

Glen Canyon Dam Technical Work Group Meeting
November 8-9, 2006

Conducting: Kurt Dongoske, Chairperson

Convened: 9:30 a.m.

Committee Members Present:

Mary Barger, WAPA
Steven Begay, Navajo Nation
Charley Bullets, Kaibab Band of Paiute Indians
Kerry Christensen, Hualapai Tribe
Jonathan Damp, Pueblo of Zuni
William Davis, CREDA
Lloyd Greiner, UAMPS
Jay Groseclose, NM Interstate Stream Comm.
Christopher Harris, CR/CA
Norm Henderson, NPS
Amy Heuslein, BIA
Rick Johnson, Grand Canyon Trust
Robert King, UDWR

Dennis Kubly, USBR
Glen Knowles, USFWS
Phillip S. Lehr, Colo. River Comm./NV
Ken McMullen, NPS/GCNP
John O'Brien, GCRG
Don Ostler, UCRC
Bill Persons, AGFD
D. Randolph Seaholm, CWCB
Mark Steffen, Federation of Fly Fishers
Larry Stevens, Grand Canyon Wildlands Council
Bill Werner, ADWR
Michael Yeatts, The Hopi Tribe

Committee Members Absent:

John Shields, WY State Engr. Office

Alternates Present:

Don Ostler

For:

John Shields, State Engineers Ofc./WY

Interested Persons:

Matthew Andersen, USGS/GCMRC
Craig Anderson, USGS/GCMRC
Christine Beard, USGS/GCMRC
Charley Bullets, Kaibab Band of Paiute Indians
Gary Burton, WAPA
Helen Fairley, USGS/GCMRC
Dave Garrett, M3Research
J. Lonnie Gourley, USBR
John Hamill, USGS/GCMRC
Lynn Hamilton, Grand Canyon River Guides
J.D. Kite, USGS/GCMRC

Ted Kennedy, USGS/GCMRC
Lisa Leap, NPS/GRCA
Paul Li, Bob Lynch's Office
Ted Melis, USGS/GCMRC
Clayton Palmer, WAPA
R. Scott Rogers, AGFD
Tom Ryan, USBR
LeAnn Skrzynski, Kaibab Band of Paiute Indians
Pam Sponholtz, USFWS
Dave Topping, USGS
Scott Wright, USGS/GCMRC (via phone)

Recorder: Linda Whetton, USBR

Welcome and Administrative. The Chairman welcomed the TWG members, alternates, and interested persons. A quorum (16 members) was established and attendance sheets distributed.

Review of Draft Minutes from August 2-3, 2006, Meeting. The Chair said the minutes have not been completed and are not ready for distribution. They will be approved at the next TWG meeting.

Review of Action Items (**Attachment 1**)

Action Number 2006.01.25-26: Glen Knowles proposed the following motion:

MOTION (Bill Davis): The HBC AHG has reviewed the report by the Arizona Game and Fish Department entitled “Humpback Chub Hatchery Evaluation: Prospective Refuge Facilities” and recommends that the TWG accept the report. The report utilized a good process, was well done, and the evaluation was fair and unbiased. If TWG decides to recommend moving HBC into a facility, further expert evaluation should be solicited prior to making a final decision.

Motion seconded (Kerry Christensen).

Passed by consensus.

MOTION. (Kerry Christensen) Move to send the “Humpback Chub Hatchery Evaluation: Prospective Refuge Facilities” report to the AMWG for their consideration and adoption.

Motion seconded. (Lloyd Greiner)

Kerry proposed the motion because he felt the report wouldn't receive any further action. Norm told him the report will be folded into the full Humpback Chub Comprehensive Plan which will ultimately go to the AMWG as a finished product. Kerry withdrew his motion and Bill Werner withdrew his seconding of the motion.

Update on USFWS and AGFD Projects. Glen Knowles provided the following updates: (1) Potential translocation of HBC from the Little Colorado River into Shinumu Creek by NPS. They're progressing with the environmental compliance for that project. It's possible that it could happen as soon as next summer. (2) They are also progressing on another project to develop a refuge population at the Hualapai facility. The Hualapai have a fisheries facility they maintain and the USFWS and AGFD have been assisting them with adding some infrastructure to that facility. They could possibly move HBC into that facility as a refuge population by next summer. It's possible the projects could happen in conjunction with one another by collecting samples for both projects at the same time.

Potential TWG presentation. Dennis said there was an invitation from Gary Burton made at the last meeting, however, the TWG didn't respond so he asked if Gary would explain again. Gary said that WAPA is in the process of doing a lifecycle impact assessment that has been looking at environmentally preferable power certification through the ASTM standard. This would apply to Glen Canyon and other hydropower units but he used Glen Canyon as an example. They're getting close to having that document in final format and one of the things they're planning to do is give presentations to various stakeholders. As such, Gary wondered if the TWG would be interested in a presentation. Gary said the first meeting could be scheduled within the next two to three months. Bill Davis said that this particular analysis has a tremendous amount of policy implications and he feels it should go directly to the AMWG. Kurt said that given the timing of the next two TWG meetings and when the report is finalized, it's possible the TWG would make a recommendation to the AMWG anyway.

ACTION ITEM: Mary Barger will inform the TWG when WAPA would be able to make a presentation on the results of the lifecycle impact assessment.

TWG Operating Procedures. Kurt said he would like the members to look at the current TWG Operating Procedures and provide comments to Linda on potential revisions. Kurt provided the following as an interim way of handling motions until the TWG Operating Procedures are formally revised. He said there was a question on the AMWG Conference Call as to whether the TWG had deliberated sufficiently on the BHBF motion and if the members realized they were actually voting on a motion at the last TWG meeting. He thought that in order to make the TWG recommendations stronger and have more of a foundation, he offered the following suggestions:

- a. All TWG motions/recommendations to the AMWG will be developed through roll-call vote only.
- b. Internal TWG motions (i.e., approval of TWG minutes) will be the only TWG actions accomplished by “consensus” determinations.

c. Prior to every TWG motion/recommendation roll call vote, a specific question to the TWG will be posed to ensure that every TWG member present understands the language of the motion, the intent/ramifications of the motion, and that a roll call vote is about to transpire.

For the most part the members agreed with the above suggestions, however, there were still concerns about allowing proxy votes, inconsistencies in asking members to provide rationale for their votes, members having full understanding of the motions, and that all motions should be projected on a screen or flip chart.

ACTION ITEM: Linda will send out the document containing previous suggestions for revising the TWG Operating Procedures. TWG comments are due to Linda by January 1, 2007.

TWG Comment Response Document. John Hamill distributed copies of the new TWG Comment Form (**Attachment 2**). He said this was an action item from the last meeting with the intent to provide a more efficient process for people to provide comments on various GCMRC documents and receive responses to those comments from the respective authors. He received input from Lisa Leap and Mary Barger on the draft format to produce the current version. He asked the TWG to submit comments on GCMRC documents that contain substantive changes rather than grammatical edits. There was a general feeling that the TWG were comfortable with using the form. However, Randy Seaholm would prefer to see similar comments consolidated and Norm asked that a "commenter's name column" and a "date" line be added to the form. Hearing overall acceptance for the form, it was decided the members would use the form and submit their comments directly to GCMRC.

ACTION ITEM. Linda will send the MS Word version of the Comments Response form to the TWG.

Update on GCRMC FY07 Projects. John Hamill said each of the program managers would give updates on major FY07 work being done. He distributed copies of the "Major FY07 AMP/GCMRC Milestones" calendar (**Attachment 3**) and said many of the items have implications for the TWG but more discussion will occur at tomorrow's meeting.

River Trip Logistics. Ted Melis said that Carol Fritzing, GCMRC's Logistics Program Manager, couldn't attend today's meeting but prepared a handout, "Comparison of 06/07 GCMRC River Trip Logistics" (**Attachment 4**) which provided information on trips conducted in 2006 and those trips that are planned for 2007. He said that Carol has combined trips where possible to save on logistics, funds, and to fully integrate the projects. If anyone has any questions, they should e-mail or call her personally. He said the extension of the non-motorized season has taken effect but he doesn't see that it will have a significant impact on the science program. He is hopeful to have waivers approved by the NPS for their winter work.

Socio-Cultural Program. Helen Fairley said they got started on some of the projects that were approved for FY07 including all things related to campsites. They put all the campsite-related activities together and got a good start getting campsites mapped and developed a GIS. They worked with the NAU Geology group on repeat surveys of sandbars in conjunction with campable areas and were also getting started on evaluating those approaches alongside remotely sensed data that came out in 2005 and made an aerial overflight as an alternative approach to looking at campsite areas. It was a very productive trip and they had a lot of opportunities for sharing ideas, comparing results, and discussing the reasons for discrepancies as they emerged.

Biological Resources Program. Matthew Andersen said the largest change is that mechanical removal is not anticipated for FY07, but the large field effort in the coming year will be made up of GCMRC, FWS, and AGFD. They tried to conduct a concurrent sampling of HBC in the spring and in the fall. He said it looks like they will probably have one exception to the non-motorized season.

Aquatic Foodbase FY2006 Results. Ted Kennedy said they are starting to get preliminary results on invertebrate densities and distributed a handout on "Current *Gammarus* Density in Lees Ferry is Similar to

Early 1990s” (**Attachment 5**). They’re also sampling some additional habitat types that AGFD wasn’t sampling like cliff faces and talus slopes.

Mark Steffen said he was interested in an update on nutrients coming out of Lake Powell, phosphates and nitrates in particular, because anecdotal observations by fishermen indicate that there was a really good aquatic foodbase growth in the spring but not as good as anticipated in early fall and September. He asked if there was any information on what the nutrient levels were in the spring relative to September and if Ted could provide a chart depicting those changes. Ted said they’ve been collecting sampling for about six months but they’re not ready to provide additional details at this time.

Larry expressed concern for the failure of past foodbase studies to understand variability and asked GCMRC to present 95% confidence intervals in reports from now on and also undertake an effort to compile ALL past data.

Lake Powell Water Quality Update. Bill Vernieu provided an update on water quality work that has been done at Lake Powell and what work will be done in the coming year. He distributed copies of his PPT, “Update on Water Quality of Lake Powell and Glen Canyon Dam Releases” (**Attachment 6**).

