

**Glen Canyon Dam Technical Work Group Meeting**  
January 21, 2010

**Conducting:** Shane Capron, Chairperson

**Convened:** 8:15 a.m.

**Committee Members/Alternates Present:**

Mary Barger, WAPA  
Cliff Barrett, UAMPS  
Charley Bullets, So. Paiute Consortium  
Kerry Christensen, Hualapai Tribe  
William Davis, CREDA  
Kurt Dongoske, Pueblo of Zuni  
Norm Henderson, NPS/GCNRA  
Amy Heuslein, BIA  
Rick Johnson, Grand Canyon Trust  
Glen Knowles, USFWS  
Ted Kowalski, Colorado CWCB

Dennis Kubly, USBR  
Andy Makinster, AGFD  
Don Ostler, UCRC (alternate for WY)  
VACANT, AGFD  
Larry Stevens, Grand Canyon Wildlands Council  
Jason Thiriout, Colo. River Comm./NV  
Bill Werner, ADWR  
Michael Yeatts, the Hopi Tribe  
VACANT, Federation of Fly Fishers  
VACANT, NM Interstate Stream Comm.

**Committee Members Absent:**

Robert King, UDWR  
Christopher Harris, Colorado River Board/CA

Steve Mietz, NPS/GRNP  
John O'Brien, Grand Canyon River Guides

**Interested Persons:**

Matthew Andersen, GCRM/USGS  
Gary Burton, Public  
Marianne Crawford, Bureau of Reclamation  
Alan Downer, Navajo Nation  
Helen Fairley, USGS/GCMRC  
Dave Garrett, Science Advisors

Pamela Garrett, M<sup>3</sup>Research  
John Hamill, USGS/GCMRC  
Barbara McKenzie, USGS/GCMRC  
Tom Ryan, Bureau of Reclamation  
Sam Spiller, U.S. Fish and Wildlife Service (alternate)  
Bill Stewart, AGFD

**Approval of the September 29-30, 2009, Meeting Minutes.** Without objection, the minutes were approved.

**Review of Action Items.** The action items were reviewed (**Attachment 1**). Norm Henderson asked for an update on the current litigation between the Grand Canyon Trust and the Fish and Wildlife Service. Shane told him this would be covered at the next AMWG meeting (February 2010).

**Old Business:**

**Reporting Requirements.** Dennis Kubly said he has been involved with the Report to Congress but the other documents are more DOI documents and asked if the other DOI members had any information to provide. Rick said there were nine different reporting requirements which the Secretary said were done, but he feels there are still outstanding reports. He thinks it's more of an AMWG issue and the people who are doing the work. He reminded the TWG that his concerns were passed as a motion at the April 29-30, 2009, AMWG Meeting.

**New Business.**

**Desired Future Conditions (DFCs) Update.** Shane Capron said there was a January 14, 2010, conference call in which the Secretary's Designee gave an update. There will be a document released shortly which will identify those DFCs followed by a second process to establish more detailed, numerical goals on the narratives. It would be a 2-step process. Shane explained more about what he thought the process would be and TWG's future involvement. He suspected the TWG would be interested in working in the Phase II

process and could convey that to AMWG. Dennis said he feels science informs policy so it will be interesting to see how it works. Cliff Barrett said there was one phase already done based on previous science and feels they are in a third-phase process. Larry Stevens said there is enough confusion about this that he feels a motion from the TWG might help clarify the issue. Mary said she agreed with Larry and said if the TWG doesn't have the information, they won't be able to perform the work. Shane suggested the members talk to their AMWG representatives.

