

## Glen Canyon Dam Technical Work Group

Meeting Minutes

February 2, 2004

**Conducting:** Norm Henderson, TWG Chairman

**FINAL**

### Committee Members Present:

Mary Barger, WAPA  
Kerry Christensen, Hualapai Tribe  
Wayne Cook, UCRC  
William Davis, CREDA  
Lisa Force, Grand Canyon Trust  
Lloyd Greiner, UAMPS  
Christopher Harris, CRB/CA  
Matt Kaplinski, GCRG

Robert King, UDWR  
Glen Knowles, USFWS  
Dennis Kubly, USBR  
Bill Persons, AGFD  
John Ritenour, NPS/GLCA  
Mark Steffen, Federation of Fly Fishers  
Mike Yeatts, The Hopi Tribe

### Committee Members Absent:

Robert Begay, Navajo Nation  
Perri Benemelis, ADWR  
Illa Bullets, So. Paiute Consortium  
Jonathan Damp, Pueblo of Zuni  
Amy Heuslein, BIA

Phil Lehr, Colo. River Commission/NV  
D. Randolph Seaholm, CWCB  
John Shields, WY State Engineer's Office  
Larry Stevens, Grand Canyon Wildlands Council  
John Whipple, NM Interstate Stream Commission

### Alternates Present:

Jan Balsom  
Marklyn Chee  
Heidi Kloepffel  
Wayne Cook  
Wayne Cook

### For:

Ken McMullen, NPS/GRCA  
Robert Begay, Navajo Nation  
Larry Stevens, GC Wildlands Council  
John Whipple, NM Interstate Stream Comm.  
John Shields, WY State Engineers Office

### Interested Persons:

Gary Burton, WAPA  
Kurt Dongoske, CREDA  
Lee Failing, Ecometric  
Helen Fairley, USGS/GCMRC  
Dave & Pam Garrett, M3Research

Steve Gloss, USGS/GCMRC  
Josh Korman, Ecometric  
Mike Liszewski, USGS/GCMRC  
Ted Melis, USGS/GCMRC  
Carl Walters, Ecometric

Meeting Recorder: Linda Whetton, USBR

**Convened:** 9:30 a.m.

**Welcome and Administrative Items.** The chairman welcomed the members, alternates, and general public. A quorum was not established, however, introductions were made and attendance sheets (**Attachment 1**) distributed.

**Review of Action Items. Dennis**

#1 – The item was clarified by Ted Melis: The TWG needs to provide GCMRC with direction on how to proceed preparing the contracts (RFPs), who should do the work – outside contractor or GCMRC staff, etc. It was decided to address at tomorrow’s meeting during part of the budget discussion.

#2 – Dennis said there are questions regarding the new charter language - ethics, conflict of interest, and procurement. He advised the TWG members to provide input to their AMWG member because this topic will be on the agenda for the AMWG March meeting.

#3 – Pending. Change “disconnect” to “relationship.” Bill Persons will prepare a presentation (30 minutes) for a future meeting. Steve Gloss added that this should be a joint presentation between AGFD and GCMRC because the work being done is under contract to GCMRC.

Dennis asked if the TWG will revisit the management objectives and identify the quantification of those objectives. He asked if it is the right time to go back to the MOs, if they are still the MOs that the TWG is recommending, and whether or not the monitoring and metrics are in place to identify whether the objectives are being met. He advised that information will become very important when Reclamation prepares their report to Congress on the progress of the AMP. Norm said this could be discussed at the next TWG meeting.

**Review of Jan. 7-8, 2004 Minutes.** Corrections were noted by the recorder.

**Review of Nov. 12-13, 2003 Minutes.** Corrections were noted by the recorder.

The recorder advised that Pam Hyde provided comments on the above meeting minutes via an e-mail message (**Attachment 2**). Those changes will be incorporated with the above and corrections will be made.

**ACTION ITEM:** The TWG will review the TWG Operating Procedures and provide any comments or suggested changes to the TWG Chairman. A complete review of the Operating Procedures will be addressed at a future TWG meeting.

**Approval of Meeting Minutes.** A quorum was established and the meeting minutes for both meetings were approved pending the corrections noted.

**MATA Workshop** – The chairman said he would like Ecometrics personnel to continue with the discussion from the MATA Workshop and following that the TWG would need to determine how to use the information to incorporate into a new experimental flow proposal to the AMWG. Dennis added the TWG will need to determine whether or not MATA is the process by which to provide an 2005 recommendation to the AMWG or whether or not there is some other process. He said the line was drawn at 2005 and advocated that the TWG needs to get the MATA presentation and AMWG’s support as a process for developing something that they could come back in July with for 2006 and beyond.

Lee Failing said the purpose of today's discussion would be to evaluate the experimental options and build on the results from the MATA Workshop held in December (**Attachment 3a**). It was her intent to talk about the options so that the TWG could think through the pros and cons. She gave a PowerPoint presentation (**Attachment 3b**).

Carl Walters commented that the policy options that most of the TWG members favored would involve a radical change in flow operations and would involve much more fall flow fluctuations than had been done in recent years. He said the river would look very different under any of the options that were favored by the TWG. The summer fall steady flows would come up in the experimental design discussions as one of the most expensive policy choices that could be started next year. There are two aims in the steady flows, one is to conserve sediment by not pumping sand, and the other is to see if humpback chub juveniles could survive in the mainstem under the thermal heating that would occur on the river edges under that policy. There are two juvenile HBC migrations into the mainstem, one of fry in June and the second is under yearly dispersal in the flood events. There are hints of over litter survival in the mainstem of juveniles that are flushed into the mainstem but they have not grown and they have to grow in order to survive. The test from a HBC standpoint is whether or not warmer water in the fall would allow the juveniles to not only survive but to grow enough to be able to move back into the LCR.

Lee continued that if one is going to have a defensible rationale for experimentation, the following are needed: (1) a plausible hypothesis to expect some kind of beneficial results, (2) be able to demonstrate that the experiment is going to have the capacity to resolve the uncertainties, and (3) some demonstration that the tradeoffs implied in the treatments being tested are plausible. She said there are tradeoffs and implications for trout in terms of smaller numbers of bigger fish, implications for boating, and if they go with BHBF flows there are implications for the Kanab ambersnail. Those tradeoffs need to be considered before one embarks on testing for those things.

**FY 2005 Budget Update.** Norm said a copy of the FY05 Budget was distributed (**Attachment 4**). He advised the members to review the budget and be prepared to discuss tomorrow so it can be presented to the AMWG in March.

**Experimental Design Options.** Carl Walters said the following exercise would look at some experimental designs and help the TWG think about (1) what are the experimental options, and (2) and what are the arrangements that could be planned for. He presented several options from the MATA workshop and came up with four main treatments that were widely favored: (1) Power Treatment – it's a move in some months of the year towards allowing the power companies a lot more flexibility to run the flows up and down, 3-30 with negotiation on ramping rates; (2) Mechanical Removal of Non-native Fish in the LCR and Bright Angel Creek; (3) Summer/Fall Steady Flows which are designed to accomplish two things, provide warm edges along the river for native fish and to conserve sand; and (4) build a temperature control device. He said the fall steady flows would be accompanied with an option to do beach habitat building flows.

Mark Steffen said he was concerned with the impact on the aquatic food base. The fish, regardless of HBC or trout, need the same amount of food in the summer as they do in the winter. The HBC needs to eat all winter long in preparation for spawning in the spring. He said that any damage done to the food base in the winter has serious potential harm. Carl said the floods aren't going to destroy the foodbase but that the power treatment would cause the most harm.

Dennis said that whatever decision is made, a background document needs to be developed that would substantiate what everyone knows. The recovery program for the big river fish has flow

recommendations for Navajo and for Flaming Gorge and they're about to be developed for Aspinall. Every one of those flow recommendations assumes that a natural hydrograph is the desirable hydrograph for the fish and assumes that conditions are close to normal for the fish. In Glen Canyon, that's not the way it is being operated. The document would also need to address that particular issue because there is a movement to incorporate what's going on in Grand Canyon into a recovery program for humpback chub.

