Glen Canyon Dam Adaptive Management Work Group
March 7-8, 2006

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

Date: March 7, 2006
Convened: 9:30 a.m.

Committee Members:

Joe Alston, NPS
Darryl Beckmann, USBR
Steven Begay, Navajo Nation
Brenda Drye, Southern Paiute Consortium
Loretta Jackson Kelly, Hualapai Tribe
Leslie James, CREDA
Rod Kuharich, State of Colorado
Phillip S. Lehr, Colorado River Comm./NV
Clayton Palmer, WAPA
André Potochnik, GCRG
Ted Rampton, UAMPS
Nikolai Ramsey, Grand Canyon Trust
Sam Spiller, USFWS
Mark Steffen, Federation of Fly Fishers
Bruce Taubert, AGFD
Bill Werner, ADWR
Gerald Zimmerman, Calif. Water Board

Committee Members Absent:

Carleton Albert, Jr., Pueblo of Zuni
D. Larry Anderson, UDWR
John R. D'Antonio, NM Interstate Stream Comm.
Amy Heuslein, BIA
Max Oelschlaeger, Grand Canyon Wildlands Council
Leigh Kuwanwisiwma, The Hopi Tribe
John Shields, WY State Engineer's Office

Alternates Present:

Garry Cantley
D. Randolph Seaholm
Don Ostler
Larry Stevens
Mike Yeatts

For:

Amy Heuslein, BIA
D. Larry Anderson, UDWR
John R. D'Antonio, New Mexico
Max Oelschlaeger, Grand Canyon Wildlands Council
Leigh Kuwanwisiwma, The Hopi Tribe

Interested Persons:

Andrea Alpine, USGS
Matthew Andersen, USGS/GCMRC
Mary Barger, WAPA
Christine Beard, USGS/GCMRC
Mike Berry, USBR
Brenda Burman, DOI
Gary Burton, WAPA
Kerry Christensen, Hualapai Tribe
Tara Conrad, Office of the AS-WS DOI
Jeff Cross, GCNP
Williams Davis, CREDA
Kurt Dongoske, CREDA
Amy Draut, USGS/GCMRC
Helen Fairley, USGS/GCMRC
Dave and Pam Garrett, M^3 Research
Rick Gold, USBR
Jay Groseclose, NM Interstate Stream Comm.
John Hamill, USGS/GCMRC
Michelle Harrington, Center for Biological Diversity
Norm Henderson, NPS
Doug Hendrix, USBR
Lisa Iams, USBR
Rick Johnson, Grand Canyon Trust
Anne Kinsinger, USGS
J.D. Kite, USGS/GCMRC
Glen Knowles, USFWS
Dennis Kubly, USBR
Mark Limbaugh, AS-WS/DOI
Paul Li, Bob Lynch and Associates
Robert Lynch, Attorney
Ken McMullen, GCNP
Ted Melis, USGS/GCMRC
Bill Persons, AGFD
Randall Peterson, USBR
Ginger Reeve, USBR
Ken Rice, USBR Glen Canyon Dam
Larry Riley, AGFD
William Rinne, USBR
Tom Ryan, USBR
Bob Snow, DOI
Barb Steffen, Federation of Fly Fishers
John Weisheit, Living Rivers
Barry Wirth, USBR
Scott Wright, USGS/GCMRC

Recorder: Linda Whetton, USBR

Introductions and Administrative Items. Mike Gabaldón welcomed the members, alternates, and members of the public. He introduced Mr. Mark Limbaugh, the Assistant Secretary for Water and Science (AS-WS) for the Department of the Interior in Washington, D.C., who will be the new Secretary's Designee, and John Hamill, the new Chief at the Grand Canyon Monitoring and Research Center.

Approval of August 30-31, 2005, Meeting Minutes. Without objection, the minutes were approved.

Meeting Management Changes. Mike Gabaldón said that, following the last AMWG meeting, he determined a few changes needed to be made. He asked Mary Orton, facilitator, to explain.

Voting Process. The AMWG Operating Procedures allow only those members on the non-prevailing side of a motion to submit a minority report. Under the current voting process, there is no way to determine who is eligible to submit a minority report. Starting today, when a vote is to be taken, the meeting recorder (Linda Whetton) will call the names of the stakeholder entities and record the votes. When everyone has voted, she will read aloud the results to ensure accuracy, and then will announce the results.

Action Item Form. This form, included in the meeting packets for each agenda item, was developed to provide members with background information on agenda items and what action would be sought from the AMWG. Suggestions for improving the format should be given to Mary Orton.

Time-Certain Agenda Items. Agenda items identified with two asterisks (**) will be begun at the time indicated on the agenda, even if another agenda item is not yet completed. This is in order to allow members of the public to be present during that discussion, which will usually be an action item.

TWG Chair Reports. Instead of having the TWG Chair (Kurt Dongoske) make a comprehensive report at the beginning of the meeting, he will now report the TWG's actions during discussion of the specific agenda items.

Time Warnings. Linda will provide time warnings to presenters on her computer screen in 15, 10, and 5-minute increments in order to allow time for questions following each presentation.

Legislative Updates. Dennis Kubly reported President Bush signed the Energy Policy Act of 2005 on August 8, 2005. Two sections of the Act are relevant to hydropower production. The first one, Section 1840, identifies a 90-day study to be done that would describe the status of potential hydropower facilities considered part of previous water surface storage studies but not completed or authorized. That report has been completed and was turned in on November 5, 2005. The second one, Section 1834, is a joint analysis by the Secretaries of Interior, Energy, and the Army to evaluate the potential for increasing power production at federally owned facilities. That project is underway and moving along well.

Dennis also commented on House Bill 3824, "The Threatened and Endangered Species Recovery Act of 2005." He read the following paragraph which describes provisions of the bill: *"Amends the Endangered Species Act of 1973 to revise various provisions of that act relating to determinations of endangered or threatened species, recovery plans for such species, and the role of states and private property owners in protecting such species."* That bill was passed out of the House on Sept. 29, 2005, was referred to the Committee on Environment, Public Works, and the Senate has read it twice.

Old/New Business. Mike said the AMWG Charter must be renewed by July 1, 2006. He read the new ethics language being proposed: *"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."* He informed the members there was a document included in their meeting packets with questions posted by Reclamation staff and answers provided by Hale Hawbecker with the Departmental Ethics Office (***Attachment 1***).

Tribal Consultation Plan. Mike Berry said representatives from the DOI agencies and WAPA met for a two-day session, and accomplished a significant reorganization and rewrite of the Tribal Consultation Plan provided by the Hualapai Tribe. They will meet again in April and finish the work. Following that, they will request a Solicitor's review, distribute it to the AMP tribal representatives for comment and modification, and ideally complete it in FY06.

Departmental Perspective.

USGS Update. Anne Kinsinger, Acting Western Regional Director for USGS, said she was representing Pat Leahy, the acting USGS Director, at today's meeting. She introduced Fred Kipley, acting for her as the Deputy Western Regional Biologist, and Andrea Alpine, acting director of the Southwest Biological Science Center. She announced that the Grand Canyon Monitoring and Research Center is now fully staffed with well-qualified people. She introduced John Hamill, the new chief of GCMRC, and Matthew Andersen, the Biology Program Manager. Both individuals bring a lot of management and technical skills to the group and she feels the AMWG will enjoy working with them. She addressed two AMP concerns: (1) Every year the USGS has committed an additional $1 million to the AMP and every year they have had to fight to get the money. For FY2007, Director Leahy has already committed the $1 million. She said that in FY08 and beyond, the USGS will be looking at some long-term solutions and will keep the AMWG informed of their efforts. (2) She did not want to go into the details of the SCORE report but wanted to clarify how the USGS sees their role in the AMP process. From their perspective, they are to provide the AMWG with credible, objective scientific information to inform management decisions. They are not policy makers or resource managers but do think science has a strong role in the adaptive management process. The complementary role of the AMP is to tell the USGS what they need to help them design studies to meet their AMP needs. She feels the success at USGS is going to be measured by how well they are providing the AMWG with the information they need to make decisions.