Q: In a drought period like the one you observed in this study, can turbine operations alone get the dissolved oxygen back to where it meets water quality standards or not? (Ostler)

A: Well, it appears that it can but if that’s the only reason Reclamation ran the turbines, it would be fairly effective. It appears to be when the output of an individual turbine drops below a certain point, there starts to be a lot of air entrained in the turbine vents and it causes the re-aeration. We’re not comfortable with that operation. We were hearing popping. We also measured a lot of reduced efficiency. It took a lot more water under those operations to generate the same amount of power. But, yes, it can be used for that purpose. (Vernieu)

Q: The turbidity spike that you got through the penstocks, was it really noticeable? How high was it? (Henderson)

A: I heard reports that the water coming out of Glen Canyon Dam was muddy. I didn’t see that. There’s a lot of inflow surface runoff just below the dam so if you look over the river, you could see a muddy river, not necessarily coming out of the dam but what we measured was a small pulse. I think it got up to about 5 NTUs which is not visibly very cloudy but it is measurable. (Vernieu)

Q: If a BHBF is run and we have enough monitoring in place, can nutrient contributions be detected? (Stevens)

A: Our current monitoring program is measuring nutrient concentrations on a monthly basis so if there was a BHBF, we’d probably want to look at that and increase our sampling frequency just to see what kind of nutrient input pulse goes down the canyon and how effective a short-term increase period of nutrient concentrations is. (Vernieu)

Q: If we don’t have a high inflow, are we expected to have another low DO or is there some temperature affect or influence on that DO level? (Davis)

A: I don’t think so as much as the fact the low reservoir level brings that surface water close to the penstock release and then the amount of re-suspension that happens, the amount of organic material that’s dug up. I showed the slide of 2003 because there was a lot of fresh sediment being stirred up. (Vernieu)

Update on Recent Trends in the Downstream Fish Community. Scott Rogers’ presentation focused on recent trends in the downstream fish community, the ongoing development of long-term monitoring of fish in the Grand Canyon, and what he intends to do with the information. He gave a PowerPoint presentation entitled, “Update on Recent Trends in the Downstream Fish Community” (**Attachment 7**)

Q: Based on the data you had from Diamond down, it didn’t look like you did too well catching catfish with electroshocking? (Steffen)

A: Electroshocking uses those settings that are good for other fish but not good for catfish. Some people will argue that nets are actually better. Over the past three years we’ve been using angling, worm on a hook, which worked pretty well in the upper basin. Electroshocking does okay with red shiners, however, we still don’t know if it’s working real well with fathead minnows. (Rogers)

Q: The year 2000 flow was one of the warmer years but your hypothesis that warming being an even playing goal doesn’t quite pan out in that context. Do you have an explanation? (Stevens)

A: No, I don’t. I looked for that and it’s just not there for flannelmouth suckers. One of the interesting things is that we do have a huge signal for rainbow trout and brown trout, especially in the Bright Angel Reach for 2000. The signal was there for the salmonids but I didn’t see the signal for 2000 for flannelmouth suckers. (Rogers)

Q: *Would you be able to guess on the order of magnitude is the biomass of catfish is probably something like that of carp?*

A: *No. In looking at our angling data, we know there are catfish around the Little Colorado River. Once we get below Tanner we start angling and you really don't catch many catfish, however, below Lava Falls there are a lot of catfish. I don't think there is a lot of biomass out there right now. We have to work on our ability to monitor catfish. (Rogers)*

Q: *Over the course of time we've had numerous presentations on mechanical removal and people have assumed that it's been very efficient. I think, if I'm interpreting right, is that you're telling us that the system-wide effect that's lying in the background that leads us into believing that the mechanical removal is more effective than perhaps it really is. (Kubly)*

A: *The mechanical removal is very effective and we know this by calculating removal of fishes. Now our ability to sustain that at an incredibly low level that we had recently may be partially due to the fact that immigration has been reduced. We really understand how efficiently we can take rainbow trout out and you can model different rates of immigration to predict how much effort is needed to remove rainbow trout in that reach. (Rogers)*

Q: *If you go back to the two graphs, you have to subtract what's going on in the rest of the system from what's going on at the reach in order to get a true rate? (Kubly)*

A: *Recapture probabilities and removal of fish is a better way to do it but in terms of sustaining, you have to take into account immigration. That's a function of what's going outside. It's not affecting our removal effort but the number of those things moving in are. (Rogers)*

Q: *How do you validate and verify your conversion from catch rates to biomass if you don't have recaptures and population estimates? (Kubly)*

A: *Right now we have recapture probabilities that are calculated for rainbow trout and brown trout. I've got placeholders for some of these other species and the way I've done that is we have pretty good population estimates for some of these cases in time and space which overlaps with the modeling. Basically I solved the recapture probability to fit those. The best case scenario is we can go out and calculate those recapture probabilities. I view this as a core model that can show data gaps in terms of information and it can show some of the potential relationships between these fish. It's the beginning of a core model and that's where we're working from. (Rogers)*

Action on Science Plans. John Hamill distributed copies of the "GCMRC Monitoring and Research Plan to Support the Glen Canyon Dam Adaptive Management Program dated Sept. 13, 2006" (**Attachment 8a**) and gave a corresponding PowerPoint presentation (**Attachment 8b**). He talked about the background of the MRP, reviewed some of the major elements, and then discussed the comments and responses GCRMC has received to date. He feels the MRP is a good plan, is consistent with both the Strategic Science Plan and AMP Annual Work Plan, and is ready for implementation. He referenced the table on pages 12-18 which address specific AMP priorities.

Dennis said that while the Science Advisors advocated for replacing RINs and CMINs with strategic science questions (SSQs), he questioned if the TWG adopted the document today, would they be agreeing before the fact, before the AMWG decides to supplant the RINs through an extensive process and sequencing. John responded that there's a lot of valuable information in the RINs and CMINs and it would be foolhardy to throw all that out but at the same time they had to find a way of setting priorities and providing focus on over 160 things. He said the SPG felt it would be more appropriate to take a more strategic science question based approach and that the AMWG had given the charge to develop a long-term monitoring and research plan and he intends to take that approach to the AMWG for their approval. As a member of the SPG, Dennis said that if he had known that the intent was to supplant the RINs, he would've recommended going directly to the AMWG and asking them for their buy-in because the INs are tied to the AMP Strategic Plan and come right down from the management objectives. He reminded the group that the TWG went through a very lengthy prioritization process to establish those priorities. He would've liked to have seen some development of SSQs from the RINs. He also said that he had been part of a small group that met in Tucson (USGS Science Symposium) and there was agreement about how changes advocated by the Science Advisors would be brought to the program and AMWG members made it very clear that they wanted any changes brought to the program would come to the AMWG first. Dennis said that one of the reasons he's concerned is there might be resistance and resentment from the AMWG to surfacing the SSQs when they have not been previously brought before the AMWG, and having the TWG adopt this new document only to hear AMWG ask, "why didn't you bring this to us in June or July of 2005?"

Dave Garrett said in forming the SPG with TWG members, GCMRC staff, and the Science Advisors, Michael Gabaldon asked for a formal proposal to be drafted for the AMWG's approval. The proposal

outlined a 12-month process to get the work done and the AMWG approved it. They also wanted quarterly updates. He said there were three AMWG members involved in the process as well. Dave said it will be important to ensure the CMINs and RINs are referenced and bridged with the SSQs. I think the issue here though is maybe you've overdrawn, and what we need to do is bridge this right by providing referencing bridges back to the CMINs and the RINs very succinctly. I think we just need to do a better job of that. (Garrett)

Bill Persons said he liked the plan because it precisely weighs out what direction the program wants to do in the next five years. For the most part, he agrees with the direction they're headed and feels that his AMWG representative would be more than happy if he came back and said there is a completed plan.

Larry Stevens also expressed his support for the plan. He feels it has been laid out well and incorporates the many thousands of hours of conversation over what our research and monitoring should be. He feels it it's a way to move forward. (Stevens)

John Hamill concluded by saying there is a collection of things that GCMRC will be doing over the next five years, providing staff support, reporting independent reviews, bridging science and management, logistics, acquisition, etc., and the MRP identifies the anticipated level of funding to do that work. He reiterated that USGS is trying to get their increase to \$2 million. He thinks the MRP should be recommended to the AMWG and be updated to include a long-term experimental plan. He distributed copies of a memorandum from GCMRC to the TWG, subject, "Comment Response re: September 13, 2006 Draft Monitoring and Research Plan (MRP) to Support the GCDAMP FY 2007-11" (**Attachment 8c**) which responds to comments received from other stakeholders on the MRP.

SPG/Science Advisors Assessment MRP Review Comments/GCRMC Response. Dave Garrett distributed copies of the document, "SA's Input on the SPG Process and Science Plans" (**Attachment 9a**) and gave a PowerPoint presentation on "GCD AMP Science Planning Group (SPG) Evaluation of Effectiveness and Recommendation" (**Attachment 9b**). He said one of the criticisms was there were too many meetings and Dave concurred but felt the meetings were needed in order to reach a certain level of trust among the members. Dave held a conference call last week because there were still some concerns about how good the MRP was. The SAs felt the SPG had made progress and there was good direction on the Annual Work Plan, but it also identified areas where the SPG and GCMRC could make improvements.

Long-Term Experimental Plan

Part I - Experimental Options Assessment. John Hamill said there was a small oversight team led by Ted Melis and they had a pretty thorough discussion of the different options. He distributed copies of the report, "Assessment of the Estimated Effects of Four Experimental Options on Resources Below Glen Canyon Dam" (**Attachment 10a**) along with the Executive Summary (**Attachment 10b**) and corresponding PPT presentation (**Attachment 10c**).

Rick Johnson asked if there would be an opportunity to comment on what's in the assessment or if he feels it is a one-time assessment. John told him that he thought the outcome of the assessment would be decided at today's meeting. He said it's complicated to him because it is going to be used in some type of NEPA compliance process but it was unclear to him how that was going to happen. If anyone has comments, they can provide those comments to John.

Part II - Assessment Results. Ted Melis continued the PPT presentation on resource responses for flow and non-flow treatments. He asked that questions be held until after the presentation and said several authors are present to address specific questions.

Part III – Economic Assessment Results. Clayton Palmer distributed copies of the report completed by the Science Advisors entitled, "A Review of the Western Area Power Administration on 'Economic Analysis of

Power Impacts of Glen Canyon Dam Long-term Experimental Options” (**Attachment 10d**) and said his PowerPoint presentation (**Attachment 10e**) would focus on the economic analysis as it relates to hydroelectric power impacts from the proposed options.

Part IV - Evaluation of Experimental Designs. John Hamill proceeded concluded with the following recommendations:

- Complete the current experiment (MLFF)
- Specify desired future conditions
- Implement and scientifically test a temperature control device
- Continue testing sand-enriched BHBFs
- Hydrologic variability masks the effects of Glen Canyon Dam operations in wet years
- Limit confounding variables
- Conduct stable flow tests after current experiment is completed, as needed
- Continue model development to support management decisions

Part VI - Peer Review. Dave Garrett said that even though the Science Planning Group accomplished their goals, they felt it was very important to do an economic assessment and a biophysical assessment of the options. He organized two reviews but since the SAs were reduced and no longer had an economics expertise, he obtained an external review of the WAPA assessment and then the biophysical socio-cultural assessment by GCMRC was done by the SAs (**Attachment 10f: A Review of the GCMRC Report on an “Analysis of Biophysical and Socio-Cultural Impacts of Four Experimental Options”**). He said the TWG had been given the results of both reviews and in the appendices of each of those was a second review of the methods that had been used. They had those reviews and gave that information back to the two groups and asked them to change methodologies as appropriate to improve them. They conducted their assessment and then the assessment was reviewed. They then sent the two assessments out for review and Dave provided a quick overview of those reviews. He said there is still a need for improved specification of methods in the final report, that’s in spite of the fact that there was significant work done on the methodologies in the final report. They found inconsistencies of the statements relating to resource impacts in different sections of the paper. The SAs were keying everything to the Knowledge Assessment report.

TIME CHECK: Kurt said there were two motions that were proposed but neither one had been seconded by the TWG. He suggested using the remainder of the time to discuss the experimental options and the MRP and then focus on formulating some motions tomorrow. However, doing so would result in postponing some items on tomorrow’s agenda: the TWG Ad Hoc Group update, carryover funds, and possibly the Budget FY08 discussion.

NEPA Process: Dennis Kubly passed out copies of a USBR news release, a Federal Register Notice, and a recent letter from AS-WS Limbaugh (**Attachment 11**). He said the Long-Term Experimental Plan (LTEP) EIS will be conducted like any other EIS except it will consider options for experiments recommended by the AMWG which will become part of the public scoping process. There are going to be two scoping meetings in early January (Phoenix and Salt Lake City). He said the process is going to be treated very much as it typically is and the foundation for the development of the alternatives will include whatever set of options come up through the AMWG. He believes this is the first time Interior has handled an EIS with an adaptive management program as part of the process. The documents also contain a reference to the settlement with the Center for Biological Diversity and others which is driving the schedule. The kickoff will be the AMWG meeting (Dec. 5-6, 2006), ensuing public scoping meetings, and the development of alternatives.

