

## Glen Canyon Dam Technical Work Group Meeting

April 16-17, 2012

Note: Some of the agenda items were addressed in a different order than in these notes, but are presented here in a way that makes clear to the reader what occurred.

**Conducting:** Shane Capron, Chairperson  
Facilitator: Marty Rozelle, The Mary Orton Company, LLC

**Convened:** 9:40 a.m.

### **Committee Members/Alternates Present:**

Jan Balsom, NPS/GRCA  
Cliff Barrett, UAMPS  
Charley Bullets, So. Paiute Consortium (phone p.m.)  
Kerry Christensen, Hualapai Tribe  
Jerry Lee Cox, Grand Canyon River Guides  
Bill Davis, CREDA  
Kurt Dongoske, Pueblo of Zuni  
Alan Downer, Navajo Nation  
Paul Harms, State of New Mexico  
Vineetha Kartha, State of Arizona  
Robert King, State of Utah

Glen Knowles, U.S. Bureau of Reclamation  
Ted Kowalski, State of Colorado  
Nikolai Lash, Grand Canyon Trust  
Gerald Myers, Federation of Fly Fishers  
Don Ostler, State of Wyoming  
Clayton Palmer, WAPA  
Pam Sponholtz, USFWS  
Larry Stevens, GCWC (phone p.m.)  
Bill Stewart, AGFD  
Jason Thiriout, State of Nevada  
Michael Yeatts, Hopi Tribe

### **Committee Members Absent:**

Chris Harris, State of California  
Amy Heuslein, BIA  
Chris Hughes, NPS/GLCA

Tony H. Joe, Jr., Navajo Nation  
John Shields, State of Wyoming

### **Grand Canyon Monitoring and Research Center:**

Helen Fairley, Program Manager  
Ted Melis, Deputy Chief

Jack Schmidt, Chief  
Scott Vanderkooi, Program Manager

### **Interested Persons:**

Janet Bair, U. S. Fish & Wildlife Service  
Mary Barger, USBR  
Peter Bungart, Hualapai Tribe  
Daren Carlisle, USGS (Reston VA)  
Todd Chaudhry, NPS/GRCA  
Marianne Crawford, USBR  
Kevin Dahl, Grand Canyon Trust  
Craig Ellsworth, WAPA

Evelyn Erlandsen, ADWR  
Lesley Fitzpatrick, USFWS  
Dave Garrett, M<sup>3</sup>Research/Science Advisors  
John Halliday, DOI  
Leslie James, CREDA  
John Jordan, Federation of Fly Fishers  
Brian Kopt, Federation of Fly Fishers  
Seth Shanahan, SNWA

**Meeting Recorder:** Linda Whetton

**Welcome and Administrative.** Shane Capron welcomed the members and the public. He welcomed Marty Rozelle who would be facilitating the meeting. She gave a quick overview of the process that would be used to help the members reach consensus on budget concerns.

1. Approval of February 2, 2012, Meeting Minutes. Without objection, the minutes were approved.
2. Review of Action Items (**Attachment 1**)
3. Old Business
  - Ad Hoc Group Updates (**Attachment 2**)
  - Reclamation Updates
    - Programmatic Agreement – Glen Knowles reported that Mary Barger was developing for review the bibliography of documents related to the PA that was agreed to in September. Reclamation will focus on the PA after the MOAs for the two EAs are completed.

- Status of Non-Native Fish Control (NNFC) and High Flow Experiment (HFE) EAs – Glen reported the documents were finalized on December 31, 2011 and BOR has been working on preparing FONSI documents and MOAs for Reclamation's NHPA compliance. A few more signatures are needed on the MOAs before they are sent to the ACHP for review. After a two-week public review of the FONSIs, the two EAs will be finalized.
- LTEMP EIS – Glen said BOR is co-lead with the NPS on this EIS. They hope to have a draft EIS by December 2012. They held a cooperating agency meeting on February 24, 2012 for input on some early aspects of the EIS. They presented alternative concepts to the public on April 4 and 5, 2012 in Flagstaff. The next step is to develop a suite of alternatives for analysis. The co-leads meet with cooperating agency monthly. Jan Balsom said they hoped stakeholders would offer suggestions for alternatives. After the Flagstaff meeting, they believed that they had not missed any significant concepts, though the alternatives need more work. All the presentations will be posted on the LTEMP EIS website (<http://ltempeis.anl.gov>) for those who want more information. In answer to a question, Glen said GCMRC would be involved in the alternatives analysis and Ted Melis will be directly involved in providing assistance to the EIS process. A stakeholder noted that they still have time to submit alternatives, and there may be some significant concepts that have yet to be articulated in an alternative.
- Socioeconomic Ad Hoc Group (SEAHG) – Glen reminded the group that AMWG passed a motion at its last meeting requesting that the Secretary advise the AMWG regarding those elements of the proposed Socioeconomic Implementation Plan that would be developed within the LTEMP EIS process. Reclamation has explored, with economists at GCMRC, BOR, and NPS, ways to build on work done by NPS in its Colorado River Socioeconomics Study, and how to address the Implementation Plan through the LTEMP EIS socioeconomic analysis. A progress report will be provided at the August AMWG meeting.
- Economist Position Update – Jack Schmidt reported GCMRC had a failed search and are now in a mandatory 90-day waiting period before the position can be re-advertised. There have been substantial internal discussions about this position with other economic centers of excellence within the USGS, and how to provide the best support to the LTEMP EIS process. There are some implications for the FY13-14 budget and those would be discussed in detail later today.

