 8, 2005. Two sections are relevant to the AMP:

- (1) Section 1834 requires the Secretaries of the Interior, Energy, and the Army to conduct a joint study to evaluate the potential for increasing power production at Federally owned and operated water regulation storage and conveyance facilities. The departments have 18 months to complete that study
- (2) Section 1840 directs only the Secretary of the Interior, acting through Reclamation, to identify and describe the status of potential hydropower facilities that were considered as part of previous water surface storage studies but not completed or authorized for construction. Her response is due in 90 days. Mike Gabaldón added that personnel in the Denver Office are reviewing the bill very closely with a focus on potential budget implications.

André Potochnik said he recently learned that two AMWG members, from CREDA and WAPA, had testified before Congress, and CREDA had advocated removing funding for the AMP from CRSP revenues. Mike said Leslie James would address that issue at tomorrow's meeting.

### **Old Business**

**FY05 Tribal Funding.** Mike asked the tribal representatives for their patience as he worked through the tribal funding process. Because of prior problems with getting the dollars obligated from the various bureaus, a new process was developed with each DOI agency contributing \$95,000 into the Department's working capital fund. These contracts are just being finalized for FY 2005 and FY 2006. Both contracts will run through the end of FY 2006. Dennis Kubly said there are four activities that the Secretary will fund through these contracts: (1) evaluating resource management issues, (2) tribal monitoring of Grand Canyon resources, including logistics, (3) attendance at meetings, and (4) government-to-government consultations. The agreement between Reclamation and Interior is under a "reimbursable service agreement," which means the tribes will bill Reclamation after spending the funds and Reclamation will bill the Department. Mike Berry (Upper Colorado Regional Office) will be administering the contracts, and Dennis said four of the five tribes have signed contracts. Reclamation will get back on the cycle for the AMP so the expenditures can be incorporated into the normal budget process. Both Jeff Cross and Sam Spiller requested where the money will come from their respective budgets. Mike said he would contact the budget office and provide that information to them.

**Action Item:** Mike Gabaldón will contact Pam Hayes (DOI) to ascertain where the funding is coming from the NPS and FWS budgets and will report to Jeff Cross and Sam Spiller.

**Retreat Follow-up.** Mike said one of the follow-up items from the AMWG Retreat was that the Roles Ad Hoc Group would make a recommendation on roles and responsibilities for the various AMP entities. He distributed copies of their draft report (**Attachment 1**). The Roles AHG was comprised of Denny Fenn (GCMRC), Dave Garrett (Science Advisors), Norm Henderson (Technical Work Group), and Randy Peterson (AMWG). Mike said the Department has not completed its review, but he requested comments from the AMWG be sent to Mary Orton by September 30, 2005.

**Action Item:** AMWG to provide comments on Roles AHG Draft Report to Mary Orton ([mary@maryorton.com](mailto:mary@maryorton.com)) by Sept. 30, 2005.

Responses from the Secretary of the Interior. Mike said the Roles AHG draft report also addresses the responsibilities of the Secretary's Designee on how he reports on behalf of the Secretary to the AMWG.

Progress on Programmatic Agreement (PA) Signatory Issue. Dennis Kubly said there was a request to add WAPA, CREDA, and BIA as new PA signatories. The PA fulfills Reclamation's obligation under Section 106 of the National Historic Preservation Act to mitigate the effects of its actions on cultural resources. A letter was sent out on June 3, 2005, to all the PA signatories and the new proposed PA signatories. As of today, only the newly proposed PA signatories have responded. Reclamation sent an e-mail message on August 10, 2005, requesting that the existing PA signatories respond to the letter.

**Action Item.** The current PA signatories will respond to Reclamation's letter regarding adding WAPA, CREDA, and BIA as new signatories to the PA by September 30, 2005.

Tribal Consultation Plan. Dennis Kubly reported that the Federal agency representatives reviewed the Plan in April. They asked the Solicitor's Office whether Federal agencies could commit to certain actions that were requested by the tribes. The Solicitor's comments will be sent to the tribes when that review is completed. Following receipt of tribal comments, Reclamation will initiate additional dialogue with the tribes and the Federal agencies. Dennis urged those interested in getting the Plan completed to let Mike Berry at Reclamation ([mberry@uc.usbr.gov](mailto:mberry@uc.usbr.gov)) know they support the effort.

Nomination of New AS-WS Secretary. Mike said Mark Limbaugh, the nominee for the new Assistant Secretary for Water and Science (AS-WS), has been confirmed but not yet sworn in. Mark has been the deputy commissioner of Reclamation for five years. He was previously an Idaho farmer and president of the Family Farm Alliance. Mike has discussed the GCDAMP with him and expects him to be involved with the program. Tom Weimer has been acting AS-WS, and is the nominee for the Assistant Secretary for Policy, Management, and Budget. Ms. P. Lynn Scarlett, who formerly held that position, has been nominated to be the Deputy Secretary of the Interior. Lynn and Tom have had their hearings but are not yet confirmed.

USGS Interim Director. Denny Fenn reported that Chip Groat resigned as director of USGS and has taken an endowed chair position at the University of Texas at Austin. The Secretary has named Patrick Leahy, the associate director for geology at the USGS, as the acting director. The Secretary has asked the National Academy of Sciences for candidates for the vacant USGS director position.

Selection of New GCMRC Chief Position. Denny Fenn received more than 50 applications for the position, of which 30 were ranked highly qualified. He interviewed ten individuals by telephone, and four will have panel interviews later this week. Denny anticipates making a selection within two weeks.

USGS Funding for GCD AMP. Denny Fenn said before Director Chip Groat left the USGS, he directed staff to designate \$1 million in USGS base funds for the GCDAMP science program, as it has for the last several years. Acting Director Pat Leahy intends to honor that request and Denny will talk with him about making it a long-term commitment. Because Congress did not award those funds, they will rely on the USGS director to provide them.

