Glen Canyon Dam Adaptive Management Work Group Meeting

August 8, 2013
Conducting: Anne Castle, Secretary's Designee Start Time: 9:30 a.m.
Facilitator: Bob Wheeler (Triangle Associates)

Committee Members/Alternates:
Charley Bulletts, Southern Paiute Consortium
Tom Buschatzke, State of Arizona
Kerry Christensen, Hualapai Tribe
Alan Downer, Navajo Nation
Ann Gold, U.S. Bureau of Reclamation
Jayne Harkins, State of Nevada
Gerald Hooee, Sr., Pueblo of Zuni
Leslie James, CREDA
Sam Jansen, Grand Canyon River Guides
John Jordan, Federation of Fly Fishers
Lynn Jeka, Western Area Power Adminstration
Leigh Kuwanwisiwma, Hopi Tribe
Charles "Chip" Lewis, Bureau of Indian Affairs
Estevan López, State of New Mexico
Ted Rampton, UAMPS
John Shields, State of Wyoming
Steve Spangle, U.S. Fish and Wildlife Service
Larry Stevens, Grand Canyon Wildlands Council
Bill Stewart, AZ Game and Fish Department
Dennis Strong, State of Utah
Dave Uberuaga, National Park Service (GRCA)
VACANT, State of Colorado
VACANT, San Juan Southern Paiute Tribe

Committee Members Absent:
Loretta Jackson-Kelly, Hualapai Tribe
Larry Riley, AZ Game and Fish Department
Frederick H. White, Navajo Nation

USGS/Grand Canyon Monitoring and Research Center
Lucas Bair, Economist (via phone)
Helen Fairley, Program Manager
Dave Lytle, SBSC Manager
Ted Melis, Program Manager
Jack Schmidt, Center Director
Scott Vanderkooi, Acting Deputy Director

Interested Persons:
Adam Arellano, WAPA
Jan Balsom, NPS/GRCA
Mary Barger, U.S. Bureau of Reclamation
Peter Bungart, Hualapai Tribe
Daniel Buscombe, GCMRC
Rob Billerbeck, National Park Service
Shane Capron, WAPA
Lori Caramanian, DOI
Jennifer Crandell, Colorado River Comm. of Nevada
Marianne Crawford, U.S. Bureau of Reclamation
Kevin Dahl, National Parks Conservation Assoc.
Kurt Dongoske, Pueblo of Zuni
Kyrie Fry, GCMRC
Dr. Dave Garrett, M^3Research/Science Advisors
Katrina Grantz, U.S. Bureau of Reclamation
Martha Hahn, NPS/GRCA
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Paul Harms, NM Insterstate Stream Commission
Beverley Heffernan, U.S. Bureau of Reclamation
Amy Heuslein, Bureau of Indian Affairs
Chris Hughes, NPS/GCNRA
Lisa Iams, U.S. Bureau of Reclamation
Tony Joe, Jr., Navajo Nation (by phone)
Genevieve Johnson, Desert LCC
Vineetha Kartha, AZ Dept. of Water Resources
Glen Knowles, U.S. Bureau of Reclamation
Mark Martinez, Pueblo of Zuni
John McClow, Colorado Water Conservation Board
Gerald Myers, Federation of Fly Fishers
Ariel Neill, Grand Canyon River Guides
David Nimkin, National Parks Conservation Assoc.
Maureen Oltrogge, NPS/GRCA
Don Ostler, Upper Colorado River Commission
Dr. Sarah Rinkevich, DOI (Federal Tribal Liaison)
Mike Runge, USGS
Kendra Russell, U.S. Bureau of Reclamation
Seth Shanahan, SNWA
Bob Snow, DOI/SOL
Paul Stannell, U.S. Bureau of Reclamation/GCD
Gaylord Staveley, Canyonneers, Inc.
Justin Tade, DOI/SOL
Jason Thiriot, State of Nevada
Shana Tighi, U.S. Breau of Reclamation
Dave Trueman, U.S. Bureau of Reclamation
Tanya Trujillo, State of California
Jason Tucker, U.S. Bureau of Reclamation/GCD
Teri Tucker, NPS/GCNRA
Mark Van Vlack, Colorado River Board of California
Larry Walkoviak, U.S. Bureau of Reclamation
Christi Wedig, Glen Canyon Institute
Charles Yackulic, USGS
Mike Yeatts, Hopi Tribe

Recorder: Linda Whetton, USBR

Welcome and Administrative. Ms. Anne Castle welcomed the members and the public. Introductions were made and a quorum was determined. Ms. Castle thanked those who had participated in the previous three days of the Structured Decision Analysis (SDM) workshop. Approval of May 8, 2013, Web/Ex Meeting Minutes. Motion to approve made by John Shields, seconded by Larry Stevens. Without objection, the minutes were approved by consensus.

