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**+Glen Canyon Dam Technical Work Group Meeting**  
April 20-21, 2017

**Summary of Actions Taken**

1. Draft Minutes for January 26, 2017, meeting were approved by consensus.

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**Date:** April 20, 2017

**Start Time:** 9:30 a.m.

**Conducting:** Seth Shanahan, TWG Chair  
Vineetha Kartha, TWG Vice-Chair

[Attendees](#)

**Meeting Recorder:** Linda Whetton

**Welcome and Administrative:** Mr. Shanahan welcomed the members and the public. Introductions were made and a quorum determined.

- Approval of January 26, 2017, Meeting Minutes. Without objection, they were approved by consensus.
- Review of Action Items. No action required.
- Next Meeting Date: (W) June 28, 1-5 p.m. and (Th) June 29, 8:30a – 5P at ADWR.
- [Ad Hoc Group Updates](#) – Mr. Shanahan. Chris Budwig resigned as the TWG member for FFF/TU. Seth recognized his contributions and involvement with the program. His departure leaves the TAHG chair position vacant so anyone interested in that should let Seth know.
- TAHG Update – Mr. Shanahan. The TAHG worked on reaching consensus on some priority issues and produced a document that was delivered to the TWG in January. They felt those items were consensus from the group. There wasn't a lot of feedback so all the items previously brought forth remain unchanged.
- CRAHG Update. Nothing to report.
- SEAHG Update – Mr. Reeder. The group updated Table 1 and developed the [SEAHG high priority list](#).
- AHAHG Update. Nothing to report.
- BAHG Update. Will be provided tomorrow during the budget discussion.
- Science Advisors Program Update – Dr. Braun. The SA are finishing the Knowledge Assessment Report and will provide feedback on the Draft TWP to BOR and GCMRC.
- Update on Plan for Controlling High Risk Aquatic Invasive Fish Species – Mr. Hyde. A crew will go out tomorrow morning to install a metal screen barrier between the upper slough and the lower slough. They don't believe there is any fish in the upper slough after the successful chemical treatment last year. The barrier should keep the GSF from entering the one-third acre little pond that gets the warmest. A fish net will be done in the small portion of the lower slough which is the unknown this year and whether the 2015 GSF ever found a spot in that lower slough to also spawn. They will net off the most likely area and hopefully be able to keep them out of the upper slough. They and other partners will monitor the lower slough.
  - Ms. Balsom. The second piece of the plan is to move forward with an EA to look at high risk non-natives. They talked about GSF, BT, striped fish and others and have tried to figure out how the best strategy. They're looking at beginning a public scoping process in late May/early June to open the dialogue on how to prevent, minimize, and reduce the presence of these potentially harmful non-natives in the system. They would use the same affected environment as was done in the CMFP and look at the same geographic area from the dam downstream to the tributaries. They're trying to do it in a way that is comprehensive and not have to do repeat work. It will take at least a year to get that process through and also look at potential management actions to reduce those threats. They're hoping to engage BOR, AZGFD, and tribes as cooperators. They will also be addressing the BT issue. They're looking at a more holistic process to address the issues so as not to have to revisit next year.
- Update on Progress Toward Completing the Brown Trout Motion Approved by the AMWG in Feb 2017 – Ms. Grantz. The motion recommended the workshop be held before August 2017. At the time the motion was passed, the timing to hold a workshop was optimistic given the need to forward that motion to the Department. She has given briefings to new Washington Office staff on the GCDAMP and sent a formal

letter to the Washington Office. Unfortunately DOI staff and Trump transition teams have many competing priorities. Mr. Rhees did establish a small planning team to be led by NPS to start the process.

- Potential Experimental and Management Actions Considered in CY 2017 – Ms. Grantz. Each year BOR contemplates what types of experiments could occur, but the only one likely to happen is a Fall HFE and possibly an extended HFE under the LTEMP. The outcome of the BT Workshop and information gathered there will be incorporated into the decision making for potential Fall HFEs. She is committed to determining early on if and when one will occur, but the decision won't be made until Oct-Nov by the HFE Planning Team.

**Hydrology and Operations** – Mr. Davidson. As of April 18, the Upper Basin was 106% of median with 95% of total seasonal accumulation. There were historic snowpacks in the basin from February into March and the possibility of flooding similar to those seen in [Salt Lake City](#) in 1983. There was a really dry period the first of March and a sharp decline followed by a period of storm activity. Mid-March to early April brought us back up and now we're on a pretty good reduction coming into the present time. Current totals in the basin show Fontenelle at 42% and Flaming Gorge at 83% with Green River expecting some pretty large inflows into those two reservoirs. Quite a bit of water has been released out of those two reservoirs preparatory for those inflows. Lake Powell is currently at 48%. The 2017 operating tier was set in August 2016 at 8.23 maf release year with balancing at 8.23-9.0 maf and equalization at >8.23 maf.