DOI Update. Mark Limbaugh said he grew up in Idaho, and he was a farmer as well as an accountant. He managed the Fayette River, which had a very similar issues to those of the GCD AMP. Inclusiveness is very powerful and that is why he is here today on behalf of the Secretary Norton. The Department is encouraged by and supportive of the AMP. He said the AS-WS has responsibility over two bureaus that are intimately involved in the AMP, the Bureau of Reclamation and the U.S. Geological Survey.

He distributed a memo (***Attachment 2a***) from Secretary Norton announcing that after four successful years, Mike Gabaldón will be concluding his tenure as the Secretary's Designee to focus on his new position as head of the Technical Service Center in Denver. As head of the TSC, Mike will continue to work with the AMWG as they look at the design and cost estimates of a possible selective withdrawal structure. Mr. Limbaugh has been appointed as the new Secretary's Designee, with Rick Gold as his alternate. Mark said the Department remains committed to the principles of adaptive management especially in relation to the Grand Canyon and the operation of Glen Canyon Dam and reiterated the Secretary's support for the GCD AMP (***Attachment 2b***). He feels it is vital to recognize the relationships that have been built and the investments made. They need to be protected and everyone must work together in order to make important recommendations to the Secretary. He welcomes the opportunity to become engaged in the effort. He recognizes there are hard decisions that will need to be made on funding, water operations and power generation, and prioritizing areas of scientific research and monitoring. One example that has been discussed for some time is whether the AMWG should continue to take the lead in humpback chub efforts in the Grand Canyon or whether the development of a recovery implementation program is the appropriate methodology. The Department will analyze each of the issues primarily based on AMWG recommendations. Consensus input, if achieved from the stakeholders involved, is a very powerful message.

Mark said he will personally take the lead to ensure that AMWG recommendations are fully discussed among all involved agencies of the Department and that the Department responds to the AMWG in a timely manner. He said the Secretary had directed that a Glen Canyon Dam Adaptive Management Policy Group be formed, co-chaired by Tom Weimer, the Assistant Secretary for Policy, Management

and Budget, and consisting of the most senior Departmental officials that oversee the Department's agencies that participate with the AMWG. He looks forward to working with the AMWG in the coming year and thinks it is a tremendous opportunity. He believes by working together the differences can be overcome, and they can move towards a common goal of protecting the Grand Canyon and the resources that everyone depends upon. He looks forward to meeting the individual stakeholders.

SCORE Report. John Hamill said he spent a good part of his career working on endangered fish in the Upper Colorado River Basin and is proud of the program that has evolved. While his role is one of providing science support, he recognizes that the processes are about people and relationships. His goal is to operate transparently and openly in providing the AMWG with objective science. He distributed copies of the SCORE report and gave a presentation, "Highlights of the State of the Colorado River Ecosystem (SCORE) in the Grand Canyon" (***Attachment 3a***).

Several members expressed concern for warming conditions in Lake Powell and the increase of warm water piscivorous fish, the decline of humpback chub in relation to hydrologic conditions and flushing flows, and restocking HBC in the Colorado River.

Knowledge Assessment Workshop Summary & Report Update (***Attachment 3b***). Ted Melis said the AMWG passed a motion directing the TWG and GCMRC to assess the status of their knowledge. He noted that the SCORE Report is the report on the status and trends of key resources within the program. Ted stressed that much of the cause and effect relationships for those resource responses is still uncertain. The Knowledge Assessment Workshop provided an opportunity for the first time since the Grand Canyon conceptual model was developed six years ago to reflect on their gains in knowledge, specifically on cause and effect. The first workshop was in the context of a TWG meeting in May 2005. The second was a three-day workshop in July 2005. It was incorporated in presentations at the Science Symposium in October 2005. The knowledge assessment process is ongoing as knowledge increases.

Larry Stevens expressed concern that the program still did not have a comprehensive ecosystem approach. He said the amount of uncertainty displayed on the physical resource matrix slide should be alarming to everyone. A great deal of time and money has been invested in the AMP and there are still some very grave uncertainties. While he feels the USGS has done a tremendous job in advocating and pursuing the control of non-native trout, it is unknown if the $1 million a year being spent to keep trout at bay is will have a positive impact on the chub.

Public Comment. Bob Lynch said that the program has not isolated the impacts of variables, from warm water to mechanical removal to fluctuating flow experiments. Simultaneous and multiple variables make it impossible to isolate cause and effect. He did not see how anyone could testify in court as to causation in the system.

Selective Withdrawal Structure. Darryl Beckmann said the Science Advisors presented the results of a risk assessment on a selective withdrawal structure in August 2003 (***Attachment 4***). Subsequently, the AMWG recommended to the Secretary that Reclamation be tasked to do NEPA compliance on a selective withdrawal device on Glen Canyon Dam. Last August, Reclamation had an estimate of $80 million for a 2-unit selective withdrawal structure, and asked the Technical Service Center to look at two alternatives for reducing costs. The costs for those were approximately $30-35 million, but they had only about a 70-foot operating range. The concern was they would install two units only to find that they were not going to provide the wide range of operating utility they needed in the long term. Reclamation decided the best approach at that time was to move forward with the original design which would provide a wider range of flexibility – from 3,510 feet to full reservoir capacity at 3,700 feet. Reclamation will now begin NEPA compliance, which should be completed in FY07. In August 2006, they will ask AMWG to make a recommendation to the Secretary. Darryl said $80 million is more than Reclamation's appropriated budget, so they will also need to provide a financial package that includes a significant cost share from other stakeholders and sponsors. In addition, they will need to make a recommendation to the Secretary on a long-term experimental plan. The Science Advisors are currently working on four or

five options for a longer-term science plan. Depending on which of those options AMWG agrees upon, NEPA compliance should also be included. The TSC staff is fine-tuning the estimate so it can be forwarded in a budget request proposal AMWG can recommend to the Secretary.

Nikolai Ramsey said he understood the money was not in Reclamation's budget but that it could be if litigation were being pursued. He said litigation might result if the Reasonable and Prudent Alternative is not subjected to more rigorous enforcement or if there is a new RPA. He is concerned that some people may try to manage the AMP through litigation. He is sympathetic to the economic reality of building costs but does not want to see the program stretched to do a two-unit version if four units are needed.

TWG Chair Report. Kurt Dongoske said the TWG was in support of Reclamation's plan, and encouraged Reclamation to move forward with the environmental compliance and construction of a unit. They passed the following motion on January 25, 2006: The TWG recommends Reclamation complete compliance on the TCD as soon as possible.

Jerry Zimmerman asked if they had looked at modifying the penstock so they can generate power below the minimum power head in conjunction with looking at temperature control devices. Ken Rice replies that they had not, that it was probably pretty costly, and a minimum power pool head is only going to give us about 20 feet to play with. The new turbine design is supposed to be more efficient through a whole variety of ranges.

Rod Kuharich said that he could not support the idea unless eradication of introduced species and repopulation through stocking were included in the EIS. He felt the group should not just focus on a TCD while the situation worsens.

Bruce Taubert said that the group was being shortsighted. They made a recommendation to the Secretary to move HBC to a refuge and to assist the Fish and Wildlife Service to develop a genetics management plan, but nothing is happening in either area. He said there had been no progress on getting fish out of this system, nor on evaluating the potential for stocking them if necessary. He was concerned that the group may move ahead with NEPA compliance without knowing if the warmer water will negatively affect the HBC.