Establishment of High Flow Experiment Protocols: Tom Ryan stated there are three pieces of information on the HFE protocols: 1) Secretary Ken Salazar's speech (**Attachment 2a**), 2) Anne Castle's speech to the Colorado Water Users Association (**Attachment 2b**), and 3) the Federal Register Notice (**Attachment 2c**) published on December 31, 2009. The FRN basically proposes to put forth a protocol for future HFEs, multiple experiments and multiple years and scoping that will begin at the next AMWG meeting. Rick said he thinks the subject should be on the agenda to ensure the science, budget, and the AOP process get meshed together. Norm said the only processes available to the TWG are through the reporting processes and that's where the determinations are made. Shane said the issue should go back to the BAHG for further discussion. Tom Ryan said there is a 24-month study done every month and the Upper and Lower Colorado regions look at how the monthly volumes will be done for the next two years. The AOP doesn't sit around and debate what the monthly volumes are. It uses the 24-month study and formalizes it into an ongoing plan. Rick said he will have his AMWG member bring up his concerns at the next meeting and Shane said he would also include the TWG's concerns as part of his TWG Chair report to the AMWG.

Upcoming Genetics Symposium. Glen Knowles announced the "International Symposium on Genetic Biocontrol of Invasive Fish" to be held June 21-24, 2010, at the Doubletree Hotel in Minneapolis, Minnesota. He said Reclamation provided funding for this symposium as a conservation measure of the December 12, 2007 Final Biological Opinion for the Proposed Adoption of Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead. The purpose of the symposium will be to look at the technology and how to do the best risk assessment, policy and compliance issues. For more information, see the following URL: <http://www.seagrant.umn.edu/ais/biocontrol>

Two-year Budget Process Paper: Recommendation to AMWG. Shane distributed copies of the GCDAMP Biennial Budget Process paper (**Attachment 3a**) and referred to Table 1. He said the AMWG has already approved a 2-year budget. Norm said that it restricts the flexibility of making any changes. Rick moved to curtail further discussion given that some members hadn't read the document and the weather conditions were such (severe snow storms) that some members may not be able to return to Flagstaff today. Shane asked if the TWG supported having the BAHG use this paper in developing a draft budget recommendation for the AMWG in March. John added he thought the AMWG made it pretty clear that they think the program needs to go to a 2-year fixed budget and he thinks the TWG needs to be true to that direction and can't come up with something that isn't going to achieve the objectives for which they recommended a 2-year budget be established in order to make the budget process more efficient. There was no objection. He said right now there is a FY2011 budget but the TWG needs to work on the FY2012 budget. Mary said she was concerned about funding for compliance documents. Dennis said there is a two-year rolling budget in place and that they can't ignore core monitoring which would take away from the BAHG discussion. The other thing that occurred to him was in the 2-year rolling budget there was a 3-year budget process that was never discussed by the AMWG. He wants to make sure the 2-year fixed process has a 3-year consideration and also said there was a 5-year process as well. He wanted to hear from people whether the strategic planning on budget development at a 5-year scale is important. Shane asked Dennis to explain more about the 3-year process. Dennis said you have to be 3 years out if you're going to be looking at additional federal funding from appropriations. That's why that component was put in place. He reminded people that Reclamation has a 3-year budget planning process which needs to be taken into consideration. Shane said the three and five year outlook processes could be included in the budget paper and inform the long-term budget process. John said there is a 5-year monitoring and research plan and the budget described in it was described generally, but he thought it would be worthwhile to do a better job of budgeting that out to see what it really costs. They didn't do that in-depth budget analysis of that document and that's probably

why they have deferred projects. The other thing missing from that is consideration of management actions that may need to be carried out as a result of compliance commitments or other things that need to get done (HFE protocols, non-native fish issues, etc.).

Shane said he thought the first goal would be to tie down the process budget from a 2-year perspective and make sure everyone is on the same page of what is being done. Dennis asked if the TWG could inquire of the AMWG about elements that appear to have been left out, whether they're important, and should they be pursued. Shane concurred with Dennis and then asked the TWG to make review the concerns he captured from the above discussion:

Issues to Consider:

- Natal origins of trout paper
- Consider new initiative to study trout movement dynamics in application to future management decisions
- Consider future of sediment modeling projects/continuation, hand over of models to GCMRC (evaluation)
- NSE/FSF two FY2010 projects (temperature modeling, thermal imaging)
- Results of the economic value workshop, and phase I
- Clarity on implementation of nonnative control
- Funding for compliance documents
- Add core monitoring to the budget process paper discussion
- Consider the 3-year and 5-year project projection process in the budget process paper discussion
- Review unfunded projects from FY2011
- Consider ecosystem modeling in FY2011-12 budget
- Consideration of management procedures for decision processes/decision support tools to assist policy decisions
- Guidance on future experimental plans, i.e., new LTEP processes

Shane distributed copies of Figure 1 (**Attachment 3b**) which focuses on the AOP, BOR, and AMWG process for how monthly volumes are determined.