**GCD Operations**. During Feb-Mar 2017, three units will be offline. The WY 2017 release scenarios for the minimum, most, and maximum will be 9.0 maf. Using the Interim Guidelines to calculate how much water would be released from Lake Powell and using April adjustment to balancing releases, the most probable unregulated inflow is 13.2 maf with a Lake Powell release of 9.0 maf. There's a potential for a November 2017 HFE.

**Biological Opinion for the GCD LTEMP Plan, Coconino County, Arizona** – Mr. Young and Ms. Gwinn. Mechanical removal of nonnative species is a controversial issue in the Colorado River through Glen and Grand Canyons. A spring 2015 meeting of Grand Canyon biologists (NPS, USFWS, AZGFD, GMCRC) to assess current trout removal triggers resulted in a concept of early conservation measure intervention to maximize conservation benefit to HBC and minimize the likelihood of mechanical predator removal. Two tiers of sequential actions were identified; the first would emphasize conservation actions that would take place early during an adult or sub-adult HBC population decline. The second tier would serve as a backstop prescribing removal (threat reduction) if conservation measures did not mitigate a decline in HBC abundance. Refer to [Appendix D](#) for more information.

**End of Fiscal Year 2016 Reporting of Expenditures and Carry Over Funds** – Ms. Grantz. The approved budgets for FY2016 were:

Reclamation = **\$2,083,000**                      GCMRC = \$8,672,000                      Total: \$10,755,000

The working budget factored at a 0% CPI rate and the final expenditures were as follows:

| Category           | FY16 Working Budget<br>(0% CPI) | FY16 Expenditures  |
|--------------------|---------------------------------|--------------------|
| AMWG               | \$365,159                       | \$312,964          |
| TWG                | \$169,294                       | \$106,807          |
| Reclamation Admin. | \$762,227                       | \$292,189          |
| Cultural Resources | \$766,390                       | \$609,695          |
| <b>Total</b>       | <b>\$2,063,069</b>              | <b>\$1,321,655</b> |

Note: The Non-Native Fish Contingency Fund has a current balance of \$1,095,000.

**GCMRC Budget** and **PPT** – Mr. VanderKooi. The [GCMRC Annual Report](#) was distributed in December with all the FY16 expenditures, so he didn't include that information but thought people would be interested in what carryover would be going into FY18. He focused on the [FY2017 Project Budgets](#) and noted the following:

- Project 9 has a negative of \$160,000. This included the additional fisheries monitoring trips that they hadn't included in the FY17 budget as the natal origins study sunsetted. This budget includes costs for technicians, staff time and logistics.
- Logistics was under budgeted throughout this work plan. The previous GCMRC chief had pushed the staff to really limit this budget and it was drastically reduced to what was actually needed. As they've reviewed the work plan and the various activities associated with it, it appears to have been cut a little too close and exceeded what was budgeted for.

Overall they are looking to finish FY17 with \$130,000 in carryover. These are preliminary budget numbers and will likely change as they move forward in time.

**Final Report for the Fisheries Program Review – Protocols Evaluation Panel (PEP)** – Mr. Yackulic and Mr. Ward. The Fish PEP was convened in August 2016 and asked to evaluate the quality and breadth of the monitoring and research conducted by the fisheries program in the Colorado River and its major tributaries. Five questions were submitted to the panel for their consideration but they also identified management and institutional issues that potentially influence the effectiveness of the fisheries program going forward. Their recommendations include:

- Given the complexity of the system, trout research efforts should consider incorporating all levels of ecosystem into their study and develop a conceptual model to place all existing hypothesis into a broader context.
- The program should reconsider and clarify the goals of the translocation experiments. The reevaluation should also incorporate a new quantitative analysis of the effects of translocations on the donor population using the demographic parameters estimated by the program.
- An evaluation of alternative designs also could be used to identify designs that minimize handling of fish and meet program objectives. The program should expand its efforts using PIT tags arrays or similar technologies to improve data quality while minimize handling of fish.
- The program should consider developing a separate invasive species detection program that includes quantitative triggers and remedial actions.
- The program should consider developing an adaptive management framework that is sufficiently flexible to accommodate opportunistic learning.
- Modeling of the potential impacts of quagga mussel on water clarity, nutrient conditions, and thermal structure should be considered.

Mr. Dongoske expressed concerned with the recommendation to increase communication with the tribes. If the intent is to bring the scientific view, that won't work and that often times the scientists and the Zuni end up talking past each other. When Zuni first raised the issue, a lot of DOI people came out to convince them it was the right thing to do and ran into a wall. The Zuni aren't going to compromise their cultural values, beliefs, sense of stewardship and responsibility to the spirits of their ancestors.