Nikolai Ramsey said he did not think the group made a recommendation to the Secretary to stock HBC, and he thought there was some ambiguity about the issue of using a refuge. The recent increase in HBC numbers would suggest that they are not at the catastrophic level at which a refuge would be necessary. He said the group should focus on habitat improvement first, and only then on stocking if necessary.

Mary Orton read the motion (from the April 2002 letter) regarding the recommendation to the Secretary: "GCDAMP should adopt an experimental framework that includes Scenarios 1 through 4 and possibly other scenarios to benefit resources of concern with a twice-a-year evaluation of data by the AMWG. Initiate all needed activities (consultation [include endangered humpback chub], compliance, development of a science plan, public outreach, development of a captive breeding population of humpback chub from Grand Canyon)."

Science Advisors Membership Selection (***Attachment 5***) John Hamill said a critical element of the AMP is the formation of independent review panels, one of which is the standing committee of Science Advisors that was created to provide independent, objective oversight of the science that is going on in the GCDAMP. A letter was sent to the AMWG members on January 18, 2006, seeking nominations of persons in various disciplines for the Science Advisors Panel. Thus far, he has not received any nominations from the AMWG. The next step is for GCMRC to consult with the AMWG on the selection. He gave a PowerPoint presentation. John said they will most likely select a geomorphologist, an anthropologist, and an aquatic ecologist. Dr. Garrett asked that any additional names be provided to him. Kurt Dongoske said he knows Don Fowler and Alan Sullivan very well and they are highly qualified individuals, but both are archaeologists and not anthropologists. He would like to see one slot be filled

with an anthropologist who is knowledgeable in the subfield of cultural anthropology. He suggested Dr. Pete Whitely be considered. Dr. Garrett will follow up.

Basin Hydrology. Tom Ryan provided several slides (***Attachment 6***) depicting conditions in the Upper Basin.

FY06 Budget Modifications. Mike Gabaldón said that, because of a change in the CPI, GCMRC had $188,000 in unprogrammed funds at the end of FY06. He was faced a decision about the additional funds and could not wait for the next AMWG meeting. The Roles AHG had recommended a process for this circumstance. Even though the Roles AHG Report has not been finalized, Mike elected to use that process to determine what should be done with the additional funds.

The process involved consultation between GCMRC and the Secretary's Designee and the Budget Ad Hoc Group (BAHG). The BAHG forwarded a recommendation to the TWG, who made a recommendation to the Secretary's Designee. He agreed with the recommendation, with one exception.

The exception was a recommendation of $50,000 for a genetics management plan. He felt this should be brought to the AMWG for consideration, because in August 2003 the AMWG unanimously agreed to have FWS fund that work. He said GCMRC and FWS would present more information on this issue.

John Hamill said he committed $20,000 to the LCR and Paria River gages and $25,000 to a sediment augmentation study. There was $143,000 remaining, and the GCMRC made recommendations of how the funds should be allocated. TWG recommended, and Michael agreed, that the money be allocated as follows (***Attachment 7***):

Warm Water Nonnative Fish Startup (hire a ww species biologist)	$42,000
HBC Genetics Plan (Refugia plan, additional sampling)	$50,000
LCR Gage	$22,000
Experimental Trout Suppression Research	$13,000
Experimental Flow Fund	$16,000

Presentations followed on the projects.

Warm Water Nonnative Species Control Plan. Matthew Andersen said GCMRC was asked by AMWG and TWG to proceed with the development of a plan to address the risks of non-native fish species vis-à-vis humpback chub. GCMRC convened a workshop in December 2005 and brought managers and biologists from around the Southwest and additional experts from outside the Colorado River Basin to review those risks and how best to address them. He will hire someone soon to begin that work. He provided copies of a one-page outline and gave a PowerPoint presentation (***Attachment 8***).

Bruce Taubert asked about the status of the construction of weirs for brown trout. Jeff Cross said that the contracting issues have been addressed, a draft environmental assessment has been sent to the NPS regional office for review, and the next step is to put the EA out for public review. Once the public has reviewed it, Grand Canyon National Park will analyze the comments and decide how we go forward. He is hoping to be able to build the weir in the fall.

HBC Ad Hoc Group Report (AIF and Court Order - ***Attachment 9a***). Glen Knowles said he would report on what the HBC AHG has been doing and provide an update on the HBC Comprehensive Plan. He reminded the AMWG that they passed two motions, one of which directed the creation of an implementation ad hoc group to look at all the HBC actions that were recommended in the HBC Comprehensive Plan (HBCCP) and determine which actions were within the authorities of the AMP. Sam Spiller, Nikolai Ramsey, and Randy Seaholm are co-chairing the ad hoc group. When the next draft of the HBCCP is completed, they will produce a report of what projects are recommended to be in and out of the AMP, as well as identify possible sources for funding those outside projects.

Another AMWG motion passed last year directed the TWG to further develop the version of the HBC Plan with specific focus on describing the linkages, sequences, and feedback loops among projects; and to identify priorities and a timeline for completion of each action, etc. Glen gave a PowerPoint presentation (***Attachment 9b***).

The HBCCP has been updated to incorporate the latest science and what is available to them on the upper basin populations of humpback chub. They updated all the projects and the appendix that listed specific projects for HBC conservation actions. Glen said that Region 6 produced a draft of a Genetics Management Plan (GMP) last year but the HBCCP felt it was not sufficient to meet AMP needs. Since that time, they have had some changes in the FWS with new staff hired at the Dexter Fish Hatchery. FWS also has been evaluating the genetics of the few HBC they have in captivity at Willow Beach National Fish Hatchery. That information will be presented to the TWG in May and to the AMWG in August, if AMWG so wanted. They found the fish at Willow Beach were probably a good representation of the fish in Grand Canyon but they wanted to obtain more information. He said it is important to complete the GMP because it will guide creation of a refuge population and translocation efforts in the Grand Canyon. Dexter National Fish Hatchery has hired a new geneticist and might be able to complete the work. This is why there was a request for $50,000 for a genetics management plan from the available $188,000.

Sam Spiller said that once the GMP is completed, the Ad Hoc Group will determine if there is any interest in recovery work for the species, and what is appropriate for funding by AMWG. There is the potential for a lower basin recovery implementation program, which he feels is a good idea. Based on how it might be funded or structured, it could address all the big river fish in the lower basin.

TWG Chair Report. Kurt said the TWG decided the best way to disburse the funds was to rank the projects (***Attachment 9c***).

Bruce Taubert said he wants to see the GMP completed by FY06. If the FWS cannot complete it, he suggested the money be moved to GCMRC so they can do the work. He said there is a distinction between refugia and the GMP. The GMP is necessary for determining what is a good mix of fish for eventual augmentation or stocking, while refugia are simply places to hold fish. He questioned why funds for concurrent estimates were ranked so low by TWG. He said direction had been given to GCMRC to do an evaluation of concurrent estimates and that the work be done as soon as possible, because a starting point for recovery can't be established unless the FWS agrees on the estimate. Glen Knowles assured Bruce the GMP would include a translocation plan, a refugia plan, a captive breeding plan, and would provide specific direction on completing on the projects.

Clayton said he agreed with Bruce, and that plan should be developed in conjunction with Region 6 so that it is their plan as well. Glen said the FWS sees completion of the GMP as their responsibility. It is a FWS document and something that Region 6 would have to sign off on because it relates so closely to HBC recovery. Region 6 in Denver is the lead for recovery of the species.