Carl said from a statistical experimental design point of view, there are two strategic choices: (1) a progressive experiment or titration experiment, or (2) something that mixes up treatments, turning them on and off so they can be cross compared under different conditions. He referred to one of Susan Hueftle's pictures of a temperature below the dam against lake elevation so as the reservoir was filling, the water going into the intakes was warm water (surface water), the dam gets filled up but only cold water makes it down to the inlets. The lake level has fallen over the last several years and is likely to continue to fall. Susan's prediction is the water will start warming and very possible cold be warmed up to 15-16° this summer.

Carl said there are a range of alternatives and that range is defined by two things: progressive treatment or trying to cross compare treatments so turning off mechanical removal from a scientific point of view is intended to help determine whether the effects seen were due to temperatures and warm water or to the mechanical removal. He said the next step would be to look at what the treatment sequences possibly are and the options and see if anything stands out as being the preferred choice by the TWG.

Lee said that power is only on for 2005-2008 but in 2009-2013, Carl has it on for part of the year but is offsetting it with the fall steady flows. Bill Persons said he needed a better definition of what the options are. Lee agreed and said they need to start by defining what they mean by power and how things are going to work and what options are available.

Carl said the biggest source of confusion and lack of consensus is not knowing about the power option. There are two very different definitions. He thought they were talking about 12 months of load following with some restrictions on minimum and maximum flows and ramping. There has been two years of something approaching that, 3 months of load following early in the year and then MLFF through the remainder of the year. Carl said the power option would remove most of the restrictions.

Lee said what they were originally trying to do with the two tables was to present two different designs, a titration one and a factorial one. The next step is to determine which design makes the most sense.

Carl said the big difference is that the titration design saves money by stopping the adding of costs to mitigation at the earliest possible time but it only works if there are weird long-term flow changes, etc. Choosing between the two types of designs is a matter of deciding on whether the risk of getting the results confused with climate change is an acceptable risk. If it is, then the titration design is better. He said another alternative is to throw everything in and then start subtracting treatments.

Dave Garrett (SAB) asked if they could get sufficient scientific data given the variance in the system to realistically assess impacts and whether a specific impact could be separated out and assigned a realistic statistical assessment so a cause could be identified. Carl said that from the standpoint of the Endangered Species Act, in order that the HBC population will be concluded as being recovered, the adult recruitment has to about double from what it is today. He said the methods being used can

detect the doubling and also if recovery has occurred. He said whether they can separate the effects of different factors depends on how the treatments are arranged.

Referring to the titration design (below), Carl said that assuming the water gets warmer by the amount in mid-summer that the TCD is likely to be able to generate, then the mechanical removal design in already in place. There is a question as to whether or not to move the power operation towards more months of fluctuating flows. An obvious thing to do would be to start an experiment with the summer/fall steady flows. Carl said if the plan was to shut down mechanical removal for at least a couple of years, they would have a declining effect but they would have at least one chance to observe the effect of the fall steady flows with probably no mechanical removal.

Month	Disadvantage Boatman	Rec. Boating	Kill Trout
Jan	3 to 30	3 to 30	5 to 20
Feb	3 to 30	3 to 30	5 to 20
Mar	3 to 30	3 to 30	5 to 20
Apr	3 to 30	3 to 30	MLFF
May	3 to 30	MLFF	MLFF
Jun	3 to 30	MLFF	MLFF
Jul	3 to 30	MLFF	MLFF
Aug	3 to 30	MLLF	MLFF
Sep	3 to 30	3 to 30	MLFF
Oct	3 to 30	3 to 30	MLFF
Nov	3 to 30	3 to 30	MLFF
Dec	3 to 30	3 to 30	MLFF

Dennis recommended the TWG concentrate on 04 and 05 because the AMWG meets in March and if they're going to recommend any changes in the near term, it would have to be at that meeting. He fears that by the end of the day the TWG won't have developed a recommendation to give to the AMWG.

Josh said that if fluctuating flows provide more positive resource conditions for native fish, for sediment, and probably for riparian and marsh vegetation, as well as disadvantage non-native fish, then they are a positive attribute of the system. The fact that they may also produce hydroelectric benefit is almost secondary to the other resources.

Ted said that power was their attempt to use data provided by Clark Burbidge (WAPA) to estimate the cost vs. the benefit from what they call power max, which approximates how the diurnal operation is released from the dam.

Lee suggested the TWG look at how to redefine it constructively. It is a fluctuating flow regime that will have benefit for some of the ecological resources. There are probably several ways to define it and that any of them are going to have benefits for power relative to a really super constrained one. The focus should be to think about it from the standpoint of resources.

Dennis said he wants to make sure there is a commitment to document the information in writing. He referred to the Upper Basin Recovery Program where hydroelectric facilities are being constrained just as they are in Glen Canyon under the assumption that there is a benefit to native fish, the same native fish by and large as are in Grand Canyon.

The chairman said an issue before the TWG is going to be what their recommendation to the AMWG is going to be with regard to the 04 and 05 experimental program. He asked the group what they

thought they could recommend to the AMWG given that there may be higher water temperatures in 04 and 05. He asked if the TWG should continue with the existing experimental design that is in place for 04 or suggest to the AMWG that for 05 they continue with what GCMRC had already proposed in their 16-year plan. He asked GCMRC what they would recommend doing in 04 and 05. Ted said that because they had identified that the sediment paradigm of the EIS doesn't work the way it was hoped for, and the AMWG directed them initially to look at this as a sediment experiment, and the fact that they had major inputs from the Paria in 1997-99, and 2000, and were ineffective at either studying them experimentally or managing those inputs, their feeling is that if they get an input in 2004 that there has to be a follow through with trying to manage it in the January time frame to rebuild bar habitats. Throwing out the option of having a low fall flow in 04 doesn't seem to be a defensible option from his perspective. If they were allowed to choose a scenario whereby they get 2 million tons of sediment in September from the Paria and decided in advance to forego experimentally trying to manage those inputs, that would be hard to justify to anyone. They would have a BHBF component for testing in 04 and probably in 05 if it doesn't occur in 04, but they are not making a formal recommendation until they better understand what the TWG wants from today's meeting.

Ted said that based on the discussions he has heard, it seemed like a relaxation of the constraints for diurnal operations in other months besides just January thru March might warrant further discussion and maybe a formal recommendation. Ted said there was clear consensus from some meetings that 5-20 was sort of a good attempt. The original proposal for the fish for January thru March was actually 5-25 and then that was curtailed back to 5-20. Some people are saying now that for sediment transport in the months of Jun-Jul-Aug, it would be better doing 3 to 30 even though it sounds kind of crazy to limit export than sticking with the ROD constraints where they can never go below 10,000 cfs for 3 months.