Q&A / Discussion on Experimental Options

Q: One thing that I've been pondering in the discussion of weaknesses of the options. Some of these things because of the delay and detectability of young fish, like pictures of difficulty in several of these things and actually seeing a response to the fish. I mean you could have something that you could turn on for two years but it takes awhile for the fish to be detectable. Do these really track and detect the fish? (Werner)

A: That's the basis for our recommendation to continue with MLFF. We had a series of 4 or 5 years now of warmer water temperatures. We've had trout removal and so if we wait and keep things steady for the next 2-4 years, we'll be able to detect if there is a response that can be attributed to those conditions. If we change the flow regime or implement some other major action, then it will confound the interpretation of those effects. That's just the reality. (Hamill)

Q: If the current conditions are the MLFF? (McMullen)

A: That's the no action alternative. (Hamill)

Q: Why was the MLFF not analyzed as far as its effect on resources? (Henderson)

A: It was not an option that came forward to this group. It was basically evaluated against the other options. (Hamill)

Q: Just as a point of clarification, the Bureau of Indian Affairs was a proponent of Option C. It seems as if the sediment trigger was met every year, and we could theoretically have a BHBF every year, so for all options we would have a BHBF. (Knowles)

A: The first year we specifically don't because under the equalized monthly volume fluctuating flows, you're actually trying to answer the question: Can a sediment supply be accumulated from year one to year two? (Melis)

C: In theory but I don't think that's necessarily explicitly stated in any of the options that that's the way it would be. I don't think it's clear how that would be implemented as tests. We've concluded there are several criteria that have been developed for conducting tests. You have to have enough water, enough money, and enough sediment. (Hamill)

C: It's theoretically possible that after the next test, based on those results, you folks may decide enough testing has been done and now you may want to evaluate through monitoring that type of management action. The main recommendation from the sediment side now is that you definitely need to do another test but they're not saying you do five tests. And could the outcome of the next test sufficiently meet your needs and then you have to decide on whether to include this as a management action. (Melis)

C: Those of you who are scientists around the table, I would ask you to look at this program and ask yourself if a student came to you with a proposal for an experimental design, what would you say to them? It's quite clear to me that there has not been an overall hypothesis presented. You have questions about flow and temperature and cold varying factors related to sediment to cost and let us at least understand that we need to frame our experimental hypothesis supposedly as an experimental planning process. Experiments are based on hypotheses that are clearly stated and identify the factors. In the flow you have a variety of options, steady flow, low fluctuations, higher fluctuations, seasonality is another topic there, and ramping. You also have temperature, cool constant versus seasonally variant. I am positive that we cannot approach this process without clear experimental design questions and would recommend that we proceed with that. The question that comes to my mind is there an optimal flow and temperature regime needed to maintain the CRE to weigh humpback chub and beaches. That seems to be the overriding question. Please, let's operate from a clear question rather than from the -" We're putting the cart here of adaptive management planning before we've got a horse of science." We've got a dual carrot that might be economic and environmental methods. I would suggest we have all those mixed up. I recommend we really try to understand what our key questions are then the array of experimental options we're talking about can be put into context. (Stevens)

C: One of the comments I heard from a fish scientist was for us to apply a specific treatment and see a response to HBC, we'd have to see about a 50% change in population in order to be able to detect such small number of fish we're dealing with. The problem I'm having is that we're not looking to receive anything like or near a 50% response. If you want to try things on a forward titration basis where you would try a treatment and then try and get a response, you're not going to be able to see it. I've been working with people in the Upper Basin Recovery Program and they've taken the exact opposite approach where they try to do everything to help out the endangered fish and if they find some things that work, they're probably not going to know what they are and the fish are going to recover or they're going to get better, then as time goes by they will try to eliminate those more costly items from that suite of things they want to do. In that way the endangered fish is helped early. If we try to take an incremental approach, first of all we're probably not going to be able to show them effect and if you wait and see whether or not you get an effect and you keep adding these things one at a time, you're never going to get anywhere. The species is still going to be struggling. That was why we supported the idea of going to the whole suite of things. There are a whole bunch of things out there that based upon not only this particular program but other programs that we know work, certain basic fundamental biological processes that work, and apply some of those things and see if we get a response to population. It seems to me that's the least costly way to do it. I'm just curious as to how you arrived at the conclusion that the reverse titration method is not better than the forward titration method. (Davis)

R: Because there is no documentation that a reverse titration has worked as a strategy. The fish in the Upper Basin is a mess ... so using them as a model for this program is not adequate. (Stevens)

R: Well, I agree with you. It's a mess. I'm not trying to defend the Upper Basin Recovery Program because I do believe it's a mess but that's not what I'm talking about here. Part and parcel up there is because the non-native fish are pummeling the native fish, not the trout, the salmonids. (Davis)

Q: Isn't the temperature control device working up there or not? (Steffen)

A: Well, a little bit on the Flaming Gorge. (Davis)

C: I think we're going under the assumption to try and determine cause and effect relationships between the actions in response to the resource and desirable flow. I just came out of the California desert where there is a \$3 million recovery program for desert tortoise and one of the things that the land management agencies here got hammered on was spending \$100 million and they couldn't tell what was working. They were regulating off-road vehicle use, they were regulating cattle collection. They were doing everything they possibly could but the population of tortoises was continuing to go down and they had no clue whether or not those actions were contributing to the situation in any positive or negative way. The conclusions of that report was that it was irresponsible to be putting all these regulatory effects in place without being able to discriminate cause and effect relationships. There needs to be some accountability. That was the general understanding. Who said you can't detect change? (Hamill)

C: Your biologists said that. Lew Coggins said that. (Davis)

R: I guess I'll have to talk with Lew. There is certainly a power analysis that needs to be done to figure out whether you can detect the change or not. (Hamill)

R: He says you can't because there are so few numbers that you can't apply. Let's say a parasite control and see whether or not you get a change in population or do a flow control and see if you get a change. You just can't detect. You'd have to get a massive change in order to detect.

R: I'll talk with Lew. (Hamill)

C: Since the topic of non-natives has come up, Option B really showed out pretty well. The scariest thing about option B is steady flows and what goes with those non-natives. It wasn't addressed in the presentation. It appears to be it has been glossed over in that assessment and basically comes out as a neutral effect as the most conservative prediction. It seems because the non-natives might benefit or natives might benefit as well under those conditions. I'm not clear on how that's the most conservative position to take for prediction. It seems to me that conventional wisdom and maybe historic evidence shows us that the non-natives out compete the natives under steady flow conditions and so the conventional wisdom would be there is a high risk here, and I guess the most conservative point would be to assume that non-natives are at least an interest. Any response as to how this was addressed up here? (Burton)

R: I guess I thought it was more even. You don't feel that the steady flows could have increased nearshore habitat stability and warming benefits for natives. Certainly non-natives could benefit from that too. I thought we said both of those things in a subsequent document. (Andersen)

Q: So you're saying the most conservative approach is to assume that it's a neutral effect? (Burton)

A: In the absence of more quantitative data I would say that that is a conservative approach to say it's neutral. (Andersen)

R: I would disagree. (Burton)

C: I'd refer to the risk analysis that the Science Advisors did on constructing the TCD where they looked at those kinds of issues. Their bottom-line conclusion was we really don't know what's going to happen if you build a TCD but they recommend moving forward with it. I don't think we clearly know whether or not it's a benefit to natives or non-natives or? (Hamill)

C: The issue of competition has never been even remotely addressed in this program or it comes up all the time testing competition is a formulaic, ecological (?) process. You vary the density of competitors and food resources and watch the effect on your target species. You do that typically in a very controlled environment using a systemwide basis until the response is identified. If you demonstrate competition in a confined environment, this has the possibility of playing out in the larger ecosystem. You cannot demonstrate competition in a closed environment. No likely benefits will play out in the biological NEPA way. (Stevens)

R: For the last several years we've seen some natural warming going on and we have in effect a theory experiment that's been thrown at us and we've seen some of those results today in terms of response to the fish community where we've seen this very positive response to the native fish community presumably to the warmer water temperatures. We've seen similar responses going on with the HBC population. In a way we're being given an opportunity to evaluate those effects before building the TCD. We ought to continue that experiment before we move into something else. (Hamill)

C: I just wanted to mention as one of the sponsors of A and address the question that we were working on a little while earlier which is the science design. We, and AGFD and the Federation of Fly Fishers, have given this question a lot of thought. We think it's clear that has been portrayed and that our option is to achieve the resource goals laid out in the 1996 GCDEIS. One of the things described in the ROD was achieving these goals and if these goals can be achieved, going back and restoring some of the impact of power. So that's where we started. One of the things we now know after 10 years of operating under MLFF is that MLFF has failed to get the improvements to the HBC population anticipated in the EIS. The approach for an endangered species should not be to "dink" around with scientific designs. It should be to implement actions on a kitchen sink basis. I recall 10 years ago standing in a room about this same size with John Hamill directing the Upper Colorado River Recovery program saying "We have done enough research. The endangered species are not increasing in their population. We need to do on-the-ground work and we need to do it and as much of it as we can as soon as we can." And so I believe we're looking at three different paths to recommend

as a FACA committee and to recommend to AMWG as a FACA committee. The paths are: (1) Will we implement actions that benefit the HBC population at least to the point that the FWS will say we've achieved the recovery numbers, at least to that, or (2) Shall we take the path of Option B for example which is we need to do science, we need to have cause and effect established as we go. We need to do it through flow mechanisms or are we going to take the path of (3) which is we need to do science, cause and effect, but we will do it on an incremental basis that has a reasonable impact in terms of power reduction. Those are the three paths and the details as far as I'm concerned are less important. I think we'll work those out more through the Dept. of the Interior's EIS process. We'll work out to a greater extent the details. For example, A or A Variation. I think those are matters of details that will be worked out as you uncover the anticipated effects to power and other resources. Extracting these kinds of details that we're just talking about, the question for the TWG and the subsequent question for the AMWG is: What's the path do you want to trod? Once you've assigned or identified that path from basically a policy point of view, then you start enumerating the details of that path. That in my view is what's under consideration. (Palmer)

C: I think part of the question that Gary asked and I'd like to follow up on is with regard to stable flows. I think that what we've seen over the last 10 years in stable flows is an increase in RBT populations and the impacts from those. We've assumed that the increase in trout populations has had a detrimental effect on HBC at the LCR. The scientists, including Carl Walters, have attributed those increases to flatter flows for MLFF. And so it seems to me that again under your analysis and about stable flows, going to the assumption there is a neutral effect or that this has a beneficial effect to RBT is probably true and it will have a beneficial effect on RBT but to me an integrated look at that seems to be a detrimental effect on HBC. They kind of go together. If you're going to improve the RBT conditions, it seems to me that you're going to have an impact on HBC under that scenario for stable flows. Do you want to comment on that at all? The past two speakers have made a couple of assumptions that are contrary to what I know anyway, one is that the HBC population continues to decline. We have presented to this body and the general public with a Fact Sheet that shows how the HBC population in Grand Canyon stabilized at about 5,000 individuals in 2000 and that is the largest population that exists anywhere in the world of HBC. The populations in the Upper Basin continue to decline so this population is relatively stable. In reference to endangered species considerations, that's still a doubling of the most recent recovery goals. Given that those have been set aside by a court order, there aren't any recovery goals at the moment but the most recent guidance that we had we have more than achieved in this environment anyway those goals for HBC. Secondly, we've watched a presentation this morning by AGFD about how the RBT population has been declining for the past 5-6-7 years so I'm not sure what the tripling of RBT population references. Number 1, the HBC population declined to the level you're talking about in 2000 and that's what I'm talking about. Under MLFF which has been in existence for longer than the last five years. Was that responsible for the decline in HBC down to what you now call a stable population? (Davis)

R: I don't know if anyone knows that. (Andersen)

C: We don't know that so to jump to the conclusion that the HBC population is now stable because the trout population _____. (Davis)

R: Again, we refer to that Fact Sheet. I don't claim to understand why that population is stabilized where it is. There are a lot of theories, one of which may be that none of the actions has had an effect since we dropped the carrying capacity in the LCR but there have been other actions including different kinds of experimental flows, both low and high experiment flows. There has been control of RBT. There has been a natural warming in the system. Was it "D" all of the above? A, B, or C? The jury is still out on this. (Andersen)

R: And that's why I'm concerned about any kind of a conclusion in the assessment report which reached the conclusion that stable flows will in fact help the RBT population without also making a simultaneous comment about the effect of that increase in trout population on HBC. That's what I'm concerned about. (Davis)

C: We're having this response today but what is the bigger, broader process of responding to this assessment? There is no process? I'm trying to think of what is going to be presented to the AMWG. It is going to be the same that was presented today or is it going to be something that has been modified by the comments. Here again, the calendar is against us. We have to mail out the AMWG materials by next Tuesday [Nov 14]. (Kubly)

At this point Kurt said he thought the TWG would want to make a recommendation to the AMWG about the experimental options and the analysis by GCMRC and whether or not there is a process whereby they want to rank them. He said there were two motions to be presented one of which was from Grand Canyon Trust, however, Rick Johnson had to leave early but before he did, he added three items to his motion. The current three now becomes four and he advised the TWG to review as they will be discussed and voted on at tomorrow's meeting. Kurt also said there were two motions presented before this meeting which are intended to help facilitate the process of the TWG dealing with experimental options and how to make a recommendation to the AMWG. He said that discussion would take place tomorrow morning.

