

Glen Canyon Dam Adaptive Management Program Adaptive Management Work Group Meeting August 21-22, 2024

"Meeting minutes were certified for accuracy by Chairman Pullan on October 9, 2024."

Day 1: Wednesday, August 21, 2024

Start Time: 9:40 AM PDT

Conducting: Wayne Pullan, Bureau of Reclamation, Acting Secretary's Designee to the AMWG

Designated Federal Official: Daniel Picard, Bureau of Reclamation

Facilitator: Terra Alpaugh, Kearns & West Inc.

Meeting Recorder: Beccie Mendenhall, SeaJay Environmental LLC

Welcome and Administrative

- **Opening Remarks: Wayne Pullan (Acting Secretary's Designee)** Welcome to the August 2024 meeting of the Adaptive Management Work Group (AMWG). I am joined by Daniel Picard, the Deputy Regional Director for Reclamation and the Designated Federal Officer for this meeting. I also want to introduce Christina Kalavritinos who represents the Assistant Secretary for the Water and Sciences office and is a great support to this effort. My day job is the regional director for the Bureau of Reclamation, but today I am wearing the Secretary Designee hat. I think it is important to make that distinction. Before we begin, Daniel has agreed to offer us a tribal prayer.
Daniel Bullets (Southern Paiute Consortium) This blessing I am going to give hopefully inspires you to think about what is being said at this meeting and take it to heart. This is something serious that affects all of us here, as well as the animals, the plants and the other things that live on this land. Please keep that in mind. *(Blessing followed)*
Wayne Pullan (Acting Secretary's Designee) Thank you Daniel for blessing our efforts today. As we begin, we are here in the Grand Canyon National Park. I would like to turn this over to our host for a welcome and then Christina Kalavritinos for a few comments.
Ed Keable (Superintendent Grand Canyon National Park) Welcome to everyone and thank you to the chairman for the vision of convening this meeting here in the park. I have spoken many times about the Grand Canyon Protection Act as one of the lynch pins of this program. I think it is really important that AMWG members, staff and the public have an opportunity to consider the issues we discuss in these meetings in the place itself. As Daniel pointed out, this is a special place to the affiliated tribes, to the park, to the American public and to the world as a World Heritage Site. For logistics, please connect with Jan Balsom, or any member of our staff.
Christina Kalavritinos (DOI) It is a joy to be here. Yesterday we were privileged to be with the tribal representatives who participate in AMWG who opened windows for us into their timeless and unbroken bond with the canyon. I am deeply grateful. I bring greetings and gratitude from the Principal Deputy Assistant Secretary for Water and Science Michael Brain. Thank you to our park service hosts, to Wayne for his steady and involved leadership, and to all of you that participate throughout the year. The work that you do is as important and immense as the canyon itself.
Wayne Pullan (Acting Secretary's Designee) What a blessing and opportunity it is for the AMWG to be meeting at the Grand Canyon. To be able to meet in such close proximity to this resource, this miracle of creation that drives our mission. The canyon defies definition, it defies description, it challenges us to wrap our minds and spirits around its significance and meaning. It is important that we thank each of the tribes who spent time yesterday sharing with us their knowledge and the meaning that they place on the canyon. We were instructed and inspired. Thank you for that experience.

I believe in the power of place, and I think we all share a belief in the power of this place. There is the potential that our meeting here at the canyon yields for our work more than we imagined, with this meeting in this place becoming a watershed for the work of the AMWG. To be able to meet here has required additional investment and sacrifice. My point in emphasizing the additional work is to say this, let's leverage the additional investment by extracting an additional measure of effectiveness. I will gently remind you that there is power in consensus and in a consensus recommendation to the Secretary.

It has been a little over two months since the last AMWG. During that time there has been a great deal of work in developing the Triennial Work Plan (TWP). I want to thank Erik Skeie, the Budget Ad Hoc Group chair, for his rigor in running numerous meetings and Seth Shanahan, the Technical Work Group (TWG) Chair, who helped navigate the TWG to a recommendation that will be discussed today. I want to thank Andrew, Mark and their staff at GCMRC who have worked tirelessly to develop proposals and answer questions from stakeholders over the last eight months. And finally, I want to thank all of you who have reviewed drafts and provided input into the development of the workplan. Your input is why this program works so well. Economics tells us that the relative value of things is revealed by the amount of scarce resources that an organization dedicates to that thing. This is what makes development of the workplan and budget so critical and so difficult. Acknowledging that difficulty, we still hope to have a motion passed today by this body recommending a workplan for the next three years. I look forward to a robust discussion today.

It has been a race against time to stop the spread of Smallmouth Bass (SMB) which we have seen do great damage to our native fish species in the rivers and tributaries above Lake Powell. And yet as we sit here today, a cool mix of releases from Glen Canyon dam is keeping a portion of the river below spawning temperature for SMB. This experiment was initiated on July 9 and to this date no spawning of SMB has been detected. This should allow us to avoid chemical treatment in the slough this year, a welcome milestone. The cool mix delivery has been a remarkable response to an emergent threat that would not have been possible without the extraordinary effort by so many in this room who helped develop, comment and review the LTEMP SEIS on a compressed and aggressive timeline. This experiment does come at a cost, and I want to thank Western Area Power Authority (WAPA) for its engagement and collaboration. WAPA recently produced a document that explains this year's releases to their stakeholders. WAPA's dedication to the AMWG and its objectives are clearly confirmed in the pages of this document. It is important to note that WAPA has been working closely with Reclamation staff to find ways to mitigate the hydropower costs of this experiment while still maintaining the experiment's objectives. We have always acknowledged that there will be immediate tools for addressing SMB, and then intermediate and longer term measures. We are not taking our foot off the gas for assessing other SMB efforts.