Public Comments: None

MOTION: To use $50,000 from CPI to support a HBC Genetics Plan, including a refugia plan and additional sampling, contingent upon FWS notifying the Secretary's Designee by April 15, 2006 that they can accomplish this effort alone or with GCMRC by December 31, 2006.
Motion seconded.

REVISED MOTION: **To use $50,000 in funds reprogrammed from CPI to support a HBC Genetics Plan, including a refugia plan and additional sampling.**
Motion seconded.

Arizona Game and Fish Department	N	Federation of Fly Fishers	Y
Bureau of Indian Affairs	Y	Grand Canyon River Guides	Y
Bureau of Reclamation	Y	Arizona	Y
Hopi Tribe	Y	California	N
Hualapai Tribe	Y	Colorado	N
National Park Service	Y	Nevada	Y
Navajo Nation	Y	New Mexico	Y
Pueblo of Zuni	Absent	Utah	Y
San Juan Southern Paiute Tribe	Absent	Wyoming	Absent
Southern Paiute Consortium	Y	Colorado River Energy Distributors Association	Y
U.S. Fish and Wildlife Service	Y	Utah Associated Municipal Power Systems	Y
Western Area Power Administration	Y		
Grand Canyon Trust	Y		
Grand Canyon Wildlands Council	Y		

Total Yes	**19**
Total No	**3**
Total Abstain	**0**

Motion Passed.

Update on Science Plans Development. Dave Garrett said the outcome of the science planning process would be: (1) a Strategic Science Plan (SSP), a long term science planning document; (2) a Monitoring and Research Plan (MRP), focused on science in both monitoring and research areas; and (3) an annual workplan and budget for the program that would incorporate (1) and (2). They have also included a five-year assessment of experimental options.

Planning Documents And Planning Process. Dave said that initially, science in this program was driven by a management description of goals, objectives, and information needs. The Science Planning Group built a parallel process that would correlate to the goals, objectives, and information needs of managers while assessing knowledge and answering critical science questions. He said that it was critical that these two processes were well merged, and that they would be the adaptive design for the science effort. He gave a PowerPoint presentation (***Attachment 10a***).

Dave said the Science Advisors are recommending a modeling effort and a tradeoff analysis be completed by the managers. He said the MRP is on schedule and will be delivered to the TWG in April, and approval for the SSP will be sought in June.

Leslie James asked how the MATA results are being incorporated into the plans and overall discussions. Dave said the MATA process was developed out of some modeling exercises and the conceptual model will be driving the process. However, the biggest piece missing from the conceptual model is decision support systems.

Knowledge Assessment. Ted noted that the Knowledge Assessment document had some areas in which scientists believe there is greater certainty based on the data and experimental results. Those areas tended to be in the realm of stable flows and lower flows, which could have a desired effect of promoting downstream warming even without a selective withdrawal structure. Those same flows can also limit sand export. They might be deemed as management actions, but the economical and financial costs are unknown. Without known costs, a cost/benefit analysis could not be completed.

Clayton Palmer said WAPA supports the knowledge assessment and feels it improved the understanding of what scientists know and do not know. However, they think the knowledge assessment document falls short in its ability to be used to identify management actions.

Rod Kuharich expressed concern that the AMP has spent over $100 million. He said he wanted to know if there is an endgame in sight. He asked whether the program will come up with an operational scheme,

after which they can just monitor and not have to do a lot of research. Dave responded that implementing a selective withdrawal structure may not provide the information needed until the end of a decade, but it would be used as a management tool. He thinks there have been some strong signals from the physical sciences in the movement of sand into higher locations and perhaps not much more research will be needed in that area. As for monitoring, he feels the AMP will have to operate another 15 years in order to have the information to help managers make informed decisions.

Experimental Options Review, FY07-2011. John Hamill said one of the driving forces behind the planning process will be determining the major experiments to be done over the next 10 years and how the dam will be operated. He gave a PowerPoint presentation (***Attachment 10b***) detailing the four experimental options being considered:

Experimental Option **1**	Continue evaluating MLFF in spring/summer/fall, with winter ramping experiments + BHBF in winter/spring
Experimental Option **2**	Continue evaluating MLFF in spring and summer, with winter ramping experiments + BHBF in winter/spring + stable flows in Sept. and Oct.
Experimental Option **3**	Increased fluctuating flows in summer and winter + BHBF in fall + implementation of a suite of management actions
Experimental Option **4**	Seasonally adjusted steady flows throughout the year + spring BHBF

John said a GCMRC Experimental Options Report has been completed. It describes and compares options and assesses positive and negative impacts to the resources based on the Knowledge Assessment and other available information. Mary Barger is chair of a small group tasked to look at how opportunities for combining the best aspects of each of the options in an effort to reach consensus. TWG will make a recommendation to AMWG in late spring, and AMWG will consider it in August.

Darryl Beckmann noted that all four options mention the TCD, and asked how many units were anticipated. Ted Melis said the consensus was all eight units. Discussion ensued, with some members (Clayton Palmer and Rick Johnson) indicating that they felt it should include as many units as was necessary to achieve the biological goals. Sam Spiller noted that it would be important to ascertain the impacts on cultural resources, sediment values, beach maintenance values, power, and other resources. He said there would need to be a good amount of time in August to do that. Darryl noted that the NEPA compliance for a two-unit structure would probably be an EA, but for more units, it could entail an EIS.

Public Outreach AHG (POAHG) Presentation. (AIF-***Attachment 11a***) André Potochnik gave a brief PowerPoint Presentation (***Attachment 11b***) on what the POAHG has been doing and actions they are seeking from the AMWG. He said Doug Hendrix, Ginger Reeve, and Lisa Iams from Reclamation would provide additional information on products the POAHG has been working on. He encouraged the members to look at the fact sheets posted on the walls, as they would be seeking approval of those tomorrow.

POAHG Phase 1 - Doug Hendrix said this phase was focused on developing a website, preparing fact sheet materials, creating a visual identity (logo creation), and designing portable displays.

Glen Canyon Dam Stationary Display. Ginger Reeve said the basic designs of the stationary display were developed for the 3-5 temporary displays currently at the Glen Canyon Dam Visitor Center. At present, a 13-panel drought display uses the same layout and design concept in order to give continuity to the entire display at the Visitors Center. Ginger said it was very difficult to condense the AMP into four panels of a certain size. Initially she thought the panels might be too “text heavy” but then she saw how much time people spent reading the information and studying the maps. The panels will be strategically located in the Visitors Center (near restrooms and in the tour waiting area). She encouraged the members to look at the display sheets and provide comments to her. The POAHG would like final approval on the displays so they can be set up by Memorial Day.

Larry Stevens suggested a small brochure be prepared so people could take it with them. Barry Wirth commented that brochures or flyers often end up discarded in the Visitors Center parking lot. André said the POAHG has been looking at preparing some business-sized, laminated information cards, and suggested directing people where to obtain the products versus distributing them to everyone. Mark Steffen felt it was very important to provide the mechanical trout removal locations in the Colorado River. Ginger said the river mile information could be added to the display panel.

AMP Public Outreach Website. Lisa Iams provided background information on the POAHG website and gave a demonstration on the layout, design, and basic functionality of the website. The content is still being reviewed and pieces being developed. At some point in time the AMWG will be provided with a link giving them access to the website. She anticipates having the website done prior to the August meeting and the POAHG will be seeking final approval from the AMWG before the site goes live to the public. A search engine is also being added to the site.

André asked the AMWG to consider the three motions provided in the POAHG packets. The comments provided by Larry Stevens and Mark Steffen were incorporated into the first motion.

POAHG Motion #1: AMWG recommends to the Secretary of the Interior the design, content, and installation of the AMP Stationary Display, with the following changes: consideration of a small flyer to take away and identification of the location of the mechanical removal.
Motion passed by consensus.