New AMWG Charter Ethics Language. Mike reported that new ethics language would be incorporated in the next renewal of the AMWG Charter (June 2006). That language states: "No Council or subcommittee member shall participate in any specific party matter including a lease, license, permit, contract, claim, agreement, or related litigation with the Department in which the member has a direct financial interest." Because of the vagueness of that language, Mike asked the members to review it (**Attachment 2**) and provide and comments and questions to Linda Whetton by December 31, 2005. They will be forwarded to the Department for clarification. Bill Persons requested clarification on the language by the next AMWG meeting (tentatively March 2006).

**Action Item:** Comments/questions on ethics language to Linda Whetton ([lwhetton@uc.usbr.gov](mailto:lwhetton@uc.usbr.gov)) by December 31, 2005.

**Science Plans and Planning.** Dave Garrett distributed copies of “A Process to Develop Science Plans for the GCDAMP” presentation (**Attachment 3a**). He said the development of science planning documents for the AMP is critical. The Science Advisors urged GCMRC to update the original science plans from 1997-98, and felt there needed to be an aggressive, proactive stance on science planning. The process was very difficult then and has become more difficult. GCMRC is trying to prepare needed science planning documents together with the TWG and in the process approached the Science Advisors for some assistance.

Ted Melis distributed copies of his “Update on GCMRC’s FY2007-11 Strategic Science Planning” PowerPoint presentation (**Attachment 3b**). Ted said they are working on four separate documents but they should ultimately be seamless: (1) Strategic Science Plan, (2) Experimental Design Planning Process: Embracing the “Hybrid” Approach, (3) Core Monitoring Plan, and (4) FY2007-08 Draft Workplan Proposed Timeline. He would like to have TWG bring a recommendation to the next AMWG meeting.

In response to a question about how these plans will ensure a science-driven process, Dave and Ted replied that the plans will help, but it is ultimately up to AMWG to implement the science and insist on an ecosystem approach.

A member said he wanted to make sure that development of the long-term experimental plan continues with the hybrid design approach. Another was interested in a long-term goal of attaining the management actions that the experimental design is suppose to lead us to, and keeping the end game in mind.

**Update on the Temperature of Glen Canyon Dam Releases.** Barbara Ralston said her presentation would provide an update on temperatures being released from Glen Canyon Dam as well as dissolved oxygen values, and how they relate primarily to fishery resources downstream of the Dam. She distributed copies of her “Status of Temperature and Dissolved Oxygen Levels Released from Glen Canyon Dam” PowerPoint presentation (**Attachment 4**).

In discussion after her presentation, Barbara noted that the river picks up about a milligram per liter of oxygen by Lees Ferry, and would be fairly saturated by Badger (3 miles downstream).

Mike Gabaldón said WAPA and Reclamation would investigate, without a recommendation to the Secretary, implementing spinning reserve on should oxygen levels get to a certain level. Bill Persons noted that a telemetry station should be in place in the next few weeks to collect real-time data on oxygen as well as temperature right below the Dam. He recommended WAPA and Reclamation work on developing an action plan should oxygen levels fall below two parts per million.

Several members said they would like to see more data on warming, oxygen levels, and native and non-native fish. This is a TCD experiment without building a TCD. Barbara said GCRMC would be collecting more data. Other members suggested having a production source or refuge for native fish if warm-water piscivorous fish present a problem. The warm water fish workshop should give us more information.

**Temperature Control Device (TCD) Status Report.** Darryl Beckmann said that in 2003, AMWG asked the Science Advisors to do a risk assessment. That assessment led AMWG to recommend that Reclamation initiate NEPA compliance on a TCD. The Denver Technical Service Center (TSC) provided an estimate of \$80 million. Because that cost was too high to support a test on two units, Reclamation asked the TSC to go back and provide other options in the range of a \$30-40 million. They are currently evaluating three designs, controlled overdraw and two external frames. These would last about 10 years during the testing period. They expect a report by the end of September. If appropriate, they will request to make an award in mid- to late-FY 2007.

The members discussed other alternatives to a TCD, increasing the mechanical removal effort, waiting for more data on recruitment of HBC with the warming water (which could take three to four years) and trying an SASF with the warm water. Several members expressed concern about moving forward without sufficient data. Darryl said Reclamation would complete the design, and then delay construction for a year or two, if needed, until there is sufficient data to proceed.

**Humpback Chub Translocation Above Chute Falls.** Pam Sponholtz said she and her co-authors have been working on the HBC translocation project for three years. They will complete this phase of the project after one more monitoring event this November. A final report is due to GCMRC by the end of this year. Pam proceeded with her “Monitoring for humpback chub (*Gila cypha*) above Chute Falls, Little Colorado River” PowerPoint presentation (**Attachment 5a**).

Pam reviewed the recommendations they presented to the TWG and their goal to determine if there were any F1s in the system. They didn't catch any YOY this summer, but a flood event made their sampling less than effective. If conditions are conducive in November, they will try to delineate the upstream extent of the fish. They have also agreed to develop a management plan for this area in cooperation with the HBC AHG. This will include whether and when future translocations are necessary. They hope to initiate population estimates in spring 2006, but now they are only measuring catch-rate efforts through hoopnets. This does not tell them how many fish were put up there and how many fish are staying. They also hope to do a genetic bank. If they find F1 fish, she recommended saving them in ethanol until they have funding to analyze the fin clips. The analysis would determine if there were genetic deviations from the HBC population as a whole.

**Update on Little Colorado River Management Plan.** Pam Sponholtz gave an update on the “Little Colorado River Watershed Coordinating Council” (**Attachment 5b**). She said development of a LCR management plan has long been an interest of the GCDAMP. It was included in the 1995 Biological Opinion, and Reclamation has committed to helping develop this plan by contracting with SWCA to develop a strategic plan. There is \$100,000 in the AMP budget to develop a watershed management plan, the purpose of which is to protect HBC spawning habitat by looking at the watershed as a whole.

A community-based, locally-driven watershed group – LCR Watershed Coordinating Council (LCRWCC) – is also interested in bringing together all the watershed issues in a management plan. Pam said she, Dennis Kubly, and Glen Knowles met with the LCRWCC last month to give them an overview of the GCDAMP and explore their interest in working together to satisfy mutual interests. They also talked about developing a workshop to determine how the groups might work together.