Last May we discussed Reclamation initiatives to reduce or eliminate the threat of cavitation which occurs when the river outlet works must be operated at low reservoir elevations. The relining of the river outlet works (bypass tubes) is now underway. It has been in the planning stages for several years and is not as a result of the cavitation threat from low reservoir levels. The original lining is over 60 years old with normal signs of wear and tear and has been due for replacement for some time. This relining will provide corrosion protection to preserve infrastructure integrity but will not prevent the risk of cavitation at low reservoir elevations. Reclamation is working on reducing cavitation risk through interim operating guidance for the outlets and additional analysis that includes studies to better understand the impacts of operation at the low reservoir levels. Also note that the relining work will not impact SMB flows.

The last couple years have been a whirlwind. The pace and challenges continue. Let's briefly consider a list of what's on the horizon.:

- 1) **Goals and Metrics:** At the Feb AMWG meeting we spent time discussing the LTEMP goals and associated metrics. There is consensus about many of the goals, but hydropower and tribal goals need more time. I asked that we have a set of metrics developed that can be acted upon by the Feb 2025 AMWG meeting. I look forward to meeting that deadline. That being said, yesterday Daniel Bullets offered an important truth. Some things defy measurement in metrics. Spiritual and cultural things, many of the most important things. As we move to metrics in February, our intention is to respect Daniel's observation and the truth behind it.
- 2) **SMB Experimental Flows:** After WY 2024 is behind us, each year through 2027 we will need to decide if a SMB flow is warranted, and if so plan that experiment, execute it and evaluate its effectiveness. Decision making for 2025 will occur this coming winter and spring.
- 3) **Post 2026 annual flows and LTEMP 2.0:** Before the end of 2026, new guidelines for management of the Colorado River need to be in place. This effort will likely result in a new range of annual releases. Designing the sub annual timing and amounts of those releases to ensure compliance with ESA and GCPA will require initiation of an LTEMP 2.0 effort. That effort will take time, so in addition to considering LTEMP 2.0 itself, we need to consider ESA and GCPA compliance during the interim period between completion of the Post 2026 effort and LTEMP 2.0 implementation.
- 4) **10-year review:** The LTEMP ROD requires a 10-year review of the LTEMP. (reference LTEMP ROD for details). The 10-year review is intended to be after October 21, 2027, but I think it is prudent for us to act sooner than that date. Doing so will make sure we have learned the lessons from LTEMP 1.0 and implement them in LTEMP 2.0 efforts. While the 10-year review is primarily considered to be a scientific evaluation, it will be important for us to also evaluate our processes for planning and budgeting. It will be important that the reviewers have sufficient independence to evaluate without bias. I will be asking the AMWG staff to begin laying the groundwork to initiate the 10-year review immediately. There is funding in the TWP set aside for this. It is important over the next few days that we think about how we will summarize the tribal and scientific information for this comprehensive review. I look forward to further conversations on this topic.

In closing, the primary purpose of today's meeting is to act on a recommendation to the Secretary of the Interior with respect to the FY 2025-2027 Triennial Work Plan. We have 3 hours set aside to try to reach consensus on a recommendation. Proposed language was sent out last week, we will use that as the basis for our discussions this afternoon. (Reference agenda for additional topics to be covered this meeting) Let me say in advance how much I and the department appreciate your participation and your focus on this committee meeting. I believe in this process, the process of the nation calling upon its citizens and experts to advise on a critical aspect of the nation's business, the protection of the Grand Canyon. I respect and am confident in the capabilities of all of you in this federal advisory committee. I look forward to working with you on our current challenges.

- **Introductions and Determination of Quorum (13 members):** A quorum was reached.
- **Review May Meeting Evaluation: Terra Alpaugh (Facilitator)**
There were only 3 responses to the last meeting, all with positive feedback and suggestions. Rather than review this small sampling I will just say please keep the feedback coming!
- **Administrative Updates: Bill Stewart (BOR)**
 - AMWG Charter: There is a renewal due every 2 years, it will need to be done in 2025.
 - AMWG Membership Status: New members were introduced. There are several members whose terms expire in Jan 2025. Nominations for all have been submitted.
 - Action Item Tracking Report:

- 1) The planning process for the next 20 years of LTEMP has been on our goals for some time. This is really about the metrics, there have been no updates since the May meeting. As Wayne mentioned, we plan to have this ready for the Feb 2025 AMWG.
- 2) This action is specifically related to the 2021-2023 TWP. There was a request to develop a priority process for TWP planning. We have worked on this since 2021, and it was used in the current planning process. This item should be closed today.
- 3) Five Area Actions identified at the Aug 2022 AMWG:
 - a) Evaluation of Low Elevation/Low Flow HFE – Completed at Annual Reporting.
 - b) Evaluation of downstream resources – Completed as part of SEIS.
 - c) Drafting of non-native fish strategic plan - Completed Feb 2023
 - d) NEPA compliance for operational flexibility to address non-native fish – Completed with final LTEMP SEIS and ROD July 2024.
 - e) Evaluate exclusion and temperature control options – ongoing effort with updates to be provided later in this meeting.
- o May Meeting Minutes: Meeting minutes need to be reviewed, approved and signed off by our Designated Federal Officer within 90 days. Due to that timeline, we will no longer review prior minutes in our meetings. We are working to ensure minutes get to everyone in a timely fashion with ample time to review and return comments before the deadline.

Brian Sadler (WAPA) Can you remind me how the AMWG charter is updated?

Bill Stewart We work internally in Reclamation, then send a draft out for review and comments. The charter has to be signed by the Secretary of the Interior in September. We try to start the draft and review period about 6 months in advance of the signing date.