#### 4. New Business

- Next TWG Meeting → June 20-21, 2012. This meeting will include a TWG Chair Election.

#### **GCMRC Updates. (Attachment 3a)**

**Age-Structure Mark Recapture (ASMR) Update.** Scott Vanderkooi gave a PowerPoint presentation (**Attachment 3b**), on behalf of Dr. Steven Martell, who ran the ASMR analysis in 2009. Mark-recapture information collected between 1989 and 2011 was used to estimate the abundance and recruitment of humpback chub. Catch-at-length data is converted into catch-at-age data using a length-age relationship that was developed from a bioenergetics model. The unmarked population is reconstructed using Virtual Population Analysis (VPA) with an assumed value of natural mortality rate. The fate of marked individuals is tracked using an age-structured model, and the capture-recapture probability is assumed to be a Poisson sampling process. He went through a series of plots and offered the following summary of information:

Strong residual pattern arising age-assignment of newly marked fish (max age = 30)

Recapture residuals suggest lower natural mortality rate.

Assuming the asymptotic natural mortality rate:

- Median Age-4+ in 2011: 8912 (8,736, 9,095)-95%CI
- Median age-2 in 2011: 3998 (3,814, 4,195)-95%CI

Freely estimating natural mortality rate ( $M = 0.094$ ):

- Median age-4+ in 2011: 12274 (1,178, 12,812)-95%CI
- Median age-2 in 2011: 3635 (3,463, 3,838)-95%CI

Uncertainty is grossly under-estimated due to observation error only, and assignment of age from length.

Future work will include developing a length-based version of ASMR where there is no age-assignment from length. Key features will include: mixed-error model (better uncertainty estimates), growth based on length-transition matrix (no aging information), and use of smaller fish.

**Action Item:** Scott and others will host a webinar for more discussion on the ASMR findings.

*Update after the meeting: Due to Dr. Martell's travel schedule, the earliest this could be held is the last week of May.*

Traditional Ecological Knowledge (TEK) Background Presentation. Helen Fairley offered a PowerPoint presentation (**Attachment 3c**) on the subject of TEK. Because the tribes have expressed an interest in incorporating TEK in this program, she felt it would be helpful to have a common understanding of the concept. She provided background information on TEK and western science, historical roots of TEK in environmental decision-making, barriers to integration of TEK in environmental management programs, past efforts to integrate TEK and Native American perspectives in the GCDAMP, and establishing foundations for success. Her "take home points" from her literature review were as follows:

- TEK has some commonalities with traditional western science – but there are also significant differences
- Value of TEK as alternative source of knowledge for environmental management is recognized internationally
- Different epistemologies, language, and cultural views make integration with science very challenging
- Processes and frameworks for incorporating TEK in environmental planning are still evolving
- There have been many attempts to integrate TEK, but relatively few unqualified success stories
- Integration of TEK is inherently political
  - Requires validation/acceptance of other forms of knowledge besides western science
  - Provides a platform for Native people's involvement
  - Has implications re: power-sharing
- Successful incorporation of TEK in adaptive management requires (at a minimum):
  - Clear goals for incorporating TEK (explanation of how and where TEK could be applied in the process)
  - Agreement and commitment by scientists, stakeholders, and managers to embrace alternative knowledge sources
  - Standards and agreements for accountability (all parties)

John Halliday said the tribes who have traditional ties to the Grand Canyon were asked, by authority of the President, to be a part of a federal advisory council. In that context, the tribes are asking that the concepts and traditions of their people be incorporated into the philosophies that are utilized during policy decisions. The trust responsibility of the Federal Government to have tribal interests at heart when making decisions should be incorporated and should allow for that kind of decision-making perspective to happen. He feels it is important to focus on the tribal perspectives and determine what the tribes are asking for specifically.