**Status of Developing Triennial Budget and Work Plan** – Mr. Shanahan. There are many aspects that feed into the TWP and people should utilize information received from the Annual Reporting Meeting, Knowledge Assessment, ad hoc group updates, TWG and AMWG discussions, etc., as they review the budget. He identified target dates for completing work in preparation for forwarding a motion to the AMWG at their August 2017 meeting. The following timeline was presented:

- April 26 = 1<sup>st</sup> draft comments due
- April 28 = BAHG Call
- May 9 = BAHG Call
- May 16 = 2<sup>nd</sup> draft issued
- May 19 = BAHG Call
- May 24 = AMWG Webinar
- May 25 = BAHG in-person meeting
- June 6 = 2<sup>nd</sup> draft comments due
- June 12 = BAHG Call
- June 16 = 3<sup>rd</sup> draft issued
- June 28 = TWG Meeting

**Reclamation's Triennial Budget and Work Plan – First Draft** – Ms. Grantz. As people are reviewing the TWP, they should forward additional project details to her. In the past a 3% CPI rate was used in developing budgets but they're assuming a 1% growth is a reasonable target for building outyear budgets. The proposed draft budget for FY2018-2020 is:

|  | 2018 | 2019 | 2020 |
|--|------|------|------|
|--|------|------|------|

|                              |              |              |              |
|------------------------------|--------------|--------------|--------------|
| AMP Total w/1% CPI           | \$11,025,454 | \$11,135,708 | \$11,247,066 |
| Reclamation side total (20%) | \$2,205,091  | \$2,227,142  | \$2,249,413  |

Changes noted in Section C:

- Contract Administration has increased due to time and labor involved in getting contracts awarded.
- Integrated Stakeholder River Trip will be done every 2-3 years and is separate from cultural resources river trips.
- Experimental Management Fund requires input on how that functions and rolls into the Native Fish Conservation Contingency Fund
- Experimental Vegetation Treatment is a commitment from the LTEMP ROD.
- Evaluation of means to prevent fish passage through GCD is a new CM under the LTEMP ROD.
- Evaluation of temperature control methods at GCD is a new CM under the LTEMP ROD.
- Ridgway Rail and Southwest Willow Flycatcher Monitoring is a new CM under the LTEMP ROD

**Preliminary GCMRC FY2018-20 TWP and Budget** – Mr. VanderKooi. He presented the following budget summary:

|                                                                                                                                                                                                                         | 2018                | 2019                | 2020                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------|---------------------|
| A. Streamflow, Water Quality, and Sediment Transport and Budgeting in the Colorado River Ecosystem                                                                                                                      | \$1,396,000         | \$1,424,000         | \$1,453,000         |
| B. Sandbar and Sediment Storage Monitoring & Research                                                                                                                                                                   | \$1,370,000         | \$1,416,000         | \$1,460,000         |
| C. Riparian Vegetation Monitoring and Research                                                                                                                                                                          | \$749,000           | \$765,000           | \$788,000           |
| D. Effects of vegetation management and dam operations for geomorphic condition and sand resources at archaeological sites and source-bordering dunefields                                                              | \$531,000           | \$592,000           | \$543,000           |
| E. Nutrients and temperature as ecosystem drivers: understanding patterns, establishing links and developing predictive tools for an uncertain future<br>* Up to \$200,000 in Lake Powell funding available for FY18-19 | \$689,000*          | \$551,000*          | \$514,000           |
| F. Aquatic Invertebrate Ecology (Food Base)                                                                                                                                                                             | \$1,055,000         | \$1,147,000         | \$1,180,000         |
| G. Humpback chub population dynamics throughout the Colorado River                                                                                                                                                      | \$1,949,000         | \$1,940,000         | \$2,060,000         |
| H. Salmonid Research and Monitoring                                                                                                                                                                                     | \$1,274,000         | \$1,378,000         | \$1,430,000         |
| I. Aquatic Invasive Species Research and Monitoring                                                                                                                                                                     | \$323,000           | \$394,000           | \$421,000           |
| J. Socioeconomic Monitoring and Research in the Colorado River Ecosystem                                                                                                                                                | \$369,000           | \$389,000           | \$400,000           |
| K. Geospatial Science and Technology                                                                                                                                                                                    | \$264,000           | \$271,000           | \$278,000           |
| L. Administration and Support                                                                                                                                                                                           | \$1,570,000         | \$1,621,000         | \$1,673,000         |
| <b>Total</b>                                                                                                                                                                                                            | <b>\$11,539,000</b> | <b>\$11,888,000</b> | <b>\$12,200,000</b> |

Note: The next budget iteration will include overhead rates separated out for each project. The City of Flagstaff has determined that the #4 building GCMRC is in and the building with the large conference room have outlived their useful life span. The buildings will be leveled and the City of Flagstaff will not enter into another long-term lease. Overhead rates will increase due to new facilities being planned for January 2018, but he's very skeptical of that date. If the building is delayed, there is a potential for cost savings.