- Action Item Tracking Report (***Attachment 1***). No comments were offered on items to be closed.
- Progress on Nominations and Re-appointments. Several re-appointments are in Departmental routing and should be finalized soon. Ms. Castle welcomed the following new members and alternates: Gerald Hooee, Sr. (member, Pueblo of Zuni), Chip Lewis (member, State of Arizona), Mark Martinez (aternate, Pueblo of Zuni), and Jason Thiriot (alternate, State of Nevada).
  - The Grand Canyon Trust relinquished their AMWG seat on August 2, 2013 (***Attachment 2***) Mr. David Nimkin will be appointed as the AMWG member from from the National Parks Conservation Association (NCPA).
  - Ms. Castle provided the following DOI personnel changes: (1) Tom Eisner, Deputy Assistant Secretary position for AS-WS, (2) Ms. Jennifer Gimbel, counselor for the AS-WS Office and she will recuse herself from some Colorado issues, (3) Reclamation Commissioner, Mike Connor has been nominated to for Deputy Secretary for DOI.
- TWG Chair/Vice Chair for FY 2014. Mr. John Jordan was re-elected as TWG Chair and Mr. Shane Capron as vice chair for FY 2014. Mr. Glen Knowles will continue as Reclamation's vice chair.
- AMWG Charter Renewal. The revised charter will include the "*desired future conditions"* language recommended by the AMWG, but will not reference the memo signed by Secretary Salazar. The charter doesn't allow linking memos to previous DOI secretaries.
  - Follow-up is needed with Havasupai Tribe for potential participation in the GCDAMP. A meeting will be scheduled with feedback to be provided at a later date.

Basin Hydrology and Operations (***Attachment 3*** = AIF and PPT). Ms. Katrina Grantz. Spring runoff in the Upper Basin was significantly below average for each of the major CRSP reservoirs, Lake Powell is 46% full. The inflow indicates that water year 2013 will be the third driest water year on record. The most probable forecast for water year 2014 is 77% of average, but currently there are wide error bands that go up to 15.5 maf which would be 143% of average and a low projection of 5.00 maf which is 46% of average. There is a 10% chance that inflows could be higher or lower than the current projection. The water year (WY) 2014 release volume and operational tier will be determined after the August 24-Month Study modeling is completed. Current projections are a 7.48 maf release year for WY14, however, these are very close to the threshold and could change. There is an important difference between the 24-month study model and the CRSS model. The CRSS model assumes a range of hydrology as seen from 1906 through 2010, whereas the 24-month study model uses an actual forecast.

Ms. Castle noted the Bureau of Reclamation's Colorado River Basin Study has generated a "next steps" process and people are thinking very seriously about what kinds of municipal and agriculture conservation should be considered, and what amounts and locations of environmental flows are necessary for healthy ecosystems up and down the river in the basin.

Glen Canyon Dam Maintenance Schedule. Glen Canyon Dam has eight units, Unit 4 is offline for turbine runner replacement and Unit 6 is offline due to instability. In November there will be six units available. The volume of an approximate peak of an HFE is 17,800 cfs; 15,000 cfs can be released through bypass tubes, providing a total maximum release of 32,800 cfs.

Water Year 2014 Hydrograph (***Attachment 4*** = AIF and PPT). Mr. Dave Trueman. Lower flows coming into the reservoir raise concerns for the volume that will be released from the reservoir. Low inflows are expected to continue into the future and as a result of low reservoir conditions; a 7.48 maf release is is projected to be required under the Interim Guidelines. The WY14 hydrologic conditions: (1) GCD annual release will be determined in August, (2) an equal probability it will be 7.48 maf or 8.23 maf, minor chance of balancing (higher than 8.23), (3) monthly volumes will be established early in the year.

TWG Report Mr. John Jordan. TWG discussed the hydrograph on their June webinar. Mr. Trueman read the draft hydrograph motion from the AIF.

Motion Proposed by Tom Buschatzke, seconded by: Ted Rampton
AMWG recommends to the Secretary of the Interior for her approval the DOI-DOE Proposed Hydrograph for Water Year 2014 as follows:

- **Annual Release Volumes will be determined in compliance with the 2007 Interim Guidelines (in consultation with the Basin States as appropriate)**
- **Monthly Release Volumes are anticipated to shift depending upon: (1) the Annual Release Volume, and (2) the magnitude of a potential High Flow Experiment.**
- **Monthly Release Volumes may vary within the targets identified below. Any remaining monthly operational flexibility will be used for existing power production operations under the Modified Low Fluctuating Flow (MLFF) alternative selected by the 1996 ROD and contained in the 1995 FEIS and in compliance with all applicable NEPA compliance documents (HFE EA, NNFC EA, 2007 IG).**
- **Release objective for June is 600 kaf to 650 kaf**
- **Release objective for August is 800 kaf.**
- **Release objective for September and October is 600 kaf to 630 kaf (or less).**
- **Monthly Release Volumes will generally strive to maintain 600 kaf levels in the spring/fall timeframe and 800 kaf in December/January and July/August timeframe.**
- **Additionally the Bureau of Reclamation will continue to apply best professional judgment in conducting actual operations and in response to changing conditions throughout the water year. Such efforts will continue to be undertaken in coordination with DOI/DOE agencies, and after consultation with the Basin States as appropriate, to consider changing conditions and adjust projected operations in a manner consistent with the objectives of these parameters as stated above and pursuant to the Law of the River.**

Hearing no objection, the motion was passed by consensus.