Zuni Tribe's Wetland Project on the Little Colorado River:

Councilman Edward Wemytewa (Pueblo of Zuni) My presentation is about the Little Colorado River from the Zuni perspective. We refer to it as a cultural mandate. What we do on the LCR reflects what we see happening at the Grand Canyon. We need to make sure we commit to the GCPA. The LCR Zuni Settlement in June 2003 defined the lands for this wetland project. There are two objectives for Zuni in this area, the first is water rights and the second is protecting a pilgrimage trail from the Zuni reservation to our sacred site on the LCR. This little reach of the LCR is Zuni Heaven on our cultural map. This is a location where children's lives were lost during a flash flood in ancient times. Our pilgrimage to this site occurs every 4 years, with the last one in July 2024. In a photo from 1878, you can see the Zuni river was half a mile wide near the Zuni lands, flowing year round. The 2024 picture shows the marshy wetlands restoration area where riverbeds are filled with vegetation. Our wetland is estimated to be about 700 acres. We had a wetland plant palette planned with intentions to plant, but once we added water the legacy plants came back. Their water source is the Lyman Dam. Per the settlement, Zuni owns 12% of the outflow, which is 1000 acre feet per year. But they have only been able to extract 300-400 acre feet per year due to aging infrastructure that does not support larger flows. Also, only about one quarter of the release makes it to the Zuni land. One factor impacting water reaching their site is silt and sediment build up. Other problems are beavers and ranchers that build dams or divert water for local reservoirs. They need permission from private landowners to install instruments or break the dams. The weirs need to be redesigned and updated. Another struggle is managing large unplanned flood flows. And they have had to add fencing due to the cows from neighboring ranches. One short section from RM 29 to 31 there is no LCR river channel left. The Zuni are working to redefine this area reclaiming it one foot at a time. They are developing the long term Wetland and Riparian restoration plan for the entire 700 acres, including a 20 acre pond.

Q&A and discussion

Larry Stevens (GCWC) Some of the project area involves flowing water, have you thought about relocating suckers into this region? **Edward Wemytewa (Pueblo of Zuni)** You are several steps ahead of us. We are the last generation that experienced the river. We had those wetland species when the river was

healthy. This Zuni Heaven restoration is going to take several years. In order to support fish and turtles the flow of water has to be constant, which will take some time.

Erik Stanfield (Navajo Nation) We are working on getting LCR funding as well, I would like to see if we can take a look at this presentation and integrate the work we are doing on the LCR. I am also curious if you have through this project any lessons that were learned that we can apply to the Grand Canyon and Colorado river programs. **Edward Wemytewa (Pueblo of Zuni)** There is a lot. For example, the river trip in late May we had fruitful discussions. I feel that down the road as our shared discussions continue we will have additional learning back and forth. We are looking forward to it.

GCDAMP Triennial Budget and Work Plan:

Terra Alpaugh (Facilitator) Our next presentation on the TWP will be a joint effort by Seth Shanahan, Bill Stewart and Andrew Schultz. It is intended to provide the context that will allow us to have a fruitful conversation after lunch. I would like to request that we focus on content and clarity for the next 60 minutes. Discussion on the merits of the plan will be after lunch.

Seth Shanahan (TWG Chair) There are a lot of lessons that we learned in developing this plan, and lots of frustrations experienced in the process. We have a TWG Action Item to improve the process going forward which Eric Skie has agreed to lead as a new charge to the BAHG. We will talk about this more in my presentation tomorrow. After our July meeting we had two follow up meetings to get this motion to the AMWG. In the end, despite our best efforts, we did not reach consensus. We had 15 supporting votes, 1 abstention (New Mexico) and one opposing vote (Zuni). The budget exceeded the proposed funds by less than 1%. We urge the AMWG to acknowledge the cuts and accept the recommendation as submitted. We also offer some guidance as you pursue your motion today.

Bullet 1: The TWG did not have a lot of time to review the full final draft. We got the component parts as we worked through changes, just not the full text. I hope by now, however, that your TWG member has read the full plan and as an AMWG member you have discussed it with them, so this is now resolved.

Bullet 2: People are concerned about the SMB Flows being prioritized appropriately in the experimental fund usage. Managing these funds is a nuance item where these decisions often get made in real time and in offline discussions. The priority concern is just something we want the AMWG to be aware of.

Bullet 3: The tribal representatives have a list of projects which did not make the TWP, which we request that BOR looks at for funding through other sources.

Dissent: The Pueblo of Zuni Minority opinion was submitted to the AMWG before this meeting. This expressed concerns about the process for consultation and the productiveness of consultation. Also, they were not part of the tribal prioritization discussion that was presented with the TWG motion.

Bill Stewart (BOR) This program was funded through power revenues until the end of 2021. Since then, we moved to appropriations, which has some challenges in terms of how we plan. We will not know what money we actually have until congress passes a budget for us. Reference slides for details on the proposed \$2.5M Reclamation budget. Two highlights in Project 4:

- The Experimental Management Fund was one of the bullets called out by Seth. This fund is available for unexpected actions required to address emerging needs. It is important to have these funds available for unexpected LTEMP experiments, rather than wait for new appropriations.
- The Hydropower Monitoring and Research Fund is for a workshop in early spring to look at hydropower monitoring as well as ways to reduce impacts to hydropower from experiments.

Q&A and discussion

Julie Carter (AZGFD) How are the experimental management funds allocated? **Bill Stewart** Often we use the Implementation team process to work through that. It has been on an as needed basis as issues arise. There is a lot of coordination between Reclamation and GCMRC. I think there is room for discussion on how to prioritize SMB flows.

Andrew Schultz (GCMRC) I want to start with a slide of the TWP milestones, starting in Dec 2023 through the Final Draft on Aug 7, 2024. These milestones highlight the huge amount of work and collaboration for everyone involved. Every project in the TWP must tie into at least one of the 11 LTEMP goals plus GCDAMP Goal 12 which is “to maintain a high quality monitoring, research and adaptive management program”. Reference slides for details on the historical and current budget for each project. Note that the previous TWP was over budget by \$945K, as compared to \$197K in the current plan. One difference in this TWP versus previous, there were overhead cost increases that reduced the funds available for science:

- DOI overhead rate increase from 7.5 to 15%
- Cost of living increase (5.2%)
- Logistics cost increase (10%)
- No inflation adjustment method

Some suggestions for the future:

- Investigate alternatives and options to address the shrinking science funds
- More frequent assessments of programs
- More structured decision making process
- Continue to develop and implement a prioritization process
- Budget for Expert independent evaluation of program

Q&A and discussion

Kevin Garlick (UMPA) Overhead doubled, is there any explanation why? **Andrew Schultz** It is important to state our overall rate charged to the program is a special rate, much lower than our agency normally charges. Only the DOI rate doubled, which is a component of the total.