POAHG Motion #2: AMWG approves the layout and functionality of the AMP website as presented at the AMWG meeting.
Motion passed by consensus.

POAHG Motion #3: AMWG recommends to the Secretary of the Interior the following public outreach fact sheets as presented at the AMWG meeting: Cultural Resources, Recreational River Rafting, and Hydropower and the Adaptive Management Program (graphic only).
Motion passed by consensus.

ACTION ITEM: AMWG members should provide additional comments/edits regarding any of the POAHG products to André Potochnik or Amy Heuslein by Friday, March 31, 2006. (André's e-mail address is: arp4@infomagic.net).

POAHG Budget Update. André said $57,256 was carried over from last fiscal year, and of that amount, Reclamation has supplied a total of $31,861 in staff work and expenses for the month of February were approximately $8,000. This leaves approximately $17,395, and the Ad Hoc Group will need about $30,000 to complete Phase I. He said the AMWG also approved funding the Adopt-a-Beach program and want to get their products this year.

Rotation/Selection of New POAHG Co-Chairs. Both co-chairs of the POAHG, André Potochnik and Amy Heuslein, are looking for replacements. It is a large time commitment and does require someone to track tasks, create products on time, and present to the AMWG. He asked if the chair of the POAHG has to be an AMWG member, and Mary Orton said that according to the Operating Procedures, it does.

ACTION ITEM: AMWG members interested in participating and/or chairing the POAHG should submit their names to Linda Whetton by Friday, March 31, 2006. (lwhetton@uc.usbr.gov)

Leslie James said she had some concerns about the Adopt-A-Beach (AAB) program. She believes the AAB is outside the scope of Phase 1 of the POAHG work. The proposal for AAB speaks to providing relevant data to the scientific community. If this is so, she feels the AAB proposal should be treated as would any other science-based proposal that is funded through this program. She wasn't clear how the

data would be supplied to GCMRC, how GCMRC had used that data in the past, how it would be used in the program, and how the deliverables were coming back into the AMP. She voted not to approve the program in the POAHG for those reasons. She commended André and Amy for all their efforts and leadership of the POAHG, the outside media experts who have participated, as well as Reclamation staff for producing products.

Public Comments: No comments.

Adjourned: 4:50 p.m.

Glen Canyon Dam Adaptive Management Work Group
March 7-8, 2006

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

Date: March 8, 2006
Convened: 8 a.m.

Committee Members:

Joe Alston, NPS
Darryl Beckmann, USBR
Steven Begay, Navajo Nation
Brenda Drye, Southern Paiute Consortium
Loretta Jackson Kelly, Hualapai Tribe
Leslie James, CREDA
Rod Kuharich, State of Colorado
Phillip S. Lehr, Colorado River Comm./NV
Clayton Palmer, WAPA
André Potochnik, GCRG
Ted Rampton, UAMPS
Nikolai Ramsey, Grand Canyon Trust
Sam Spiller, USFWS
Mark Steffen, Federation of Fly Fishers
Bruce Taubert, AGFD
Bill Werner, ADWR
Gerald Zimmerman, Calif. Water Board

Committee Members Absent:

Carleton Albert, Jr., Pueblo of Zuni
D. Larry Anderson, UDWR
John R. D'Antonio, NM Interstate Stream Comm.
Amy Heuslein, BIA
Max Oelschlaeger, Grand Canyon Wildlands Council
Leigh Kuwanwisiwma, The Hopi Tribe
John Shields, WY State Engineer's Office

Alternates Present:

Garry Cantley
D. Randolph Seaholm
Don Ostler
Larry Stevens
Mike Yeatts

For:

Amy Heuslein, BIA
D. Larry Anderson, UDWR
John R. D'Antonio, New Mexico
Max Oelschlaeger, Grand Canyon Wildlands Council
Leigh Kuwanwisiwma, The Hopi Tribe

Interested Persons:

Andrea Alpine, USGS
Matthew Andersen, USGS/GCMRC
Mary Barger, WAPA
Christine Beard, USGS/GCMRC
Mike Berry, USBR
Brenda Burman, DOI
Gary Burton, WAPA
Kerry Christensen, Hualapai Tribe
Tara Conrad, Office of the AS-WS DOI
Jeff Cross, GCNP
Williams Davis, CREDA
Kurt Dongoske, TWG Chair/CREDA
Amy Draut, USGS/GCMRC
Helen Fairley, USGS/GCMRC
Dave and Pam Garrett, M^3 Research
Rick Gold, USBR
Jay Groseclose, NM Interstate Stream Comm.
John Hamill, USGS/GCMRC
Michelle Harrington, Center for Biological Diversity
Norm Henderson, NPS
Doug Hendrix, USBR
Lisa Iams, USBR
Holly Johns, So. Nevada Water Authority
Rick Johnson, Grand Canyon Trust
Anne Kinsinger, USGS
J.D. Kite, USGS/GCMRC
Glen Knowles, USFWS
Dennis Kubly, USBR
Lisa Leap, GCNP
Mark Limbaugh, AS-WS/DOI
Paul Li, Bob Lynch and Associates
Robert Lynch, Attorney
Ken McMullen, GCNP
Ted Melis, USGS/GCMRC
Bill Persons, AGFD
Randall Peterson, USBR
Ginger Reeve, USBR
Ken Rice, USBR Glen Canyon Dam
Larry Riley, AGFD
William Rinne, USBR
Tom Ryan, USBR
Bob Snow, DOI
Barb Steffen, Federation of Fly Fishers
John Weisheit, Living Rivers
Barry Wirth, USBR
Scott Wright, USGS/GCMRC

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

Follow-up to Genetics Management Program Report. Bruce Taubert expressed his concern, again, for lack of action on the recommendation to the Secretary of the Interior from 2002, in which she was urged to, "initiate all needed activities (consultation [include endangered Humpback chub], compliance, development of a science plan, public outreach, development of a captive breeding population of Humpback Chub from Grand Canyon)."

Cultural Resources

Programmatic Agreement Signatory Status. Mike Berry provided a brief history and the status of the Programmatic Agreement (***Attachment 12a***). The following options exist in getting a new PA:

- Rewrite the PA to cover section NHPA 106 and GCPA compliance and repeat the signatory process with the new additions.
- Await the recommendations of the GLCA and GRCA treatment plans and: (1) enter into an MOA for treatment with Arizona SHPO and NPS to implement treatment and satisfy NHPA section 106 requirements and terminate the current PA; (2) develop a new PA restricted to long-term monitoring under the GCPA.
- Consider additional options in consultation with NPS and Arizona SHPO.

Clayton said that Reclamation's obligation is to consult with the Advisory Council but not necessarily take its advice. He said WAPA wishes to be a signatory to the PA so that its suggestions will be considered. WAPA would like to help Reclamation get a PA in place but is concerned they will continue to not be a full participant without being a signatory to the PA. Clayton said he wanted to be on the record for saying that five years ago there was no objection to having WAPA added as a signatory. He questioned whether that role can be replaced by a cultural resource ad hoc group and believes it will depend on how that group conducts itself as a collaborative body.

Mike said members of the Cultural Resource Ad Hoc Group (CRAHG) have discussed many of Clayton's concerns. He concurs and said the treatment plans are underway. The compliance responsibilities can be resolved and then they can move onto doing the GCPA long-term monitoring, where WAPA, CREDA, and BIA would be signatories.

Mike Yeatts said stakeholders are objecting to the addition of the three new organizations because as a legal matter, they cannot add signatories without rewriting the PA. The original PA pre-dates the Record of Decision, so it does not address the whole program and is not meeting the needs of most of the participants. He thinks a new PA would focus essentially on the AMP activities and not the dam operation activities of Reclamation.