AMP Federal Tribal Liaison Report (***Attachment 5*** = AIF + PPT). Dr. Sarah Rinkevich. Since December 2012, Dr. Rinkevich has met with four of the five tribes and gave the following report:

- Met with several council members and the governor of Pueblo of Zuni, they explained their cultural values.
- Kurt Dongoske took her to a archaeological site and tribal dance.
- Met with the Hualapai Tribal Council
- Spent a day in the field with Tony Joe from the Navajo Nation.
- Met with the Southern Paiute Consortium. Charley Bulletts also took her to the Shivwits Council.
- Participated in a series of meetings with the tribes to assist with the LTEMP EIS on tribal coordination and with Mike Runge and Argonne Labs. One of the performance metrics at the LTEMP workshop was sanctity of life which was expressed in meetings with the tribal elders.
- Participted in several river trips.
- Plans to work with Charley Bulletts on collating vegetation information
- Will report on the Hualapai's proposal for TEK and LTEMP EIS activities at a future meeting.

Update on Tribal Liaison Position. When the tribal liaison position was established, DOI envisioned hiring a tribal member for half of the position. Due to sequestation and contracting issues, filling that position has taken longer than anticipated. A Statement of Work was prepared and input requested from the tribal members. Contracting issues have been resolved and funding secured for an interagency agreement with a tribe.

Mr. Leigh Kuwanwisiwma. The Hopi Tribe was the first cooperating agency in the AMP process in 1992. Inspite of their reporting efforts and providing results from their monitoring trips, the Hopi Tribe feels their

contributions haven't been incorporated into the science but the biological and natural sciences have been taken very seriously. The tribes need to sit down with other stakeholders and determine how TEK information can be utilized in making recommendations to the Secretary. Traditions are very important to the Hopi. There needs to be a commitment of resources to bolster up tribal technical abilities. Tribes lack training in the natural and biological sciences, and lack staff such as plant and hydrology experts. He's encouraged with Dr. Rinkevich's role in the program and looks forward to her assistance in preparing grants for work to be done.

Ms. Castle thanked Mr. Kuwanwisiwma for his comments and concurred with the needs for more understanding, which was a primary reason for creating the tribal liaison position. DOI is committed to tribal involvement and consultation.

Mr. Gerald Hooee said the tribes want their perspectives taken more seriously when developing agreements and documents. Mr. Tony Joe concurred and expressed appreciation for those who went on the Navajo River trip and felt it was a great success.

Science Updates: Overflights, Riparian Vegetation, and Sediment (***Attachment 6a*** = AIF).

- 2013 Overflight Mission Update (***Attachment 6b***). Dr. Phil Davis. The main objective of the overflights is to collect data for the entire Colorado River corridor starting one-half mile above the dam all the way to Pearce Ferry, every four years. Data was collected in 2013 in six days without cloud shadows. The cost was approximately $525,000. Staff are starting the analysis work for sandbars and camping beaches on 1,650 sites. WAPA spent $74,000 for additional power as a result of the low flows to accomplish the work.
- Changes in Riparian Vegetation in the Colorado River Corridor, 1965-present. Dr. Joel Sankey (***Attachment 6c***). The overflight data provides change detection. Longer-term datasets are specific to shorter reaches along the river and are representative of corridor-wide changes. A comparison of changes from 2002 to 2009 showed riparian vegetation increased system-wide; 25% of the shoreline below 45,000 ft^3/s was vegetated in 2009. From 1965 to 2009, vegetation was less stable at lower elevations, vegetation at higher elevation zones is more stable because it is not subject to hydrological changes or flooding. Remote sensing datasets allow both large-scale change detetion and local-scale analysis in order to quantify plant response to changing dam operations.
- Status of Sediment Resources–August 2013 (***Attachment 6d***). Dr. Paul Grams. Monitoring of sandbar resources confirm that each HFE builds sandbars. Images are collected by remote cameras; annual (fall) sandbar surveys at long-term sites, and analysis of remote sensing images every four years. It is necessary to determine if the sand supply needed to plan for HFEs is available and is done through monitoring sediment flux and in-channel sand storage. During HFEs, the accumulated sand is carried downstream and some gets deposited on the banks. Following HFEs, the bars erode and sand is carried downstream and the cycle starts again. For the cycle to be sustainable, there must be an approximate balance between what comes in and what goes out. Over the past year Dr. Topping has made great efforts to build this information on GCMRC's website (http://www.gcmrc.gov/discharge_qw_sediment/reaches/GCDAMP). In general, the Marble Canyon long-term sand balance is negative while the Grand Canyon long-term balance is more neutral. Sand mass balance is computed for six reaches between Lees Ferry and Lake Mead. The entire record for the Upper Marble Canyon and Eastern Grand Canyon reaches have large negative numbers. In the 2013 accounting period, Upper Marble Canyon was in slow decline. Although the median trend in Marble Canyon is negative, there are sites that have increased since 1990. Results from the 2012 HFE indicate a substantial gain to 18 sandbars (55% of sites), no substantial change in 12 sandbars (36% of sites), and substantial loss of 3 sanbars (9% of sites). Before summer fluctuations with flows peaking at 18,000 cfs, the sandbar condition in May 2013 was still somewhat larger (8 sites), about the same as pre-HFE size (14 sites), and smaller than pre-HFE (7 sites).