David Brown (GCRG) I am curious, one of the projects we were interested in was B4 which did not get funded at all. It is so critical for HFE. I am curious what was the decision-making process used to determine why that particular project was unfunded? **Andrew Schultz (GCMRC)** It is just the fact that we could not fund everything. We have discussed possible alternative ways to fund this. I believe it was not funded in the last workplan either. That does not mean the project is not vital or important. **David Brown** I just want to point out, we need more money. This is such a critical model. Not funding this project means we will not meet some of the LTEMP objectives.

Larry Stevens (GCWC) In past years there was a difference between actual costs and projected costs. How do we propose to manage this? **Andrew Schultz (GCMRC)** I will start with rollover funds. We were over budget quite a bit in the first TWP, but we had surplus money from prior years that we used. We are now entering into an agreement where there will be no rollover. Differences in actual versus projected rates are generally related to changes in overhead. With the projects we try to budget everything down to the dollar. There can be things such as staffing shortages that create a surplus. But we do our best to ensure budgets are exactly what we need to do the work. We do not have a lot of buffer. **Charlie Ferrantelli (State of Wyoming)** Can you advise if we have been in this place before? You had a slide that showed we were over budget in the previous TWP as well. **Andrew Schultz** We do not have surplus or carry over anymore. **Charlie Ferrantelli** So we had rollover funds in FY2021 – 2023 that helped to cover the overage in that TWP? **Bill Stewart (BOR)** The TWP planning is for 3 years, but we will be reviewing this every year and adjust as needed if overages or cost savings are recognized.

Brian Sadler (WAPA) I have a broad question about the overall summary we are looking at for the next 3 years. There are some big questions we have been asking for a number of years that I am not sure we are getting at. Such as the Western Grand Canyon Chub population and some of the other priorities Seth hit that we hope to do as funds become available. Also, it is always tough to do a “stop doing” exercise. How do you stop doing something so you can free up money and resources? What does this budget really mean about answering our questions and accomplishing our goals? **Andrew Schultz (GCMRC)** I will

start with off ramping, as you said when do we decide to “stop doing” things. I hope the evaluations we are adding will help with making these difficult decisions for off ramping. As far as your point about key components that are missing from the budget. I agree there are key components missing. We tried to lessen that, and we tried to balance that with feedback from the program as a whole.

Shana Rapoport (State of California) Can you speak about how the communication between the scientists and the project managers has been impacted by this plan? It is such a critical component of this program.

Andrew Schultz (GCMRC) As the amount of dollars for science shrinks, it has made these conversations even more important. In my opinion these conversations have increased in this plan and need to continue to increase. I believe the program is already working on improving and prioritizing this.

Kristen Johnson (State of Arizona) Can you expand on that, what you think the better process should be between the PI and the program folks? **Andrew Schultz** As a scientist myself, I think we need to look into that, we can do better. I think there needs to be more interaction between the scientist and the stakeholder on the front end of this. Long before the 300 page document is prepared for you to read. But it has to be balanced and efficient, so the GCMRC staff also has time to get their work done.

Ed Keable (NPS) One slide you flashed is the increase in DOI overhead. That is a federal wide government phenomenon that I can relate to. What are our opportunities to get additional funding for this program rather than continue to cut things we cannot afford to remove? **Andrew Schultz (GCMRC)** I will let Bill chime in on that.

Bill Stewart (BOR) When we think about the appropriations process, we make requests three years in advance and wait. Last year we only received a portion of the funds due to a continuing resolution. This is one of the challenges we are having to navigate through. **Kathy Callister (BOR)** The challenge is the budget is a three-year cycle. People above us have to balance budgets as well, all the way up to the top. We cannot just ask for additional funds and think we are going to get it. Within the three-year cycle, however, we are given opportunities to request an over target. Some years we get that funded, some years we do not. It depends on what is going on at the top. An appropriation is what congress gives us through the legislative process. As Bill said, we do not know the final detail of that until the law is passed. When we are on a continuing resolution, as was the case last year, the funding is given at the previous level two months at a time until the full budget is passed. **Seth Shanahan (TWG Chair)** The TWG talked about this as well. We are trying to be very creative and efficient about what we can control. And we want to hear ideas about how we can find support in other places, such as sharing helicopters or providing resources for slough monitoring. And having access to a grant writer.

Larry Stevens (GCWC) We are one of the few organizations who brings funding to the Park Service for GCDAMP. I don't think the AMWG has much agreement on what types of funds to accept. It might help address some of the overage.

Kathy Callister (BOR) Because we are a federal advisory committee, we have to be very careful about how we accept funds through AMWG and GCDAMP. We do not want to cross the federal funds advisory committee regulations. **Leslie James (CREDA)** I want to tag onto the previous two comments. To rely only on federal funds seems foolish. This is the Grand Canyon. You would think there could be creativity in supplementing funds. The conundrum between FACA and GCPA is something we should be able to solve.

David Brown (GCRG) Leslie, I feel the same way. We are disappointed that B4 was not funded at all. I did not get a satisfactory answer to the question of why or how that decision was made. We should give more consideration to outside funding. We are diminishing the value of the program when we cannot provide the resources the scientists need to answer the hard questions that this program was designed to resolve. **Amy Haas (State of Utah)** It occurs to me we are seeing once in a generation federal funding through the Inflation Reduction Act (IRA). Money is being made available in the upper basin specifically for environmental drought mitigation projects. There has been discussion about funding the slough with IRA funds. Should that be a part of the discussion for other discreet projects in this program?