Comments:

- *The sediment part hasn't taken place so what we have done is two good years. (Davis)*
- *If we think about 04 and what's left to do in 04, we've already gotten agreement that if we get a sediment input, we are going to low steady fall flows with steady 8,000 and 6,500-9,000 fluctuations. The easiest way to deal with this is to decide whether that's all you want to do for 04 or is there an alternative to invoke those low steady flows and evaluate sediment transport and potential effects of temperature and the low flows on backwater habitats this fall, irrespective of whether we get enough sediment input to trigger the flows. We've just barely begun the second year of the mechanical removal of non-native fish control effort and it was our position in the beginning when we proposed doing that for 4 years was we really didn't know how intensive that effort would have to be in order to reduce the presumed predator level down to a level where they would no longer be having a detrimental effect on HBC. I don't think that we know the answer to that and it would be premature to cut off the mechanical removal effort even though I don't disagree with Carl said that there is going to be a couple of years after it is stopped before those levels come back. I don't think right now we know whether we've achieved a steady state or whether we're going to have to continue to be able to reduce that predator population over the course of 2 years, 3 years, 4 years. If it's the case after 2 years and we know we can't seemingly reduce to a lower level, then that in effect becomes the mechanical removal treatment then albeit that stays the way it is and we can make decisions there but don't think we shouldn't make those decisions at this point in time. The first thing to decide is whether anyone wants to change next fall to a steady flow regime in light of the possible warmer water and test those other things or if they just want to leave it the same and do what we did last year. (Gloss)*
- *My thinking is in line with what Steve was saying that 04 would remain the same with the one question being since we do have warmer temperatures coming, that it would be very interesting to have the comparison in the autumn of flat flows versus 6,500-9,000 which is something we've already agreed with if we get the sediment trigger. A consideration would be whether to do it anyway but to concentrate on the response of native fish rather than on sediment. The second thing is what would we advocate in 05 for the winter flows and I would advocate that since we've already made a transition this year, we would stay with the same winter fluctuations (Jan-Mar) that we have this year in 05. (Kubly)*

- *There is the issue of treatment consistency vs. meeting the objective of the Jan-Mar time frame. If it was to reduce the trout and we figured out a better way to do that, should we mess up our nice experiment and keep it the way it was even though we know it's an inefficient way to get there or should we try to change it because our real objective of this lever we're pulling now is to reduce trout to save native fish? If we find a better way to do it, let's do it. (Korman)*

Dennis asked what the estimate of the number of trout, age 2+ in the Lees Ferry Reach. Josh said it was probably 80,000 – 140,000. Dennis then asked what the management objective was. Josh said it was 100,000. Dennis said we may there and asked if the objective was to continue to drive the trout population down or to meet the management objective and stay there. He asked if they were ready to start stocking if the numbers continue to drop and whether NPS and the FWS would support.

- *Dave said that anytime you have a long-term science program, you have to stay true to a monitoring or science effort that needs multiple years. The science advisors recommended it then and because of some of the things that Susan has found that possibly several levers could be pulled to see if in 2 or 3 years you can get that impact. (Garrett)*
- *The TWG just went through a lengthy discussion to extend the treatment by 2 hours and even contemplated going to a whole other month. It seems to me that we should stay with we have right now because of all the problems with compliance issues. (Davis)*
- *The difficulty with what Carl is proposing in the recreation boating column (below) is that the MLFF in July and August will be the two highest volume months of the year. Water will have to be taken out of Sep-Dec to get the flat flows, backed up in July and August, and are going to be constrained by MLFF and that is going to be the highest sediment transport months of the whole year which violates the very thing the sediment people are saying not to do in the highest months of the year. (Cook)*

Carl added the last column.

Month	Disadvantage Boatman	Rec. Boating	Kill Trout	Screw Carl
Jan	3 to 30	3 to 30	5 to 20	8 steady
Feb	3 to 30	3 to 30	5 to 20	8 steady
Mar	3 to 30	3 to 30	5 to 20	8 steady
Apr	3 to 30	3 to 30	MLFF	8 steady
May	3 to 30	3 to 30	MLFF	8 steady
Jun	3 to 30	MLFF	MLFF	8 steady
Jul	3 to 30	MLFF	MLFF	8 steady
Aug	3 to 30	MLFF	MLFF	8 steady
Sep	3 to 30	3 to 30	MLFF	8 steady
Oct	3 to 30	3 to 30	MLFF	8 steady
Nov	3 to 30	3 to 30	MLFF	8 steady
Dec	3 to 30	3 to 30	MLFF	8 steady

- *One of the biggest concerns in terms of this whole adaptive management frame is that it keeps adjusting and switching from year to year. The chub are still declining. What would be gained by switching the experiment mid-way? (Kloeppe)*

Lee said that since people are coming around to another option, essentially reverse titration which is to do everything at once, then they should take advantage of the temperature opportunity that is coming, and think about removing or slightly modifying the treatments.

- *It's sort of absent a formal MATA process although to some extent I think this group had already gotten there in December. What you have is an opportunity to make a decision about next fall for 04. What Carl has put on the table is basically the next factorial design for what could be the following two years in 05 and 06 to do the fluctuating flows during the first three-quarters of the year with low steady flows in the fall that would accommodate testing some of the temperature hypotheses and whether to continue with mechanical removal. I think the decision about that can probably await this year's data coming in. One of the things we said about mechanical removal at the onset was that no matter what else we did, it was possible that the effects of the predation by salmonids around the LCR might preclude our ability to detect any effect on native fish so it may be the case that mechanical removal could be part of the standard operating procedure for this program even while we test some of these other factorial elements. Carl has laid out a very plausible and defensible alternative to go the fluctuating flows for the first eight months of the year, followed by flat flows in the fall. (Gloss)*
- *If you remember our discussions when we identified how we were going to treat the budget and work plans, we said we know we can't come up with something big and new in 05 and 06 is really our jump off year. I would advocate that we largely stay the course through 05 and stick with that in 06 and beyond as when we can move into a long-term plan. I think as far as process goes, I'd recommend the TWG constitute a motion and then look at the calendar.. (Kubly)*

Carl presented another design, a reverse titration factorial design - it's a factorial design that starts with combining mechanical removal of the fall steady flows and hopefully some warm water from the outside for the next 2-3 years. It would then stop mechanical removal and try to use a thermal regime management which may work just as well as mechanical removal. The TCD might come on line by that time and interrupt the design. It would also deliberately leave out mechanical removal for a short period of time. This could be a test combination to determine if you could get rid of the most expensive part of the treatment and try a low flow steady in that period.

- *Flat flows right now with the edges on the dam, 8000 cfs is good for about 320 megawatts, about 40 megawatts for 1000 cfs. If you can drop it to 6,000 cfs at night, you drop 320 down to 240 so that's 80 megawatts of "extra" power that you don't need at night. You move some of that back into the daytime so that the 320 goes up to 360. You're shifting the generation of that much. (Greiner)*
- *I'm against steady flows no matter what. I think the fish will have more food to eat under the 6000-9000 than they will have under 8,000 cfs. I don't want to see steady 8,000 cfs for any period of time. Although if it's necessary for maybe Sept to help the HBC, it would just be a small detriment and might be worth it. (Steffen)*
- *I would like to see the actions by month. (Kubly)*

Carl created another table:

Month	Disadvantage Boatman	Rec. Boating	Kill Trout	Screw Carl
Jan	3 to 30	5 to 20	5 to 20	8 steady
Feb	3 to 30	5 to 20	5 to 20	8 steady
Mar	3 to 30	5 to 20	5 to 20	8 steady
Apr	3 to 30	5 to 20	MLFF	8 steady
May	3 to 30	MLFF	MLFF	8 steady
Jun	3 to 30	MLFF	MLFF	8 steady
Jul	3 to 30	MLFF	MLFF	8 steady
Aug	3 to 30	MLFF	MLFF	8 steady
Sep	FSF	FSF	MLFF	8 steady
Oct	FSF	FSF	MLFF	8 steady
Nov	FSF	MFSF	MLFF	8 steady
Dec	FSF	MFSF	MLFF	8 steady

- *How can we support MLFF in July and August? I cannot support that and I don't think the sand heads can either. I want to see 5-25. (Cook)*

Month	Disadvantage Boatman	Rec. Boating	Kill Trout	Screw Carl
Jan	5 to 20	5 to 20	5 to 20	8 steady
Feb	5 to 20	5 to 20	5 to 20	8 steady
Mar	5 to 20	5 to 20	5 to 20	8 steady
Apr	5 to 20	5 to 20	MLFF	8 steady
May	5 to 20	MLFF	MLFF	8 steady
Jun	5 to 20	MLFF	MLFF	8 steady
Jul	5 to 20	5 to 20	MLFF	8 steady
Aug	5 to 20	5 to 20	MLFF	8 steady
Sep	FSF	FSF	MLFF	8 steady
Oct	FSF	FSF	MLFF	8 steady
Nov	FSF	MFSF	MLFF	8 steady
Dec	FSF	MFSF	MLFF	8 steady

- *The GCRG can't support unrestricted load following fluctuations outside the Record of Decision. If you do go to these high fluctuations during the summer months, I think it's a prime opportunity to crank up the engine on the public outreach program because there is going to be a backlash of outcry that after all the years of this program, we're going right back to where we started to high fluctuating flows. There is going to have to be some public outreach to explain very carefully the reasons why we're going back to these things. (Kaplinski)*

- *Aren't we in the middle of a 4-year experiment? I'm unsure as to why we're talking about doing something different than what we have up there right now. (Knowles)*

The chairman said there are possibly two motions to consider, one is to stay the course with the existing experiment or to make some modifications. He asked how many members would support modifying the experiment.