Technical Work Group Chair Report (***Attachment 7a***). Mr. John Jordan. The TWG utilized a webinar for its June meeting and will do the same for the upcoming October meeting.

- Revised TWG Operating Procedures (***Attachment 7b***) – The TWG adopted new operating procedures by consensus. The new operating procedures mirror the AMWG procdures in that DOI agencies are non-voting, but highlight the need for DOI agencies to provide input in discussions. The TWG chair and vice chairs will work toward ensuring open participation.
- Administrative History Ad Hoc Group Update (***Attachment 7c***) - Mr. Jason Thiriot. An update was provided on the GCDAMP "wiki" website (http://gcdamp.com); AMP members are encouraged to upload documents important to the program.
- Socioeconomic Ad Hoc Group Update – Dr. Dave Garrett. The socioeconomics program hasn't been implemented, but some activities have started: (1) NPS has a program looking at environmental impacts, non-market values, non-use values, etc., of wilderness and various resources in the Colorado River corridor, and (2) Dr. Dave Harpman is doing research on non-market, non-use recreational resources in the riverine corridor, and (3) Argonne is doing a hydropower market impact assessment. The SEAHG will review those acitivites and determine if they can provide the information needs AMWG recommended they pursue.
- An economist (Lucas Bair) was hired by GCMRC.
- Dr. Jack Schmidt distributed copies of the Food Web Fact Sheet (***Attachment 7d***).

Science Update: Fisheries (***Attachment 8 = AIF and PPT***) - Dr. Scott VanderKooi. Trout abundance estimates have been revised. They were previously closed population estimates, but there are issues with those calculations. A more robust, open population model is now being used and in some cases their estimates increased considerably. RBT populations were high in the upstream third of Marble Canyon, but low where HBC live. There has been a steady decrease in trout into late 2012 and that trend has continued into 2013. The high levels of trout in 2012 were a result of the 2011 equalization flows. Although there has been an overall decrease in abundance system-wide, this is not true at all sites including the reach below the LCR. RBT abundance has slightly exceeded the FWS biological opinion trigger level, but there are other aspects of the trigger for non-native fish control that have not been met.

Open vs. Closed Population Models – Closed population models estimate abundance based on capture histories within a single trip. A key assumption is that fish behavior does not change in response to capture and marked and unmarked fish behave exactly the same. There wasn't adequate data to populate the models when the study was started. Simple models tend to give an overestimate abundance.

Results from the reach below the LCR indicate a shift in trout numbers. There has always been a few BT there. In 2012 it was less than five per trip but in January it increased into the teens. That trend has continued since. At Tapeats Gorge near the confluence of the LCR, BT catches increased in 2013 and recently were dominated by smaller fish. These data indicate that BT populations near the LCR are increasing. BT are a highly piscivorous species known to eat humpback chub. Increasing numbers of BT below the LCR is of concern.

Fish response to HFE. In October several thousand RBT were PIT tagged and monitored again in early December to determine how far they had moved. Most were recaptured within a quarter mile of the release location, few fish moved any great distance. In 2008 Kara Hilwig and others radio-tagged trout and looked at movement in response to a spring HFE. They concluded that fish didn't move downstream in significant numbers. The natal origins study has also been monitoring movement to determine if, when, and at what size, fish are moving from Lees Ferry downstream. They are tracking not only populations but how much they are moving. Data indicates that large numbers of fish are not moving significant distances. In some instances they saw fish move upstream, but very little movement downstream.

The Juvenile Chub Monitoring Program below the LCR is using the same sampling protocols as the Nearshore Ecology Project (NSE). Data collected last fall indicated a temporary increase in chub in the

LCR reach however fluctuations are not unusual in juvenile fish populations, they can be highly variable annually and seasonally. The juvenile numbers in 2012 and 2013 were above the levels seen during the NSE project. Data from the USFWS spring chub monitoring trip indicated 1,583 juvenile HBC 50-199 mm in size. The trigger for trout removal in the 2011 FWS BO is < 900 HBC. The fish hatchery in New Mexico is evaluating the feasibility of tagging smaller HBC with smaller PIT tags. This new PIT tag equipment will provide a better understanding of spawning frequency, survival and abundance estimates.