Wayne Pullan (Chair) We have only been funded through appropriations for a few years, so this is still new territory. We do have significant funding under the IRA. The BOR Upper Colorado Region has access to \$450M for water conservation and ecosystem restoration projects needed because of drought. We divided the IRA funds into Bucket 1 for short term water conservation projects, and Bucket 2 for the longer term projects. We call the ecosystem restoration piece B2E, for Bucket 2 Environmental as opposed to Bucket 2 Water conservation. Our intention is to fund the slough work through the B2E funds. Reclamation is hosting a workshop on B2E funding on Sept 6. The deadline to submit requests for project funding is Oct 14th. But the current concern being discussed is funding for science. I do not believe science would qualify for B2E project funds. Reclamation has access to the Contributed Funds Act, which allows Reclamation to accept outside funding to do the things that Reclamation does. It has a wide range of applications. Whether the AMP itself can accept that funding is a question I need to put to Rod. I may be able to report back on that tomorrow.

GCDAMP Triennial Budget and Work Plan – Action:

Terra Alpaugh (Facilitator) TWG and BAGH representatives worked really hard this year on creating the TWP. It was not an easy process, and the outcome was not ideal as important projects did not get funded. So first I want to acknowledge all this hard work and say thanks for the program. I have heard concerns about the TWP process itself. There is belief that the current structure prevents accomplishing the program goals and needs to be addressed. Seth has committed to a TWG lessons learned process through the BAHG. The Chair has committed to initiating an independent review of the process as part of the 10 year review. I want to create some space for the AMWG to offer suggestions about what you would like that lessons learned conversation and process review to look like. I would like to allocate the first 45 minutes of this session to discuss your ideas and thoughts about improving the process. After that we will move to the TWP Plan and Budget motion itself.

Larry Stevens (GCWC) If Shane is here, it would be good to have historical perspective on the TWP process. **Shane Capron (WAPA)** I was TWG chairman when we developed the TWP process. A lot of thought went into that as we didn't really have a process before that time. It was hammered out between the TWG, and Jack Schmidt and GCMRC. I think in general it is a good outline. Maybe it is the change in personnel or potential drift from process that is at the root. Or maybe we just need to make some change from where things were 6 or 7 years ago. **Terra Alpaugh (Facilitator)** Thanks, that is a helpful observation that what may have been intent from the originators may not have persisted over time and that is worth revisiting. I will open it up to the rest of you, what would you as the AMWG like to see as the outcome?

Larry Stevens (GCWC) For us, the biggest picture is where we want the LTEMP to be in 12 years. We do not have a good roadmap for that. How do the projects relate to each other? How do they accomplish the end goal? Where we want to end up is core to the budget decisions. **Erik Stanfield (Navajo Nation)** I feel like the way we started it in terms of how we organized the projects is a problem. They are based on administrative categories and not the values or goals of the program. I think we need to work backwards, starting with the values and goals first, then match the funding to that. **Leslie James (CREDA)** In past years we also spent some time on developing the strategic science questions. What are the scientific questions we are trying to get answers for in order to meet the LTEMP goals and objectives.

Heather Whitlaw (USFWS) I heard some discussion around facilitation. These are difficult conversations and there is a large diversity of opinions. Facilitation is helpful when we want to make

space for everyone to be heard while staying grounded in the purpose of the discussion. Perhaps that would help in the process.

Shana Rapoport (State of California) Finding a way to make the document more concise, move the background information to an appendix and keep the plan itself focused on the specific details of the work.

Kurt Dongoske (Pueblo of Zuni) (chat) The Triennial Work Plan process demonstrates the Western science bias that is continuing to disenfranchise the Zuni Tribe. If the FACA process is not appropriate for Tribal Consultation, then it is the responsibility of Reclamation and GCMRC to put the effort into meaningful and honest consultation with the Pueblo of Zuni prior to any TWG/AMWG meeting.

Moreover, this program continues to elide, dismiss, or deflect acknowledgement of Zuni indigenous knowledge as aspects of best available science. This program continues to perpetuate epistemic injustice.

Sara Price (State of Nevada) Is the Zuni concern predominately the process or is it the budget itself?

Terra Alpaugh (Facilitator) Is that something I can ask the councilman to respond to? **Edward**

Wemytewa (Pueblo of Zuni) I think there are some subtle points that we need to introduce in the process. In our dialogue we have been zig zagging. That is why we feel strongly that things must be written. I think in time and continued conversation we can get to where we need to be. We support the protection of the Grand Canyon. Having the tribes at the table presenting yesterday made it worthwhile for me representing Zuni in this discussion. Hearing the tribes talk about what they value. Daniel made a good point yesterday that some things that are important and have value cannot be measured. But they need to be taken into consideration. **Malcom Bokeway (Pueblo of Zuni)** We resolved most of the issues going forward and that's why you have unanimous consent for the motion to move forward. **Kurt**

Dongoske The issue is providing Zuni the dignity and respect they deserve. **Jakob Maase (Hopi Tribe)** It comes down to talking to us about these projects. Very few of these were discussed with us in advance. We were just given a list of projects and asked to support the budget. **Sara Price** Just to clarify, did you see some progress that got you here today and allowed you to pick up from where things were previously?

Edward Wemytewa I don't think we have an issue with the process so much as the subject matter. Now that we have received a written response, we can sit down, analyze and respond to the subtle points. In the process I think we will be able to address our concerns. There are layers we do not see yet, some of them may be uncomfortable. We question if there is equanimity in the time and space and funding. What will be the benefits from this research? Will it make a difference in what we are trying to accomplish as partners here? To the original question, yes we are making gains.