### **FY13-14 Biennial Budget and Workplan**

Tribal Perspectives. John Halliday said he spoke with representatives from the Southern Paiute Consortium and the Hopi and Hualapai tribes relative to their concerns with the FY13-14 budget. He

distributed copies of his summary document, "Report on Tribal AMWG Representative Budget Discussion for Fiscal Year 13-14" (**Attachment 4**). While there is no cultural resources program identified in the budget, he said NPS and GCMRC are conducting a review of proposed cultural activities and will propose an integrated program. He offered the following key tribal concerns:

1. Tribes respectfully request that these comments be included in the budget process as recommendations for honoring the trust responsibility of the federal government to AMWG tribes and their tribal citizens.
2. Tribes request CPI be included as real dollars in the Tribal Concerns DOI Agency Appropriated funds budgets for FY13-14 and subsequent future budgets so funding can be budgeted in accordance with tribal finance policy.
3. Tribes request the NPS Cultural Resources Monitoring \$91,000 Program scope of work be the subject of tribal consultation prior to any final determination.
4. Tribes request that appropriate Tribal Consultation Policy in this new cultural resources programming matter be followed and meetings that include tribal participation in the program development process be implemented providing an opportunity for meaningful consultation with the tribes before any new cultural resources program is adopted.
5. Tribes request the budget specifically identify how the HFE and NNFC EA MOAs stipulations are going to be covered in the FY13-14 AMP budget, and what and how specific funded programs will cover which MOA stipulations.
6. Tribes request that tribal values and monitoring be incorporated into the Terrestrial Monitoring Program and that it articulate the specifics of its operational goals and functions.
7. Tribes request that DOI state how they are going to proceed with developing TEK and TEK incorporation into DOI administrative mechanisms development be included in the FY13-14 AMP budget and annual work plan.
8. Tribes request that DOI provide a schedule for how and when tribal concerns are going to be resolved.

Science Advisors Presentation. Dave Garrett distributed copies of a report entitled, "USGS Service Contract Inventory: 2012 Contract," and gave a PowerPoint presentation (**Attachment 5a**). He said the GCDAMP SA program was contracted by USGS through a competitive process to M3Research in 2009. The current contract runs through 2014 at a cost of \$189,000 annually. He outlined the duties of the SAs, types of reviews and other services they provide, and projected assignments for 2012.

SAs Comments on GCMRC Draft Budget. Dave said the SAs were asked to perform a quick review of the GCMRC FY13-14 draft budget. He and two science advisors, Dr. Carr from the University of Washington and Dr. Kitchell from the University of Wisconsin, offered comments on their top concerns (**Attachment 5b**):

- No cultural resources program identified; merge the cultural resource activities.
- No economist position on GCMRC staff. This program needs socioeconomic assessments, as does the LTEMP EIS.
- There needs to be a viable core monitoring program.
- The budget table does not track goals.
- A Knowledge Assessment document needs to be produced.

Discussion included the following:

- The program should track whether and how the SAs' recommendations are implemented.
  - Dave said it was up to GCMRC to determine whether to implement the recommendations, and he committed to including that information in the SAs' annual report.
- How do the changes proposed in the budget correspond to the Fish PEP recommendations?

- Dave said they do try to track the recommendations. He said all the PEPs are done now and he will prepare a briefing document.
- Has there been any progress on Secretary's Designee Anne Castle's suggestion from the August 2011 AMWG meeting to hire a Science Advisor from the social science realm?
  - Dave said he met with Lori Caramanian at the recent LTEMP meeting and she has not been able to get a specific job description for that position.

Shane Capron said for this part of the budget cycle, TWG would be addressing general issues or concerns with the budget; the decision on a budget recommendation will occur at the June TWG meeting. The TWG developed a list of budget issues at its February meeting that were forwarded to DOI. In addition, the one policy issue addressing the missing and at-risk extirpated species was forwarded to the AMWG. There has been no guidance from AMWG yet on that issue. It appears DOI implemented many of the issues forwarded in February. The draft budget was released on April 6, 2012. At a BAHG conference call on April 12, 2012 (**Attachment 6a**), members heard budget presentations from Reclamation and GCMRC, and had an opportunity to ask questions.

USBR Proposed Budget. Glen Knowles referred to his April 9, 2012 memo and offered a PowerPoint presentation (**Attachment 6b**). He highlighted changes made to the budget, as follows:

- Compliance Documents. This line item has been funded at approximately \$250,000. It is now proposed to be eliminated for FY13-14. This line has typically funded the cost of EAs for high flow experiments, but because the HFE Protocol EA is almost completed, and the fundamental shift of having compliance in place for 10 years (should that decision be implemented), there would not be a need for this line item. Even the \$259,750 identified in FY12 will likely not be needed, so those funds have been moved to the Non-native Fish Contingency Fund.
- Experimental Flow Carryover Fund. This line item was funded at \$500,000 every year for the research and monitoring associated with conducting a high flow experiment. With the move to a standard HFE Protocol, GCMRC now includes sufficient funds to study an HFE in its annual budget and workplan. Reclamation proposes to move these funds into the Non-native Fish Contingency Fund.
- The NNFC Contingency Fund. This line item is \$0 for FY12, and increases to \$782,660 in FY13 and \$1.3 million in FY14 because of transfers noted above. If the NNFC EA is implemented and the trigger for NNFC met, this line item would be used to fund the activity.
- USBR Revised Budget Table. During the BAHG call last week, it was suggested that Reclamation's bottom line should be portrayed with and without carryover. The table attached to Glen's memo includes the carryover in the Non-native Fish Contingency Fund. It shows the budget being greater than it actually is in terms of actual allocated funds for a given fiscal year. He adopted that suggestion and put in a new line for Reclamation's budget without carryover. There is a reduction from the FY12 amount (\$2.1M) down to \$1.9 million for FY13-14.
- Grand Canyon Treatment Plan Implementation. Reclamation budgeted \$500,000 when they were implementing the 2007 GRCA treatment plan. Last year this line item was retained despite the fact that no action was taken because there was not agreement on implementing the plan. Reclamation retained that line item for FY13-14. The contract by Utah State University was terminated in 2011. The 560-page synthesis report was posted to the TWG webpage (<http://www.usbr.gov/uc/rm/amp/twg/mtgs/12apr16/index.html>) with a letter from Joel Pederson (**Attachment 6c**) that includes comments from TWG members used to revise the document.