Loretta Jackson Kelly concurred that the PA is outdated and said a new one should address the tribal historic preservation officer's responsibilities. The Hualapai Tribe contends they own 108 miles of the Grand Canyon Colorado River. Everything that occurs in that section starting from National Canyon to the Lake Mead boundary is the property of the Hualapai Tribe. They have THPO status and within the PA, would like to be a main signatory to that document in order to help manage those resources.

Glen Canyon (GLCA) Treatment Plan. Mike said the GLCA Treatment Plan is well underway after a significant delay in getting people into the field. They are operating on 2004 AMP funds

and have completed their fieldwork. A report was submitted to Mike and Chris Kincaid from Glen Canyon, which they reviewed and sent it back to the Navajo Nation Archeological Department for revision. It was revised and Mike distributed it to the PA members. He is waiting for comments from them. They also received a separate geomorphological assessment from a contractor that was under a CESU agreement from NAU. It appears to be an excellent document, and he will follow the same review process for it. Mike said it is time to get away from "placeholder mentality" and present the AMWG with some responsible budgets. He envisions the FY07 workplan to be consultation with the SHPO and with all the tribes, and taking tribes on river trips to particular sites of interest to resolve any issues.

Grand Canyon (GRCA) Treatment Plan. Mike said the Plan is under a CESU agreement with Utah State University with Joel Pedersen as the Primary Investigator. They obligated $250,000 from the FY05 AMWG recommendation as well as $155,000 from FY06. Mike is holding the remainder of the money in case they do not meet schedules or have to schedule an additional river trip. The preliminary assessment of all stamped data has been accomplished by Zuni Cultural Resource Enterprise, Inc. (ZCRE), under a subcontract to USU. The fieldwork is scheduled to start in March and the first drafts of the treatment plan are to be completed by January 1, 2007.

Clayton said that the ROD was signed in November 1996 and the operating criteria changed in February 1997. Normally when WAPA does Section 106 compliance, the mitigation and treatments are done by the time the Federal action is in place. It has been about 10 years since the Federal action came into place and 106 compliance has not been completed. They would like to see the CRAHG address the issue of 106 compliance and put a plan in place for getting it done. Mike said that Mary Barger from WAPA is the CRAHG's chairperson and will address that in their next meeting.

NPS Mitigation Process for 10 Threatened Sites. Lisa Leap said GRCA is proposing to excavate ten archeological sites located along the Colorado River. They took PA representatives on the river in April 1999 and showed them the sites. As a result of that river trip, they wrote a formal memo in May 1999 to PA representatives and shared the assessments of the proposal for the excavations. They also presented the information at PA and TWG meetings on the sites they would like to excavate. This was also part of the SAB review. She distributed a handout (***Attachment 12b)***

Lisa said the cost is estimated at $1.1 million. So far, they have allocated $20,000 to the Museum of Northern Arizona for the research design and are anticipating obligating more this year. The source of the funding, the fee demonstration program, is strict on how work can be accomplished. Joe Alston added that fee demo funds are entrance fees coming into the Park for which they can keep 80%.

Cultural Resource Monitoring Program. Helen Fairly said that in August 2005 GCMRC was approved to redesign cultural monitoring for FY06 and beyond. Shortly thereafter, they were encouraged to get with the CRAHG to discuss where the program was headed. She gave a PowerPoint presentation (***Attachment 12c).***

FY05 Expenses and Project Progress Report through Sept. 30, 2005.

USBR FY05 costs. Dennis Kubly said that as part of the two-year budget development process, the AMWG directed Reclamation and GCMRC to provide updates twice a year, mid-term at their summer meeting, and an end-of-year fiscal accounting at the winter meeting. He said

Reclamation is responsible for the administration of reimbursements to the AMWG and TWG for their travel costs, the Programmatic Agreement, and support to the tribes for their participation, and in this last cycle, for the sediment augmentation feasibility study along with some of the monitoring in the cultural arena. Reclamation has responsibility for approximately $1.8 million in the FY05 budget. He reviewed the distribution of those funds (***Attachment 13a***) and said approximately $1.4 million was obligated and $1.2 million expended. He pointed out "other" costs for the LCR management plan endeavor in which they are working with the Little Colorado River Watershed Coordinating Council. They have obligated $25,000 to a contractor, Dr. Rich Valdez, to help update an existing draft report that will satisfy, if necessary, Reclamation's obligation under the Biological Opinion. Reclamation's commitment under the BO is to be a cooperator with the development of the management plan, but not to actually write it. They prefer to work with the stakeholders in the Watershed to develop a plan that is suitable for them, and have made that offer. Part of the funds would be provided for the purpose of a workshop this summer.

The tribal dollars are now being handled under what is called a "reimbursable service agreement" with Interior, under which each tribe bills Reclamation and then Reclamation passes those charges onto the Department.

He said there are some underexpended funds in the category of Programmatic Agreement. As much as Reclamation would like to have efficient accounting at the end of the year and be able to say that all funds are expended or not, in reality there are carryover funds. An additional column will be added to the form showing the carryover funds. There is a practice of moving any carryover dollars into Experimental Flow Fund, and that will continue unless the AMWG deems otherwise.

Mike Yeatts said the Hopi Tribe did not do a river trip last year so the $15,000 went somewhere else. Brenda Drye expressed concern that the $15,000 they normally receive for river trips was sent directly to GCMRC in July 2005. She said that GCMRC told them they had to have all the money for the tribal river trips upfront. Dennis suggested Mike and Brenda meet with Mike Berry and Chris Beard (GCMRC) to talk about the funds.

Loretta said they are still using FY05 funds. Their contracts are now lagging because of the new system and they will not get FY06 funds until August. Dennis said there was a learning process with the first Reimbursable Service Agreements (RSAs). It was his understanding that Reclamation can move the contracts back by a maximum of two months. Reclamation would like to get back on the regular fiscal cycle so that tribal funding is on the same schedule as the rest of the program.

<u>GCMRC FY05 Costs</u>. J.D. Kite distributed copies of the GCMRC budget (***Attachment 13b***) along with copies of the FY05 GCMRC AMP Actual Balances (***Attachment 13c***). J.D. said that FY05 was a unique year for GCMRC. The contract with Reclamation ended, and the $36.2 million they had received over the 5-year period had to be completely obligated or expended by September 30, 2005. With that in mind, GCMRC staff reviewed five years of obligations. They also had to pay for the experimental test flow in November. For FY05 they were approved for $7.7 million. They received another $1.36 million from FY03 and FY04 funds. They found another $276,000 from contracts since FY02, received $210,000 for Lake Powell, and received $196,000 for Compliance, for a total of $9.8 million.

John Hamill decided that GCMRC needed a report card, so the next 11 slides showed GCMRC FY05 accomplishments. J.D. said that GCMRC accomplished everything the AMWG had

requested except for a few shortfalls. He said one of the slides showed $8.2 million as the approved budget when it was actually $8.136 million. The only carryover they had was for the Compliance, and $112,000 was carried over into FY06. J.D. said the burden/overhead is to pay for GCMRC salaries, administrative supplies, rent, utilities, security, telecommunication, administration, and equipment.

Larry Stevens questioned whether other program stakeholders, such as the tribes, could use computers being excessed by the GCMRC. J.D. thought the equipment had to go to another Government agency and advised Larry to contact him for further clarification.

John Hamill said he would like feedback on whether the AMWG found the accomplishment report useful. In the future, they will provide the report to the TWG and allow them to review and comment on it before it is presented to the AMWG. If the AMWG is not interested, then they will discontinue preparing it.

Recreation Protocol Evaluation Panel. Helen Fairley said that panel members of the Recreation Protocol Evaluation Panel prepared the presentation she would give today (***Attachment 14***). It was presented to the TWG in November 2005 by the chair of the panel, Dr. John Loomis, who could not be present today.