**Humpback Chub Hatchery Evaluation: Prospective Refuge Facilities.** Bill Persons presented the “Humpback Chub Hatchery Evaluation: Prospective Refuge Facilities” report (**Attachment 6**) prepared by Mike Childs. He said the report resulted from a Science Advisors' river trip where Bruce Taubert made a commitment to evaluate hatcheries, aquaria, and established refuge facilities as potential refugia for HBC. They ranked 14 different facilities based on the 36 criteria (page 11). Mora National Fish Hatchery was the highest ranked. Bill said the report was distributed to the TWG in June and comments requested.

**Report from the Public Outreach Ad Hoc Group (POAHG).** Amy Heuslein distributed copies of her PowerPoint presentation (**Attachment 7a**) and also referenced the pre-meeting materials, fact sheets, logo, catch phrase, etc. (**Attachment 7b**). She reminded the AMWG that they approved the logo and catch phrase at their March 2005 meeting and delegated other responsibilities to the POAHG. They also gave approval for the POAHG to develop a public outreach web site to be hosted by the Bureau of Reclamation. Doug Hendrix demonstrated the proposed navigation of the POAHG web site, and asked for comments by September 30, 2005. He clarified that content would be separately approved by AMWG, and the comments were to be on the navigation and the “look and feel” of the website.

During discussion, it was noted that the purpose of the public outreach effort was to clarify some of the complexities of the program. Suggestions were made to link the AMP website with the GCMRC website, and to make the words, "Glen Canyon Dam" larger on the logo. Darryl Beckmann expressed concern about the amount of time Reclamation personnel were spending on development of these various products, and suggested that it was time to stop developing and start maintaining.

Amy noted that per AMWG's direction, funding for the Adopt-a-Beach program would be presented to Reclamation for consideration. In response to a question about why the Adopt-a-Beach program was no longer part of the GCMRC program, Ted Melis explained that after funding it for seven or eight years, it and some other programs were de-funded in an effort to support enhanced HBC efforts.

Amy said the POAHG would like to have a half page narrative from all the stakeholders, a list of three frequently asked questions/answers as to why they are AMP stakeholders, and three photos from a research area by September 30, 2005.

**MOTION: Approve the four "final" fact sheets (AMP Purpose and Goals, AMP Origins, Hydropower and the AMP, and Who we Are) with the insertion of "consistent with the Law of the River" in AMP Orgins, second paragraph, first line, after the 13<sup>th</sup> word).**

**Motion seconded.**

**Voting Results:      Yes = 16                      No = 3                      Abstaining = 0**

**Motion carried.**

***Action Item:*** AMWG to provide feedback on Stationery Display outline, the website navigation, and the draft fact sheet "Whitewater Recreation on the Colorado River in Grand Canyon," to André Potochnik and Linda Whetton by September 30, 2005.

***Action Item:*** AMWG stakeholders to provide, one-half page profile, three FAQs (and answers), three photos to André Potochnik by September 30, 2005.

**Budget Process.** Mike Gabaldón said he had asked Mary Orton to facilitate the discussion on the budget. Mary distributed a one-page outline of the budget approval process she recommended for this meeting (**Attachment 8a**). She told the AMWG they would have approximately 4.5 hours to discuss and approve the FY06 budget and workplan. She reminded them that they had passed a motion in March 2005 directing the TWG to bring two FY06 budget options to this meeting, one with and one without an experiment. She reviewed the order of the presentations and suggested that if any member wants to propose a change to the budget, they should also allow Ted, Norm, or Dennis to respond as to what impact the proposed change would have on the program. She also asked that any motions be given to her in writing so copies could be made and distributed to the other members for further discussion. The group agreed to follow the recommended process.

**FY05 Expenses and Project Progress Report through June 30, 2005.** Dennis Kubly directed the AMWG to the "FY05 Expenses and Project Progress Report" (**Attachment 8b**). He explained the report was developed as part of the process agreed upon in August 2004. It reflects an accounting of the expenditures through the third quarter and includes an update on progress made on the projects. He said standard DOI accounting categories were used on the Excel spreadsheet. He explained the difference between obligated and expended funds: funds were obligated when a contract was executed, but they are expended only as the contractor bills and the agency pays on that contract. He made a correction to the LCR Management Plan: it should be a separate line item and not under the PA heading. He said that cooperative agreements with the tribes are actually contracts this year.

During discussion, Dennis clarified that unused funds at the end of the fiscal year were carried over to the experimental flow fund. It was noted that, with increased attention paid to expenditures, it should be possible to move funds around in an efficient manner.

**GCMRC FY05 Actual Expenditures.** J.D. Kite said his presentation would be a summary of the FY05 budget expenses by program. In January, he will present a report by project. He referenced the cost of all programs as approved at \$8.2 million while what was actually funded was \$8.6 million. He explained that last year, approximately \$800,000 was held by Reclamation for the experimental flow. These funds were transferred to GCMRC when they needed them, so they were only \$700,000 short for the experimental flow. While normally they can carry over funds, this year they will not be able to because they are at the end of their five-year contract with Reclamation. J.D. distributed a copy of GCMRC's Project Report (**Attachment 8d**). Denny Fenn clarified that an internal USGS policy requires that if the cost center overhead rate is 35%, and they use the DOI preferred rate of 15%, USGS must make up the other 20% ("cost-share").

The group agreed that there was a consensus to request that Reclamation and GCMRC change their expenditure report as follows:

- Differentiate between obligated and expended
- Include projections through year-end
- Consistent reporting by USBR and GCMRC
- Financial report by project and line item, w/budget and actual
- Show burden at 35%
- Show income and expenses

**Technical Work Group (TWG) Approved Budget.** Norm Henderson said the TWG recommended the budget with experimentation, as outlined in the workplan. He reviewed the assumptions they used to formulate the budget via a PowerPoint presentation (**Attachment 9a**). Because the science planning process is not yet completed, they are considering the FY 2006 budget a "transition budget" in which they would limit any new starts because it would preempt the planning process. Therefore, they recommended no major new experiments for 2006 in order to give GCMRC time to evaluate and synthesize existing data and to plan future experimentation. This would allow them to carry-forward part of the FY 2006 budget for executing the eventual experimental plan in FY 2007 and beyond.