- Cultural Resources Monitoring. Glen said Reclamation transferred \$91,000 in appropriated dollars to NPS for cultural resources monitoring. He advised members to contact Jan Balsom if they had any questions.
- Tribal Contracts. These are appropriated funds provided to the tribes for their participation in the AMP. Each of the five DOI agencies provides \$95,000 annually, and \$95,000 is allocated to each of the five AMP tribes. This will continue through FY13-14. There has been a request to index these funds to the CPI. Reclamation has moved from a contracting system to a grant system to make it easier for the tribes to invoice Reclamation. They also advised the tribes would consider indexing the funds to CPI; however, this has not been done because the funds have not been completely expended by the tribes. Reclamation will consider indexing if a tribe expends its funds by 90 days before the end of the fiscal year and makes a request of Reclamation.

Glen presented a pie chart depicting how Reclamation's budget is allocated and said project summaries will be completed on every budget line item.

In answer to a question about integrated tribal resource monitoring, Glen said Reclamation funds the tribes to conduct their own monitoring programs.

Tribal representatives expressed dissatisfaction with the inaction on the treatment plan. Some felt the treatment plan funds should be given to the tribes to do the work. Others felt the reason the work had been interrupted was not disagreements among the tribes about what should be done, but rather a failure of Reclamation's contractors and Reclamation to integrate tribal values into the data recovery program. Specific issues with allocating and accounting for funds were raised, and Glen said he would address those offline. Glen also emphasized that Reclamation intends to again address the treatment plan issues once the MOAs for the two EAs are completed.

GCMRC Proposed Budget. Jack Schmidt referred to his budget memo of April 6, 2012 and gave a PowerPoint presentation (**Attachment 6d**). In developing the GCMRC budget, he said he charged his staff to develop integrative projects that are responsive to the major issues in natural and socioeconomic science that are confronted by the GCDAMP. As such, the program is organized into 10 major projects (including the pending program in cultural resources monitoring). He reviewed what the members had said they wanted in sediment-related resources, ecosystem structure, and water quality. In preparing the budget, he tried to provide budgets that showed the full cost of the projects. If work crosses over into other programs (for example remote sensing), then the cost is captured in both program areas. He also does not want to produce proposals that may be rejected because of disputes over who has jurisdiction over the issue. Consequently, he directed his staff to work fully and cooperatively with the land, water, and species management agencies. He intends to provide the best science possible.

Jack said that approximately 50% of the preliminary budget is related to fulfilling data collection and analysis associated with environmental compliance issues of the HFE Protocol and Non-Native Fish Control EAs and the associated Biological Opinion; 13% is associated with research activities needed to resolve critical management uncertainties, especially in the biological sciences; and 18% constitutes new projects not previously undertaken. The following budget breakdown was provided with comments from Jack and Scott Vanderkooi:

Project	Budget
Sandbars and sediment storage dynamics	\$1,391,000
Stream flow, water quality, and sediment transport	1,258,000
Lake Powell water quality monitoring	236,000

Project	Budget
Mainstem humpback chub aggregation studies	504,000
Humpback chub early life history near LCR	358,000
Long-term monitoring of native and non-native fishes in the mainstem Colorado River and LCR	1,988,000
Interactions between native fish and non-native trout	277,000
Identifying main drivers of rainbow trout growth, population size, demographics, distribution	814,000
Integrated riparian vegetation studies	509,000
Cultural Resources monitoring	0
Independent Reviews	170,000
USGS Administration	1,780,000
Other Allocations	85,000
<b>Total</b>	<b>\$ 9,370,000</b>

CRAHG Issues with FY13-14 Budget and Workplan (**Attachment 6e**). Kurt Dongoske said it was difficult for the CRAHG to make meaningful comments on the budget without the inclusion of a cultural resources budget. As a result, they feel this program is continuing to remove or at least marginalize humanistic values and reduce its considerations to an ecosystem that is measured from a materialistic perspective. The following comments were provided:

- The CRAHG would like to see geomorphological criteria applied to any archaeological monitoring done in the canyon(s).
- The tribal monitoring programs are not being integrated and each is being developed by GCMRC and the NPS.
- There is an overall lack of detail on tribal integration especially with the renewed focus on terrestrial monitoring (including TEK issues).
- The CRAHG strongly encourages GCMRC to develop and implement a pilot TEK project in FY13.
- Reclamation needs to specifically explain what they intend to do with the \$515,000 budgeted for the Treatment Plan, what work has been done in 2011 and 2012, and how they intend to integrate tribal perspectives.
- Reclamation needs to provide more information on the \$91,000 for the NPS cultural resource monitoring and how that will fulfill Reclamation’s compliance responsibility under Section 106.
- Funding to implement activities defined under the MOA for NNFC and the HFE Protocol are missing from Reclamation’s budget. The CRAHG would like to know how Reclamation plans to carry out any monitoring activities without having money budgeted for those activities.