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Ed Keable (NPS) I think in terms of process, one of the things we can improve on is being clearer about the relationship between TWG and AMWG. Define how the AMWG members are given opportunity to understand what TWG is doing in real time. Define a process to ensure that AMWG is aware of the TWG proceedings, so no one is surprised.

Brian Sadler (WAPA) I just want to add a little bit about the history. There are a lot of historical documents that could be beneficial to where we are today. There is an opportunity to go back and review those guiding documents, which would feed into what goes into the TWP including goals and outstanding questions. Also, the AMWG should perhaps give more guidance to the TWG to make sure the goals are clear, and budgets meet those requests. **Terra Alpaugh (Facilitator)** Absolutely, let's build on what we have not tear it down.

Larry Stevens (GCWC) With all due respect, we have a core lack of agreement about the purpose of the program. The non-government, non-state folks view this as a way for NPS to improve management of this park. There is a long discourse between the economic versus the resource value of the program that is still

not resolved. **Jakob Maase (Hopi Tribe)** Our main duty throughout all of this, especially when we get to 2027, is the GCPA. We need to think of new ways to approach these goals. There are biases in this program that we have put a lot of resources into that does not equal the whole of our task. **Terra Alpaugh (Facilitator)** I think we will have another opportunity to circle back on this topic tomorrow in a presentation with Seth.

Edward Wemytewa (Pueblo of Zuni) Since we are discussing how we might approach this aspect of work, maybe it would be good for us to draft a sketch of how we might move forward. **Terra Alpaugh (Facilitator)** Are you suggesting we draft a schedule today? Or assign that as an action for the future. **Edward Wemytewa** It seems we are just brainstorming. Maybe instead we can spell out how we think the process should take place going forward. **Wayne Pullan (Chair)** We are headed in that direction. I will be interested to see what comes from the TWG, then look at what recommendations we receive from the independent entity and consider how to move forward from there. I think it is going to be a long process. I am concerned that we are too close to the last process to be objective about the future. **Edward Wemytewa** We are discussing LTEMP and TWP process and goals as well as the role of TWG versus AMWG. I think we just need to make sure we have a clear frame of mind on the various processes, roles and issues as we work through them. **Terra Alpaugh** There are a lot of strands going on here. We are documenting everything we hear today. We hope that will then inform the conversation on process improvement. I am not sure if that is something for TWG or BAHG to own. Seth? **Seth Shanahan (TWG Chair)** Typically, AMWG tells TWG what to do, then TWG tells BAHG. There will be an email shortly going to BAHG charging them with improving the process.

Leslie James (CREDA) Andrew had a point on his last slide, a proposal that we use a tool for decision support or value of information analysis. We need to take that step. It will help us get to the recommendations that are critical to what we deliver. **Seth Shanahan (TWG Chair)** I appreciate Leslie's comment. The TWP budget is not a set it and forget it thing. There is a lot of conversation and analysis that needs to occur as part of the adaptive process. One of the challenges is that we don't have enough tools to help us organize and analyze the immense amount of information in this program. We need better decision support tools and procedures that enable this.

Terra Alpaugh (Facilitator) What can AMWG expect post the TWG / BAHG process improvement action? **Seth Shanahan** There will be a written report that I send to the AMWG post this activity. Hopefully it will be open and flexible. **Ed Keable (NPS)** Something in a draft format that AMWG can respond to? **Seth Shanahan** Yes, we can do something like that. But also note, if you as an AMWG member hear anything new at this meeting, then we as TWG members are not doing a good job. **Ed Keable** Or we on the AMWG are not doing our job to engage and listen.

Julie Carter (AZGFD) You mentioned the TWG will be looking at the TWP periodically. Will you look at the impact of some of the cuts? For instance, our Lees Ferry monitoring was just cut after 21 years. Will you evaluate that with the cuts made we are still meeting the LTEMP objectives? **Seth Shanahan (TWG Chair)** Maybe not that specific, but we do have a process to review. What is it we are doing that is working? And that is not? The tough part is if we want to change things next year, how do we fund those things. **Terra Alpaugh (Facilitator)** It sounds like there is going to be work at the TWG level and a document that comes back to the AMWG. That will feed into the larger process. This conversation is not at an end. But I would like to transition to the recommendation for action.

Draft AMWG Motion on the Budget Recommendation to the Secretary

The Adaptive Management Work Group (AMWG) recommends for approval to the Secretary of the Interior; the Triennial Budget and Work Plan (TWP) Fiscal Years (FY) 2025-2027 provided to the AMWG on August 21, 2024. The AMWG provides the following additional guidance for the Secretary's consideration:

- *Given the potential for multiple experimental flows to occur within any given year and that several proposed projects in the FY25-27 TWP are seeking funding from the Experimental Management Fund (Reclamation 4.C), possibly exceeding its current limit, the AMWG recommends the Experimental Management Funds prioritize research and monitoring to further understand the impact LTEMP and LTEMP SEIS flow experiments have on smallmouth bass establishment below Glen Canyon Dam.*
- *The following tribal prioritization of unfunded projects in the proposed TWP, by the AMWG representatives from the Hopi Tribe, Navajo Nation, and the Southern Paiute Consortium, may be proposed when funding is available through the Reclamation budget or non-GCDAMP funds:*
 - 1.D.4 - Pilot study to evaluate potential to extract cultural and ecological information from Colorado River deposits using eDNA, phytoliths, and pollen*
 - 2.C.1.2 - Can bird habitat quality be reliably assessed by combining plant traits with estimates of plant species composition and cover? Can the data collected by the riparian plant monitoring program be used to assess patterns in riparian-dependent bird communities?*
 - 3.D.5 - Monitoring petroglyphs and pictographs with photogrammetry and LiDAR*
 - 4.J.3 - Tribal resource research*
 - 5.B.4 - Streamflow, sediment and sandbar modeling*

Terra Alpaugh (Facilitator) This is the language as it currently stands. Is there a general consensus to approve the motion, with the understanding that some of you may want to add or remove additional language? (no response) Is there anyone who is not supportive of recommending the workplan and budget? (no response) Then can I ask for additional concepts that are not in the current motion that any of you would like to see reflected?