Adjourned: 5 p.m.

Glen Canyon Dam Technical Work Group Meeting
November 8-9, 2006

Conducting: Kurt Dongoske, Chairperson

Convened: 8 a.m.

Committee Members Present:

Mary Barger, WAPA
Steven Begay, Navajo Nation
Charley Bullets, Kaibab Band of Paiute Indians
Kerry Christensen, Hualapai Tribe
Jonathan Damp, Pueblo of Zuni
William Davis, CREDA
Lloyd Greiner, UAMPS
Jay Groseclose, NM Interstate Stream Comm.
Christopher Harris, CR/CA
Norm Henderson, NPS
Amy Heuslein, BIA
Rick Johnson, Grand Canyon Trust
Robert King, UDWR

Dennis Kubly, USBR
Glen Knowles, USFWS
Phillip S. Lehr, Colo. River Comm./NV
Ken McMullen, NPS/GCNP
John O'Brien, GCRG
Don Ostler, UCRC
Bill Persons, AGFD
D. Randolph Seaholm, CWCB
Mark Steffen, Federation of Fly Fishers
Larry Stevens, Grand Canyon Wildlands Council
Bill Werner, ADWR
Michael Yeatts, The Hopi Tribe

Committee Members Absent:

John Shields, WY State Engr. Office

Alternates Present:

Don Ostler

For:

John Shields, State Engineers Ofc./WY

Interested Persons:

Matthew Andersen, USGS/GCMRC
Craig Anderson, USGS/GCMRC
Charley Bullets, Kaibab Paiute Tribe
Gary Burton, WAPA
Helen Fairley, USGS/GCMRC
Dave Garrett, M3Research
J. Lonnie Gourley, USBR
John Hamill, USGS/GCMRC
Lynn Hamilton, Grand Canyon River Guides
Leslie James, CREDA
J.D. Kite, USGS/GCMRC
Ted Kennedy, USGS/GCMRC

Lisa Leap, NPS/GRCA
Paul Li, Bob Lynch's Office
Ted Melis, USGS/GCMRC
Clayton Palmer, WAPA
Joel Pedersen, Utah State University
R. Scott Rogers, AGFD
Tom Ryan, USBR
LeAnn Skrzynski, Kaibab Band of Paiute Indians
Pam Sponholtz, USFWS
Dave Topping, USGS
Ellen Wohl, Colorado State University
Scott Wright, USGS/GCMRC (via phone)

Recorder: Linda Whetton, USBR

Welcome and Administrative. The Chairman welcomed the TWG members, alternates, and interested persons. A quorum was established and attendance sheets distributed. He asked if there were any comments from the public regarding items from yesterday's meeting. Hearing none, he advised the TWG they would have 50 minutes to (1) deal with the experimental options and the analysis by GCMRC and develop a recommendation to AMWG, and (2) make a recommendation on the Monitoring and Research Plan.

Based on yesterday's meeting, Kurt said he didn't get a clear sense of the TWG's reaction to the analysis done by GCMRC and wanted to use the first 15 minutes to get comments from the TWG on their opinion of the analysis of the options done by GCMRC. He would like to have a clear understanding of what the TWG would like him to report to the AMWG, how the discussion proceeded, and the comfort level of the TWG had with the analysis performed.

The following comments were captured on flip charts:

1. Good information, but needs clarification.
2. Issue of drift – needs work
3. DSV effect on YOY HBC – needs temperature variable
4. RBT Conflict with HBC – steady flows
5. Inconsistency between Executive Summary and 10/26/06 Document GCRMC Assessment
6. Need to develop coherent scientific framework
7. Need to move forward with the recognition that there is disagreement and scientific uncertainty
8. Lack of clarity of what is the experiment
9. Assessment does not consider the integration of the effects
10. What is the effect of continuation of MLFF (Base condition)
11. Economic assessment too limited to hydropower. What about other economic impacts to resources?
12. Concerned about absolute values used in hydropower economic assessment
13. What is the process for responding to the GCMRC Assessment?
14. Need more information – Assessment too qualitative – need more quantitative assessment
15. Economic effect of hydropower in a broader context – Regional?
16. How do we proceed – What is the EIS Process?
17. Need to move forward
18. Asked by SOI Designee to provide a suite of experimental options – no need to choose one.

Mary Barger requested to introduce her motion (which had previously been distributed to the TWG) but Kurt expressed concerns that her motion had two elements/two activities that would be done by the TWG; one is to give a thumbs up or down on the individual options and the other one is to rank the options. He also said that Rick Johnson wanted to propose a motion which puts the TWG in a bit of a conundrum in that they're going to have to look at both motions equally and choose one over the other or choose to create a hybrid motion. There was additional discussion as to whether the DOI agencies should vote because they might be seen as second-guessing and/or pre-empting the NEPA process. Rick said he was concerned that in passing one motion, the other motion (his motion) would be irrelevant. He didn't think it was particularly fair regardless of which motion came in first. Kurt said that in all fairness Western's motion came in first and that Rick's motion was in reaction to Western's motion. Therefore, he accepted moving on WAPA's motion first.

Mary proposed the following motion:

Western Area Power Administration:

The TWG shall adopt a two-step process for developing a recommendation to the AMWG regarding the four proposed experimental options.

First, voting TWG members will vote up or down on the merit of each option to be included in the recommendation to AMWG.

Second, remaining experimental options for AMWG consideration shall be recommended by the TWG in rank order. The TWG voting process to establish the rank order will be as follows: each voting TWG member will assign a rank number (up to the number of options established in first step voting) to each of the remaining options, Each rank number can only be assigned once per voting member. The highest rank number will be the highest support vote with the lowest rank number as the lowest support vote. The resulting tally will establish the TWG rank order recommendation for the AMWG to consider."

Motion seconded by Lloyd Greiner.

Because the motion was presented in a two-step process, the TWG had concerns on how to vote on the motion. Mary explained there have been some questions about how this works and the discomfort of how it weighs into the EIS process. She explained the ranking process: Members would vote up or down and then they would all be ranked. Each person would then get a vote of a 4, a vote of a 3, a vote of a 2, and a vote of a 1. The total score would be assigned to each of the options and the results forwarded to the AMWG.

Mary said WAPA's motion was just another way of providing a sense of what the TWG felt and hopefully the information would be included somewhere in the EIS. John O'Brien expressed concern that the MLFF option was not considered. Mary said that was because the four options proposed by the SPG didn't include the MLFF. Norm said that was a problem for him because then it implies that the MLFF is not even part of the Secretary's consideration for all options to be considered. Mary stated she was on the SPG, the LTEP, and the Core Monitoring Group and no one proposed MLFF. Ken said he agreed with 90% of what Mary said but reminded the TWG that the groups had started out with proposals from GCMRC on Options 1 and 2 and that included the continuation of the experiment of MLFF and some change to that experiment in one of those options. The SPG group then left that behind and moved into these other four options so there wasn't discussion early on about MLFF but it did get consideration for whatever reasons. It's always been there but it's like many options that were thrown out during that process, some were vetted and some were not. Ken feels that MLFF should be considered as an option and it should've been assessed under existing conditions.

Rick said his motion was in response to WAPA's motion because he didn't feel any of the options nor the assessment was at the level of development the TWG should even be considering at this point. He presented the following motion but said he left the recommendations open as a way of including more discussion from the TWG:

Grand Canyon Trust Motion:

Whereas: there has not been sufficient time for the TWG to provide comments to GCMRC on the Resource Assessment of the four experimental options and for GCMRC to reply;

Whereas: an objective list of criteria for TWG to base a recommendation(s) on the options has not been created and agreed to by TWG;

Whereas: the Department of Interior is initiating an EIS on the development of a long-term experimental plan in conjunction with the AMP, and the EIS process will require additional public scoping and development of alternatives;

It was resolved that:

1. It was not constructive for the TWG to attempt specific recommendations for each option at this time.

However, the TWG does make the following recommendations:

- 1. The description of the Experimental Options [does/does not] accurately and sufficiently describe the purpose and approach of each option;**
- 2. The Experimental Options [do/do not] represent the full range of possible options for meeting the requirements of NEPA and the intent of the Grand Canyon Protection Act;**

3. The information contained in the Resource Assessment [is/is not] an accurate portrayal of relevant scientific results and expert opinion.

4. The information contained in the Resource Assessment [does/does not] provide the necessary detail to recommend the most appropriate option to meet the intent of the Grand Canyon Protection Act.

Rick said he didn't feel the options had been fleshed out enough to be comfortable in making a recommendation to the AMWG. For example, he expected the SPG would've put all the options on the table and evaluated how each would focus on native fish, sediment, and cultural resources, etc., so that the TWG could have a thorough discussion. Randy agreed with Rick but said the DOI settlement with the Center for Biological Diversity has an obligation to move forward on the suite of options and believes the EIS process will become bigger than the TWG and its recommendations. He feels there is a lot more work to be done in evaluating the options and that the process WAPA outlined allows the TWG to give the AMWG some sense of where to go and buys additional time to weigh the merits of both approaches.

Kurt suggested putting the motions side by side or doing each motion one at a time. Mary said that WAPA would be open to any friendly amendments in order to help people feel more comfortable in supporting it. Norm offered the following amendment as a third tier: "Adopt these as a suite of options to go forward to the Secretary for consideration within the EIS process," in order to make it clear that it's a suite.

Kurt said he wanted to clarify that the group was going to vote on the WAPA motion to see who supports utilizing that motion which then can possibly be amended to move forward in developing a recommendation to AMWG. After this, the TWG would vote on the motion proposed by Grand Canyon Trust.

GCT Motion Withdrawn. At this point in time, Rick withdrew his motion stating that he felt it was pointless because there was more work to be done on assessing the options and he didn't want to spend all morning arguing about it. He doesn't think it really matters because the AMWG is not going to be the decision maker and the information will go into the LTEP EIS process.

The members held a 5-minute caucus. Upon return, Kurt explained how the voting would be handled: **The first motion** would deal with WAPA's motion recommending that all four options and the MLFF be considered for development of the long-term experimental plan and **the second motion** would deal with the ranking process with number 4 being the highest and number 1 being the lowest. .