He reviewed the materials that were sent to AMWG before the meeting, including three motions passed by TWG. The first added funds for downstream fish monitoring, and he noted that this motion would be modified by another during this meeting. The second delegated to a subcommittee the task of developing a budget and workplan for integrated tribal values monitoring (Project C2). The results of that subcommittee's work were sent to AMWG before the meeting. The third motion sent the budget to AMWG with a recommendation for approval, and TWG passed that motion unanimously.

During discussion, a member suggested that flows that were described as "disadvantaging trout" should be described as "Lees Ferry fishery improvement flows." It was also clarified that NPS was the primary source of funding for the brown trout project, and while the funds were obligated in a prior year, work continues into FY 2006. Clayton Palmer said that the WAPA TWG member, when she voted for the budget, did not intend to vote for the hydrograph as described in the workplan. He suggested that the AMWG reconsider the hydrograph recommendation. Norm said the understanding was that the motion to approve the budget included the workplan, including the hydrograph. He said that GCMRC's recommendation was based on their experimental design and consistent with the original proposal. He believed the TWG understood this was being approved as the best scientific proposal to compare the high fluctuating flows to the MLFF Record of Decision flows.

**FY06 Budget and Workplan (Attachment 9b).** Ted Melis gave an overview of the budget and workplan as approved by TWG (**Attachment 9c**). He noted that three hydrographs and budgets were considered by GCMRC: no experiment, an experimental treatment as described in the EA approved by the Secretary, and a modified experiment that still fit within the approved EA. GCMRC recommended the third option, which includes mechanical removal and a return to MLFF in January, for three reasons. The first is that there was not sufficient funding for the full experiment, and if they limited their experimental

action, they could carry forward funds for future years' experiments. Second, AMWG members had wanted to see more than preliminary results from previous experiments before approving new experiments. These will be presented during the October Science Symposium sponsored by GCMRC. Third, the science planning process will be completed soon, and part of it will be a long-term experimental plan. This will give direction for future years' experiments, budgets, and workplans.

During discussion, Ted noted that FY 2005 was the third year of continued fluctuating flow experiments, but there were no funds programmed to collect or analyze the data. He was asked if there were sufficient data to determine whether fluctuating flows will improve or decrease the density of trout, improve their growth rate, and improve the quality of fishery at Lees Ferry. He said that based on the sediment transport data and the model simulation conclusions, the next logical thing to do is return to the Record of Decision or control operation (MLFF) which be useful on two fronts: (1) it would reduce the sand export and, (2) provide an opportunity to verify or refute Josh Korman's simulation conclusions.

Mary requested those members who were considering proposing a different hydrograph be prepared to explain how it would change the FY 2006 budget. AMWG members will need that information to consider a change in the hydrograph. Clayton said that he would not propose a new hydrograph but he did propose that the FY 2006 hydrograph be discussed with the scientists and not be approved at this meeting.

**Other Related Projects.** Dennis Kubly said AMWG had agreed that TWG should develop a list of all non-GCDAMP projects that were being conducted in the CRE or nearby, so that if an appropriations request were developed, there would be complete picture of what is being spent and accomplished. The Budget AHG sent out a request to TWG members to identify any such projects. Dennis distributed copies of their findings (**Attachment 9d**).

**Suggested Changes to the FY 2006 Proposed Budget - Discussion.** Mary said that proponents of proposed changes to the FY 2006 budget and workplan would now explain them, and AMWG members would have an opportunity to discuss them. She said that she would start with those proposed changes that had been sent in before the meeting, and then entertain any new proposed changes. She reminded the group that they had agreed to discuss all proposed changes before taking action on any of them.

Item Proposed	Amount	To	From
POAHG efforts	\$19,000 (no burden)	p. 1, Line 23D	F7, carry-forward experimental fund

André Potochnik distributed copies of his presentation (**Attachment 9e**) that described the POAHG budget process, FY 2005 expenditures, and FY 2006 proposed budget. He said POAHG was asking the AMWG to approve \$19,000 be added to the proposed FY 2006 budget for public outreach activities.

Item Proposed	Amount	To	From
Warm water fish workshop	\$25,000 \$28,750 with burden	New project (see description in FY 2005 workplan)	B9, Dam Operations Experiment

Bill Persons said AGFD proposed adding a warm water fish monitoring suppression workshop, taking the money from Project B.9. Part of the motion will be requesting that the TWG and GCMRC bring forward the results of that workshop with a workplan and a budget recommendation to the next AMWG.

During discussion, Bill clarified that the workshop is needed to refine our monitoring and suppression efforts. They are not sure that they have a good method to catch the fish. Sam Spiller added that one of the values of the workshop would be to have discussion by the scientists on what is known today with regard to the response of green sunfish on YOY from the warming of Lake Powell, and what this means for HBC.

**Adjourn:** 5:30 p.m.



Glen Canyon Dam Adaptive Management Work Group  
August 30-31, 2005

**Conducting:** Michael Gabaldón, Secretary's Designee  
**Facilitator:** Mary Orton

**Date:** August 31, 2005  
**Convened:** 7:30 a.m.

**Committee Members:**

Carleton Albert, Jr., Pueblo of Zuni  
Darryl Beckmann, USBR  
Steven Begay, Navajo Nation  
Brenda Drye, Southern Paiute Consortium  
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Rod Kuharich, State of Colorado

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D. Randolph Seaholm, CWCB  
Pam Sponholtz, UWFWS  
Melinda Trembl, private research consultant  
Brad Warren, WAPA  
John Weisheit, Living Rivers

Meeting Recorder: Linda Whetton, USBR

**Introductions and Administrative Items.** The Secretary's Designee, Mike Gabaldón, welcomed the members, alternates, and members of the public.

**Continuation of FY06 Budget Discussion.** Mary Orton said she would keep track of suggested changes to the budget and said the AMWG will start today's discussion on those items which were sent out prior to the meeting.