Leslie James said she recalled that one of the National Academy of Sciences recommendations was to seek alternate and additional funding sources for the AMP. The PEP recommended more funding for the recreation program, and also noted the $40 million per year economic benefit from recreational use. She recommended bringing some of that economic benefit into the AMP to enhance the funding of the recreation program. She said that the report made clear there are many impacts that are due to visitor use, and not due to dam operations. It makes sense to have some of the benefit from that impact coming back to monitor and mitigate the effects.

Joe Alston said the recreational users are paying already and it is benefiting the AMP. The river running concessionaires pay a franchise fee based on their revenue. Those funds are available for the Park and in large part funded several million dollars for the development of the Colorado River Management Plan. Archeological work was also paid from franchise fees. Private boaters pay approximately $1,000 per trip, and that pays for river rangers and the permitting systems. Recreation use monitoring will be paid in part through user fees. Joe said that no dollars are coming directly into the AMP, but these programs benefit the AMP.

Helen said the PEP would like to see a more integrated approach to dealing with the recreation issues that may be rising up through the CRMP process as well as through the AMP.

Presentation of Plaque to Mike Gabaldón. Mark Limbaugh thanked Mike Gabaldón for his contribution to the AMP, and for serving the Secretary and the Department as the Secretary's Designee. He presented Mike with a plaque and read the inscription, "In recognition of your exemplary service, dedication, and outstanding contributions to the Glen Canyon Dam Adaptive Management Program while serving as the Secretary of the Interior's Designee to the Adaptive Management Work Group."

Follow-up on the Humpback Chub Recovery Effort. Rod Kuharich said he thinks it is important to move forward with the humpback chub recovery effort. He proposed a motion in an effort to mobilize AMWG to develop recommendations on HBC recovery:

MOTION: In recognition of the significance of Humpback chub conservation to the GCD AMP, AMWG directs the establishment of an AMWG ad hoc committee to work with the DOI Policy Group, to make a recommendation to AMWG at its August 2006 meeting on what actions AMWG should take with regard to the implementation of a program whose goal is recovery of the HBC under the Endangered Species Act, with geographic scope and other details to be included in the recommendation.
Motion seconded (by Larry Stevens).

Bruce Taubert suggested additional language: "directs the establishment of an AMWG ad hoc committee to work with the DOI Policy Group in consultation with the Colorado River Fish and Wildlife Council, to make a …" This would ensure that the state fish and wildlife agency directors be involved. After discussion, the language was added to the motion.

Discussion:
- John Hamill requested that GCMRC be invited to join in those discussions, in order to coordinate the science they are doing in the Grand Canyon with those things that would be outside the scope of the AMP.
- Clayton Palmer said he supported the motion. WAPA supports a lower basin, RIP, but they would be willing to support this as a first step.
- Jerry Zimmerman said he thought this was outside the scope of the AMP. In addition, a recovery program should be for the entire lower basin, not just Grand Canyon. However, he thought the motion was vague enough to move forward to provide additional emphasis in addressing a critical issue within the Grand Canyon, within the lower basin, and within the entire basin to address the big river fish and the HBC.

Public Comment (John Weisheit, Living Rivers): I think this is window dressing. I personally do not see any recovery in any of the RIP programs. I think this is just a tactic to delay implementation of more effective things, such as sediment augmentation, a temperature control device, and the RPAs of the BO.

MOTION: In recognition of the significance of Humpback chub conservation to the GCD AMP, AMWG directs the establishment of an AMWG ad hoc committee, in consultation with the DOI Policy Group and the Colorado River Fish and Wildlife Council, to make a recommendation to AMWG at its August 2006 meeting on what actions AMWG should take with regard to the implementation of a program whose goal is recovery of the HBC under the Endangered Species Act, with geographic scope and other details to be included in the recommendation.
Motion seconded by Larry Stevens.
Motion passed by consensus.

ACTION ITEM: Linda will send a message to the AMWG requesting participation in the newly created Humpback Chub Recovery Consultation (HBCRC) Ad Hoc Group. She will forward the names to the Secretary's Designee and he will make a final determination on the membership in order to keep the group relatively small in scope.

2005/2006 Fine Sediment Experiment Update. Scott Wright gave a presentation (***Attachment 15a***) on what they have learned from experiments about fine sediment and sandbars over the last eighteen months. He provided the following overall summary results:

- The November 2004 high flow resulted in net gains of sand in eddies above mile 40, but there was not enough sand for system-wide restoration and post-flood erosion rates were high.
- Since August 1999, the overall sand mass balance between Lees Ferry and Phantom Ranch is within measurement error (i.e., could be positive or negative).
- Export following the 2004 high flow has been less than expected based on previous data under comparable conditions.
- There is a comparable amount of sand in Marble Canyon and Eastern Grand Canyon now as compared to before the 2004 high flow.

Clayton Palmer said that this flow has demonstrated policy issue that AMWG will consider expressly when discussing options for experimentation in the next five years: in what part of the Grand Canyon does the program conserve sediment? The EIS named Marble Canyon the critical reach, and this program has also concentrated there because the sediment trigger is from the Paria River. If the program were concerned about sediment conservation Grand Canyon-wide, the sediment trigger would include the LCR. The problem with triggering a high flow from an LCR flood is the risk of exporting sand and harming Marble Canyon in order to retain sand below the LCR.

Rick Johnson said he was not sure the EIS concentrated only on Marble Canyon, and asked for that cite. He added that the GCPA does not direct consideration of a particular reach, but rather to park values within the two park units. He said it was clear what the program's mandate is.

Clayton said that, with regard to non-native fish suppression flows, the purpose of the experimental BHBF in November 2004, from WAPA's point of view, was to determine if sediment can be conserved above the fluctuating zone following inputs. He said they needed more information regarding whether a November BHBF at 42,000 cfs and subsequent fluctuations do not preserve enough sand, maybe the BHBF should be at a higher flow. He said he would like to explore this question in future experimentation.

Scott Wright said that some sand that is deposited at high elevations during a high flow is out of reach. An unknown amount is sitting on top of other sand. There is sand above and below 25, and the water is undercutting it. This is what was observed at 30-mile, and why he showed 25% had been eroded above 25,000 and about 50% in the fluctuating zone. Therefore, some, but not all, is out of reach. Clayton said he understood, and if November BHBF following sediment inputs don't allow or require subsequently steadier flows, then we no longer need November BHBFs following sediment inputs.

André Potochnik said the data clearly demonstrated that a 600,000 AF month retains sediment while an 800,000 AF month loses it. That means to retain a sustainable amount of sediment in the system would require a reduction in high monthly volumes and reallocation of that water to different months of the year. He said the group should consider this when developing a 5-year experimental plan.

Larry Stevens said that significant effects can be very small but still statistically significant. He would like to have a better understanding of what error means in that sediment modeling.

Grand Canyon Fishes 2005. Matt Andersen gave a PowerPoint presentation (***Attachment 15b***) on Grand Canyon fishes, mostly about from the top of Lake Powell down through the Little Colorado River inflow reach.

Review of FY2007-2008 Draft Budget and Workplan Presentation. Dennis Kubly reminded the AMWG that they approved a 2-year revolving budget process in 2004 that has inputs and reviews on fiscal accounting and progress on projects in the products themselves. Two other components have not been addressed well: a two-year outlook on securing appropriations if they were needed, and a three-year strategic analysis. The more strategic approach comes in the form of the planning documents. He gave a PowerPoint presentation (***Attachment 16a***)

He noted that the group is six months behind the approved process, and they continue to get the science planning documents completed so they can serve as the budget and workplan foundation. Once core monitoring is developed, they will not have to revisit it every year. The core parts of the program would become standard, so the group can spend less time deliberating over budgets and perhaps revise the strategic plan or update the management objectives. The Budget Ad Hoc Group was hoping to have the two-year budget completed for FY07-08. This could save a significant amount of time, because when FY08 arrives, the budget will be largely formulated and will not require a lot of change. However, with the increased time necessitated by compliance with the new experimental plan, they may not be on track by FY07-08.