Motion: The TWG recommends to the AMWG that all four options and the MLFF be considered (both scientifically and for management purposes) for development of the Long-Term Experimental Plan. Motion seconded by Lloyd Greiner.				
Representative	Stakeholder Entity	Yes	No	Abstain
Bill Persons / Scott Rogers	Arizona Game and Fish Department	1		
Amy Heuslein / Garry Cantley	Bureau of Indian Affairs			1
Dennis Kubly / Randy Peterson	Bureau of Reclamation	1		
Mike Yeatts	Hopi Tribe	1		
Kerry Christensen	Hualapai Tribe	1		
Ken McMullen / Jan Balsom	National Park Service - Grand Canyon	1		
Norm Henderson / Chris Kincaid	National Park Service - GLNRA	1		
Steven Begay	Navajo Nation			1
Jonathan Damp / Suzette Homer	Pueblo of Zuni	1		
VACANT	San Juan Southern Paiute Tribe			
Charley Bullets / LeAnn Skrzyński	Kaibab Band of Paiute Indians	1		
Glen Knowles	U.S. Fish and Wildlife Service	1		
Mary Barger / Gary Burton	Western Area Power Administration (DOE)	1		
Rick Johnson / Nikolai Ramsey	Grand Canyon Trust		1	

Larry Stevens	Grand Canyon Wildlands Council		1	
Mark Steffen / Tim Steffen	Federation of Fly Fishers	1		
John O'Brien / Andre Potochnik	Grand Canyon River Guides	1		
Bill Werner	Arizona	1		
Christopher Harris	California	1		
Randy Seaholm	Colorado	1		
Phil Lehr	Nevada	1		
Jay Groseclose / Don Ostler	New Mexico	1		
Robert King	Utah		1	
John Shields / Don Ostler	Wyoming			
Bill Davis	CREDA	1		
Lloyd Greiner	Utah Associated Municipal Power Systems	1		
Totals		19	3	2

Rick Johnson (voting no): That motion is irrelevant. Kind of like the whole TWG.

Robert King (voting no): I think it's non-responsive to what we were asked by the AMWG irrespective of what we think. the Secretary and AMWG are going to ask us.

Steven Begay (abstaining): The motion that was moved by Mary and seconded by Lloyd is not what the vote was called for. This vote was for a motion that was not moved by anybody and not seconded by anybody in the group. The second part of the motion should be an amendment to this motion.

Motion: The TWG recommends to the AMWG the following rank order of the four options for development of the Long Term Experimental Plan, for Option A, Option A Variation, Option B, and Option C. Motion seconded by Lloyd Greiner.

Representative	Stakeholder Entity	Option A	A Var.	Option B	Option C
Bill Persons / Scott Rogers	Arizona Game and Fish Department	4	3	1	2
Amy Heuslein / Garry Cantley	Bureau of Indian Affairs	a	a	a	a
Dennis Kubly / Randy Peterson	Bureau of Reclamation	a	a	a	a
Mike Yeatts	Hopi Tribe	a	a	a	a
Kerry Christensen	Hualapai Tribe	3	1	2	4
Ken McMullen / Jan Balsom	National Park Service - Grand Canyon	a	a	a	a
Norm Henderson / Chris Kincaid	National Park Service - GLNRA	a	a	a	a
Steven Begay	Navajo Nation	a	a	a	a
Jonathan Damp	Pueblo of Zuni	3	4	1	2
VACANT	San Juan Southern Paiute Tribe	vacant	vacant	vacant	vacant
Charley Bullets/LeAnn Skrzyński	Kaibab Band of Paiute Indians	2	1	4	3
Glen Knowles	U.S. Fish and Wildlife Service	a	a	a	a
Mary Barger / Gary Burton	Western Area Power Administration (DOE)	4	3	1	2
Rick Johnson / Nikolai Ramsey	Grand Canyon Trust	a	a	a	a
Larry Stevens	Grand Canyon Wildlands Council	a	a	a	a
Mark Steffen / Tim Steffen	Federation of Fly Fishers	4	3	1	2
John O'Brien / Andre Potochnik	Grand Canyon River Guides	a	a	a	a
Bill Werner	Arizona	4	3	1	2
Christopher Harris	California	4	3	1	2
Randy Seaholm	Colorado	4	3	1	2
Phil Lehr	Nevada	4	3	1	2
Jay Groseclose	New Mexico	3	4	1	2
Robert King	Utah	3	4	1	2
John Shields / Don Ostler	Wyoming	3	4	1	2
Bill Davis	CREDA	3	4	1	2
Lloyd Greiner	UAMPS	3	4	1	2

	4	7	6	1	1
	3	7	7	0	1
	2	1	0	1	13
	1	0	2	13	0
	abstaining	10	10	10	10
		25	25	25	25
	Total	51	47	19	33
	Percent	85	78.3	31.7	55

Report of the Physical Resources Monitoring Peer Review Panel. Ted Melis introduced Dr. Ellen Wohl, a professor at Colorado State University, who was also the chair of the Sediment Protocol Evaluation Panel. The panel had met previously in 1998-99. The panel was given the charge to review the research and development findings and results from 5-6 years of work that were approved in sediment research and monitoring. The final report (**Attachment 12a**) was delivered to GCRMC on October 6, 2006, and it has been posted and distributed. Dr. Garrett added that Dr. Wohl has also been appointed to the Science Advisory Board to provide expertise in the field of geomorphology. Dr. Wohl gave a PowerPoint presentation (**Attachment 12b**). She concluded with the following recommendations:

1. The panel stresses the need for more experimental flow releases in order to assess the adequacy of models.
2. The panel emphasizes the need for (1) clear articulation of a structured approach that guides core monitoring and analysis efforts, (2) closer integration within the physical resources program between modeling and applied studies, (3) integration of frequent experimental releases in core monitoring and analysis, and (4) development of a common frame of reference and discussion of trade-offs among differing resources.

John thanked Ellen and the panel for all their work and said there are a number of things within the MRP that seem to address the activities outlined by Ellen. For example, under plans to update the conceptual ecosystem model, GCMRC will be working with the science advisors this year to develop a work plan for the scope of that particular activity. One of the things they have implemented is monthly integrated science meetings where all the different disciplines are brought together. They also plan to develop a science plan to go along with the experimental options that integrates a lot of today's comments and recommendations. He said there is support for the concept in the MRP and the next step would be to produce an evaluation report to the TWG which would provide sufficient information for the TWG to determine whether or not a project is suitable for moving into the core monitoring status. Their goal is to have that report to the TWG by April 2007. Scott Wright is also moving forward with putting together a modeling workshop to follow up on how we can improve some of these models so that the little subgroup is going to be getting together and provide recommendations.

Cultural Sites Along the River Corridor in Grand Canyon. Joel Pedersen said that he and Jonathan Damp are currently working on the first draft of the treatment plan and today's presentation would be a preview of that document. Joel cautioned that his presentation, "Grand Canyon Treatment Plan Preview" (**Attachment 13**), includes preliminary information which will likely change in the next few months.

Q: *Have you considered doing some kind of a ranking exercise along with what we just did because all or some of those processes will presumably affect many of those sites? So you're just focusing on the dominant one but don't necessarily say that all the other ones aren't also playing in at some level. (Fairley)*

A: *We had to pick a single process. At any given site there are usually multiple processes happening that might be degrading the site and we definitely have to pick the number one. And in some cases, that was difficult to do. I'm also going to claim that although Helen is right that it would be nice to have some way of talking about what's the secondary one and get a better feeling for it, I really believe that you'll end up with a very similar ranking of importance. (Pedersen)*

Q: *But you did have sites where creep was the most important? (O'Brien)*

A: This suggests that there are actually 26 sites where creep was the dominant process degrading the site. And actually creep by definition is happening at every single site. (Pedersen)

Jonathan proceeded with his portion of the presentation. Jonathan said the erosion was characterized as either 1-5 depending on severity. They did the same thing for the information potential of the archeological sites and developed a matrix with number 1 having the least (lowest) information potential and number 5 having the most (highest) information potential. The easiest way to see it for an individual site is to ask how many questions you can ask of that site. It's a little more complex than that but the more questions asked, the more information potential it has. They're guided by federal regulations and coming up with the plan. For example, category 1 might be a pot just sitting out there by itself. That pot has already been recorded. All the information about it has been put down and is on file somewhere. There also might be limited information potential on petroglyphs and the rock art that's been recorded. It doesn't mean the information isn't important to Native Americans but as far as the categorization and development of a treatment plan through data recovery, this is how the rankings are proceeding.

Continuation of MRP Discussion

Bill Werner proposed the following motion:

Move the TWG recommend to the AMWG (a) acceptance and implementation of the Sept. 13, 2006 Draft of the MRP, and (b) the MRP be amended to incorporate the Long-Term Experimental Plan once it is finalized by the AMP/DOI.

Motion seconded by Larry Stevens.

Randy Seaholm said there have been a lot of good discussions with the Park Service, Reclamation, and others. Basically they're okay with having the Draft MRP go forward as an interim working document but there are some things they would like to see further incorporated. For example, there were some information needs and things that showed up as priorities from discussions and they would still like to have the opportunity of incorporating those things into the MRP as well. As such, he introduced the following motion:

The TWG recommends that the AMWG adopt the Sept. 13, 2006 draft MRP as an interim working document to be used to assist in the development of the annual budget and workplan until it is fully completed. Completion of the MRP for TWG/AMWG approval will require GCMRC and TWG to work together to address the following needs:

- **Clarification of the relationship between the Strategic Science Questions (SSQs) and the existing INs**
- **Further integration of stakeholder input into the development and selection of the SSQs**
- **Clarification of the relationship between selected SSQs and the proposed MRP projects**
- **Better incorporation of the concepts of the Core Monitoring Plan development process specified in the Provisional Core Monitoring Plan**
- **Definition and implementation of a process for identifying and distinguishing between management actions and research/experimentation integrated into the MRP**

The TWG recommends the use of a facilitator to work with GCRMC and the TWG to immediately develop and implement a process for addressing these concerns and incorporating the results of discussions about the above factors.

Motion seconded by Larry Stevens.

Bill Persons felt that the process was done a couple of years ago. Norm agreed but recognized that a certain group of stakeholders recognized the process isn't totally satisfactory and that there is some additional work that needs to be done. John Hamill said the TWG needs to realize GCMRC spent the last

year getting to the point where they're at today. To him, the plan has implications for the Strategic Science Plan that have already been approved. He is not prepared to go forward with these core monitoring workshops to evaluate things if in fact the TWG is going to go back and sit on it. He expressed concern about the relationship to the SSQ and MRP projects that requires going back and looking at the Knowledge Assessment and how the SSQs were developed. John feels this is a major step backwards. He stressed there are processes built into the MRP where many of these same issues will get addressed. For example, in core monitoring, GCMRC has laid out a very stepwise process wherein they're going to bring back proposals, hold information needs workshops, where the incorporation of RINs and CMINs will get brought to the TWG for them to evaluate whether or not they're adequately addressing the priorities that have been developed through this program. He thinks there are processes built into the MRP that will address many of these issues and give you and everyone a second chance in trying to provide the level of precision and direction that you all seem to desire.

TIME CHECK: Kurt reminded the TWG they had less than 2 hours to come to resolution on the current motion and then deal with the BHBF. He asked for primary concerns from the stakeholders.