Dr. Schmidt explained the primary home of BT is Bright Angel Creek, 25 miles downstream from the LCR reach. The NPS is aggressively working to eliminate the population of BT in BAC, but there is a need to understand how many lived a full life in the Colorado River. While the good news is that chub numbers are increasing at the mouth of the LCR, the bad news is the BT are increasing and they eat chub.

Planning for a Fall 2013 High Flow Experiment (***Attachment 9*** = AIF + PPT). Glen Knowles. Mr. Knowles provided a review of the process for determining when to conduct HFEs under the HFE Protocol. He said that a May 2012 Secretarial Directive created the Glen Canyon Leadership Team that makes the determination and a Technical Team that provides a recommendation to them based on a review of all resources affected downstream of Glen Canyon Dam, and he highlighted information on cultural, biological, and hydropower resources and noted that no resource concerns have been identified for conducting a 2013 HFE. He said that Ms. Grantz provided information on the possible monthly distributions for various HFE scenarios in a 7.48 maf year and for a 8.23 maf water year. Due to maintenance at Glen Canyon Dam, currently only 6 units would be available for use during an HFE limiting total release to 32,800 cfs. Based on the July forecasts, if there is 7.48 maf, a maximum of about 200kaf would need to be reallocated from other months to the November release for the largest possible HFE of 96 hours, and about 130kaf would be expected to be bypass.

Mr. Knowles reviewed the reporting requirements under the HFE Protocol. He said there are 5 ways in which HFE results are reported: 1) In reports given by GCMRC and Reclamation at the GCDAMP Annual Reporting meeting every January; 2) In updates provided at every TWG and AMWG meeting; 3) In a required meeting after every HFE with the HFE MOA consulting parties, including as-needed tribal consultation; 4) In the HFE Technical Team report to the Secretary's Glen Canyon Leadership Team for their consideration in HFE decisions; 5) In an annual report to the FWS on the effects of prior HFEs and conservation measures of the 2011 FWS biological opinion.

Mr. Shields said he had sent an e-mail to Mr. Knowles regarding the requirement in the FONSI that stated Reclamation's commitment to summarize what had been learned in the previous HFE. Mr. Knowles told him that Secretary Salazar had issued a directive that Reclamation would produce a report if a decision is to be made, which is the report from the Technical Team. He noted that a Technical Team report was submitted to the Leadership Team last fall for the 2012 HFE and that a similar report would be generated if there is enough sediment input this fall to warrant consideration of a 2013 HFE. Ms. Castle said the AMWG has been consulted and kept current on plans to conduct an HFE at the Annual Reporting meeting in January 2013, the AMWG meeting in February 2013, at TWG meetings and weibnars, and in information provided by GCMRC. The Technical Team will produce a written report if they recommend an HFE be conducted. Mr. Shields responded that scheduling another HFE isn't really an experiment because the AMWG isn't making a decision on information learned from the previous HFE.

Dr. Schmidt accessed the GCMRC web page (http://www.gcmrc.gov/discharge_qw_sediment/). This information was used to develop the 2013 HFE, and this web site is where real time sediment information can be obtained. Currently there are 445,000 tons of sediment in the system. Scott Wright's model indicates that an additional 121,000 tons of sand input are necessary to tripper the smallest HFE under the HFE Protocol, a one-hour HFE at 31,500 cfs. Last year there was 650,000 tons of sediment for the November HFE. Since July 1, 445,000 tons have accumulated in the system. The Colorado River continues evacuating sand out of Marble Canyon even as the Paria floods bring sediment in. Sand coming into the system doesn't get retained in a holding tank. As soon as the flood stops the system

starts evacuating sand again. This new website is going to be a powerful tool in planning future HFEs, and anyone can access the site at any time to see what the latest conditions are. If the TWG or AMWG would like a formal webinar about these new developments, they should contact Dr. Schmidt.

FY 2013-14 Budget and Work Plan (*Attachment 10* = AIF + PPT). Ms. Castle. The AMWG budget in the context of the larger Interior budget; the Interior budget for 2014 was passed by the House Appropriations Subcommittee for Interior and Environment and a second budget for Interior and Environment was marked in the Senate. The House budget works from a very different bottom line than the Senate budget. The House allocations are very, very low and is based on a budget scenario that is lower than even sequester levels, which get worse next year. Consequetnly the budget for the Department of the Interior is significantly reduced in the version passed by the House Subcommittee. It cuts substantially from USGS and the other Interior agencies. There is a different Appropriations Subcommittee for the Bureau of Reclamation which makes the whole Interior budget a little schizophrenic to deal with, but the Energy and Water Appropriations Subcommittee deals with Reclamation's budget and it is also very low. The Senate version, in essence, are higher but reduced from previous years. It's unlikely the House and the Senate will be able to reconcile the two budgets before the end of this fiscal year and the start of fiscal year 2014, it's just 45 days away. There are only nine working days in the House of Representatives between now and the end of the fiscal year. It's likely there will be a continuing resolution, but that doesn't mean agencies will continue at the same levels as before. The sequester in 2013 required a 5.1% cut and in 2014, it will be an 8% cut. The only way we get out from under this is if there is agreement in the House and Senate and a bill is passed that eliminates or lifts the sequester. As such, the AMWG budget recommendation will provide two budgets, one with and one without sequester.