AIF: Nonnative Fish Control in Grand Canyon – Summary of Non-native Fish Control Options and Recommended Monitoring and Research Activities. (**Attachment 4a**). Shane pointed out the motion that was passed by the AMWG in 2004 that started this process. He has a partial draft motion from the January 5<sup>th</sup> conference call which ended with the action to add some language that would address tribal concerns. He said there was a request from that call to make some modifications to the document which Kara Hilwig has done. A redline/strikeout document was provided (**Attachment 4b**) so the members could readily see the changes along with the Comment Response Table (**Attachment 4c**) John said Kara had planned to give a more detailed PowerPoint presentation of the changes but in order to move things along, he decided to forego that. He said there were two major changes made as a result of comments on the conference call and subsequent discussions with tribal representatives. One was the concern that this plan was being portrayed as an implementation plan, a plan, a management plan, and some of the management actions were concerned that approval of this would somehow commit them to certain actions and that they felt nervous about that given that they haven't really looked at how the various recommendations fit within agency policies, legal mandates, compliance requirements, etc.. He said it's not GCMRC's responsibility to engage in those kinds of decisions and are issues for NPS, FWS, AGFD, and other land and resource management agencies. They restructured it and are now referring to it as a document and not a plan that contains a variety of options that could be pursued for non-native fish control based on the best scientific information they currently have and includes their recommendations for further monitoring and research. It was their intent to pass it off to the TWG and the management agencies to work together and figure out how they want to carry those out, which projects should be funded, which control options should be pursued, how those would need to be modified based on compliance, policies, and tribal consultation issues, etc..

The second change resulted from discussions with the tribes. They tried to integrate some of their issues related to mechanical removal and other control actions that result in removal or killing of non-native fishes. John said there are numerous references to tribal consultation requirements to address those issues and concerns. They tried to be responsive to the tribes but don't necessarily address those because they don't think it's GCMRC's job to reconcile all the issues, either with compliance or tribal consultation but do acknowledge that they exist and need to be addressed. He reminded the group that one of the key elements of the plan is an annual non-native fish workshop with managers and scientists to look at the data that comes out on an annual basis and to make annual adjustments to the direction of this program. They see this as an adaptive management process and that this plan needs to evolve and they see it evolving through the annual workshops. Kara Hilwig was on the phone and available to answer any questions on changes made to the plan.

Shane said he thought the group was close to passing a motion on the last conference call and read the following draft motion language:

TWG has reviewed the following plan, "Nonnative Fish Control in Grand Canyon—Summary of Non-native Fish Control Options and Recommended Monitoring and Research Activities" dated January 15, 2010. This document was requested by AMWG and described as a conservation measure in the 2008 Biological Opinion for Glen Canyon Dam Operations. TWG has reviewed the document plan and finds it is scientifically and technically credible and recommends that AMWG review it. TWG recognizes there are Native American concerns with the implementation of this plan and understands there is ongoing tribal consultation between the Department of Interior and the interested tribes, and from those consultations changes may need to be incorporated into this document.

He asked if the TWG was able to vote on the language and/or had any questions for Kara regarding the document.