**Preliminary Comments from the Sciences Advisors Program (SAP) on the Triennial Budget and Work Plan** – Mr. Braun. His review focused on (1) requirements for adaptive management under LTEMP, and (2) implications of 2017 Knowledge Assessment results. He determined where the unknowns and uncertainties were in relation to status and trends, drivers and constraints and LTEMP experimental and management actions results. There was an analysis of the potential impacts of the management and experimental actions in the LTEMP EIS. What was done for the KA was the expert teams putting their voices and is different from what is in the LTEMP documentation. He presented the LTEMP Adaptive Management Learning Matrix noting that learning will occur in the **1** and **2** boxes

and ended with a list of potential independent review panel research project topics for the FY2018-20. He provided the SA comments on [Reclamation's](#) and [GCMRC's](#) budgets.

**Public Comment:** None

**Adjourned:** 5:00 p.m.

## Glen Canyon Dam Technical Work Group Meeting April 20-21, 2017

**Date:** April 21, 2017

**Start Time:** 8:15 a.m.

**Conducting:** Seth Shanahan, TWG Chair  
Vineetha Kartha, TWG Vice-Chair

Attendees

**Meeting Recorder:** Linda Whetton

**Welcome and Administrative:** Mr. Shanahan welcomed the members and the public. Introductions were made and a quorum determined. There was a lengthy discussion about holding meetings in Las Vegas, Salt Lake City, and Flagstaff and particularly the many options considered for the Phoenix area. It was decided to hold the next TWG meeting on June 28 (1-5) and June 29 (830a-3) at ADWR.

**Vegetation Monitoring by the Southern Paiute Consortium (SPC)** – Mr. Bullets. He has been the Consortium director for the past 10 years, but monitoring has been done since 1994. Over the last six years the tribal leaders want to be more involved and are looking forward to having spring floods anytime and seeing changes in the system now that sediment is coming in. Out of 160 sites along the corridor, they monitored those which they felt were the most important because it was where their ancestors camped and lived along the Colorado River. Their science is more along the lines of photo matching and counting vegetation and the Consortium probably has one of the older processes of monitoring plans which is laying transect lines. It's been very hard for them to find a botanist to help them better understand western science.

**Budget Ad Hoc Group (BAHG) Input to the Triennial Budget and Work Plan** – Mr. Capron. Thus far they've held five meetings and the notes are available [here](#). The following timeline was announced: Get ideas on timeline and how we want to do business over the next few months.

- (W) April 26 – written comments from TWG back to GCMRC & USBR to Linda, Seth, Scott, Katrina
- (F) April 28 – BAHG meeting 8-10 PDT, 9-11 MDT
- (Tu) May 9 – 10-12 MDT, 9-11 PDT – BAHG Call → Send comments to Linda
- (Tu) May 16 – full workplan draft is sent out with input back to GCMRC & USBR by June 6
- (F) May 19 – 10-12 MDT BAHG Call
- (Th) May 25 – in-person BAHG in PHX FULL DAY MEETING
- (Tu) June 6 – Comments due back to GCMRC & USBR (the third draft TWP)
- (M) June 12 – SA Call 3 hours – 12-3 PDT, 1-4 MDT, 3-5 EDT
- (F) June 16 – Comments due (10 days ahead of the meeting for posting purposes)
- (Tu) June 27 – BAHG Meeting ?
- (W-Th) June 28-29 – TWG Meeting in Phoenix

**UPDATE 5/9/17:** The above items are postponed per direction from the Department pending a review of all DOI FACA committees. An [e-mail](#) was sent on May 9 informing the AMWG and TWG.

Because there wasn't time to discuss Reclamation's proposed budget and members may still have concerns about GCMRC's budget, members were asked to e-mail their comments or questions to Ms. Grantz and Mr. VanderKooi by close of business (W) April 26, 2017.

**Group Exercise with Red/Yellow/Green Colored Cards to Identify Triennial Budget and Work Plan Items that Lack Consensus** – Mr. Shanahan. Instructions were provided to the members on how to use the red (major concerns), yellow (need more information) and green (no concerns) cards to discuss the various projects. The [issues](#) were discussed and captured by Ms. Kartha.

**Request for Agenda Items for Next Meeting** – Mr. Shanahan. Members should submit any proposed agenda items to Mr. Shanahan by (W) April 26, 2017.

**Public Comment:** None

**Adjourned:** 3 p.m.

Respectfully submitted,

Linda Whetton  
Upper Colorado Region  
Bureau of Reclamation



## Key to Glen Canyon Dam Adaptive Management Program Acronyms

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