- *Are we going to decide on those changes today? I would like some input from GCMRC. I have their Plan A. I haven't seen their Plan B. They gave me a 16-year science plan two years ago and we're 2 years into that experiment and I feel a little bit rushed. I thought I was here at a MATA workshop and now I realize that maybe I'm making a recommendation to the AMWG for the next 16 years. (Persons)*
- *We could of course continue the existing Jan –Mar fluctuations including what we just agreed to without any additional compliance. We could have the fall fluctuating and steady flows back to back which we would have under a sediment trigger without any additional compliance. There are some things here that can be done that we've already covered. If we go beyond those parameters, then we're talking about additional compliance. (Kubly)*
- *I could paraphrase a motion that somebody could make. If you were to just change the last month of FY04 water year to go to flat 8,000 and 6,500-9,000, irrespective of sediment then just deal with water year 05 and say that you're going to do flat flows for the first 4 months irrespective of sediment inputs and then do fluctuating flows the other 8 months. You would be there. It seems to me if there is an argument that the recreational boaters want to make, they're quickly going to find themselves as the primary advocate for sediment conservation arguing that they would rather have flows of convenience than flows that we know will sustain the sediment resource better than fluctuating flows. If they want to be there, then let them be there. (Gloss)*

Dennis said he thought Steve was arguing for a bigger deviation than what was just said. He said people may have trouble following what was said without being able to see it a calendar and identifying what will happen. Steve made changes on the table.

Josh cautioned that there is going to be opposition because like the EIS concluded this is a big departure and the TWG hasn't seen the first report from the first experiment yet.

Dennis said he was very uncomfortable with making major modifications to 05 because they already have a budget and a set of work plans that are going to be presented to the AMWG in March. He cautioned that there is no recommendation for 05 so there is nothing to change. The AMWG didn't agree to more than 2 years.

- *The question you have to ask yourself is it the right thing to do. If it's the right thing to do, then spend that \$80,000. If it's not the right thing to do, then don't do it. Everyone seems to agree that we need to be doing this. (Garrett)*

The chairman said they tried to summarize the existing design in the first two columns: mechanical control and the flow proposed without sediment and the flow with sediment for the existing experiment. He referenced Steve's suggested changes - changing from fluctuating flows to steady flows in the Oct-Nov-Dec range and then fluctuating flows through the Aug-Sep or April through August. He said another proposal was from Dennis to basically go with the existing experiment only institute a low flow with or without the sediment trigger. This would be a minor change from the existing one and this would be a little more radical as far as the changes go.

Steve said the only other caveat he would throw in is that he doesn't think there is enough water in 05 to meet an 8.23 maf year so there isn't enough water to sustain the 5-25 range for 8 months so there would have to be some negotiation. He went on to say that absent any new information, it's the best

possible flow scenario to retain sediment absent going to a steady flow below 10,000 cfs year round. It's the absolute best flow scenario to retain the sediment in the system. It has potential but undemonstrated positive impacts on HBC and that's based on the fact that HBC were in better condition when they left this kind of flow regime back in the 70s and 80s than they have been in the 90s since starting modifying low fluctuating flows. The same pertains to the trout fishery. The trout fishery was a blue ribbon, world class fishery in the late 70's and 80s and maybe the early 90s but has not been as good in recent years. He thinks the riparian vegetation with fluctuating flows is likely to see less erosion in the beach areas and things like that. He feels, irrespective of power generation, this would be the most positive scenario that could be created now for all the resources.

- *We need to do the science to answer that question once and for all. (Cook)*
- *I understand that we're doing it so we can have warmer water in the back waters this September in particular. (Steffen)*
- *If going to fluctuating flows is a good idea, how come we're waiting until next year and not implementing it in April? Continuing in April? (Christensen)*
- *I didn't expect to come here and make a recommendation to the AMWG today on something like this. Could we get a report or something? Can we postpone this and get an analysis of this? I'm just not comfortable. (Knowles)*
- *I've tried to stay with the existing design as much as I can. I've tried to address Bill's questions about increasing temperatures which theoretically could be instituted in September not October of 04, warmer temperatures, additional studies, monitoring and research, to address what are the effects on target resources during that period of time in both 04 and 05. If you set the trigger off in 04 and not 05, you would have Sep-Oct of both years. I've tried to keep the impact on hydropower and minimize in the autumn by only going to the 6500-9000 and 8000 switch during Sept and Oct and not all 4 months unless you get the sediment trigger which is already agreed to. I appreciate Matt's comments on perception. I think they're very real and my last one is I don't know what I would write for 5-25 because I don't think we have convinced the world that large fluctuations during the summer time, which was a primary concern of the FWS and the EIS, have a beneficial impact on native fish, particularly on HBC. (Kubly)*

The chairman advised that if a recommendation isn't made, they would have to until July to be able to put together a proposal on what to do for the 04 and 05 so it doesn't leave a whole lot of time to make any changes. He said the TWG could reconvene sometime between now and the June mailout to revise the proposal again or try to get something to them by March setting the stage for what is being planned for 04 and 05.

- *As uncomfortable as this is, I think what we argue for is the relevance of the TWG if we don't have a flow recommendation or an experimental recommendation for March along with its budget and work plans. (Kubly)*
- *I think one of the most important things that we can do, the change in here, is take advantage of the low flows/high temperatures in the fall. It's important to be able to assess those temperatures. I would support going ahead with these minor changes and moving ahead with the recommendation. (Kaplinski)*
- *If you want us to make recommendations to the AMWG, put it on the agenda. I'm not happy coming to these meetings and passing recommendations up to the AMWG without at least maybe having a package to look at, having some time to think about it. (Persons)*
- *We might think about that a little bit different. Our purpose is to come here and talk about experimental flows and to sort our way through that experimental flow activity. Having to go through that and obviously focusing on the next 2 years because we didn't have one. I don't think it's out of character for us to say we spent time at the MATA Workshop, have had discussions, and this is where we are. (Cook)*
- *I think what you would be recommending to the AMWG in March is this concept in principle and I think there are a lot of issues that would have to be developed in the context of the experimental plan that would probably be subject to final approval in July and then subject to compliance after that. I see this as resulting potentially in an AMWG motion much like the one that was passed in January 2001 directing GCMRC and TWG to come forward with fleshed out experimental plan to conserve sediment for FY05 (Gloss)*

The TWG used the following table to propose a motion:

<b>05 FLOW SCENARIOS CONSIDERED BY THE TWG</b>					
<b>Calendar / Fiscal Year</b>	<b>GCMRC 16 -Year Conceptual Plan</b>	<b>Proposal 1</b>	<b>Proposal 2</b>	<b>Mech Removal</b>	<b>EHF</b>
Oct 04 / WY 05	MLFF/FSF <sup>a</sup>	FSF(begin Sep 04)	FSF (begin Sep 04)		
Nov	MLFF/FSF	FSF/FF	MLFF/FSF		
Dec	MLFF	FF	MLFF/FSF		
Jan	MLFF	FF	PNNF	Yes	Yes
Feb	MLFF	FF	PNNF	Yes	
Mar	MLFF	FF	PNFF	Yes	
Apr	MLFF	FF	MLFF		
May	MLFF	FF	MLFF		
Jun	MLFF	FF	MLFF		
Jul	MLFF	FF	MLFF	Yes	
Aug	MLFF	FF	MLFF	Yes	
Sep	MLFF/FSF	FSF	FSF	Yes	
Vote	No Vote	Yes = 10, No = 8, ab = 1	Yes = 6, No = 9, ab = 1		

MLFF (see EIS; actual flow varies but never fluctuates more than 8k daily)

FSF = Fall steady flow of alternating 8 kcfs for two weeks and 6-9 kcfs for two weeks

FF = Fluctuating daily for of 5-25 kcfs sufficient to release monthly volume

PNNF = Power and Non-native Flows = 5-20,000 cfs as in FY04

EHF = Experimental High Flow of 42-45,000 cfs that would occur in all scenarios if autumn sediment trigger occurs.