Mary said based on some other things that came up in the last few days that there was the potential to change the trigger and have different types of triggers, maybe related to numbers of HBC as well as RBT. There is the workshop coming up in April that is supposed to talk about the non-native plan and other options to remove the fish or disadvantage fish. There was a handout provided by John at the tribal consultation meeting last week on other ways and there was an evening fish meeting where they talked about some other options of translocating the RBT. As such, she thought there was a lot more than just the tribal issue related to rewriting the plan that would imply that there shouldn't be a motion on the table yet. John said there is language in the document that makes reference to looking at alternatives to the current mechanical removal. There was a section added that basically said that one of the things that they were going to do in FY2010 is to evaluate other options and alternatives to the current mechanical removal and look at other management strategies that could be pursued to achieve those goals. He said he would like to move into the implementation phase and feels the longer they dwell on trying to get everything in the document will only delay that process. He said the details can be worked out in the annual workshop and recognize there are going to be changes. Shane agreed and said the document is always going to be a moving target and the TWG needs to think about being responsive to AMWG's request. He would really like to see this get before AMWG and move towards implementation.

Norm said there is a recommended trigger in the document and asked John if the trigger is to be used in 2010. John said yes with the understanding that it's an ongoing issue to be discussed in the future and adjustments may be made to that trigger at a future date, but based on what they know today this was their best recommendation for what the trigger should be.

Kurt said a good part of the document has to do with mechanical removal. He said the Zuni Governor's letter (**Attachment 5a**) was sent out last summer to the Bureau of Reclamation, Fish and Wildlife Service, and GCMRC about their mechanical removal concerns and the killing of trout. The DOI representatives came to the Zuni tribe on Sept. 15, 2009 and heard from the Governor, the tribal council, and the Zuni

religious leaders their objections to mechanical removal. The Pueblo of Zuni received a response from the Department last week and in their response was a paper by the FWS that talked about options to the killing of trout and there was also a response from GCMRC with two options. The Zuni has not been able to get back and talk with the tribal government or with religious leaders about those options and provide feedback to the Department. He said it took five months for the Department to respond (**Attachment 5b**) to the Zuni's concerns. He said Arden Kucate and Dixie Tsabetsaye, another councilman, were in Phoenix at the DOI tribal consultation meeting last week. Mr. Kucate made a very passionate speech about the Zuni relationship to the Grand Canyon, the Zuni ceremonial performances, and religious duties they do in December as part of the focus in the Grand Canyon of promoting life and regenerating life and the continuation of life. Mr. Kucate stated that he thought some of the reasons why the HBC were still present was because of the Zuni ceremonial practices. Yet the Department seemed to be intent on continuing mechanical removal in spite of what the Zuni representatives said and he didn't feel as though true consultation had taken place yet. The Zuni Councilmen went back and had a tribal council meeting on Friday last week. They reported back to the Governor and the Governor feels that this plan is premature and should be part of government-to-government consultation. He feels the USGS has a legal responsibility with this plan to come to the Governor and the tribal council and discuss the plan before it gets approved, which hasn't happened. The language that was put into the plan to talk about tribal concerns and further consultation, if any of the management actions are implemented, has not been reviewed by the tribes. They have not been given the opportunity to provide feedback to GCMRC on that language because they first saw it last Wednesday. Kurt says he feels to portray this as the language has been changed in consultation with the tribes is not correct. He thinks it's premature to make a recommendation to the AMWG on this when the TWG knows full well that a stakeholder has a serious issue with this and is going through the consultation process with the Department to approve it and send it forward when a major component of it is the mechanical removal is callous and is a slap in the face to the Pueblo of Zuni. He thinks if other stakeholders around the table had other issues that were similar, they should be respectful of that and maintain that in their consideration before something is approved to go to the AMWG. He read from Secretary Salazar's memo appointing Anne Castle as the Secretary's Designee to the AMWG that in her confirmation statement to the Senate Committee on Energy and Natural Resources she identified "a number of key elements are needed to resolve challenging resource issues, that we work toward building consensus, that we reconcile disparate interests, and that we foster a willingness to recognize the validity of others' claims." Kurt said if the TWG approves the document and sends a motion forward, they're telling the Pueblo of Zuni that their cultural views and values are of no concern to this program and are not legitimate. He feels that's the wrong message to send.