Ed Keable (NPS) We had some discussion about Project B4, if Paul is available I would like to get an understanding of that. **Paul Grams (GCMRC)** Project B4 is stream sediment modeling. One component of that project is maintenance of the sediment transport model currently used for HFE planning. The second part is enhancements to that model and expanding to sand bar modeling. There is also two dimensional stream flow modeling expanded to Marble Canyon and turbidity modeling. There are some components of the modeling that are occurring for Reclamation as part of the post 2026 process but that is outside the AMWG.

Larry Stevens (GCWC) I found it odd that Zuni was not mentioned in the tribal bullet. **Seth Shanahan (TWG Chair)** There were only 4 tribes that participated in the project prioritization discussion that resulted in that bullet. Then there was one tribal representative not at the meeting where we did the final language, hence the reason it only mentioned three tribes. **Larry Stevens** Yes I realize that, but the Secretary might wonder why we do not have all the tribes represented. **Terra Alpaugh (Facilitator)** I think that is a question for the Hualapai and Zuni representatives. **Carrie Cannon (Hualapai Tribe)** We support the bullet and can be added to this list. **Kurt Dongoske (Pueblo of Zuni)** Zuni has objections with D.4 and J.3 projects that have not been addressed sufficiently. **Jakob Maase (Hopi Tribe)** I just want to make a point to the AMWG that leaving the tribal priorities out of the budget is not something that should happen again in 2027. **Erik Stanfield (Navajo Nation)** I suggest we change the language to state 4 of the 5 tribes agreed, just to make it clear one was not in agreement.
(Word Smithing on Tribal Project bullet followed)

Kurt Dongoske (Pueblo of Zuni) The AMWG is just going to dismiss the Zuni issues with D.4 and J.3 and move this triennial work plan forward; thereby, continuing the process of dismissing Zuni concerns.

Terra Alpaugh (Facilitator) Edward do you want to chime in? **Edward Wemytewa (Pueblo of Zuni)** We just don't see much value in the eDNA in D4. For J3 tribal research, our objection is that tribal interests should be a priority and be funded. **Terra Alpaugh** My question is, in this context, is there any language that you want to add to this recommendation to the secretary? Seeing as the Zuni tribe is currently not listed. **Edward Wemytewa** I see your point. **Terra Alpaugh** OK, I will leave that avenue open. Everyone else, is this the final language of recommendation you want to present to the Secretary? **Sinjin Eberle (American Rivers)** Would it be appropriate to call out the concern from Zuni in each of these project line items? **Deborah Shirley (BIA)** I suggest to add that as a foot note. **Edward Wemytewa** May I ask to return to Kurt's comment? Can we include his comment in a phrase that justifies why Zuni is not listed? **Christina Noftsker (State of New Mexico)** I suggest that we reference the letter Zuni provided on each of the 2 project lines that are impacted. **Terra Alpaugh** Kurt do you agree to this edit? Or do you prefer that we use language from the letter. **Kurt Dongoske** Is the language we are adding going to have any impact on the Secretary? I seriously doubt it. Once again the central government is deciding what is best for Zuni. I find that very insulting. **Wayne Pullan (Chair)** Kurt, it seems that you are confident that the argument was made fully in the letter. Let's reference the letter and attach it to the recommendation. That will give the Secretary full evidence of the information. **Erik Stanfield (Navajo Nation)** I just want to give a reminder that 4 of the 5 tribes agreed to this bullet. Including a letter from the Zuni in that bullet does not fairly represent the tribal interests. I think that is unfair to those of us that did work to prioritize the list, vote on it and support it. **Terra Alpaugh** How would the 4 tribes feel if we removed the Zuni objections from the tribal bullet and add them in a new third bullet? **Edward Wemytewa** We are arguing about unfunded projects. I feel like this goes against the spirit of why we are here.

<break>

Terra Alpaugh (Facilitator) We made further edits during the break. We changed the bullets to letters, the tribal bullet is now letter B. We have some new language from the Zuni which will be included as letter C. I am not asking for edits. But if anyone has deep concerns about the changes I am open to hearing those.

Kristen Johnson (State of Arizona) This is a process question for Rod. I am confused about the "recommends for approval." Is it more appropriate to simply say "recommends" to the secretary? **Rodney Smith (DOI)** Yes, that is more appropriate.

Charlie Ferrantelli (State of Wyoming) I have a question for the group. We all know there was a gap in the funding for the budget. That language was taken out. **Terra Alpaugh** The language is still in the TWG motion. The question is does there need to be similar language in the AMWG motion. **Sara Price (State of Nevada)** I think you will have the history of the TWG motion moving up to AMWG. I do not think it is critical to have the language in the AMWG motion. **Larry Stevens (GCWC)** We did that to make sure the Secretary was clear that the overage was small. **Sara Price** But she would know that. **Ed Keable (NPS)** Just to clarify, is it appropriate for the secretary to approve a budget that is over funds? **Wayne Pullan (Chair)** This is so close. From my perspective it is essentially on budget. **Ed Keable** Then I don't think this language needs to be in the recommendation to the Secretary. The point that I think is important is that a lot of cuts were made to meet this budget.
(discussion and wordsmithing continued on this point, in the end the over budget language was retained)

Sara Price (State of Nevada) I motion to approve the Recommendation.

Larry Stevens (GCWC) I second the motion.

Wayne Pullan (Chair) The motion passes by consensus.

Jakob Maase (Hopi Tribe) I do not want to belittle our hard work. But in reality we are only just maintaining the status quo. Let's put our hearts and minds into making an easier process and more concrete results in the future.