Mech Rem = Mechanical removal that would take place under all alternatives

<sup>a</sup>MLFF if no sed trigger, FSF if sed trigger

**MOTION: Move to accept Proposal 1 and be prepared to report that to AMWG as to where we're at in the MATA process and get their blessing to continue to move forward to flesh that out and get final approval.**

Motion seconded.

Discussion.

Call for the question.

Voting Results:        Yes = 10        No = 8        Abstaining = 1

**MOTION. Move to adopt Proposal #2 as a recommendation to AMWG for 04 and 05, endorse the concept.**

Motion seconded.

Discussion.

Call for the question.

Voting results:        Yes = 6        No = 9        Abstaining = 1

The chairman asked if anyone wanted to make a motion for staying with the existing program. Bill Persons said he would. However, there wasn't a quorum so it was decided to continue the discussion at tomorrow's meeting.

**Adjourned:** 5:20 p.m.

**Glen Canyon Dam Technical Work Group**  
Meeting Minutes  
February 3, 2004

**Conducting** Norm Henderson, Chairman

**Committee Members Present:**

Mary Barger, WAPA  
Perri Benemelis, ADWR  
Kerry Christensen, Hualapai Tribe  
Wayne Cook, UCRC  
Jonathan Damp, Pueblo of Zuni  
William Davis, CREDA  
Lisa Force, Grand Canyon Trust  
Lloyd Greiner, UAMPS  
Christopher Harris, CRB/CA

Amy Heuslein, BIA  
Matt Kaplinski, GCRG  
Robert King, UDWR  
Glen Knowles, USFWS  
Dennis Kubly, USBR  
Bill Persons, AGFD  
John Ritenour, NPS/GLCA  
Mark Steffen, Federation of Fly Fishers  
Mike Yeatts, The Hopi Tribe

**Committee Members Absent:**

Robert Begay, Navajo Nation  
Perri Benemelis, ADWR  
Illa Bullets, So. Paiute Consortium  
Jonathan Damp, Pueblo of Zuni  
Phil Lehr, Colo. River Commission/NV

D. Randolph Seaholm, CWCB  
John Shields, WY State Engineer's Office  
Larry Stevens, Grand Canyon Wildlands Council  
John Whipple, NM Interstate Stream Commission

**Alternates Present:**

Jan Balsom  
Marklyn Chee  
Heidi Kloepffel/Max Oelschlaeger  
Wayne Cook  
Wayne Cook

**For:**

Ken McMullen, NPS/GRCA  
Robert Begay, Navajo Nation  
Larry Stevens, GC Wildlands Council  
John Shields, WY State Engineer's Office  
John Whipple, NM Interstate Stream Comm.

**Interested Persons:**

Gary Burton, WAPA  
Kurt Dongoske, CREDA  
Helen Fairley, USGS/GCMRC  
Dave and Pam Garrett, M3Research  
Steve Gloss, USGS/GCMRC  
Lisa Leap, NPS/GRCA

Mike Liszewski, USGS/GCMRC  
Jeff Lovich, USGS/GMCRG  
Ron Maldonado, NNHPD  
Ted Melis, USGS/GCMRC

**Meeting Recorder:** Linda Whetton

Convened: 8:15 a.m.

**Welcome and Administrative Items.** The chairman welcomed the members, alternates, and general public. A quorum was established, introductions were made, and attendance sheets (**Attachment 1**) distributed.

**Status of the FY05 Budget.** The chairman asked if any of the members had comments on the FY 05 Budget. He noted that the TWG recommended Column G, the okays in there were to signify that there was consensus on that particular budget item. If there was a footnote or a superscript and it's superscript 5, that was to indicate that there wasn't consensus on that particular budget item and that a vote was taken. Apparently that didn't get reflected in that superscript 5 on the last page and the chairman said he thought there were only 3 or 4 items that were like that but that all of them did pass and were recommended but were not by consensus.

**Public Outreach Ad Hoc Group (POAHG) Update** – Amy Heuslein reported that at the last TWG meeting, the POAHG was formed and tasked with developing some options for planning and implementing a public outreach strategy in the adaptive management program. She and Pam Hyde were designated as co-chairs along with the following members: Marklyn Chee, Andre Potochnik, John Shields, Mark Steffen, and Mike Yeatts. The group held their first meeting via a conference call on January 21, 2004, with the goal of determining the target audiences for public outreach, the message that needed to be conveyed, possible tools to be used, and who should develop and/or implement the outreach plan. She distributed copies of their report (**Attachment 5**).

Comments:

- *Some AMWG members may not like some of the work farmed out to an outside public relations firm. There is enough in-house expertise to do the work. My AMWG representative felt that public outreach was an AMWG function, not a TWG task. (Persons)*
- *Consider using the Trinity River AMP pamphlet as a guide for describing the GCD AMP. (Kaplinski)*
- *The fastest way to get the AMWG to react is to produce something. Not sure about a PR firm but identify to the AMWG a proposal for a brochure. (Kubly)*
- *Need something that is a real short historic view of the program and then expand the effort. (Steffen)*

**MOTION: Move the TWG accept the recommendations of the POAHG and forward their recommendations to the AMWG.**

Motion seconded.

Discussion.

Voting results:            Yes = 18            No = 0            Abstaining = 1

Motion passes.

**Humpback Chub Comprehensive Plan** – Dennis said that following the AMWG meeting in August in which they passed the HBC Comprehensive Plan as a working document, they also identified the need to solicit additional input from the TWG and other parties. They didn't specifically say to finalize that document but they interpreted it that way. He talked to Sam Spiller about that and over the Christmas holidays there were two new proposals that were drafted, one on non-native stocking and the other on monitoring of parasites along with some revisions on some of the other projects. The thought was to finalize the document more in the form of a recovery document, submit it to the AMWG, and ask them whether they would be willing to move it as a recommended document up to the Secretary and over to the FWS to serve as a foundation for a recovery program for HBC in the Grand Canyon. In March, Sam Spiller would make a presentation to the AMWG seeking their concurrence that this is the appropriate thing to do and then by mid-April, there would be revised

document that would then be reviewed by the HBC AHG first and by the TWG second, before it would be resubmitted to the AMWG by mid-June for their mid-July meeting. He said there has been a discussion that the cover letter would make very clear to the Secretary and the FWS that the AMP does not take responsibility nor does it have the authority to address all the projects and that those decisions would be made within the AMWG through the budget process and in discussions between the AMP members and FWS as such time that document was actually incorporated into a recovery program.

**Continuation of Experimental Flow Discussion.** The chairman asked if the TWG had completed their discussion on the experimental flow proposals from yesterday or whether they wanted to discuss further. As a result of the motions passed yesterday, he said there wasn't a clear recommendation from the TWG on what to do. If nothing is done as far as the existing experiment is concerned, then they basically fall back to the remainder of what had been approved by the AMWG for the current experiment. In 04, they would continue with the experiment because that's the second year, but in 05 they would discontinue the mechanical removal and move back to meeting low fluctuating flows but would still have the potential for a sediment trigger. He said they could go to the AMWG and clarify whether it was their intent to adopt the whole 16-year program or to stop everything after 2 years if no approval is given. He asked if there any members who would like to pursue a continuation of the existing experiment within the 16-year program.