- Bureau of Reclamation Proposed Changes to FY 13-14 Budget and Work Plan. Mr. Knowles reviewed proposed changes to the FY-1314 BWP;
    - The 5.1% sequester in FY13 was a cut of $532,939. The 8% sequester cut in FY14 will be $861,063. The AMWG budget will absorb the FY13 cut and the FY14 cut (should it occur) in the Experimental Fund and Native Fish Conservation Carryover Fund.
    - AMWG/TWG Facilitation – Due to some contracting issues, there is currently not a contract in place for facilitation and this line item has been zeroed out in FY14. This is no reflection on Triangle's performance, Mr. Wheeler and his staff did a tremendous job.
    - Tribal Participation in LTEMP EIS Process - Funding in the Reclamation Cultural Program has been reallocated to fund tribes to provide input to the LTEMP EIS.

  Native Fish Conservation Carryover Fund - Triggers for trout removal haven't been met for several years, consequently this fund hasn't been used. The 5.1% cut from sequestration ($532,939) when applied leaves this fund at $850,151 and insures that other projects are fully funded. If the sequester is applied in FY14 at 8% ($861K), this fund would be reduced to $504,088 in FY14. Reclamation won't know if sequestration will continue in FY14 until the next fiscal year begins.
- FY 14 Budget Considerations. GCMRC is not proposing any changes.
- TWG and Budget AHG Report (***Attachment 10b***). Mr. Shane Capron. The major issues of discussion included sequestration cuts, HBC aggregation sampling, trout tagging for natal origins, and funding for administrative history work. He referred to the draft motion in the AIF (below) which will be discussed at tomorrow's meeting:

  AMWG recommends the revised FY2013-14 Biennial Budget and Work Plan from the Bureau of Reclamation and Grand Canyon Monitoring and Research Center, as reviewed by TWG on June 26, 2013, and as revised by Reclamation and presented at the August 2013 AMWG meeting, to the Secretary of the Interior for approval.
- The Sequestration Act is a 10-year act, 2014 is the first full year. Budget Officer Bob Wolf in the Washington Office informed Mr. Walkoviak it would take an act from Congress to not have sequestration in 2014. It's the law of the land now and the Department must include sequestration in its budget. The AMWG should not recommend a budget to the Secretary that doesn't comply with the law. Bob Wolf has also been working with OMB concerning whether power revenues must be included in agency spending plans.

Public Comment: Lynn Hamilton (GCRG) complimented the work being done by GCMRC and said the new website for tracking sediment inputs is amazing. Even though there was great information presented in today's meeting, she wants people to realize that 70 miles away there is a living river and its of great value to the American public. She thanked the members for their attendance on the river trip last August and said GCRG would be happy to sponsor another dinner.

Adjourned: 5:20 p.m.

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Christi Wedig, Glen Canyon Institute

Recorder: Linda Whetton, USBR

Welcome and Administrative. Ms. Castle welcomed the members and the public. A quorum was determined and introductions made.

FY 2013-14 Budget and Work Plan (Cont) (***Attachment 10 = AIF)***. A revised budget motion was developed and presented to the members. Ms. Castle asked if anyone wanted to move the motion.

Motion (Proposed by Kerry Christensen, seconded by Larry Stevens): AMWG recommends the FY2013-14 Biennial Budget and Work Plan for the Bureau of Reclamation and the Grand Canyon Monitoring and Research Center that includes the 2014 sequestration impacts, as reviewed by the TWG on June 26, 2013, and as revised by Reclamation and presented at the August 2013 meeting to the Secretary of the Interior for approval. In the event that sequestration is not implemented in FY2014 budget, AMWG recommends the revised FY2013-14 Biennial Budget and Work Plan from the Bureau of Reclamation and Grand Canyon Monitoring and Research Center without the 2014 sequestration.
Hearing no objection, the motion was passed by consensus.

Larry Walkoviak-As has previously occurred under a Continuing Resolution, the actual budget for the Department will not be known until midway through the fiscal year. OMB will submit a spending plan under sequestration and Reclamation's budget must match what OMB submits. When there is more information the BAHG and/or AMWG should convene to determine if modifications are needed.