Tribal members noted that some of the tribes always spent all the tribal participation dollars, and expressed concern about the lack of integration between tribal monitoring programs and other agency monitoring programs.

Shane reminded stakeholders that Lori Caramanian addressed the cultural resources issue on the BAHG conference call last Thursday (4/12) by stating DOI is committed to having a cultural resources program, but the details have not been worked out as yet.

**Budget Exercise**

Marty Rozelle provided instructions to the TWG on the steps involved in order to reach consensus on budget issues: (1) Determine the extent of consensus the TWG has with the budget as presented, (2) Identify the technical and policy concerns, (3), Decide how those concerns might be mitigated. (4) Refine the list of concerns and mitigation measures and decide which policy issues will be forwarded to the AMWG.

She divided the TWG and other attendees into several groups and provided further instructions. Approximately an hour later, the groups were brought back together and the various technical and policy concerns were grouped into five categories: Tribal and Cultural Issues, Fish, Accountability, More Information, and Management. She said the TWG would complete the steps 3 and 4 the next morning.

**Adjourned:** 5:15P

**Glen Canyon Dam Technical Work Group Meeting**  
April 16-17, 2012

**Conducting:** Shane Capron, Chairperson  
Facilitator: Marty Rozelle, The Mary Orton Company, LLC

**Convened:** 8:00 a.m.

**Committee Members/Alternates Present**

Jan Balsom, NPS/GRCA  
Cliff Barrett, UAMPS  
Charley Bullets, So. Paiute Consortium (phone)  
Kerry Christensen, Hualapai Tribe  
Jerry Lee Cox, Grand Canyon River Guides  
Bill Davis, CREDA  
Kurt Dongoske, Pueblo of Zuni  
Paul Harms, State of New Mexico  
Chris Hughes, NPS/GLCA  
Robert King, State of Utah  
Glen Knowles, U.S. Bureau of Reclamation

Ted Kowalski, State of Colorado  
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Gerald Myers, Federation of Fly Fishers  
Don Ostler, State of Wyoming  
Clayton Palmer, WAPA  
Pam Sponholtz, USFWS  
Larry Stevens, GCWC (phone p.m.)  
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**Committee Members Absent:**

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Tony H. Joe, Jr., Navajo Nation  
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**Grand Canyon Monitoring and Research Center:**

Helen Fairley  
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**Interested Persons:**

Mary Barger, USBR  
Peter Bungart, Hualapai Tribe  
Daren Carlisle, USGS (Reston VA)  
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Craig Ellsworth, WAPA  
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John Halliday, DOI  
Leslie James, CREDA  
John Jordan, Federation of Fly Fishers  
Ted Kennedy, USGS  
Seth Shanahan, SNWA

**Recorder:** Linda Whetton

**Welcome and Administrative.** Shane welcomed the members and the public to the meeting.

**Aquatic Peer Evaluation Panel.** Daren Carlisle, co-chair of the PEP, was introduced and said GCMRC initiated research to understand the foodbase resources of desired native and non-native fishes. This research quantified, for the first time, aquatic food webs of the Colorado River in Glen and Grand Canyons. The review panel was convened as part of the Protocol Evaluation Program and charged with evaluating the validity of the findings from the Aquatic Food Base Study, as well as the adequacy of the proposed long-term monitoring plan. Daren provided background information on the Aquatic PEP panel participants, distributed copies of the panel's report (**Attachment 7a**), and gave a presentation (**Attachment 7b**). The review panel offered three recommendations to strengthen GCMRC's monitoring and research efforts:

1. Develop a monitoring and research program that is flexible enough to exploit learning opportunities for both planned and unforeseen events. Such event-driven ecological response monitoring and research will build the knowledge base required to predict the effects of water management on key fish species.
2. Expand monitoring and research beyond the Colorado River mainstem within Glen and Grand Canyons: information from key tributaries and mainstem locations above Lake Powell is critical to understanding the aquatic food webs of the Colorado River and what potential exists for successful alterations to the system.
3. The Grand Canyon Monitoring and Research Center should strive for improved integration of research across disciplines internally, as well as with the Southwest Biological Center and Arizona Water Science Center.