**SASF Hydrograph.** Rick Johnson distributed copies of a motion that Grand Canyon Trust is proposing for water years 2006 and 2007 (below). The Trust favors implementation of SASF (Seasonally Adjusted Steady Flows) flows in 8.23 MAF release years as required by the Final Biological Opinion on the Operation of Glen Canyon Dam. Since the jeopardy opinion in 1994, there have been 8.23 MAF releases in 2001-2005, but no comprehensive SASF flows as required by Element 1A of the RPA. Notwithstanding the 2000 LSSF (Low Steady Summer Flow) experiment, the USFWS reported in 2003 that Reclamation has failed to make "sufficient progress" with SASF flows.

In addition to the legal imperative to implement Element 1A of the RPA, the Trust believes that the concept behind the SASF is solid and deserves a valid test at the earliest possible date. The AMP has a unique opportunity to test SASF at this time because of high release temperatures (2005 releases are the warmest in 30 years) and the relative paucity of warm-water predators and competitors. The combination of warm water, steady flows, and minimal warm-water non-natives may provide the maximum benefit to HBC and allow a high probability of detecting a response (e.g., growth and recruitment) from HBC and other native fish.

Although there is merit in beginning SASF flows in WY 2006, the Trust believes that the best course of action is to implement straight MLFF flows in WY 2006 and then SASF flows in WY 2007. Their rationale is that delaying the SASF flows until WY 2007 provides:

- A baseline year in WY 2006.
- Time to consult with SAs, construct the SASF hydrograph, and integrate it into the LTEP.
- Time to consider whether to concurrently implement mechanical removal, the Bright Angel weir, or other actions.
- Additional time to insure that the necessary research and monitoring is in place to maximize learning.
- Little or no confounding with current experiments.

Motion:

1. Implement MLFF in WY 2006.
2. Task GCMRC with the lead on developing a SASF hydrograph for WY 2007 and identifying the needed research and monitoring for detecting the response of affected resources (e.g., native fish, food base, trout, warm-water non-natives, sediment) to the SASF. This task will be completed with significant input from the TWG and the Science Advisors.
3. Task the budget ad hoc with developing a budget and workplan for an SASF experiment in WY 2007.

Mary asked Ted if the above motion had an impact on the FY 2006 budget. Ted said GCMRC is also recommending the MLFF for WY 2006, so there would be no budgetary impact for FY 2006. Rick said there might be some things they would do in anticipation of an SASF but doesn't know of anything currently. Ted said they might need more money for planning but they would look it as something tied to an experimental activity.

Dennis Kubly said that ongoing studies that are being supported by TCD dollars, which is a comparison of the effects of the low steady and fluctuating flows in the autumn, would be affected by the Trust's proposal if it is assumed they will go through the month of October 1996 as portrayed in the Supplemental Environment Assessment

Mike Gabaldón asked that further discussion on the motion be delayed until after the budget discussion.

**Budget Concerns.**

Item Proposed	Amount	To	From
Aquatic Foodbase Monitoring	\$100,000 \$115,000 with burden	Project B2, p. 71 in workplan	F7, carry-forward experimental fund

Ted Melis said GCMRC has spent two years developing the foodbase monitoring program to better link the aquatic food web to higher trophic level dynamics of the fish, and they are prepared to award a contract. They planned to spend \$200,000 in FY 2005. Assuming that, they agreed to only \$100,000 in the FY 2006 budget, in order to help to fund the carry-forward experimental fund. However, because GCMRC had so many unanticipated expenses in FY 2005, the program could not be funded. Therefore, year one funding would be in FY 2006 and an additional \$100,000 is needed to fully fund the project.

Several AMWG members noted the importance of this project, which was recommended by the Aquatic PEP, as a basis for understanding the CRE ecosystem. Concern was expressed about bringing up issues at AMWG that were not discussed at the TWG level. There was also concern expressed about depleting the experimental fund for future years. In response to a question, Barbara said the proposal is a combination of four elements: (1) whole stream metabolism, (2) secondary production, (3) fish diet, and (4) stabilize isotope work. Without the \$100,000, they could probably only fund elements 1 and 2.

Hydrograph. Clayton said that his hydrograph proposal has no effect on the FY 2006 budget, and he suggested that it be discussed after the budget discussion.

Item Proposed	Amount	To	From
POAHG efforts	No increase in proposed budget		

Darryl Beckmann said he feels there is enough in the proposed budget (with the carry-forward) for a full year of work, and would prefer to add nothing to the budget. He noted that sole source contracts must be written carefully to comply with law and regulations. He expressed concern that POAHG meetings were not convenient and some were not well attended.

Amy Heuslein encouraged any members who wanted to be involved to contact her or André. They received their FY04 funding late and are trying to catch up. She suggested using the travel funds to cover POAHG member travel and thereby free up funds for product related items. Bruce Taubert said AGFD would contribute \$25,000 if meetings were scheduled so they can participate.

Item Proposed	Amount	To	From
Fish Monitoring below Diamond Creek	\$50,000 \$57,500 with burden	New project (see FY05 workplan)	F7, carry-forward experimental fund

Bruce Taubert said this will be a warm water year, and it is important to do sampling below Diamond Creek or a year's data will be foregone. This is critical data for making a decision on the TCD.

Item Proposed	Amount	To	From
Archeology Site Monitoring	\$140,000 \$161,000 with burden	F7, carry-forward experimental fund	C1

Bill Davis asked Kurt Dongoske to speak to a CREDA proposal. Kurt said the current description of archeology site monitoring does not recognize the treatment plan that Reclamation is going to be implementing in FY 2005 and FY 2006. The treatment plan will evaluate 160 archeological sites from Lees Ferry downstream. They will assess which ones are threatened and develop ways to preserve those sites or to mitigate the adverse effects to those sites. Once that is completed, the sites that need further monitoring should be greatly reduced. In addition, monitoring will probably not be needed on an annual basis. He proposed reducing the line item by about \$140,000.

Helen Fairley said the project would give them a better understanding of what is contributing to deterioration of archeological sites, which ones were/were not a result of dam operations. She agreed that there needs to be a better job done of integrating PA activities with the other aspects of the AMP in general. Clayton said he thought NPS and Reclamation had agreed to treat the sites without regard to the causes of the deterioration. He wants to have the sites treated and complete Section 106 responsibilities. Jeff Cross confirmed that Bennett Raley (former AS-WS/DOI) had said that NPS and Reclamation would stop discussing causes of the impacts, and start treating them. Jeff said there are three pieces to the program: (1) ongoing monitoring of sites in the river corridor, (2) development of the treatment plans for GLCA and GRCA, and (3) implementation of the treatment plan that come out of the program. He said that a possible fourth piece is related to the research questions from the Geomorphology Symposium. He believes there is a research piece for GCMRC.