Long-Term Experimental and Management Plan EIS. (***Attachment 11*** = AIF + PPT) Mr. Rob Billerbeck, Mr. Glen Knowles, Mr. Mike Runge

- LTEMP EIS relationship to NPS Comprehensive Fisheries Management Plan (CFMP) – This is a comprehensive plan for GCNRA and GCNP and is focused on the recreational fishery in Lees Ferry and the native fishery downstream in Grand Canyon. It has specific goals, objectives, and a number of actions to implement. Some of those objectives and actions overlap with previous commitments from Reclamation which include four Reclamation Conservation Measures: (1) HBC translocation to tributary streams in Grand Canyon, (2) Comprehensive control of brown trout in Bright Angel Creek and the mainstem Colorado River near BAC, (3) Monitoring and conservation of Colorado River mainstem aggregations, and (4) Razorback sucker habitat evaluation and potential augmentation. The LTEMP EIS has some of the same goals and objectives but they are wide-ranging and broader. The more specific goals of the CFMP fit within the broader goals of the EIS but the LTEMP EIS is not adopting the specific goals of the NPS plan. The CFMP is a resource specific plan for the fishery, the LTEMP EIS is focused on dam operations and related actions to meet the GCPA. The LTEMP EIS is considering additional tools that would compliment the CFMP like nonnative fish control in Lees Ferry and at the LCR and trout management flows. The CFMP is an adaptive plan moving forward to manage the fishery and will work within any alternative to come out of the LTEMP EIS.
- Summary of Stakeholder Tradeoff Analysis Workshop – Mr. Knowles. Tlhe process has revealed that more work needs to be done on some of the metrics, specifically water delivery and tribal metrics. This was the first step and the next round of discussions will provide more definitive results. The group requested the process go slower and suggested some of the technical information be provided in subject specific webinars for ease of understanding. Mr. Billerback reassured everyone that their input was important and that no voices will be lost in the process.

  Mr. Mike Runge - The workshop was twofold; the science portions of the LTEMP analysis and the policy or values aspects. Formal decision analysis is a complex problem that is being undertaken in the LTEMP analysis to identify a long-term experimental management strategy that seeks to include aspects of a complex system that is not perfectly understood. The next steps will look at the analysis of the consequences of the alternatives against the resource goals. When there are multiple objectives, it's hard to manage the tradeoffs. If everything can't be attained in an alternative the right balance of objectives must be determined. An early analysis allows insight and an opportunity to refine and develop a more robust analysis. Argonne is leading the analysis

work and has assembled nine teams to focus on a number of topic areas. Nine alternatives have been analyzed against approximately 35 performance metrics.

Some resource goals are not expressed quantitativly as required by the performance metrics, particularly tribal values. The lead agencies have invested special effort to engage the tribes in the LTEMP process. The structured decision analysis processs is a Western deconstructionist, quantitative way of approaching decisions which is not the way traditional North American cultures make their decisions. However, these tribal goals can be integrated but it requires extra communication to bridge understanding. Efforts to accomplish this have included; a March workshop with the tribal representatives, webinars and phone calls from May-July, in-person meetings attended by Dr. Rinkevich and Mr. Runge with the cultural resource advisors and elders at Hulapai, Hopi, Zuni, and Southern Paiute. Face-to-face conversations have been extraordinarily informative relative to representing tribal concerns, values, and resource goals in the LTEMP process.

In response to a request to explain what the “hydrologic trace” means, Mr. Runge said it’s a forecasting and prediction process to ask what might happen over a number of years. Hydrologic traces are constructed from the historic record of inflows for water and sediment. A 20-year trace is created which provides a range of sediment conditions. The intent is not to aggregate the results but to retain an understanding of the individual variation.

Mr. Kurt Dongoske - The metric for archaeological and cultural resources is focused on aeolian sand, the goal of the metric is to preserve national register eligible sites in place and focuses mostly on archaeological sites. It fails to understand or identify what needs to be preserved which are the characteristics of those properties that make them national register eligible. Those characteristics are the things that convey historical significance and may be different for different cultural groups. Zuni may look at an archeological site and see aspects that convey significance to Zuni, but a NPS archeologist may see something different. People need to recognize that the Grand Canyon from rim to rim is a national register eligible traditional cultural property. The Colorado River is a national register traditional cultural property and so is the Little Colorado River. There may be effects to the significance of the Colorado River by different flows that Zuni may interpret as an impact to a traditional cultural property. When the Zuni’s worked on the Lake Powell Pipeline Project to convey water from Lake Powell to Utah, they considered it an adverse affect because the lifeblood of the river was being pushed to some place it wasn’t designed to go. Follow-up work will be done to ensure the issues and performance metrics are correct.

Mr. Larry Stevens - proposed mapping the metrics on an ecosystem map to see if there are major parts of the ecosystem that are not being captured. Timing could be quite useful in management for some things. For example, HBC probably don’t need to reproduce every year to have a healthy population.