- *This plan doesn't include refugia and to get some things that address that concept into the monitoring plan and until that particular issue is addressed, we're not comfortable with advancing the plan. (Seaholm)*
- *I'm concerned with the issue of SSQs and how they relate to the projects we're getting at. The projects are generalized to the point that yes they address SSQs or maybe some RINs as they're identified in the plan but they're not designed to specifically answer some of the questions that have been brought up by stakeholders. . Without that assurance in the plan, you've got some high priority specific questions out there and I'm just fearful that we'll get down to the end of five years and we'll still be sitting there with those same questions and potentially could be answered through a very focused science project and we'll be sitting there asking the same question. (Henderson)*
- *My concern is derived from questions Reclamation has been receiving lately about the cost of this program and what science is coming out of it. It is a question of accountability and prioritization. We are addressing lots of questions year after year after year but which of those questions are we actually answering and isn't it time to start and pick the few that we can actually answer in a 5-year plan, concentrate on those, and when we get done, say we have accomplished something more than just addressing questions. The second thing is there are elements in this plan that I think assert an authority that is not in the USGS and that has to do with an identification of actions where there would be a transfer of funding over to an agency in the Department of the Interior. That authority doesn't lie with the USGS. And if that were taken out of the document, that would help a lot. On the subject of management actions and treatments, we were assigned by the Assistant Secretary in his June letter to undertake a process to determine when treatments could be converted to management actions because that's very important to Interior. What have we done in this document? We just assign it. We just say it is so. That's not a process. It doesn't have a technical basis for it. So those are three objections that I have. (Kubly)*
- *I don't think passing this motion precludes us from doing what was suggested to take those concerns from a group of stakeholders, put them in the minutes, make sure those go forward, and then figure out how to deal with the next step but let's not send the Center back to the drawing board on this 5-year monitoring and research plan. I think we're sending the wrong signal if we go back to the AMWG and say well, we couldn't approve this plan. (Persons)*
- *What I hear people saying is that the program has done some work in the past on its Strategic Plan and there are some stakeholders around the table that feel there is not good enough link between the MRP and that earlier work and maybe just some general dissatisfaction with parts of it. I don't really want to give it back to GCMRC either. It just seems to a lot of folks in the program this is a very important document and I think it maybe it needs a little more involvement on the part of the TWG to get it to a point where more people can be comfortable with it. So maybe the solution isn't to give it back to GCMRC but to take it from them and to do some stuff with it and fix the problems that people have identified. (Knowles)*
- *I see the terms defined in the second motion as very vague. Improve this. Make this better. Integrate this. That can go on for years. There is no defined goal so I can understand where you're coming from. It is to make things better is what you're saying in the motion so I don't know what that means either. There is no defined limit to that. I think those are fine goals but it seems to me that you put that in the introductory part of the plan and say we need to improve these areas and that becomes part of what we continue to do to improve the integration, to make this more clear. I don't know. It's just not defined. (Davis)*

John said he would only ask that if they go down this road - hiring a facilitator, starting this process up, and having it in the near term - then the TWG needs to go through the workplan and tell GCMRC what it is that they don't want them to do. He expressed frustration that the TWG approved the workplan and every time he presented the workplan, it was followed by a discussion of the MRP. He now feels the TWG is moving in a new direction stating that a facilitator is needed. They hired a facilitator last year who worked with them for a year to get to where they're at today. He doesn't feel it's a good direction and asked Kurt that if the TWG continues down this path, then the TWG is going to have to tell him what work will need to be deferred in the FY07 workplan. (Hamill)

Dennis asked that if the long-term experimental plan is at least a 10-year investment, then what is it doing in a 5-year monitoring and research plan. Bill Werner said it wasn't, but that once the EIS process is completed there will be something that continues on through 2011 and hopefully that process will be done before 2011. Dennis said his reason for asking is that part of it seems predicated on moving it in and that the program always had a long-term experimental plan as a separate plan with its own time frame. He asked if they would need to wait for the long-term experimental plan to be inserted into this document when it's only a 5-year document as people were complaining before about open-endedness.

Rick said that the date on the draft is Sept. 13, 2006 and asked John if it was his intent to finalize it sometime in the future. John said that once the AMWG accepts the plan, GCRMC would finalize it.

Kurt read the motion again and the members voted on it.

Motion: TWG recommends to the AMWG (a) acceptance and implementation of the September 13, 2006, draft of the MRP and (b) the MRP be amended to incorporate the long-term experimental plan once it is finalized by the AMP/DOI. Motion seconded by Larry Stevens.			
Representative	Stakeholder Entity	Vote	
Bill Persons / Scott Rogers	Arizona Game and Fish Department	y	
Amy Heuslein / Garry Cantley	Bureau of Indian Affairs	a	
Dennis Kubly / Randy Peterson	Bureau of Reclamation	n	
Mike Yeatts	Hopi Tribe	y	
Kerry Christensen	Hualapai Tribe	y	
Ken McMullen / Jan Balsom	National Park Service Grand Canyon	n	
Norm Henderson / Chris Kincaid	National Park Service - GLNRA	n	
Steven Begay	Navajo Nation	y	
Jonathan Damp / Suzette Homer	Pueblo of Zuni	absent	
VACANT	San Juan Southern Paiute Tribe	vacant	
Charley Bullets / LeAnn Skrzynski	Kaibab Band of Paiute Indians	y	
Glen Knowles	U.S. Fish and Wildlife Service	n	
Mary Barger / Gary Burton	Western Area Power Administration (DOE)	n	
Rick Johnson / Nikolai Ramsey	Grand Canyon Trust	a	
Larry Stevens	Grand Canyon Wildlands Council	y	
Mark Steffen / Tim Steffen	Federation of Fly Fishers	y	
John O'Brien / Andre Potochnik	Grand Canyon River Guides	y	
Bill Werner	Arizona	y	
Christopher Harris	California	y	
Randy Seaholm	Colorado	n	
Phil Lehr	Nevada	y	
Jay Groseclose / Don Ostler	New Mexico	y	
Robert King	Utah	y	
John Shields / Don Ostler	Wyoming	y	
Bill Davis	Colorado River Energy Distributors Association	y	

Lloyd Greiner	Utah Associated Municipal Power Systems	y	
		Total Yes	16
		Total No	6
		Total Abstain	2
		Total Voting	22

Norm Henderson: (voting no). We'd be prepared to make a minority report for presentation to the AMWG. Basically the same concerns we already expressed.

Ken McMullen: (voting no). The only problem I have with this motion is the fact it doesn't really provide for a work in progress as I read that. With the outstanding issues that have surfaced today and the fact that I think the science advisors have some similar comments in those same directions on the MRP. I can't say. I'd like to see a statement that some future period that we can look at that and amend or adjust or tweak the MRP over the next few years to incorporate the rest of the concerns.

Rick Johnson: (abstaining): Ditto to Ken's comments.

Glen Knowles: (voting no): I think it's what Ken said. I don't know why people wouldn't like the idea of goals. That's kind of what the RINs were all about. The document does it to some degree but it could do it better. I would think that everybody around the table would love the idea of setting concrete goals that we're going to nail down in five years. I can't believe people wouldn't want that.

Kurt asked if the group was prepared to move on to the BHBF or if they wanted to consider the other motion but cautioned that if they did consider the other motion, they would be contradicting themselves. Norm said unless someone had a different opinion, he didn't think it was worth going through. Randy also agreed but thought that Norm's idea of the dissenters to prepare a minority opinion would be the appropriate thing to do to advance that.

Dennis asked the chairman that the TWG consider reviewing their Operating Procedures because there were two instances today where competing motions were allowed along with the introduction of a second motion without proceeding with the discussion of the second one. He felt that was a liability and just because a TWG member sends in a motion prior to another TWG member shouldn't necessarily give it leverage over that second motion. Kurt concurred and said he would contact Mary Orton for advice on how motions should be introduced with regard to Robert's Rules of Order and report back to the TWG.

ACTION ITEM: Kurt will contact Mary Orton to ask for advice on how motions should be introduced in regard to Robert's Rules of Order and report back to the TWG.

HBC AHG Update Glen Knowles said the draft plan is pretty much completed. He needs to make some final editorial revisions and give it back to the ad hoc group for their final approval of the draft. It would then be given to the Science Advisors for their review. When that is completed, it would be given to the TWG. Per direction from AMWG, they would then develop a response to comments to the TWG comments and the Science Advisors' comments and deliver all of that to the AMWG and to the AMWG HBCAHG that is suppose to evaluate the projects with regard to whether or not they're in or out of the program. He anticipates having the plan to the Science Advisors in early December. He's already talked with Dave Garrett about this so hopefully the timing will play out so that the TWG will receive their comments at their next meeting.

Dave said he would really like to have more time so the Science Advisors can contact other specialists around the country.

Beach Habitat/Building Flow. Ted Melis distributed copies of his PPT presentation entitled, "Status of Sand Supplies in the Colorado River Below Glen Canyon Dam" (**Attachment 14**). He also showed a slide with information tied in part to the Rubin, et al. memo that was circulated a few weeks ago containing additional information on biological elements of the program related to this concept of the BHBF testing.

Ted concluded current sand enrichment makes 2007 an ideal opportunity to conduct an experiment and utilize limited sand resources to meet Goal 8 and other goals. This situation occurs on the average once

every five years and the last time this level of tributary sand input for the Paria occurred was about 8 or 9 years ago. Properly timed controlled floods from the dam are the only known flow option for sandbar habitat restoration and it's the one they're currently working on and testing.

TIME CHECK. Kurt said it was almost 2:30 and he wanted to have John O'Brien introduce the motion by Grand Canyon River Guides.

John said it was their intent to pick a time frame or a window that would allow for input from other members of the TWG that would minimize damage and maximize benefit. He read the GCRG motion:

The TWG recommends to the AMWG that the Secretary of the Interior implement a BHBF in the timeframe from mid-January 2007 to March 2007 in accordance with a science plan to be developed by GCMRC, approved by the TWG, and funded from the experimental fund.

Motion seconded by Rick Johnson.

Q: The motorized vehicle restriction (NPS permit) is not an issue? (Stevens)

A: No, because it's my understanding and I haven't read through the whole management implementation plan, my understanding is there is that option to use. (McMullen)

Q: And I understand the need for the calibration of models and re-proofing as part of this BHBF. Would there be a hypothesis to try and test that is in this experiment? (Garrett)

A: There would be. Among the sediment scientists we've been doing planning around the concept of a future test since the Knowledge Assessment Workshop and most recently in August after the PEP review meeting because we had all the scientists together. We've also been starting to have meetings with our biology program staff to talk about what a new future plan would look like for BHBFs. This kind of work actually requires a lot more detailed measurements at least at a few sites and we did kind of a pilot study for some of that with Scott and Mark Schmeckly who was here earlier and some others in 2004. And now that we have evidence that there really is something to this, we'd have to add some new components. We might do some things differently. We might not do some things we did in 1996. We might do more of what we did in 2004. So as you learn, you kind of focus your questions more and more to the extent you can and the new technologies we have now for sediment measurements, bed topography, in real time would probably help us get it down to help us understand what happens. It probably requires some re-thinking of old plans but not starting over from scratch so we're trying to build on the past and develop more sophisticated plans and perhaps focus our studies on places we think we can do this but it's hard to explain right now exactly what the process is. (Melis)

Q: As the motion is written, there would be another science plan developed? Is that the intention of GCMRC to come up with a science plan for this BHBF? And if so, what are the time frames for that, the review process? (Henderson)

A: Well at this point all we alluded to was that we would develop a science plan and bring it to this body for their approval prior to implementation. We are prepared to do that by some time in mid-January. Upon approval of the TWG, we would go back and begin developing that plan next week with the idea that we need to bring something back to this body for review and discussion sometime either in December or right after the first of the year. (Hamill)

Q: So the intention is that the BHBF would have to be in the winter-spring period? (Henderson)

A: Yes, that's been our thinking all along is that this would occur sometime between mid-January and March, that we use these conditioning flows of trying to better re-distribute the sand supply throughout the river system to see if we could get a more robust response this next time around. We think that the MLFF provides an opportunity to do some of that redistribution. Maybe Ted could comment exactly how we might determine what the appropriate timing of that BHBF and I think they have some strategies for that. (Hamill)