- *My understanding of the way it was set up was the AMWG approved 2 years of a treatment because they wanted to find out how well that treatment worked, get the science back from it, and then make a recommendation for the next 2 years. I think we have some timing problems with that and don't have the preliminary results from the first year and we need to make a recommendation for years 3 and 4 of the adaptive management experiment. I'm not sure that we've gotten all the science back in yet and I suspect we'll hear from the AMWG. Obviously they have to do something or we have to do something. I thought yesterday we had sort of agreed to endorse some concepts and continue to explore some alternative flow regimes to carry forward this as an adaptive management treatment and I'm not sure where that leaves us. My impression is that there are two concurrent parts that you're talking about, one was the fluctuating flows and that that 2-year portion is basically done and the other part was the sediment part and we haven't had that so that 2 year part has yet to be done so those two parts were approved and we've done part of it but we haven't done the other part of it, the mechanical removal stuff. It seems those have already been approved. (Persons)*
- *Can we make a recommendation that the TWG make recommendations to continue the program of experimental flows in 04, and then recommend some of these individual elements, and also recommend continuation of the mechanical removal. We could probably get consensus on that. One thing we talked about yesterday that I think at the time there was consensus was that in 04 we have an opportunity to learn a lot about higher temperature outputs from the dam and there was a proposal to go into the fall with sort of a new experiment of fall steady flows to exacerbate or maximize the warming from those high temperature outputs from the dam so that would be another aspect of a recommendation to recommend mechanical removal be continued and that the fall steady flow be implemented to look at the temperature effects. I guess we can keep going until we run into something that we can't agree on. (Kaplinski)*
- *I thought the temperature was time limited. There was some discussion whether or not that would extend beyond September, some disagreement. (Greiner)*

The chairman recorded the following concerns:

Continue with experiment in FY05

Continue with mechanical removal

FSF (to take advantage of temperature) in Sep/Oct (continue down \_\_\_\_\_ (?))

and the current sediment experiment for a hydrologic trigger.

FFs/MLFF (A-S)

- *I thought I heard Carl say that the mechanical removal might be effective if we just do it for 2 years and then just because of the way it works we may not have to do it for 3 years or 4 years to see a 4-year effect. I would like some feedback from GCMRC on whether that sounds like a good approach. It was new to me yesterday. I would like to hear what the science has to say about that before we say keep on the course or discontinue. (Persons)*

Ted said when they first put together the so-called factorial or blocked strategy 2 years ago, they put forward the 4 years as their recommendation. In evaluating their plan, Carl said there were some momentum effects that he hadn't considered when they first met with him. So if you propose it for 4 consecutive years, you can't really get to the benefit of doing the factorial until year 7 at the earliest and probably years 8 for basically the full effects of that treatment is off. If you do it for 2 years in a row but not 4, Carl thinks in year 5 you're basically beyond that treatment so there's this lag or momentum because of the life history of the fish. Ted said the question for the TWG to consider is whether they want to forego having the ability to look at the controlled strategy for basically almost a decade or start getting at that question as early as year 5.

Dennis asked what the relative risks of overshooting or undershooting were - of having a greater impact on predators that are impacting HBC or having a lesser effect by truncating the experiment earlier. Ted said in the case of the fluctuating flow treatment which is being done simultaneously, they only proposed 2 consecutive years and then basically backed off. The idea was to back off on the fluctuating flow treatment and continue the mechanical removal, but that it would be 8 years before they could determine whether the fluctuating flow or the mechanical removal had any impact at all or which treatment was more effective.

The chairman asked for the Center's recommendation. Jeff said their recommendation is to continue with the 16-year experimental design. If the AMP wants a good, strong signal, they're going to have to invest the effort into doing long-term studies.

The chairman asked if there was a strong objection for continuing the mechanical removal in 05?

Steve said his recollection was that after the first 3 months last year, they achieved about an 88% reduction in the numbers in the control reach. When they went back in the summer, the numbers had come back to about 50% of the original population estimate. The last two trips in the fall were not very successful because they had highly turbid conditions so they had achieved something less than the original reduction and the expanded experimental reach by the end of the last fall. It was his understanding that the trip that just came off the water about a week ago, the first trip in 04, they had encountered trout densities in the control reach that were about half of the densities they found in the first year so they're back up so there is some movement, some re-colonization. How successful they'll be at controlling that and when or if they reach a steady stage and situation where additional control efforts don't seem to be reducing the population anymore is still an open question in his mind. He thinks Carl made a good point as far as this is either momentum or lag effort but you just can't turn this off like a light switch, it takes some time for the salmonid population to come back to its original density so that you can say that that treatment is no longer an effect but they don't yet know whether this treatment is effective at all in terms of the target for HBC. They know that it has been effective so some extent in reducing trout numbers but there has always been a question about how much do you have to reduce the number of trout to get them down to a level where they are not effective through predation and possible competition survival for the HBC and they don't know the answer to that - 10% of the fish that are left in there might be real happy, big trout that are eating as many chubs as anybody was before.

Dennis said he has talked with Jeff about having a meeting the last week in February to discuss what it is they need to do for the temperature rise, what studies are planned for, and what money is invested in those studies. Jeff added that GCMRC would like to flesh out those needs and make sure they're responding to the information that is wanted. They are collecting water temperatures now through the downstream integrated water quality program but whether or not they're going to do it in the backwaters is one of those questions they're asking. Dennis said that any TWG members who wanted to participate in that meeting would be welcome.

The chairman asked if there was any objection to recommending a change to the current experiment to implement FSF to take advantage of the temperature in Sep-Oct that is expected out of the dam - 2 weeks of steady 8,000, 2 weeks of 6,500-9,000 cfs, and that might be further modified if there is a sediment trigger. Is there any strong objection to recommending to the AMWG this change be made in the current experiment for 05? There were no objections noted.

The chairman asked if they want to continue with the current sediment experiment and if there is a trigger, then the flows would be dropped and they would do a BHBF at the appropriate time.

- *Shouldn't we try to figure whether we can move non-sediment up on the beach and all the costs that that incurs? If we devoid the sediment out of the system by the way we've operated through all the time and science has been telling us and we're unwilling to embrace, what does it takes to stop that? Why should some of us support testing whether or not we can move non-sediment up on the beach? (Cook)*
- *One of the main points from the memo science from the sediment scientists was that the only way that you can conserve sediment in the long-term is to take advantage of these inputs and temporarily deposit those up high out of the water. (Kaplinski)*

The chairman asked if the members could reach consensus on whether to continue with the current sediment experiment: If there is a hydrologic trigger in the late summer-fall, would they continue with that piece of it in 05? He asked for any objections. Three members raised their hands so the Chairman said the issue would be put to a vote. He asked if anyone wanted to present a motion. He added there might be a procedural problem because they have already approved this and if they were going to change, they would have to go back and change the whole budget. It was decided to leave this issue alone and move on to the other proposal whether to recommend a change here to implement fluctuating flows in these months, 5-25 vs. MLFF.

Dennis asked Ted to explain what the effect of adding the 5,000 on top of the 20,000 would be.

Ted said the component the TWG was talking about is not included in their original plan for year 3. They just do MLFF so that's a departure from the continued experiment as proposed. Going to 25,000 has the potential of exacerbating the export of beyond the 5-20 but 5-25 was originally considered by their team as the preferred fluctuating flow treatment for fish and said this was a bit confusing to explain. They advocated in year 3 not doing an experimental fluctuating flow treatment for fish as part of the blocked strategy, continuing mechanical removal, backed off to just MLFF in all months except if there is a sediment trigger. This is a proposal that transcends their current recommendation from 2 years ago in their plan. The basic message is if you want to limit export, keep the flows as low as possible as much of the time as possible. The more time you spend higher in any month or any day, the more you're going to exacerbate transport.