Mary stated that not everyone attended the tribal consultation meeting last week and provided a synopsis of what occurred. She said the tribes presented their concerns and several handouts were distributed focused on the killing of fish and trying to find a way of not killing them. During the meeting Deanna Archuleta announced there was a request by the tribes and agencies to act as cooperators in an EA and asked the tribes for language to the plan. She said the plan didn't need to be approved in order to go forward with tribal consultation, however, there was a feeling the plan wasn't going to go forward. John Hamill said he discussed the plan with Deanna and plan just lays out options. Whether those options get implemented is part of the purview of this group with the Secretary of the Interior. He reiterated there is nothing in the plan that commits anyone to doing anything.

Kurt said he didn't think the Zuni's plan was to stop the document but stated the consultation process needs to occur before it goes to the AMWG. He doesn't think delaying the plan is going to hurt the plan but that conversations need to continue with the Zuni.

John said the USGS has no plan to implement mechanical removal. They are in consultation with the tribes and will respect the outcome.

Mike Yeatts said he thought there was a lot in the plan the Hopi Tribe would support but most of it looks like options and recommendations and when you get to mechanical removal, it reads like it is being

implemented. He feels there is a lot of good in the plan (warm water) but things they would object to (site stream poisoning) and sees those as options in the future.

Shane said as long as the document has mechanical removal in it, it's going to be difficult to move it forward.

Kurt said from a tribal perspective, tribal consultation will not take place and they won't have an effective voice in this program. He would vote no on the motion. By FWS' own omission, if there has been meaningful consultation and dialogue from the 2007 or 2008 biological opinion, he said this issue would've come to the surface years ago and they wouldn't be dealing with it right now.

Alan Downer stated from the outset that this is NOT a plan and AMWG will be confused by the language as well. He couldn't offer a solution but shared concerns brought up by Kurt and Mike and added that no one is going to think it's a plan when it gets moved up to the next level. He feels that if the plan moves forward in its present form, AMWG will say they have a plan.

Norm suggested not calling it a plan but moving forward with an implementation plan and use the upcoming workshop for further mechanical removal discussions. Rick reminded the group that meaningful consultation needs to take place first before moving forward with the plan. Dennis said he was troubled by the discussion two nights ago and Norm's specific example of a trigger. He said he thinks GCMRC is driven more by economics than pushing the utility of removing trout and it's not tied to the present status of the HBC population. At that meeting it was suggested there is an opportunity to look and see if that trigger could be broadened and more flexible which would lead us in the direction of accommodating some of the tribes' concerns. He doesn't know the outcome of that but argued that that investigation has not been done and would have to be done with or without this plan being passed.

Kurt asked the group to respect Zuni's position and reminded them that consultation with the Department has only just begun. The Department hasn't reached out to the other four tribes and that may be part of the process as well.

Kara Hilwig (via phone) said the original purpose of the non-native fish workshop was to get a handle on non-native fish issues in the Grand Canyon and review the monitoring data and get a good handle on the priorities, if there are any red flags – any really big issues that have to be addressed quickly. That remains one of the goals of the workshop and get a technical perspective based on monitoring information of what issues they are facing and how should the work plans be modified to deal with those issue on an annual basis. She said Sam Spiller has been very instrumental to move these workshops forward to really combine the science and management aspects of the non-native fish issue in Grand Canyon. Sam and his crew will be heading up the management portion of this meeting which will include addressing tribal concerns but the goal for this year is to identify what has been recalled in the literature relative to the development of response plans. They're calling them institutional barriers so identifying those components of implementation that need to be addressed along with compliance issues, logistics, tribal compliance, etc.. She believes the goal for the second half of the non-native fish workshop (late March) is to identify the issues, identify a person to address the issues, and move forward with an implementation strategy for addressing non-native fish in Grand Canyon. It's their hope that all management agencies and the stakeholders will provide input and they can move forward with something that everyone would be happy with.

Dennis advocated there are two separate paths that could be taken in that there is a proposal for mechanical removal in the 2010 workplan and that consultation can proceed and they can try and segregate this plan away from that hot concerns and move forward on things that have to be done, i.e., balancing ESA and cultural values.

Glen said the DOI agencies are involved in ongoing consultation with the tribes but it's going to take some time. He said he sees that as very different from the technical aspects. They have a tribal consultation

responsibility and they need to address that. There are also a lot technical questions being brought up that need to be addressed.