Implementation and Response. Ted Kennedy highlighted key research findings (**Attachment 7c**):

- CMIN 1.1.1: Determine and track the composition and biomass of primary producers below Glen Canyon Dam in conjunction with measurements of flow, nutrients, water temperature, and light regime
  - Flow operations and turbidity control algae production in Grand Canyon
  - Turbidity strongly controls algae production in Grand Canyon
  - Increase in summer flow lowers GPP, likely by burying algae under water
- CMIN 1.2.1: Determine and track the composition and biomass of benthic invertebrates below Glen Canyon Dam in conjunction with measurements of flow, nutrients, water temperature, and light regime
  - Invertebrate production exhibits stepped declines below the Paria and LCR, and production below the LCR is extremely low relative to other streams and rivers
  - High flow events can exert a strong control on invertebrate assemblages and secondary production in the tailwater reach
  - The production of native and non-native fishes through the river is fueled principally by two aquatic insect taxa—midges and blackflies
  - Fish production through the river appears limited by the availability of high quality prey, and fish may exert top-down control on these prey
- CMIN 1.3.1: Determine and track the composition and biomass of drift in the Colorado River in conjunction with measurements of flow, nutrients, water temperature, and light regime
  - Drift abundance strongly related to benthic abundance
  - Some taxa more prone to drifting than others
  - Discharge regime does not appear to have strong affect on drift biomass
  - Time of day is big lever for some taxa
  - Drift is direct measure of food available to drift feeding fishes

In response to the PEP, the following monitoring strategies were addressed: (1) Benthic production monitoring in key reaches was added, (2) The strategy for monitoring emergent insects throughout the GRCA using citizen scientists was completely changed; the original proposal called for month-long sticky trap deployments of six fixed sites, (3) Drift sampling will be done from boats only, and (4) Need to study tributaries to understand relative importance of mainstem. The PEP report will be revised and provided to the TWG within the next few months.

**FY13-14 Budget Exercise** (cont). Marty asked the members to move into small groups to draft their policy and technical issues regarding the budget. Each chose a group from the following five: Tribal and Cultural Issues, Fish, Accountability, More Information, and Management. Shane suggested the groups use text from the Tribal Liaison Report, the CRAHG report, and the original comments. He gave examples of how an issue could be written as a technical or policy issue. He reminded the group that technical issues are those that go to DOI for resolution, and policy issues are those that are forwarded to AMWG for a possible recommendation to the Secretary of the Interior.

Marty reminded the group the definition of consensus is not necessarily unanimity. It is built by identifying and exploring everyone's interests and devising a statement that satisfies those interests to the greatest extent possible. She suggested that a definition of consensus could be: "Given all the concerns and circumstances, we concur that 'X' is the best decision that can be made at this time."

She distributed colored cards that could be used to indicate level of consensus. Holding up a green card means "Yes, I love it;" holding up a yellow card means "I concur because all interests have been considered and this is the best we can do at this time;" and holding up a red card means "I can't move forward." If a person holds up a red card, he or she is asked to say what they need in order to become "yellow" or "green." If the group concurs, consensus is reached. Shane affirmed that DOI TWG members, who are non-voting, would not participate in the exercise.

The TWG came to consensus that the following technical issues are important and need more consideration. No priorities were established.

## **TECHNICAL ISSUES**

### **General Information Needs**

1. There were a number of projects in the GCMRC FY13-14 budget that are new starts in FY13-14 and the TWG felt that there was not enough information to evaluate these projects. The GCMRC proposal is over-budget and lacks a cultural resources monitoring component. The TWG would like more information in the form of written project proposals for each project to fully evaluate these to make recommendations on prioritization and project selection. Several projects were also specifically identified as needing more information:
  - a. Project series I. Integrated riparian vegetation studies
  - b. The new starts for humpback chub, project series D. Mainstem humpback chub aggregation studies and E. Humpback chub early life history near LCR
  - c. Project series A. Sandbars and sediment storage dynamics and B. Stream flow, water quality, and sediment transport
  - d. Project A. 4. Geochemical signatures of mined pre- dam sediment
  - e. Project series G. Interactions between native fish and nonnative trout
  - f. Bureau of Reclamation project "Admin Support NPS Permitting"

### **Cultural/Tribal Issues**

2. DOI should consider funding for Tribal contracts based on requests from the tribes, including the possibility of CPI increases or increasing the base amount.
3. Funding for cultural resources, whether it be NHPA or GCPA needs to be fully developed and vetted through agencies and Tribes for the program as a whole. Add a cultural resource advisor to the Science Advisors.
4. Tribes will work with GCMRC staff to develop and implement a research project utilizing TEK for the FY13-14 budget. (riverine ecology - aquatic ecology and riparian)

### **Fish/Aquatic Resources Issues**

5. Do additional research proposals significantly increase handling, stress, and mortality on HBC when program has already been criticized for handling through monitoring? What is absolutely necessary to answer key questions? Make sure there is no duplication of efforts.
6. Due to ESA status, do not cut back on humpback chub monitoring except as it applies to handling issues described above. High priority is more frequent ASMR runs (e.g., every 2 years).
7. Important to maintain this work because it provides a wide view of fish population dynamics in the river. More emphasis on Diamond Down for mainstem spawning. Also focus on tributaries until temperature issue in mainstem is resolved.
8. Consolidate, combine trips to reduce costs. Collaborate with NSE project, warm water native/non-

native fish surveys at Lees Ferry. Include foodbase as well, coordination with MSCP.