Ted added there was some very preliminary evidence from Josh Korman's work that you were trying to make life miserable on salmonids and their reproductive cycle, that having this extend through April and May probably would achieve that more effectively than just Jan-Mar. He said the whole experiment was designed around trying to disadvantage salmonids in their recruitment and not around any sediment transport issue,

- *We've already agreed to change the September flows, right, fall steady flows beginning in September of 04 so there is one small change in the experimental design and I'm sensitive to that too but in the spirit of compromise, I can see continuing with the flows we've agreed on and even just modified in this supplemental EA and FONSI that is now released and will start tomorrow morning and to try to address Bill's concerns by having these FSF which would occur in a period of time that was already agreed upon if there was a sediment trigger but doing that with or without. All I'm trying to portray to you is my mindset in trying to come to a compromise that had a small modification of the experimental design and then the other proposal is a greater departure. (Kubly)*
- *Why should we try to figure out how we move sediment on the beach? If we devoid the sediment out of the system, and the scientists have said, why should some of us support that? Huge costs have been incurred by the public. We've taken energy out of December. The question is: Do we continue? (Cook)*

The members continued to discuss the experimental action proposals.

The chairman said the concerns were with the fluctuating flows vs. the MLFF for the April-Sep timeframe vs. the other two concepts. He asked what the sense of the group was.

- *I originally voted against that new experiment, Proposal 1, because I wasn't quite sure what the purpose was for it and fundamentally changing the experiment in year 3 or 4. The more I thought about it, I think what we're actually doing here is not trying to develop a flow experiment per se but what we've recognized is that the monitoring leading up to and including parts of the experiment is showing us that MLFF isn't the best way at least for sediment conservation to operate when we're not doing some kind of a treatment. It's almost easier to fundamentally decouple the specific treatment that at least in this 16-year plan were initially targeted to FIST resources and then what we go to when we're not doing one of those treatments. If you look at them across up there, the treatments are pretty much the same. It's what we go when we're not doing a treatment and so potentially maybe what we need to do is outside of those treatments is go to AMWG with a recommendation ultimately to go to the Secretary that MLFF isn't the best way to operate for the base conditions and do that is one recommendation, that concept of higher fluctuations may be better for the long-term sediment preservation and then deal with the specifics of the fish flows in the winter and things like that and that is the overlap on top of the different base line. I'm still uncomfortable designing those flows in the course of one meeting without the science center looking at the ramifications of a long-term experimental design and I think the MATA workshop showed that we need to think out that long-term experiment but what to me is the issue is what we're going to back when we're not doing some treatment within the experiment and that's come out of the long-term monitoring. (Yeatts)*
- *I'd like to look at both years at the same time. I don't want to make a radical change in 05 and then go back and look at the 16-year plan and say whoops, we shouldn't have done that in 05. It doesn't fit within our monitoring plan. (Persons)*
- *One of the things that Mike said that really catches my attention is that we need some formal statement that MLFF is not working. That statement doesn't exist as a formal statement from the TWG nor does the document that would justify that statement exist. If we feel strongly that that's the case, maybe there is a good argument for getting on with it. (Kubly)*
- *The other thing is the latest SCORE report doesn't exist yet and I'd like to get one out this year. That's my intent but the information is still there. We presented it to you at the science symposium, Ted's given you his best judgments on what's going to happen if you increase the flow rates, so it's not like there is going to be some mystery that's going to be revealed in the score report. It's just going to gather together the state of knowledge that we have but I think you have the information you need to make the judgment. The issue is that science is a very deliberate process and it requires a long-term commitment to a rigid experimental design to really get at the issues that you think are important. Opportunity is not deliberate, things like the lower lake levels, the increase of water temperature, now that provides with an opportunity. So that's where the attention is here in this group but I would still say that we have a plan before you that is a good well designed experiment and we would advocate continuing along those lines but if you want to change, then you have to decide. If you're going to have your science in little bits and pieces without the long enough duration to have adequate sample size or adequate replication in the experimental design, or whatever, it's*

*a choice you folks have to make. We'd be forced to bite off science in little chunks for you. We're trying to answer some big questions of this experiment and it's been compromised by the WAPA flows proposal, it could be potentially compromised by a new direction for 05, and talking about 06 and beyond, it would be compromised again so at what point are you willing to say, look we need to protect the science, park it off the side, wait for the results, and then we'll make the big changes. (Lovich)*

The chairman asked if the group wanted to move on to getting the current sediment experiment trigger aspect of the experiment resolved within the TWG. He asked if there were any strong objections?

- *I said it before and I'll say it again that I think the states have a very great concern that we continue to incur the costs and the difficulties preparing for those experiments. (Cook)*

The chairman said he was mistaken on yesterday's voting and that the vote on Proposal 1 (Yes=11, No=8, and Abstaining=1) was a majority recommendation. He thought a quorum vote (16 members) was required on a yes vote but that is not the case. So in essence, the TWG already made a recommendation to the AMWG.

- *Can I get a re-read of the language that was used for that vote. I think I asked for some clarification. I thought we were voting on endorsing a concept, not that we're going to recommend this monthly pattern of flows. I'm confused. (Persons)*
- *We all agreed it was a concept that we were proposing. It wasn't that we want to do this. (Barger)*
- *I would like to make this request that we get the MLFF report from the GCMRC. It will be a really important component in the compliance that will have to be done on these flows. (Kubly)*

**MOTION: Propose GCMRC produce an evaluation of the effects of the MLFF operation since it was instituted for the same resources that were considered in the EIS.**

**Motion seconded.**

**Without objection, the motion passed.**

Dennis reminded the members that they need to make a recommendation on whether MATA will be the process used to achieve development of the experimental actions that they're going to build into this long-term plan or go back and build an experimental flow ad hoc group. The chairman asked the group what they wanted to do. It was decided to reconstitute the Experimental Flow Ad Hoc Group for that purpose. Dennis said there is a difference in having the full TWG engaged in a process vs. having it go to an ad hoc group. The chairman said it was a resolution that the TWG would recommend to the AMWG that we pursue and experimental action plan with GCMRC for 06 and beyond utilizing the MATA process.

Dennis said that was not the original intent. The group will have to look at the fall steady flows and ask whether there is money to measure them. He said the dam operations experiment is one of the projects that was funded and its intent was not originally to fund MATA. They did that because they didn't have fall steady flows. He said there's enough money to cover that from somewhere else but he doesn't feel comfortable agreeing up front that MATA is used to replace that experiment.

The chairman asked if the TWG should meet again prior to the March 3-4 AMWG Meeting. Dennis advised that Reclamation can't schedule any more meetings without having them published in the Federal Register 15 days prior to each meeting and that it takes approximately 30 days to get that accomplished.

**Strategic Plan** – Jeff Lovich said he is going to move forward very quickly to develop a strategic plan. He talked about the various documents that would be produced (**Attachment 6a**) and proposed a timeline (**Attachment 6b**) for how the work will be completed.

- *I have a concern with your statement regarding the public outreach and in your comment that we're going to go forward whether it's with the AMP or not. The Center was created based on this AMP program and you work with the AMWG and TWG regarding this issue so I caution you to jump out ahead on public outreach without getting that issue resolved and agreed to by the AMWG and the TWG membership. (Heuslein)*
- *I'm representing Grand Canyon Wildlands Council. I share that concern. I think there are some issues here. I think GCMRC has incredible responsibilities and it's crucially important to the adaptive management program. I'm not sure that we're not entering problems of fuzzy sets here as to what the role and scope of the GCMRC ought to be. Just to underscore the point that Amy made, it says here in the Final EIS that GCMRC is supposed to support the designee and the AMWG and all the language is developing, monitoring, and research plans, managing all adaptive management research programs, managing all data collections. I'm not sure what you've laid out is entirely consistent with that. (Oelschlaeger)*

**Core Monitoring** – Jeff continued with a PowerPoint presentation on core monitoring (**Attachment 7a**) and also how he would implement the Study Plan requirement for GCMRC (**Attachment 7b**).