Dave Garrett said it's clear the TWG is mixing management with science which is what the Science Advisors have told them not to do. He feels they're working toward a solution that will separate them but hopes they can develop a process to make sure this doesn't happen again.

Given the concerns expressed by the tribal stakeholders and questions about the scientific foundation and validity of some of the choices made in the plan (triggers), Shane feels the plan is not ready to be moved forward. He said he would present the TWG's concerns to the AMWG at their next meeting and also ask for some feedback.

Agenda Update. Due to severe weather conditions, some members chose to leave at noon in order to get to Flagstaff before the roads closed. As such, Shane reviewed the remaining agenda items. 1) He really thought Mary Barger should be present for the TCD/sediment augmentation discussion. 2) As far as the General Core Monitoring Plan Workshop Update (**Attachment 6**), Shane said there were some recommendations that came out of the workshop and one was for him and a few other TWG members to work with GCMRC in revising parts of the document. They haven't had a chance to get started but are hoping to have a revision for the TWG to review in March. He invited any other members who wanted to participate to let him know. 3) The revised document for the Fall Steady Flow Plan is out and will be on the March agenda for TWG review and possibly forward to the AMWG, and 4) Science Advisors' Annual Report Update will be moved to the March TWG meeting.

Fall Steady Flow Plan. Pam Sponholtz (via phone) said in Feb 2008 the EA described two flow events for the HFE in March and the steady flow releases in September and October from 2008-2012. Also, the biological opinion had two conservation measures, the nearshore ecology project and the second one was impacts and flow transitions, transition between the August high fluctuating flows and the more steady flows that were proposed for September and October. In 2008 the AMWG made a motion for GCMRC to prepare a study plan to study those steady flows but they also wanted to include flow recommendations to support the study. In July 2009 the document that GCMRC developed with expert technical review, comments were incorporated and a document distributed to the TWG in August for their review. It was presented to the AMWG in August 2009. TWG comments were received and a revised document given to them in September. During her detail at GCMRC in December 2009, Pam worked with Ted Kennedy and incorporated the comments from the TWG, updated the report, and then submitted it for editorial review in early January. However, with the aggressive timeline to get the HFE reports edited and out for external review, the FSF report dropped to a lower priority.

She reviewed how the comments were dealt with and those that were not addressed. They did not address adding in testable hypotheses. She referred the TWG to the memo Matthew Andersen wrote in September 2009 regarding testable hypotheses. It was the feeling of GCMRC that adding in hypotheses into the plan would make it unachievable given the time frame of the study. She went through the remaining comments.

**Q:** *Have you been able to review the past literature on stranding in Grand Canyon due to flow fluctuations? (Stevens)*

**A:** *No, I haven't. I worked with Ted on this and he was fairly familiar with it and felt it was fairly cojative approach given the fuzzing aspects and not wanting to design a very comprehensive plan without making sure it was an issue to begin with. But if there is some literature we need to incorporate, please let us know. (Sponholtz)*

**C:** *There is a fair amount of information from mid-1980's on trout stranding and some of the approaches they used might be of use to you. (Stevens)*

**R:** *If you have those cites, please send them to me. (Sponholtz)*

**Q:** *Glen, is the stranding issue a FWS concern as well here? If it is, I hope it's being reviewed with the viewpoint of is this going to be sufficient to answer this question if it is a question. (Capron)*

**A:** *I've spent a fair amount of time talking to Pam and Ted about this and they've even modified this a little bit since we talked and probably in response to some of my ideas about the possibility for stranding and trying to put some finality to that idea. Is that actually happening? Is it something we should be concerned about? There are other ways in which fluctuations affect fish, in which a strong transition between August and September could affect fish. Josh gave some*

*information earlier this week about what he was seeing in the Lee's Ferry trout population for that same transition. And, of course, the work that he has done a lot of which ended up in Korman and Campagna this year and in his thesis. There is the potential for similar pronounced effects during that transition. I'm anxious to see this plan but in talking with Ted and Pam, I think they've gone a long way in addressing the Service's concerns and our reasoning behind developing the conservation measure. We feel like the integration of all these studies will get at a lot of those questions. (Knowles)*

Dennis said there is a GCES Phase I record on stranding RBT but there are also many observations that suggest native fish are not nearly as susceptible to stranding. He suggested that before going too far down the road and finding themselves not reporting something that they should be doing and sufficient progress, that they look at the record and determine if it's really an issue.