Kurt added that he wasn't sure trying to understand rates of change in archeological sites is a productive avenue to go down. They are looking at \$380,000 as being proposed for monitoring per year for four years before they do an assessment of the efficacy of that monitoring, whether it is giving them the information they need so it's well over \$1 million in archeological site monitoring. Archeological site monitoring has been done over 10 years and they still haven't gotten any closer to understanding or quantifying rates of change. He's not sure it is a worthwhile endeavor at this point especially when a treatment plan is going to be implemented and deal with those sites that are currently receiving adverse effects, either through preservation or data recovery.

Monitoring for HBC Above Chute Falls. Rod Kuharich said that translocating HBC into the Little Colorado should not be part of the AMP, because the LCR is not affected by dam operations. However, because the funding level is small, he would not oppose the project. However, he feels that no AMP funds should go to the LCR Watershed Coordinating Council (LCRWCC), and asked for clarification on that point.

Dennis Kubly said that the translocation was part of Reclamation's commitment to the Fish and Wildlife Service to offset the "take" of HBC last November. He also clarified that there has been no obligation of any funds to LCRWCC. The Biological Opinion says that Reclamation is responsible for contributing resources towards the development of the management plan. They are considering funding a workshop with LCRWCC that would be attended by them and the AMP to address threats to HBC in the LCR as part of the development of the Management Plan.

There was some disagreement expressed as to whether this should be funded by the AMP. Sam Spiller, chair of the HBC AHG, said they had deferred the discussion of what was to be funded by the AMP until the plan is completed, so those decisions have not been made.

Item Proposed	Workplan Change
C2 - Integrated Tribal Values Monitoring	Include reports from tribes on previous monitoring efforts.

Dennis said there were three elements to this project: (1) a synthesis of tribal monitoring efforts, (2) tribal proposals for monitoring, and (3) integration of the process into the Core Monitoring Research Plan. He referenced the additional materials (**Attachment 10a**) that were sent out on August 8, 2005.

Kurt Dongoske said CREDA felt that each of the tribes, as part of their monitoring proposals, should provide a discussion of their past monitoring efforts and the successes of the data collection and of their working with the Center, and that their proposals should be reviewed by outside peer reviewers. Similarly, they think a synthesis of the history of tribal monitoring should be done by the Center from their perspective, without funding from the AMP. He said the past efforts were probably less effective than the proposed monitoring, and CREDA felt it was important for GCMRC to provide an evaluation of past efforts. CREDA was also interested in a report from the NAU workshop with GCMRC and the tribes.

Helen Fairley commented that, with the additional funding in the proposal, the tribes should be able to analyze data they have collected to date, and prepare a high quality, synthetic report of their results, with

recommendations to AMWG based on what they have learned. She said she could provide GCMRC's perspective on what has and has not worked over the years.

Regarding the tribal workshop that was hosted by the NAU Center for Sustainable Environments, Helen said that she had not distributed a report because it was only a first step and follow-up was needed. She distributed the following documents: Workshop on Integrating Tribal Perspectives with Western Science Perspectives (**Attachment 10b**), Continuation of Tribal Implementation and Evaluation of a Terrestrial Ecosystem Monitoring Program (**Attachment 10c**), The Need for Tribal Public Outreach: A Position Paper (**Attachment 10d**), and Tribal Programs Spearhead the Adaptive Management Program's Efforts to Assess Human Dimensions of Watershed Change in the Grand Canyon Ecosystem (**Attachment 10e**). She said she hoped AMWG would invite the tribes to make a presentation on their perspective on these resources, why they are valued, and why they are being monitored as they are.

After more discussion, Mary clarified that Kurt's proposal was to include in the FY 2006 workplan a report from the tribes on past monitoring efforts.

**Suggested Changes to the FY 2006 Proposed Budget - Motions.** After confirming that all the proposed budget changes had been discussed, Mike Gabaldón said he would entertain motions to amend the TWG-approved budget and workplan.

**MOTION: No change to POAHG budget line item.**

**Motion seconded. Voting Results: Yes = 8, No = 12, Abstaining = 0. Motion failed.**

Public Comments (Pam Hyde): I was intimately involved with the POAHG when I was part of this body. I will tell you that now, as a member of the public, this program is invisible. If you are thinking that fact sheets and a web site and some PR around the SCORE Report is all that needs to be done, that is not realistic. A much bigger effort needs to be made if this is going to be public outreach over the long term.

**MOTION: To add \$19,000 to the Outreach Program, from project F.7 (Experimental Carry Forward) p. 1, Line 23D, not to be spent until after the POAHG meeting where it is determined how the funds are to be spent. The POAHG must concur on a workplan that requires the funding at its November 2005 meeting for this to occur.**

**Motion seconded. Voting Results: Yes = 18, No = 2, Abstaining = 0. Motion carried.**

**MOTION: To replace the TWG-approved language on downstream fish monitoring with the following:**

- **Part A: To add a warm water fish monitoring and suppression workshop, as approved in October 2004; move \$27,600 from FY 2006 Project B9 to fund the workshop; and ask TWG and GCMRC to bring forward the results of that workshop, with a workplan and budget recommendation to AMWG at its next meeting; and**
- **Part B: To add a fish sampling project below Diamond Creek to the FY 2006 workplan and budget as described in the FY 2005 workplan; to move \$67,500 from the Experiment Flow line item (F7) to fund this project; and to direct GCMRC to move forward with the project by incorporating results and recommendations from the warm water fish suppression workshop, as feasible.**

**Motion seconded. Voting Results: Yes = 19, No = 1, Abstaining = 0. Motion carried.**

**MOTION: To add \$106,000 to the B2 line item (Aquatic Foodbase Monitoring, column F) from F7 (Experimental Carry Forward) to fully fund the Year 1 research activities, including all of the proposed elements (see project description B2).**