9. The ovaprim study should be conducted as a pilot in a lab setting first. Do otoliths research instead.
10. Speed up information for Martell to develop length-frequency method for aging to resolve errors. ASMR should be run more frequently so different management efforts can be evaluated.

### Management Issues

11. Resolve conflicts regarding the treatment plans and implement the treatment plans by the end of FY12.
12. Ensure the Science Advisors' contract is fully funded, as defined in the contract.
13. Clearly identify the cultural resources budget. [Budget is currently \$0.5 M over without cultural resources funding needs being identified]
14. Examine the possibility of further reducing logistical costs through consolidation of resources.
15. Reevaluate the scope of work of the facilitator position with the goal of reducing as appropriate.
16. Identify funds for biological opinion (ESA) and Section 106 compliance, and for HFE and nonnative EAs.
17. Identify all sources and amounts of funds in the AMP program.
18. Identify the possibility of a stakeholder field trip down the CRE or other activity near the CRE.

### Accountability Issues

19. Please provide a brief description of delivered reports, accomplishments and a tracking of funds spent on the development of the cultural resources monitoring program. Please describe how the AMWG approved monitoring program is being proposed to be modified by DOI in May.
20. Please provide funding for the preparation of summaries of the knowledge assessment workshops in time to be considered for the LTEMP EIS.
21. The biological opinion requires periodic monitoring for Kanab Ambersnail, however this is not provided for in the draft budget. Provide funding for taxonomic report in 2013.
22. Please provide clarification on the agencies involved and principal investigators for all projects. Also, please consult in FY13-14 with collaborative agencies involved.
23. Please provide funding for periodic reports on Lake Powell water quality and the implications for downstream ecology.
24. Please provide funding for a science plan for the Rapid Response HFE

### POLICY ISSUES

The text in bold font is the consensus language regarding the issue; the text in regular font is explanatory.

1. **Tribes should be included in the process as equal partners in the program. Specifically, Tribes, as sovereign governments, should participate at the earliest moments of development of programs, projects, and budgets.**
2. **Clarify funding for Lees Ferry Creel surveys. If annual Creel surveys are important, funding needs to come from this program. AGFD can do only every 3 years. Supplement with AMP; coordinate.**

Arizona Game and Fish Department (AGFD) creel surveys provide information on the angler catch per unit effort (CPUE) in the Lees Ferry area. These surveys cost approximately \$25,000 per year and have been funded by AGFD since 1977. These annual surveys provide a long-term data set of relative abundance. However, due to lack of funds and other priority rivers, AGFD will be reducing the survey to once every three to five years. The data from these surveys has been used in modeling and in developing comparisons with other fishery studies. If a "blue ribbon trout fishery" were a goal of the program, these surveys would give valuable information regarding movement towards that goal. Because the trout population changes quickly, a survey every three years may be of limited

use. AMWG will be asked if TWG should undertake a more detailed assessment of the utility of this study and make a recommendation to AMWG at its June meeting.

**3. Identify funding sources and funding amounts for GCMRC and Science Advisors support for LTEMP EIS development and implementation.**

If support for the Science Advisors (SAs) to participate in the LTEMP process will be forthcoming from sources outside the GCDAMP, TWG would prefer that those funds be shown in the budget tables so a true picture of funding for the SAs can be understood.

**4. The budget for FY13-14 must have a clear plan for implementing the SEAHG recommendations and set priorities.**

The budget that GCMRC presented to the TWG did not include funding for an economist or a socioeconomic research program. TWG felt that both of these should be included.

**5. Examine the possibility of using NNFC contingency funds to fund GCMRC for overage.**

Because GCMRC does not have sufficient funding from the program for its proposed workplan, TWG is suggesting that the carryover / contingency funding for non-native fish control (NNFC) could be used for some of the high-priority workplan items in the short term, particularly if there is not a projected need for NNFC activity in FY13.

**6. POAHG should re-evaluate the true budget needs and reduce accordingly.**

The Public Outreach Ad Hoc Group (POAHG) has a standing amount of funding in the budget that increases each year by the CPI. TWG suggests that this AMWG subcommittee develop a budget for high-priority items during the FY13-14 period and reduce the amount of its line item, if possible.

Shane said he would communicate these results to Deputy Assistant Secretary Lori Caramanian. The TWG will consider the full budget in June.