Shane asked if GCMRC could do a review of the literature and report back to the TWG at its next meeting whether or not additional reports need to be cited and the document modified. Larry said he would go to GCMRC's library, develop a list, and provide to Kara.

AIF: Temperature Control Device and Sediment Augmentation (Attachment 7). Shane said this was discussed at the last meeting with a presentation by Dennis on the work that has been done. A list of literature sources was provided. Shane said he went back through the minutes and looked at the issues that were brought up and tried to prepare a motion that might address the concerns presented. He reviewed the motion changes below:

**Proposed Motion language by Mary Barger:**

The TWG recommends that the AMWG consider a recommendation to the Secretary of Interior to develop a risk assessment for the implementation of a Temperature Control Device that considers the following: (a) incorporates a TCD design with both warm and cold-water release options with a combination of 2, 4, 6, and 8 units, (b) considers concerns that new warm-water non-natives might and additional planktonic food sources might be established in the CRE, and (c) considers if the development of a TCD is prudent without the ability to increase turbidity of the river. The goals of the action would be to support recovery of native fish and to meet the Desired Future Conditions for sediment in the CRE.

Mary said she still wanted sediment augmentation to be part of the motion. Mary said there was concern on Western's part about the cost of sediment augmentation that it was very expensive to do. She said it was \$150 million to build and \$10 million a year to maintain it. At the last meeting, she said there was a lot of conversation about concerns related to cost and whether that was really feasible and some concerns about increasing the sediment into Lake Mead that the State of Nevada had some concerns and more sediment below Diamond Creek that would affect boating for the Hualapai. Western thought at this point it was reasonable to consider the TCD as an option but don't want to take out turbidity as something that shouldn't be evaluated but not as part of the sediment augmentation.

The group discussed further and the motion language was modified:

The TWG recommends that the AMWG consider a recommendation to the Secretary of Interior to develop **an engineering feasibility study and risk assessment, with a synthesis of existing information**, for the implementation of a Temperature Control Device that considers the following: (a) incorporates a TCD design with both warm and cold-water release options and with a combination of 2, 4, 6, and 8 units, (b) considers concerns that new warm-water non-natives **and additional planktonic food sources might** be established in the CRE, and (c) considers the potential of using turbidity (silt and clay) as a mechanism to affect predation rates of non-native fish on native fish. The goals of the action would be to support recovery of native fish. TWG further recommends that the consideration of a TCD be implemented within a long term experiment.

THE MOTION LANGUAGE WILL BE ON THE NEXT MEETING'S AGENDA.

**Socio-economic Workshop Update.** Helen Fairley said the panel is working on the report and then it will be brought forward to the AMWG for further action by the TWG.

**Management Actions.** Dave Garrett passed out copies of his PPT, "Evaluating Criteria Guiding Transition of Science Activities to Management Actions in Adaptive Management Programs" (**Attachment 8**). He concluded with the following recommendation: GCDAMP to direct TWG to form a management group to develop programmatic directions for developing management actions.

**Public Comments:** Gary Burton (former TWG member for WAPA): I am pleased to see work on HBC, 2) framework and steps are being followed, and 3) you are adaptively trying to adjust. However, disappointed about the relationships and processes are still the same and the lack of trust among and between the stakeholders and GCMRC. There is a concerned public out there and they are watching you. They expect the dollars to be spent appropriately, accurately, and efficiently. I equate the process to the birth process and the pain you're going through.

Adjourned: 3:00 p.m.