The program started in a position of high uncertainty and purposely changed the operation of the dam. They conduct experiments, monitor, follow-up, and learn; and now they understand the system better. At some point, he said, the group should ask whether or not they can move into a set of determined management actions rather than experiments. The knowledge assessment identified what the scientists know about the effects of the experiments. They hope eventually to have high enough certainty to recommend policy changes and put into place, for example, a set of dam operations that will not be modified every few years, and that will have known effects. The big question is knowing where they are on the continuum. That is part of what the Science Planning Group is struggling with, but they will bring a experimental design to AMWG that identifies whether or not management actions are possible or they are still in the category of having experimental treatments.

Dennis noted that two years ago, Reclamation suggested that the most environmentally and economically feasible approach to a TCD was to modify two units and test it under adaptive management. Now, he is being asked how much additional change in temperature you get as you add more structures. He showed release temperatures for 1992 though 1995, and the increase in temperatures for with TCD modifications two, three, four, and eight units. Because of differences in inflow and reservoir elevation, the results are different in the different years. He pointed out that, in the right year, the temperature could be increased by more than 20 degrees Celsius with four or eight structures. However, Reclamation has always taken the position, even in the first EA, that they would not operate over about a 15-degree increase if it negatively affected the trout population. He asked the group to consider if they needed the additional control to take temperatures above 20 degrees if they do not intend to negatively affect the Lees Ferry trout fishery.

He also pointed out that as the group deviates more from present conditions, either in hydrology or temperature, the compliance gets more difficult and the amount of time necessary for that compliance increases. He noted that in August, the AMWG would make a recommendation to the Secretary on a preferred operation for the next five years under a new experiment, probably combined with a recommendation on the operation of the TCD. Because of the complexity of the compliance, it is very likely that the program will go into FY07 with some continuation of FY06 operations until compliance is completed.

Clayton Palmer said he understood that in the original EA, the Bureau's proposed operation was to release at about 13°C at the dam, to keep the water cool enough for the trout in the Lees Ferry reach, and to allow ambient air temperature to increase it to spawning temperature of 16°C below the LCR. He asked if that was correct. Dennis said the 16°C was the minimum temperature for successful spawning reproduction, and the amount of warming between the dam and the LCR depends on volume and ambient temperatures. When Reclamation proposed two units for the TCD, the thought was there were two aspects of the life cycle of the humpback chub to advantage through increased temperatures. The first was successful reproduction, and the second was the cohort of HBC that emerges from the LCR with summer monsoons and which experiences cold temperatures in the mainstem. The number and the magnitude of risks seem to increase as the temperature increases. Under adaptive management, they saw it as an economically and environmentally friendly way of testing a TCD.

Rick Johnson noted, based on the chart, that three to four units offer warmer temperature over a much longer period of the year. He said that the critical thing had group had to identify what the fish need and the length of time that they need it.

GCMRC 2007-2008 Budget Review. John Hamill said that one of the problems GCMRC has this year is there are four experimental options, all of which have significant implications for the budget. They are developing a budget for a research program that has not been defined. He distributed copies of the "Monitoring and Research Plan/Annual Work Plan (MRP/AWP) Outline" (***Attachment 16b***). They are developing the major categories of funding within the budget and the process for ranking the priorities.

Randy Seaholm asked if it were possible to put everything known into the conceptual model as a way of finding an acceptable direction that integrated impacts on all resources, instead of addressing each resource individually. John agreed that better synthesis and integration was needed.

ADJOURNED: 12:05 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
AF – Acre Feet
AGFD – Arizona Game and Fish Department
AGU – American Geophysical Union
AMP – Adaptive Management Program
AMWG – Adaptive Management Work Group
AOP – Annual Operating Plan
BA – Biological Assessment
BAHG – Budget Ad Hoc Group
BE – Biological Evaluation
BHBF – Beach/Habitat-Building Flow
BHMF – Beach/Habitat Maintenance Flow
BHTF – Beach/Habitat Test Flow
BIA – Bureau of Indian Affairs
BO – Biological Opinion
BOR – Bureau of Reclamation
CAPA – Central Arizona Project Assn.
CESU – Cooperative Ecosystems Studies Unit
cfs – cubic feet per second
CRBC – Colorado River Board of California
CRAHG - Cultural Resources Ad Hoc Group
CMAHG – Core Monitoring Ad Hoc Group
CRCN – Colorado River Commission of Nevada
CREDA – Colorado River Energy Distributors Assn.
CRSP – Colorado River Storage Project
CWCB – Colorado Water Conservation Board
DBMS – Data Base Management System
DOI – Department of the Interior
EA – Environmental Assessment
EIS – Environmental Impact Statement
ESA – Endangered Species Act
FACA – Federal Advisory Committee Act
FEIS – Final Environmental Impact Statement
FRN – Federal Register Notice
FWS – United States Fish & Wildlife Service
FY – Fiscal Year (October 1 – September 30)
GCD – Glen Canyon Dam
GCMRC – Grand Canyon Monitoring & Research Ctr.
GCNP – Grand Canyon National Park
GCNRA – Glen Canyon National Recreation Area
GCPA – Grand Canyon Protection Act
GLCA – Glen Canyon National Recreation Area
GRCA - Grand Canyon National Park
GUI – Graphical User Interface
HBC – Humpback Chub (endangered native fish)
HMF – Habitat Maintenance Flow
HPP – Historic Preservation Plan
IEDA- Irrigation & Electrical Districts Assoc. of Arizona
IN – Information Need
IT – Information Technology
KAS – Kanab ambersnail (endangered native snail)
LCR – Little Colorado River
LRRMCP – Lower Colorado River Multi-Species Conservation Program
LTEP – Long Term Experimental Plan
MAF – Million Acre Feet
MA – Management Action
MO – Management Objective
NAAO – Native American Affairs Office
NAU – Northern Arizona University (Flagstaff, AZ)
NEPA – National Environmental Policy Act
NGS – National Geodetic Survey
NHPA – National Historic Preservation Act
NPS - National Park Service
NRC - National Research Council
NWS - National Weather Service
O&M - Operations & Maintenance (USBR funding)
PA - Programmatic Agreement
PEP - Protocol Evaluation Panel
POAHG - Public Outreach Ad Hoc Group
Powerplant Capacity - 31,000 cfs
Reclamation - United States Bureau of Reclamation
RBT – Rainbow Trout
RFP - Request For Proposals
RPA - Reasonable and Prudent Alternative
SA - Science Advisors
Secretary - Secretary of the Interior
SCORE = **S**tate of the **Co**lorado **R**iver **E**cosystem
SHPO – State Historic Preservation Office(r)
SPAHG – Strategic Plan Ad Hoc Group
SPG - Science Planning Group
SWCA - Steven W. Carothers Associates
TCD - Temperature Control Device
TCP - Traditional Cultural Property
TES - Threatened and Endangered Species
TWG - Technical Work Group
UCR - Upper Colorado Region (of the USBR)
UCRC - Upper Colorado River Commission
UDWR - Utah Division of Water Resources
USBR - United States Bureau of Reclamation
USFWS - United States Fish & Wildlife Service
USGS - United States Geological Survey
WAPA - Western Area Power Administration
WY – Water Year (a calendar year)