- *We've had various ad hoc groups deal with specific subject areas - fish, foodbase, etc., in terms of developing the information needs. You may have some difficulty in terms of trying to develop core monitoring. In other words, what should we be doing here and there for sediment vs. fish vs. riparian, from a small ad hoc group. You may not have the background to be able to do that. You may have to wind up with different groups so maybe the ad hoc just changes flavor from time to time. You may have trouble having 6-7 people representing all of those disciplines. (Davis)*
- *You talked about the emphasis on core monitoring and you have other monitoring going on outside of the core monitoring which would then take another part of that 40-60% of our budget. Other kind of monitoring vs. research if you will, the breakdown between those issues is important to some of us. (Cook)*
- *Core monitoring is essential but I'm concerned about the lessons of other agencies that have practiced core monitoring and disaster has fallen upon them. I'm concerned that we don't see that here and we may be monitoring at this smaller scale when larger scale issues need to be taken into consideration as well. I'm also concerned and you don't directly address this but there seems to be an assumption of linearity here and some sort of inherent meaningfulness and I'm wondering if this system is not profoundly chaotic in that there is much to be learned in terms of our monitoring by taking catastrophe theory, chaos theory, and the like into consideration as we set up our monitoring protocols. And the third comment I want to make is one sense this is techno-speak which is fine but it seems to me that you need to take into consideration also in this core monitoring program the communicative issues that are raised, communicating this information not only to managers but to publics who ultimately who are funding the entire enterprise so to speak. I realize the power companies but there are public communication issues here that I think need to be addressed in this as well. (Oelschlaeger)*
- *Maybe a secondary way of addressing some of this information. I'm reminded that BLM came to us a few months ago and they had sediment conservation project in a tributary to the Paria River and they came in front of certain program members and were told we can't support that because we're trying to see as much sediment make it into Grand Canyon as possible. And when I heard that, I went no way, that's not a position the Bureau of Reclamation will take. So there are other sources of information coming from other activities and they don't necessarily have to be generated in the program but I do think we tend to treat as a linear system because of those funding constraints and then not look outside for other sources. (Kubly)*
- *I have to give you a little bit of concern I'm having. When we first started out with GCMRC, it was basically a contracting entity with coordinated research done by others. It now seems to be in a transition wherein a lot of the research is going to be done by your own scientists and I have some difficulty with that. From the standpoint of you proposing work plans, study plans, budgets, etc. which are supposed to be objective and all of that to meet goals, and how you can actually do that when you're promoting your own scientists to do the work. There is a little bit of a conflict there and I'm just trying to get through that. (Davis)*

- *Why is there a need for a separate review study plan process for GCMRC employees in addition to the one that is already there for any other contractor, cooperator, why isn't there one? Why do we need another one now on top of what's already there? (Kaplinski)*
- *Do you have any idea what the calendar would be like? You're talking about the time AMWG decides on a budget then you would start your plan, right? How long would it take to write this? If the decision is made to contract, can you get it done in that fiscal year? (Kubly)*
- *One of the things that keeps sort of complicating things for us at Grand Canyon is that give and take between the proposal and then what happens in the field, and the reviews that come back. There needs to be some sort of that cross polinization so we can get to a proposal that meets with the Park's requirements as well. There needs to be within the study plan a review process letting the Park's review process come into the peer review and also the peer review get back to the park personnel who are reviewing it. (Balsom)*
- *You might want to include a park representative as one of the peer reviewers and also have several cultural people from outside reviewing the study plan. I'm also concerned about how this impacts the budgeting process. I think this is great for a post-budget kind of process where you're doing peer review and giving us more information but it seems like the difficulty with the budgeting process was with not having enough detail on the proposed studies in advance and not having it early enough. (Force)*
- *I was wondering about having on the signature line for Helen Fairley whether to determine if the National Historic Preservation Act requirements are being linked to the study plan. The permitting by the Park is different because they're technically the lead federal agency by law. If they set up the project and it's their project, they should do the NHPA and the park would then ask that they do it. (Barger)*

**ACTION ITEM:** Linda will post Jeff's PowerPoint presentations to the AMP web site. The TWG should send their comments to Jeff.

Dennis said there is a lot of work that needs to be done by next January: working out the details on the proposed experimental action, the TCD science plan, the SCORE Report, etc. and wondered how everything is going to get done. Amy suggested that Jeff, Dennis, Norm, and Dave (and possibly bring in Mike Gabaldon) work together in preparing a timeline for when products are needed and the provide a calendar to the rest of the TWG.

**ACTION ITEM:** Jeff, Dennis, Norm, and Dave will discuss timeline issues and report back to the TWG via an e-mail message from the TWG Chairman.

Dennis reiterated that people have consistently assumed that the core monitoring plan is the thing to do. He would like to elevate the discussion to a combination of research and monitoring in general be it effects monitoring. It's very important for the USBR to identify establish cause and effect relationships in addition to monitoring the status and trends of key resources. There has to be a component here that is guaranteed that addresses cause and effects, vis a vis and core monitoring doesn't get you there. There have been two strategic plans developed by GCMRC, this is not black and white situation. Not that I advocate for this but people can make this argument that there are existing documents in place. We can struggle along. This doesn't have to be the highest priority. inconsistent. The strategic plan drives those issues logically.

The TWG developed a new ad hoc group to assist the GCMRC in developing their core monitoring program.

**Title:** Core Monitoring AHG (CMAHG)

**Charge:** To work with GCMRC on development of the core monitoring plan

**Membership:** All TWG Members

**Interim Lead:** Jeff Lovich. He will set up the first meeting. A chair will be selected.

Reminder to TWG members: Fax notices (and copies of e-mail messages) to Amy Heuslein since she is still without e-mail/Internet access.

**Next TWG Meeting:** March 30-31.

**Location:** ADWR Conference Room A

**Possible Agenda Items:**

- Assist GCMRC in planning assignments
- Budget outyear process
- Experimental flows – several issues/updates
- Review of draft core monitoring plan

**Adjourned:** 3:10 p.m.

### 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  
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.  
cfs – cubic feet per second  
CRBC – Colorado River Board of California  
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  
GCD – Glen Canyon Dam  
GCMRC – Grand Canyon Monitoring and Research Center  
GCNP – Grand Canyon National Park  
GCNRA – Glen Canyon National Recreation Area  
GCPA – Grand Canyon Protection Act  
GUI – Graphical User Interface  
HBC – Humpback Chub (endangered native fish)  
HMF – Habitat Maintenance Flow  
HPP – Historic Preservation Plan  
IEDA- Irrigation and Electrical Districts Association of Arizona  
IN – Information Need  
IT – Information Technology (GCMRC program)  
KAS – Kanab ambersnail (endangered native snail)  
LCR – Little Colorado River  
LRRMCP – Lower Colorado River Multi-Species Conservation Program  
MAF – Million Acre Feet  
MA – Management Action  
MO – Management Objective  
MRAP – Monitoring and Remedial Action Plan  
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  
Powerplant Capacity - 31,000 cfs  
Reclamation - United States Bureau of Reclamation  
RBT – Rainbow Trout  
RFP - Request For Proposals  
RPA - Reasonable and Prudent Alternative  
SAB - Science Advisory Board  
Secretary(=s) - Secretary of the Interior  
SWCA - Steven W. Carothers Associates  
TCD - Temperature Control Device (for Glen Canyon Dam water releases)  
TCP - Traditional Cultural Property  
TES - Threatened and Endangered Species  
TWG - Glen Canyon Technical Work Group (a subcommittee of the AMWG)  
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)