**Motion seconded. Voting Results: Yes = 18, No = 2, Abstaining = 0. Motion carried.**

**MOTION: To reduce Project C1 (line 124), Archeology Site Monitoring, total from \$374,201 to \$240,000 and appropriately reduce the scope of monitoring to reflect the reduction in the number of archeological sites that will require long-term monitoring as a result of the design and**

**implementation of the treatment plan (F3) funded by the Bureau of Reclamation. The resulting funds (\$134,201) would be added to F7 (Experimental Carry Forward Fund).**

**Motion seconded. Voting Results: Yes = 11, No = 6, Abstaining = 3. Motion failed.**

**MOTION: To approve the TWG-recommended budget as amended.**

**Motion seconded. Voting Results: Yes = 19, No = 0, Abstaining = 1. Motion carried.**

Clayton said he did not believe that the AMWG had approved the hydrograph in the workplan. Mike Gabaldón said that he would make a determination after the meeting. *(Note: After the meeting, he ruled that the hydrograph, with the rest of the workplan, had been approved as part of the motion.)*

**Glen Canyon Dam Operations: Update on Fire Impact on Flows.** Ken Rice distributed information on the Cave Creek Complex Fire and its impact on GCD flows (**Attachment 11a**). He said the information on flows was recorded directly below the Dam and does not reflect Lees Ferry readings.

Clayton Palmer suggested clarifying WAPA's operating agreement with Reclamation to address minimum flows in emergencies, including environmental considerations and how to make decisions.

Jeff Cross asked that GRCA and GLCA dispatch be notified during emergencies, including flow changes. They could then transmit the information downriver to Lees Ferry, Phantom Ranch, etc. Ken Rice agreed to do so.

**Glen Canyon Dam Operations: Update on Glen Canyon Dam Maintenance Schedule.** Ken Rice (**Attachment 11b**) showed three years of the GCD maintenance schedule. The schedule describes all the major maintenance activities at GCD, but not the normal day-to-day activities and or any TCD-type construction. The schedule reflects October-November for any special flows. Since the TCD timeframe is uncertain, it will match up with some other construction activities they have going on at the Dam.

**Science Advisor Review of the Adaptive Management Program.** Dave Garrett distributed copies of the "Prospectus, A Review of the GCDAMP" along with his presentation (**Attachment 12a**). He noted that part of the review will be complete January 2006, and the rest by October 2006.

**Science Advisor Accomplishment Report (FY 2004-2005) and FY 2006-2007 Program Approval.** Dave Garrett distributed and reviewed copies of the Science Advisor's Accomplishment Memo and presentation (**Attachment 12b**). He distributed copies of "A Prospectus for GCDAMP Science Advisor Program Support to GCMRC and GCDAMP for Completion of Science and Development Plans FY 2005-2007" and his presentation (**Attachment 12c**). While the SAs operating protocol requires approval of a two-year workplan, he suggested that the AMWG only approve a one-year workplan because of the uncertainty of what the AMP will require in the second year. Rod asked Dave to identify which programs have moved from research to management actions. Dave said the SAs would discuss this at the March 2006 meeting.

**MOTION: To approve the FY 2006 Science Advisor workplan as presented.**

**Motion seconded. Voting Results: Yes = 16, No = 0, Abstaining = 2. Motion carried.**

**Hydrograph Issues.** Mike Gabaldón suggested that an ad hoc group be formed to discuss the proposal for a SASF in FY 2007. Clayton suggested having the Science Planning Group address the issue of hydrograph for FY 2006. Others felt that this would delay the SPG's work and would not be appropriate.

Glen Knowles said the SASF was proposed by USFWS as part of their 1995 Biological Opinion and original RPA. The Service believes it should be considered by the AMP as a potential flow to benefit HBC. There is a great opportunity to try an SASF because of the warm water from Glen Canyon Dam. Toward that end, he offered the following motion: That Reclamation and GCMRC model the water temperature forecast from the dam for the next 3-5 years, and that GCMRC, with the science advisors,

use this and other pertinent information to advise AMWG as to whether the science recommends that a SASF proposal should be developed. If so, the proposal would be submitted through the TWG and AMWG, who would be invited to discuss and develop meetings to support collaboration.

Rick said there are two things to consider: (1) an obligation under the RPA to test the flows, and (2) given the science surrounding this, he believes it is the right thing to do for HBC. He said that if the point of the motion is to get the scientific input and get the action agencies together, then perhaps Reclamation and USFWS should take the lead because they have the obligation under the Biological Opinion to bring in the science and make that recommendation. He would be comfortable with that happening.

After more discussion, Mike said that because it was clear that there was not support for an Ad Hoc Group on this subject, he would like to have the original motion placed on the table for a vote.

**MOTION:**

1. **Implement MLFF in WY 2006.**
2. **Task GCMRC with the lead on developing a SASF hydrograph for WY 2007 and identifying the needed research and monitoring for detecting the response of affected resources (e.g., native fish, food base, trout, warm-water non-natives, sediment) to the SASF. This task will be completed with significant input from the TWG and the Science Advisors.**
3. **Task the Budget Ad Hoc Group with developing a budget and workplan for an SASF experiment in WY 2007.**
4. **Implement SASF in WY 2007**

**Motion seconded. Voting Results: Yes = 2, No = 14, Abstaining = 3. Motion failed.**

Public Comments (Pam Hyde): This hasn't gotten properly aired because of today's schedule and perhaps there is some other way of giving this the attention it deserves rather than trying to resolve it right now.

**Update: Federal Procurement Process.** Bruce Taubert said he wanted to express his concern that Reclamation has yet to act on his two-year-old request for more information on the Federal procurement process. Mike said he would talk to Bruce personally about the issue.

**CREDA Congressional Testimony.** In response to questions raised on the first day of the meeting regarding Congressional testimony, Leslie James said that WAPA and CREDA have made presentations to the AMWG over the past couple of years about the negative impacts of the drought on the basin fund. CREDA and WAPA are in the early stages of working on some federal legislation that could provide supplemental appropriations to continue the AMWG, and other programs, in case the Basin Fund could no longer support them. They hope they would have the support of AMP stakeholders. She testified in February 2005 on the impacts to the basin fund and that they would like to see some additional appropriations, but she wanted to be very clear that CREDA has never testified in support of cutting funding for the AMP. She said that if anyone wanted to discuss this further, or if wanted copies of her testimony, they should call her.