Q: That would be recommended in the plan? (Henderson)

A: Yes. (Hamill)

Q: We've done remote sensing and overflight imagery for previous tests and just wondering if that would be part of this so we can see sort of a comprehensive evaluation of beaches and fluctuations? (Henderson)

A: It would be in the plan as actually to do that in the context of monitoring so the next scheduled systemwide overflight would actually occur sometime in May 2009. What we focused on initially was the immediate bar response systemwide and locally and then what is the persistence of the habitat that was built. In this case I think twice we've documented bar response is relatively quickly occurring where it occurs, where the sand supply exists and the question now is what's the state of the new habitat. How long does it last? And so within the monitoring program proposed systemwide on a 4-year time scale, the question is not what happens immediately, but what's left. We can do field measurements and tell you what happens immediately and it would probably be similar to what happened in

the past, hopefully a more positive response. We can measure that with field surveys. The question is how much of that lasts and for how long so that it picked up in a data imagery set in its outyear. (Melis)

Q: *I guess the question then gets into the integration of this with the long-term experimental plan potentially where we're proposing other BHBFs tests and if these things are reoccurring on when sediments occur? So that we wouldn't necessarily be able to establish if we were to have one in 1-2 years, and we did our remote sensing imagery in 2009, we wouldn't be evaluating what was going on this time, it would be a combination of the two. (Henderson)*

A: *Yes because what you're trying to get at apparently is if you can incrementally restore and maintain habitat and each time you're blowing back a little bit more, you're getting ahead of the game. The question is do you have a cumulative advance over some time frame with one or more. So if you do three BHBFs one each year let's say, you'd be looking for a dataset with evidence of some fairly significant accumulative positive benefits. (Melis)*

Q: *I just have two, two questions. One is we've heard about the need for sediment dispersal, so we could prime the mainstem for a BHBF to be effective within the river corridor, not in a higher section of the river but throughout the system? I didn't see a proposal to look at that. And to help determine what flow range or what operational flow range do you need to disperse that sediment. I heard John allude to it just a minute ago. (McMullen)*

A: *When you say you didn't hear that, do you mean in the memo? This presentation wasn't a science plan update or briefing, it was just where is your sediment supply. (Melis)*

Q: *I didn't see it in the MRP and I didn't hear it today. So I'm just wondering if we've looked at that and what we think we need to 1) disperse the sediment in the system, and 2) is getting to this issue here of mid-January to spring flows. Do you have an idea of what period of time we need a BHBF to actually function so that we can utilize that sediment? From what I understand and looking at the flow proposal, if we wait until mid-January or March, a lot of that sediment will be gone to Lake Mead. That's why I'm wondering about dispersal flow and/or the BHBF flows. (McMullen)*

A: *What Scott presented to the AMWG last March was a really important dataset and I showed that table again today. It shows that the peaking seasons, December through February and July and August, are very effective at transporting sand downstream under MLFF. That's deemed bad because it's export, right? The idea is that this material won't accumulate over multi-year time scales even under 8.23 maf because of those operations. The shiny side of the coin is if you're trying to pre-condition the system or spread the sand supply further downstream before you implement the BHBF and your plan is to implement the BHBF within the same sediment year, it's a pretty efficient operation for doing that, just normal operations. So it's all about timing. If you wait too long and you have equalization, it stops down sediment conservation, but if you do something before that, it might be a more optimal uniform type of response than what you saw before. The problem in 2004 was we had all of our sand up top, we constrained the flows, all the sand stopped moving for the most part. But a wave which moves faster than the water or the sand in the water swept down over the new pile of sand. A lot of good things happened locally and then the wave was gone. The wave got out ahead of the sediment supply. What you would like to do if you could is sprinkle sand uniformly through the whole channel then run a short duration wave over it. We didn't do that in 04. We'd probably get a more uniform response right now anyway because we've got loading in the Little Colorado River also. So the ideal conditioning response is maybe an immediate response that we did in 04 under the constrained operations isn't the prescription for long-term management because you have the same problem. You can't slow the wave down. (Melis)*

Q: *This question is for Dennis. Does the AOP show equalization for 2007? What does the AOP show? (Barger)*

A: *I think that's what Ted was putting up was Tom Ryan's numbers on probabilities of equalization and Bill's got a table here too. (Kubly)*

Q: *So what's the AOP show? (Barger)*

C: *The AOP shows no equalization assuming average conditions. (Seaholm)*

C: *Whether there is equalization or not, you can still run a BHBF. (Johnson)*

C: *I guess that raises a question of what the trigger is within the institution of the AMWG. (Werner)*

R: *There is only a hydrology trigger in the actual criteria that we've, I guess, were more or less approved or adopted by AMWG in 1998. It's that you have basically a full lake and have about 140% or more forecasted for the April - July run. (Melis)*

C: *So you use that in your evaluation. Are you saying that the Secretary of the Interior has the authority to void that agreement for another experiment? (Kubly)*

R: *I'm just saying that for the previous test that was approved by the Department, it was adopting a sediment research trigger not a hydrologic trigger. If we were in hydrologic triggers only, you wouldn't have done the 04 test. It's a research test so the hydrology triggers I think were on the part of the AMWG more or less projected to be management implementation criteria and not research. (Melis)*

C: *I've heard some concerns from fishery scientists that there were a lot of chub in the LCR with the recent high flows out of the LCR, now there are a lot of both young and old HBC in the mainstem downstream of the LCR. Very anecdotal information from one river trip. I think there's a concern that's been voiced about what impact a BHBF in March might have on any of those fish that might still be there and their habitat. It may be more of a question for as you develop the science plan will this BHBF is something you need. Again, it's just real anecdotal information. I don't want to get in the way of doing sediment science. I'm also a little concerned that after our experience with the New*

York Times after the November transport that we are sure to cover our tracks on the effects of a BHBF on young HBC. (Persons)

R: *I can assure you that Matthew and his staff had a 3-hour planning meeting just a few days ago to discuss with the fishery scientists specifically options, questions, and what would we do. We're trying to get away from a maybe 1996 it was more or less a sediment experiment but there is a lot of peripheral activities, trying to get away from that and make it more of an integrated ecosystem experiment. Somebody asked about the timing. The first consideration might be do we have new sand and then there are all these other biological and social considerations. The first thing: is there new sand and then after that we can move on to the process. Our feeling is that even if it doesn't happen, if it happens later or sooner, we still have to have a defensible, credible BHBF science plan for the MRP no matter when it happens. (Melis)*

C: *The basis for my concern is certainly the costs to the power users of this proposal and there are four different issues. I think we need more definition on the pre-conditioning flows. You suggested some fluctuations. I guess that might be dependent upon the timing. I think defining those pre-condition flows is critical. Also, we need to define what the data collection period is going to be afterwards. If you want 2 weeks or 3 weeks of steady flows to do LIDAR or other types of data collection, what are they, when are they going to occur, and get us a cost impact. The last point I want to make is that we're already two months into the water year so we have 10 months left to redistribute the monthly volumes in order to accommodate this. What are those monthly volumes going to be particularly in the summer months? Again, so we can determine what the cost is going to be. (Greiner)*

C: *I had some similar concerns that Lloyd just raised. One of the things I'm a little bit concerned is the timing. We've talked about a hit on the Basin Fund. At this particular time there are a lot of things in the wings with regard to using the Basin Fund for TCD, the ongoing AMP budget, and the experimental fund. Given those expenditures with no other relief in sight, it seems that taking this particular time to do a BHBF, I realize it's an opportunity, but it's not an opportunity foregone. This is a recurrence interval once every 5 years or once every 5-10 years so if the timing from the standpoint of something like financial relief with regard to the Basin Fund is more short-term or like now and we do have the opportunity to pick up sand in another 5 or 10 years, or next year, we don't know. It seems to me that that's a consideration when you start to make a decision to do something right now. The timing is not very good. I don't feel compelled to support something like this simply because of that. It's not like this is a one-time shot. (Davis)*

C: *I wasn't clear that I heard your answer to my second question on the timing of the BHBF. (McMullen)*

R: *The timing of the BHBF I can refer to the assessment work we did. Western had to assess the costs for a BHBF and they said you sediment guys tell us which month, what week, what day. We can't model all of this that perfectly so what we ended up saying was it kind of depends on the hydrology. You typically get your loading in late summer or fall or sometimes in the winter. If the release volume for that year is really large, like wet conditions, peaks are high, you probably want to do it as early as you can. If you're in a most probable or a 8.23 condition, you probably have time to wait because again those peaks are low, the volumes are lower, the transport rates are lower. And the question now is can we use our real time sediment transport monitoring capability which we've displayed to you time and time again to more or less track the fate of this input in real time and keep you updated perhaps weekly. Certainly monthly on when we think this material has now moved downstream to a place where if we wait too much longer it will be in Lake Mead. So the projection right now is that might be sometime in the winter or early spring but we can't predict that so our proposal is to monitor it and report to the group and to Reclamation when we think that material has been distributed. (Melis)*

C: *In 2004, my recollection was we dropped the flows down to stable because we were so concerned about transporting that sediment out of the system. Now we'll continue to run fluctuating flows through November and December until sometime in January. I'm a little bit concerned that are we going to be able to wait that long before doing a BHBF? And I think what you're telling me is you have the confidence that sediment is still going to be there. We're not going to lose a significant amount of that sediment between now and mid-January. (Johnson)*

R: *Let's say that it's all piled up above Soap Creek, Mile 11. We want to lose some of it downstream is what we're saying but we don't want to lose all of it to Lake Mead obviously. (Melis)*

R: *It's still sort of an experiment for us because we know that winter fluctuations are going to transport sand downstream but we don't know how much of that is going to go to Lake Mead versus how quickly is it going to move through 30 miles, past Phantom Ranch, or how that wave of sand will affect it. Regardless of whether a BHBF is done, this winter will be a good experiment for us to understand if MLFF winter fluctuations are good for that or are they just exporting? (Wright)*

C: *Do you feel perfectly comfortable waiting until mid-January? (Johnson)*

R: *We're going to lose some several hundred thousand metric tons but if you look at the data that was shown up there, where they're doing these winter fluctuations, a hundred thousand tons per month is the average so you might expect a little bit higher than that because it's so enriched right now so there is definitely going to be sand. We really don't know what happens when it gets past Phantom. It might not be going all the way to Lake Mead. (Wright)*

C: *And there's a cost to doing when you're trying to restore the environment because the depositional efficiency of these things we're estimating are only about maybe 15% at most so the duration issue again is one that we would like to really work on. The proposal now is to replicate the hydrograph, shape and duration. Of course, eventually it would be nice to find out that gee maybe this could go on for 18 hours or something like that. We need to try to verify that because every hour that the flow is up at that level, sandbars are being deposited but there is also sand leaving the system. It's optimization really. But the predominate input season for the Paria typically you've heard Dave Topping tell us this from July through October. The LCR is more biomodal. It can be summer and winter and winter tends to be like 92, 93, it can be the big inputs in 1972 and October we had really big inputs you heard about that. Lloyd was asking about the conditioning flow operations. I think these data would suggest and these are just MLFF data that okay these numbers look scary because they're large and negative but again we're not trying to export all the material, we're just trying to get it to move downstream. That's why we've been saying for conditioning MLFF may not be accumulating multi-year inputs but if your plan is to try to act within the same year as enrichment, it seems to be a fairly effective way to move sand. (Melis)*