Marty asked for feedback on the budget process, the following comments were noted:

- The group liked going outside. More outside time would be an improvement.
- Many were surprised by the willingness for people to move forward
- There are more dynamics in having a small group, as people don't talk in large groups
- It was a good way to organize and distill thoughts
- Would've like more time for deliberation in breakout sessions
- It would've been good to have more time to refine the policy and technical statements

**Adjourned:** 2:55P

**Attachment 8:** Memo from TWG Chair to Deputy Assistant Secretary AS-WS dated April 19, 2012, Subject: The Glen Canyon Dam Technical Work Group Report on Budget Issues for Review by the Department of the Interior on the FY 2013-14 Glen Canyon Dam Adaptive Management Program Budget and Work Plan

Respectfully submitted,

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

### General Key to Adaptive Management Program Acronyms

ADWR – Arizona Dept. of Water Resources	KAS – Kanab ambersnail (endangered native snail)
AF – Acre Feet	LCR – Little Colorado River
AGFD – Arizona Game and Fish Department	LRRMCP – Lower Colorado River Multi-Species Conservation Program
AIF – Agenda Information Form	LTEP – Long Term Experimental Plan
AMP – Adaptive Management Program	LTEMP – Long-Term Experimental and Management Plan
AMWG – Adaptive Management Work Group	MAF – Million Acre Feet
AOP – Annual Operating Plan	MA – Management Action
ASMR – Age-Structure Mark Recapture	MATA – Multi-Attribute Trade-Off Analysis
BA – Biological Assessment	MLFF – Modified Low Fluctuating Flow
BAHG – Budget Ad Hoc Group	MO – Management Objective
BCOM – Biological Conservation Measure	MRP – Monitoring and Research Plan
BE – Biological Evaluation	NAU – Northern Arizona University (Flagstaff, AZ)
BHBF – Beach/Habitat-Building Flow	NEPA – National Environmental Policy Act
BHMF – Beach/Habitat Maintenance Flow	NHPA – National Historic Preservation Act
BHTF – Beach/Habitat Test Flow	NPS – National Park Service
BIA – Bureau of Indian Affairs	NRC – National Research Council
BO – Biological Opinion	O&M – Operations & Maintenance (USBR funding)
BOR – Bureau of Reclamation	PA – Programmatic Agreement
CAHG – Charter Ad Hoc Group	PEP – Protocol Evaluation Panel
CAPA – Central Arizona Project Association	POAHG – Public Outreach Ad Hoc Group
GCT – Grand Canyon Trust	Powerplant Capacity = 31,000 cfs
CESU – Cooperative Ecosystems Studies Unit	R&D – Research and Development
cfs – cubic feet per second	RBT – Rainbow Trout
CMINs – Core Monitoring Information Needs	RFP – Request For Proposals
CRBC – Colorado River Board of California	RINs – Research Information Needs
CRAHG – Cultural Resources Ad Hoc Group	ROD Flows – Record of Decision Flows
CRCN – Colorado River Commission of Nevada	RPA – Reasonable and Prudent Alternative
CRE – Colorado River Ecosystem	SA – Science Advisors
CREDA – Colorado River Energy Distributors Assn.	Secretary – Secretary of the Interior
CRSP – Colorado River Storage Project	SCORE – State of the Colorado River Ecosystem
DAHG2 – Desired Future Conditions Ad Hoc Group	SHPO – State Historic Preservation Office(r)
DASA – Data Acquisition, Storage and Analysis	SOW – Scope of Work
CWCB – Colorado Water Conservation Board	SPAHG – Strategic Plan Ad Hoc Group
DBMS – Data Base Management System	SPG – Science Planning Group
DOE – Department of Energy	SSQs – Strategic Science Questions
DOI – Department of the Interior	SWCA – Steven W. Carothers Associates
DOIFF – Department of the Interior Federal Family	TCD – Temperature Control Device
EA – Environmental Assessment	TCP – Traditional Cultural Property
EIS – Environmental Impact Statement	TEK – Traditional Ecological Knowledge
ESA – Endangered Species Act	TES – Threatened and Endangered Species
FACA – Federal Advisory Committee Act	TMC – Taxa of Management Concern
FEIS – Final Environmental Impact Statement	TWG – Technical Work Group
FRN – Federal Register Notice	UCRC – Upper Colorado River Commission
FWS – United States Fish & Wildlife Service	UDWR – Utah Division of Water Resources
FY – Fiscal Year (October 1 – September 30)	USBR – United States Bureau of Reclamation
GCD – Glen Canyon Dam	USFWS – United States Fish & Wildlife Service
GCT – Grand Canyon Trust	USGS – United States Geological Survey
GCDAMP – Glen Canyon Dam Adaptive Management	WAPA – Western Area Power Administration
GCMRC – Grand Canyon Monitoring & Research Center	WY – Water Year (a calendar year)
GCNP – Grand Canyon National Park	
GCNRA – Glen Canyon National Recreation Area	
GCPA – Grand Canyon Protection Act	
GLCA – Glen Canyon National Recreation Area	
GRCA – Grand Canyon National Park	
GCRG – Grand Canyon River Guides	
GCWC – Grand Canyon Wildlands Council	
HBC – Humpback Chub (endangered native fish)	
HMF – Habitat Maintenance Flow	
HPP – Historic Preservation Plan	
INs – Information Needs	
KA – Knowledge Assessment (workshop)	