**HBC Ad Hoc Group Update.** Glen Knowles said that in March 2005, the AMWG requested an Ad Hoc Group be created to address implementation of HBC actions and whether they were in or out of the program, and also established a TWG Ad Hoc Group that would address revision of the HBC Comprehensive Plan. Glen said the TWG group is working on the plan, and the AMWG group will act when the TWG group has finished. Sam Spiller, Randy Seaholm, and Nikolai Ramsey are co-chairs of the AMWG Ad Hoc Group. He detailed the information in a handout (**Attachment 13**), which includes progress on the HBC Comprehensive Plan, 2005 HBC AHG activities, an update on the Black Mesa Mine and potential impacts to the Little Colorado River, review of the HBC Genetics Management Plan, and an update on genetic evaluation of the HBC that are being housed at Willow Beach.

Bruce asked who is responsible for developing the scenarios around the current sampling of the HBC. Glen said it was his understanding that GCMRC along with Dr. David Otis is examining the issue. Glen

said he thought it was funded through FY 2005 but it is not part of the FY 2006 budget. Ted Melis said Dr. Otis would present his preliminary findings at the October Science Symposium. Dr. Otis can also make a presentation of his findings at the next AMWG meeting (March 2006).

**Basin Hydrology.** Tom Ryan (**Attachment 14**) said the drought is not over but things have improved. Lake Powell is about 30 feet higher today than a year ago. The inflow for Lake Powell from April-July was 111% of average and Navajo was 148%, but Flaming Gorge and Blue Mesa were below average. Flaming Gorge and Blue Mesa have now had 6 years of below average inflow. There is a 40% chance that there will be equalization releases in WY 2006, and a 50% chance in 2007. In the 10 years since the GCD EIS, there have been five equalization years but half of them have been 8.23 years. Tom said they will spend the next couple of days transitioning from higher August flows to the lower flow regime (6,500-9,000 cfs) for a little over two weeks, then a steady 8,000 for a little over two weeks, and then repeat that sequence for about 12 days each.

**SCORE Report and FY06 Meeting Schedule.** Mike said that due to the late hour of the meeting, these two agenda items would not be presented.

**Adjourned:** 1:30 p.m.

Respectfully submitted,

**/s/ Linda Whetton**

Linda Whetton  
U.S. Bureau of Reclamation



### General Key to Adaptive Management Program Acronyms

ADWR – Arizona Dept. of Water Resources	IT – Information Technology
AF – Acre Feet	KAS – Kanab ambersnail (endangered native snail)
AGFD – Arizona Game and Fish Department	LCR – Little Colorado River
AGU – American Geophysical Union	LRRMCP – Lower Colorado River Multi-Species Conservation Program
AMP – Adaptive Management Program	LTEP – Long Term Experimental Plan
AMWG – Adaptive Management Work Group	MAF – Million Acre Feet
AOP – Annual Operating Plan	MA – Management Action
BA – Biological Assessment	MO – Management Objective
BAHG – Budget Ad Hoc Group	NAAO – Native American Affairs Office
BE – Biological Evaluation	NAU – Northern Arizona University (Flagstaff, AZ)
BHBF – Beach/Habitat-Building Flow	NEPA – National Environmental Policy Act
BHMF – Beach/Habitat Maintenance Flow	NGS – National Geodetic Survey
BHTF – Beach/Habitat Test Flow	NHPA – National Historic Preservation Act
BIA – Bureau of Indian Affairs	NPS - National Park Service
BO – Biological Opinion	NRC - National Research Council
BOR – Bureau of Reclamation	NWS - National Weather Service
CAPA – Central Arizona Project Assn.	O&M - Operations & Maintenance (USBR funding)
cfs – cubic feet per second	PA - Programmatic Agreement
CRBC – Colorado River Board of California	PEP - Protocol Evaluation Panel
CMAHG – Core Monitoring Ad Hoc Group	Powerplant Capacity - 31,000 cfs
CRCN – Colorado River Commission of Nevada	Reclamation - United States Bureau of Reclamation
CREDA – Colorado River Energy Distributors Assn.	RBT – Rainbow Trout
CRSP – Colorado River Storage Project	RFP - Request For Proposals
CWCB – Colorado Water Conservation Board	RPA - Reasonable and Prudent Alternative
DBMS – Data Base Management System	SA - Science Advisors
DOI – Department of the Interior	Secretary - Secretary of the Interior
EA – Environmental Assessment	SPAHG – Strategic Plan Ad Hoc Group
EIS – Environmental Impact Statement	SPG - Science Planning Group
ESA – Endangered Species Act	SWCA - Steven W. Carothers Associates
FACA – Federal Advisory Committee Act	TCD - Temperature Control Device
FEIS – Final Environmental Impact Statement	TCP - Traditional Cultural Property
FRN – Federal Register Notice	TES - Threatened and Endangered Species
FWS – United States Fish & Wildlife Service	TWG - Technical Work Group
FY – Fiscal Year (October 1 – September 30)	UCR - Upper Colorado Region (of the USBR)
GCD – Glen Canyon Dam	UCRC - Upper Colorado River Commission
GCMRC – Grand Canyon Monitoring & Research Ctr.	UDWR - Utah Division of Water Resources
GCNP – Grand Canyon National Park	USBR - United States Bureau of Reclamation
GCNRA – Glen Canyon National Recreation Area	USFWS - United States Fish & Wildlife Service
GCPA – Grand Canyon Protection Act	USGS - United States Geological Survey
GUI – Graphical User Interface	WAPA - Western Area Power Administration
HBC – Humpback Chub (endangered native fish)	WY – Water Year (a calendar year)
HMF – Habitat Maintenance Flow	
HPP – Historic Preservation Plan	
IEDA- Irrigation & Electrical Districts Assoc. of Arizona	
IN – Information Need	