C: *The other point I was going to make is to me although this may be a 5-year event and we could sit back and say we can wait for five years, to me that is a long time. At four TWG meetings a year, that's 20 TWG meetings. But in all seriousness, I think we have an opportunity here and I think we absolutely need to take advantage of the opportunity that was presented to us. Although this may occur every five years or every 8 years, the number of questions that we have to answer regarding sediment and the other resources are too great to pass on this opportunity to take advantage. (Johnson)*

C: *And Ted's campsite area graph also shows that yes there are some gains but it's not much of a gain and we're still on the downside at a very low point. (Stevens)*

C: *I'd argue that these opportunities don't come along that often and when we normally talk about the sediment resources down there, we're talking about the generic sum. For the resources that depend on sediment, there is no way to get it up there unless you do a flow. Regardless of whether the river is chocked full of sediment or empty, the resources above the water level doesn't care. This is the only way we can get it up there so to waste such a resource when we're not guaranteed to have it every year, I think is bad management. I wish Clayton could repeat his kitchen sink talk from yesterday when we talked about replacing archeological sites in there. We know the trend for preservation is going down. It's not stabilizing. You can't breed more of them. This is one of the few mechanisms that we think may benefit. The only way to get sediment out of the water is to do this kind of flow. We're in that kind of situation where we have that sediment available. Even if the net amount of sediment in the system is less after it, it will be higher out of the water. That's kind of the simple end of it, I think. The only way you can get it up there is this so I think we're wasting sediment if we just manage it by keeping it in the bottom of the river and watching it go downstream at different rates. (Yeatts)*

Q: *If this test were run under this sort of MLFF Proposal you're making for the interim period between now and when the LTEP gets implemented, Is the testing that would be done under that, that we could potentially do here by implementing this, is this the same testing you would be proposing through the LTEP process? (Henderson)*

A: *You saw our recommendation for doing the MLFF for another 2-4 years and this would in fact give us an opportunity to test whether or not we can retain sand in the context of the overall MLFF operation and so we think that this - this was the direction we were given under the 1996 ROD was to evaluate MLFF and whether or not we can achieve our resource goals one of those being sediment conservation. I think this proposal is very consistent with the continued evaluation of MLFF, the current experiment. (Hamill)*

Q: *So when we get into the LTEP, then it's potentially a whole different deal because theoretically we may not be dealing with MLFF anymore. We'd be dealing with a whole other different flow regime that would then testing BHBFs under that flow regime. (Henderson)*

A: *I think the question that would change if you stick with testing or management under enrichment triggers, I'm not saying you will, but if you did, the question shifts to what are the influences of the intervening operations, be they stable or larger fluctuations or small fluctuations and it's the package. I agree with our esteemed colleague, Clayton, it's the package that you need to have science evaluate and the package that presumably you want to evaluate is the one that there is commitment among the group to implement long-term as a management scenario. It doesn't really change everything but it does change well what's the intervening operation and what's its influence on the bars that may have been built for the last three or last five BHBFs. See what I'm saying. (Melis)*

C: *I think so. I just want to be clear in my mind by doing this we wouldn't be pre-empting what we're doing in the LTEP, well, we've done our testing for that now we don't need to move forward in the LTEP process for further BHBF testing. (Henderson)*

R: *That is yet to be determined. Until we see the results of a next test, I'm not sure we could predict what the future BHBF testing needs to be. It needs to be at least one more test as I've said but if there's not enough information that comes out of those results, you may concur that you want to do another test or a different test, perhaps changing the duration. (Melis)*

C: *I want to turn my time over to Lonnie Gourley. You might want to hear from the dam operators think is the capacity we have in a January to March time frame before we get too far down the road. (Kubly)*

R: *Right now we have entered into a process that we are going through in the maintenance process cycle at Glen Canyon in which we are going to be replacing turbine mill runners on all eight of our units and that commences December 4, 2006. So for sure right now the maintenance plan has one unit out of service in this time frame that you're proposing. In addition to that, we have in our maintenance process approved a contract to replace the excitation and regulation equipment on all eight units in fiscal year 2007. That's going to commence in March 2007. That means from March on in to the summer there will be two units unavailable at Glen Canyon. That's the condition of the maintenance process we have in place and planning right now. So 41,000 cfs in January to February and possibly in March if we can delay or we have to delay startup on a contract but there will be under this current maintenance philosophy plans no ability to get to greater than 41,000 cfs. (Lonnie Gourley)*

C: *I don't think there has been an adequate appraisal of the negative side of the proposal. All I've heard is the sediment side and I don't think we've received much if any, none in fact, any of the negative sides of doing this. I hope we're not moving forward with just one side of the equation and that really concerns me because I think there are some significant implications of doing this at this particular time. I realize it's an opportunity but I think it's something we need to think about. You mentioned that if we don't get enough information in this particular go-around that we would want to do it again, I guess my question is if we do it and next year we have another sediment trigger met, would it be the proposal then to do it again next year, and if so, what about the following year? What about the following year? Is this to be done every time we get a sediment trigger? Do we do a BHBF? That's sort of what I'm getting from the sense of the group is that okay we've met the trigger, let's do it with no consideration for anything else. Is that the proposal from GCMRC that we do a BHBF every time a sediment trigger is met? (Davis)*

R: *The diagram that Ted showed was to do one more test and evaluate that test and then to look at the results of that and decide the direction to go whether it looks like its sustainable for doing some modeling, or go back to the drawing board. Right now the recommendation is to do it one more time, look at the results, and then it will be up to the managers to decide. (Topping)*

C: *I heard that in 2004 also. We need to make sure that we have enough information. (Davis)*

R: *You managers can tell us scientists we liked the results in 2004, it was a new paradigm experiment or go work on something else, this is enough information and then you face the challenge of deciding with that information and no replication that level of certainty. (Melis)*

C: *That's not what I'm saying. I don't know what I need to know that information in 2006 and 2007. I might not have to have that information for another 2-3 years. I don't have the sense of urgency that this is a panic situation we're in and yet there are significant implications in doing it now that have not been addressed. (Davis)*

Q: *Is it from the Endangered Species Act and the NEPA Compliance, is it doable? Are the dollars in place for the monitoring that's appropriately invested? (Werner)*

A: *We can do the compliance. (Kubly)*

C: *So I'm hearing that compliance is possible. It's not in the impossible range.*

John Hamill said there is \$925,000 in the experimental fund at this point and their proposal would be to develop a work plan that fits within that budget.

In preparation for the vote on the motion, Kurt reminded the TWG that in August 2006 they voted not to do a BHBF in 2007 and the AMWG took that recommendation and agreed with it. He cautioned the TWG that if they're now changing their minds 2-3 months later, he hopes they have a compelling reason for doing so and won't come off looking fickle to the AMWG.

Dennis said he was going to vote yes but wanted to express his disappointment for not having more information on the science that can be done for \$925,000 and that his "yes" vote is more because he thinks the objections are more policy level objections that really belong up at the AMWG level.

Bill Werner said he agreed with Dennis and was voting "yes" with the same reservation.

At this point Kurt read a statement from Don Ostler (representing Wyoming) who had to catch a flight: "I have no choice but to leave now. If possible, having heard all the technical discussions from Ted Melis and others and having discussed this one on one with several TWG members, I would like to cast a no vote for a BHBF on behalf of Wyoming. Inefficient science plan, inefficient monitoring, no adjustment, refinement from 2004 is too expensive to do on the fly."

Motion: The TWG recommends to the AMWG that the Secretary of the Interior implement a BHBF in the timeframe from mid-January 2007 to March 2007 in accordance with a science plan to be developed by GCMRC, approved by the TWG, and funded from the experimental fund. Motion seconded by: Rick Johnson		
Representative	Stakeholder Entity	Vote
Bill Persons / Scott Rogers	Arizona Game and Fish Department	y
Amy Heuslein / Garry Cantley	Bureau of Indian Affairs	y
Dennis Kubly / Randy Peterson	Bureau of Reclamation	y
Mike Yeatts	Hopi Tribe	y
Kerry Christensen	Hualapai Tribe	y
Ken McMullen / Jan Balsom	National Park Service - Grand Canyon	y
Norm Henderson / Chris Kincaid	National Park Service - GLNRA	y
Steven Begay	Navajo Nation	y
Jonathan Damp / Suzette Homer	Pueblo of Zuni	n
VACANT	San Juan Southern Paiute Tribe	vacant
Charley Bullets / LeAnn Skrzynski	Kaibab Band of Paiute Indians	y
Glen Knowles	U.S. Fish and Wildlife Service	y
Mary Barger / Gary Burton	Western Area Power Administration (DOE)	n
Rick Johnson / Nikolai Ramsey	Grand Canyon Trust	y
Larry Stevens	Grand Canyon Wildlands Council	y
Mark Steffen / Tim Steffen	Federation of Fly Fishers	n
John O'Brien / Andre Potochnik	Grand Canyon River Guides	y
Bill Werner	Arizona	y
Christopher Harris	California	n
Randy Seaholm	Colorado	n
Phil Lehr	Nevada	n
Jay Groseclose / Don Ostler	New Mexico	n
Robert King	Utah	n
John Shields / Don Ostler	Wyoming	n
Bill Davis	Colorado River Energy Distributors Association	n
Lloyd Greiner	Utah Associated Municipal Power Systems	n
	Total Yes	14
	Total No	11
	Total Abstain	0
	Total Voting	25

Motion passes.

Kurt said he wanted to turn over the remaining few minutes to Dave Garrett, Dennis Kubly, and John Hamill to briefly describe the presentations they weren't able to give today.

Science Advisors' FY06 Accomplishments. Dave said he was to make two presentations today but due to several items being pushed off the agenda, he wanted to give a brief update to the TWG. (1) He said the Science Advisors must go before the AMWG annually to present their plan for the next fiscal year for review and approval. In the past he has brought that information before the TWG as part of their regular protocols. He distributed a handout, "A Report on Activities and Accomplishments of the GCD AMP Science Planning Group: 2005-2006," (**Attachment 15**) and asked the TWG to review and provide comments to him so he could advise the AMWG that the TWG had read the document. He said if there were things the TWG felt the Science Advisors should be doing, he would like those comments as well. (2) The other presentation was a review of the entire AMP. He said he would send the Executive Summary to the TWG with the same request to provide him with feedback on that as well. Comments should be sent to him by November 22.

ACTION ITEM: TWG members will send comments on the following documents (1) Science Advisors FY06 Accomplishments and FY07 Program, and (2) Executive Summary of the AMP Review by November 22.

FY08 Budget Development. Dennis said the FY08 budget process hasn't been laid out but he provided copies of the form sent to the AMWG in preparation for their December meeting along with the Program and Budget WorkPlan Development Spreadsheet (**Attachment 16**). He said there were several questions posed to the AMWG which he would like the TWG to read and if they object to anything to let him know. The questions were:

1. Do they want it to be a single year budget?
2. Is it likely to be another transition year?
3. Do they have the same priorities that they had before?

FY07 Milestones/Schedule/Upcoming Events. John Hamill said he distributed a list of milestones yesterday (refer to Attachment 3) but suggested having a TWG conference call to discuss. Kurt said he would discuss with Dennis and see what arrangements could be made.

Mary Barger reminded the group that Lloyd Greiner and Gary Burton were retiring. She thanks them for their hard work in support of the program and gave them farewell cards signed by the TWG.

Additional Documents provided at the TWG Meeting:

Attachment 17: Status of Sand Mass Balance in the Colorado River Ecosystem Below Glen Canyon Dam

Attachment 18: Annual Report: FY 2006 Science Advisor Accomplishments and Proposed FY 2007/2008 Science Advisor Review & Advisory Science Program and accompanying **PPT**

Attachment 19: Review and Purpose of Technical Work Groups **PPT**

Adjourned: 3 p.m.

Respectfully submitted,

Linda Whetton
U.S. Bureau of Reclamation
Salt Lake City, Utah

General Key to Adaptive Management Program Acronyms

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