Respectfully submitted,

Linda Whetton  
U.S. Bureau of Reclamation  
Upper Colorado Region

### General Key to Adaptive Management Program Acronyms

ADWR – Arizona Dept. of Water Resources	KA – Knowledge Assessment (workshop)
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
AIF – Agenda Information Form	LTEP – Long Term Experimental Plan
AMP – Adaptive Management Program	MAF – Million Acre Feet
AMWG – Adaptive Management Work Group	MA – Management Action
AOP – Annual Operating Plan	MATA – Multi-Attribute Trade-Off Analysis
BA – Biological Assessment	MLFF – Modified Low Fluctuating Flow
BAHG – Budget Ad Hoc Group	MO – Management Objective
BCOM – Biological Conservation Measure	MRP – Monitoring and Research Plan
BE – Biological Evaluation	NAAO – Native American Affairs Office
BHBF – Beach/Habitat-Building Flow	NAU – Northern Arizona University (Flagstaff, AZ)
BHMF – Beach/Habitat Maintenance Flow	NEPA – National Environmental Policy Act
BHTF – Beach/Habitat Test Flow	NGS – National Geodetic Survey
BIA – Bureau of Indian Affairs	NHPA – National Historic Preservation Act
BO – Biological Opinion	NPS – National Park Service
BOR – Bureau of Reclamation	NRC – National Research Council
CAPA – Central Arizona Project Association	NWS – National Weather Service
GCT – Grand Canyon Trust	O&M – Operations & Maintenance (USBR funding)
CESU – Cooperative Ecosystems Studies Unit	PA – Programmatic Agreement
cfs – cubic feet per second	PEP – Protocol Evaluation Panel
CMINs – Core Monitoring Information Needs	POAHG – Public Outreach Ad Hoc Group
CRBC – Colorado River Board of California	Powerplant Capacity = 31,000 cfs
CRAHG - Cultural Resources Ad Hoc Group	PPT – PowerPoint (presentation)
CRCN – Colorado River Commission of Nevada	R&D – Research and Development
CRE – Colorado River Ecosystem	Reclamation – United States Bureau of Reclamation
CREDA – Colorado River Energy Distributors Assn.	RBT – Rainbow Trout
CRSP – Colorado River Storage Project	RFP – Request For Proposals
DASA - Data Acquisition, Storage and Analysis	RINs – Research Information Needs
DBCB – Colorado Water Conservation Board	ROD Flows – Record of Decision Flows
DBMS – Data Base Management System	RPA – Reasonable and Prudent Alternative
DFCAHG – Desired Future Conditions Ad Hoc Group	SA – Science Advisors
DOE – Department of Energy	Secretary – Secretary of the Interior
DOI – Department of the Interior	SCORE – State of the Colorado River Ecosystem
EA – Environmental Assessment	SHPO – State Historic Preservation Office(r)
EIS – Environmental Impact Statement	SOW – Scope of Work
ESA – Endangered Species Act	SPAHG – Strategic Plan Ad Hoc Group
FACA – Federal Advisory Committee Act	SPG– Science Planning Group
FEIS – Final Environmental Impact Statement	SSQs – Strategic Science Questions
FRN – Federal Register Notice	SWCA – Steven W. Carothers Associates
FWS – United States Fish & Wildlife Service	TCD – Temperature Control Device
FY – Fiscal Year (October 1 – September 30)	TCP – Traditional Cultural Property
GCD – Glen Canyon Dam	TES – Threatened and Endangered Species
GCT – Grand Canyon Trust	TWG – Technical Work Group
GCMRC – Grand Canyon Monitoring & Research Ctr.	UCRC – Upper Colorado River Commission
GCNP – Grand Canyon National Park	UDWR – Utah Division of Water Resources
GCNRA – Glen Canyon National Recreation Area	USBR – United States Bureau of Reclamation
GCPA – Grand Canyon Protection Act	USFWS – United States Fish & Wildlife Service
GLCA – Glen Canyon National Recreation Area	USGS – United States Geological Survey
GRCA – Grand Canyon National Park	WAPA – Western Area Power Administration
GCRG – Grand Canyon River Guides	WY – Water Year (a calendar year)
GCWC – Grand Canyon Wildlands Council	
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	
INs – Information Needs	
IT – Information Technology	

**Q/A/C/R** = Question/Answer/Comment/Response