Mr. John Shields - hold public meetings in advance of the release of the draft EIS so that others can provide input earlier in the process in order to have input from stakeholders that is not mixed and evaluated with the results of this SDM evaluation. It’s important that additional input not supplant nor be co-mingled with the input that comes at later stages through the more traditional means. Mr. Billerback noted a large number of public scoping meetings were held at the beginning of the LTEMP process, but they’re also considering providing science presentations open to the public prior to the release of the draft. Mr. Billerback encouraged the workshop participants to submit any follow-up comments by August 23.

Future steps:

- Cooperating agency calls/meetings
- SDM workshop via webinar
- Public meeting to present draft alternatives
- Annual Reporting Meeting in January 2014

- Knowledge Assessment with the scientists
- Release Draft EIS
- Conduct public meetings
- Received public comments
- Publish Final LTEMP EIS

Concerns:

- Impact of Lake Powell water levels and climate change in LTEMP
- FWS needs to engage with Pueblo of Zuni when beginning consultation process
- Consider convening PA members to address NHPA, EIS, and cultural resources
- Have discussions with tribes and not let laws and regulations become barriers to process
- Need tribal views to be integrated into alternatives and metrics
- Consider that recreation and water management effect Hualapai more than other tribes due to their proximity to the canyon
- Define SEAHG involvement in LTEMP EIS process
- Remember the canyon is an amazing place and protect it for future generations to enjoy

The Desert Landscape Conservation Cooperative (LCC) (***Attachment 12a*** = AIF + PPT). The LCCs are partnerships of governmental (federal, state, tribal, and local) and non-governmental entities. The primary goal of the LCCs is to bring together science and resource management to inform climate adaptation strategies to address climate changes and other stressors within an ecological region, or "landscape." There are two LCCs that cover the Colorado River Basin; the Southern Rockies LCC for the Upper Basin and the Desert LCC in the lower portion of the Colorado River Basin. While most of the LCCs across the country are led by the FWS, these two are co-led by FWS and BOR recognizing that water is such an important component of ecological function and land management in the southwest. Reclamation Commissioner Michael Connor recently announced that 12 projects will receive a total of $1.4 million to develop applied science tools in support of the Desert and Southern Rockies LCCs.

Ms. Genevieve Johnson, coordinator for the Desert LCC, was appointed by Reclamation as a co-lead for this particular LCC. The LCCs were formed based on the idea that landscape scale changes and stressors were forcing people to make management decisions that couldn't be done independently and require more information and collaboration. All of this is being compounded by climate change. It is difficult to work across various boundaries that nclude different missions, regulations, and goals; difficulty having one agency represent another; language and communication barriers; and cultural differences between organizations. There is a high level of commitment to make the program work which resulted in Secretarial Order No. 3289 (***Attachment 12b***). More information on Desert LCC can be found at their website: http://www.usbr.gov/dlcc.

Farewell to Two AMWG Members

Ms. Castle presented gifts and cards to Ms. Heuslein and Mr. Strong who will be retiring in the next few months. She thanked Ms. Heuslein for serving 16 years on the AMWG and for always reminding the members of the tribes' interests. She thanked Mr. Strong for his past seven years on the AMWG and for his wonderful, logical mind, and openness in listening to the viewpoints of others.

Stakeholder Perspective: Who is CRSP? (***Attachment 13a*** = AIF). Ms. Lynn Jeka, Colorado River Storage Project (CRSP) Manager for Western Area Power Administration - Congress created the CRSP through the CRSP Act of 1956. The Act authorized the Secretary of the Interior to construct, operate, and maintain the CRSP and participating projects. Now 57 years later, Western Area Power Administration's CRSP Management Center works collaboratively in partnership with the Bureau of Reclamation to generate and market power to customers. CRSP and Reclamation, with a total investment of $2.375 billion, provide clean, reliable, wholesale electric service to customers in the west including 53 Native American tribes.

Handout on "Capacity and Energy" (***Attachment 13b***) Capacity is the capability of suppliers to produce a good service. In the electricity market, capacity is the physical amount of generation that a utility

company has available to serve customer demand. Energy is the amount of electricity, which is produced by the generating capacity of an electric utility, that customers consume over time. Energy is measured in kilowattours or megawatthours. Energy is the product of capacity and time.

This presentation produced a lot of interest in how power is produced, marketed, sold, etc., and how the Basin Fund works (See Q&A transcript as ***Attachment 13c***).

Public Comment: None

Wrap-Up and Adjourn: The next AMWG meeting will be held in February 2014. Ms. Castle expressed appreciation to those individuals who worked so tirelessly in developing models and completing analysis of LTEMP Alternatives for use in workshop this week. Another workshop will be scheduled as a webinar in the next few months. She thanked the members and public for their attendance and participation.

Next AMWG Meeting: February 2014 in Phoenix, Arizona.

Adjourned: 12 p.m.

Respectfully submitted,

Linda Whetton
Bureau of Reclamation
Upper Colorado Region

Key to Glen Canyon Dam Adaptive Management Program Acronyms

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

(Updated: 2/5/2013)