Basin Hydrology and Operations:

Heather Patno (Bureau of Reclamation) Hydrology and Operations Upper Basin reservoirs are at normal levels for this time of year. Precipitation maps were all red a few weeks ago, but we are now significantly above average rainfall for the upper basin. We expect additional monsoon precipitation in the next 7 days. We need the extra precipitation to continue based on soil moisture measurements. August is the month that determines next year's operational tier. For WY 2025, Lake Powell will continue to operate at mid-tier level and Lake Mead at Level 1 Shortage Condition. Lake Powell releases will be reduced to 6maf if the 24 month study shows 3500 feet elevation. Reference slides for details on the Water Year and Elevation projections. For hydropower maintenance, we are almost at the end of the 24 months maintenance cycle. River outlet coating work begins this week. GCD power outages for next year are scheduled. Tail water inspection is now going to be done by ROB because no divers are allowed. More information will be forthcoming on this activity. Reference slides for dam release pattern charts.

Q&A and Discussion

Leslie James (CREDA) You said the diver inspection cannot be done now? **Heather Patno** I understand all of the Reclamation divers have been grounded. They are trying to see if the inspection can be done via robot. What that means for flow requirements we do not know yet.

Bryce Mihalevich (Bureau of Reclamation) Water Quality I did a comparison of the water temperature profiles in the reservoir at Wahweap (2.5 km from dam) and the Forebay (.6 km from dam) to see if the SMB flows are having any impact on mixing in the forebay. The results show the water profiles are the same at both locations, so there is no evidence of mixing in the forebay. This next slide is looking at the impact of SMB flows on the release temperature. Penstock temperatures are likely tracking to the top line of this curve at around 15°C. The bypass temps are measuring 7 to 8°C. Looking at Lees Ferry, where waters are well mixed, you can see the reduction in temperatures since SMB flows started as compared to profiles from previous years. The SMB flows have caused an increase in dissolved oxygen and specific conductance. It took about 2 days for the SMB flows to reach RM61 but now see similar impact to temperature, dissolved oxygen and specific conductance as compared to prior years. Reference slides for CE-Qual-W2 and Dibble model projections. Note that the Dibble model performed well up until the SMB flows started. This is not surprising as these flows create an unusual condition not aligned with historical data.

Q&A and Discussion

Leslie James (CREDA) What is your takeaways on these changes? **Bryce Mihalevich** You can over oxygenate, so that could be a problem. Someone would have to tell me how that is playing out downstream, as a lot of that will be released into the atmosphere. For specific conductivity we are at the 90th quantile relative to historical ranges. Salinity is important (specific conductance) but I don't believe these levels are out of range. **Alex Walker (BOR)** I work with Bryce on the salinity control side. The increase in specific conductivity and dissolved solids is something we are keeping an eye on. These are short term increases, and normally these metrics are measured over long periods of time. We will be diving into this in September when we anticipate the SMB flows will end.

Public Comment:

Terra Alpaugh (Facilitator) I will remind everyone to keep public comments to 3 minutes. Is there anyone in the room who wants to comment?

Lynn Hamilton (Executive Director, Grand Canyon River Guides) Thank you for hosting us, this is a great reminder on why this program exists. In regard to the budget, we sincerely hope those unfunded

projects can be funded somehow. I was thankful that B4 got some attention here today. Something really stuck out for me in the narrative about this project. “We anticipate that the sandbar model will be particularly useful to our decision makers in GCDAMP if proposed changes to the sediment accounting window under the LTEMP SEIS are implemented as it can provide qualitative predictions of sandbar volume associated with fall HFE implementation versus spring. To me this signals that this is one of the important tools that we need to make the decisions for this program. The litmus test for what is in or out of the budget comes down to the obligations, needs and goals of the LTEMP and the LTEMP SEIS. We move forward by building on what we know. In regard to the cool mix flows, that was a great example of how nimble this program can be in responding to critical needs of the ecosystem.

Jen Pelz (Grand Canyon Trust) I just have a few observations from today. It seems there were some process issues. I recommend you address those now rather than waiting for 3 years until the next TWP to revisit the problems. The integrity of this program is based in the science, both western science and traditional indigenous knowledge. Finding a way to ensure everyone is heard is something this body needs to address. The insufficient funds is also an area to be addressed, particularly for the tribal projects. There are opportunities that can be leveraged. The trust is more than willing to help in that. Please reach out if you would like support from the trust.

Kestrel Kunz (Southern Rockies Protection Director, American Whitewater) This is my first AMWG meeting, thank you so much for having me. I have been learning a lot and really appreciate all the work you have been doing for decades. Because this is our first time here, I wanted to give a brief introduction on American Whitewater. We are a national river advocacy organization who works at the intersection of river conservation and recreation. Our mission is to protect and restore whitewater resources around the country and to enhance opportunities to enjoy them safely. We have over 7000 dues paying members as well as around 72,000 supporters that follow and support our work. Crucial to our mission is supporting river management decisions that are based in science and indigenous knowledge. Many of our members are river guides on the Grand Canyon or hope to get permits one day. The experience in the Grand Canyon is directly related to stream flow, sediment transport, beaches, vegetation growth. Being able to understand those resources is critical to understanding that recreation experience in the future. We also support the concept of finding creative solutions for funding to fill the gaps in the workplan. I offer American Whitewater as another source for funding support.

Terra Alpaugh (Facilitator) Do we have any others in the room who want to comment? (No Response) Anyone online that wants to make public comment? (No response) In that case we will close the Public Comment period.

Wayne Pullan (Chair) First, thank you to Jamescita for agreeing to postpone her presentation until tomorrow. Thank you to all of you for your engagement and for working through the resolution and coming to consensus. I think it is important for all of us to recognize the tremendous amount of work put into this by TWG and BAHG resources.

Meeting adjourned at 5:12 PM PDT

Day 2: Thursday, August 22, 2024

Start Time: 8:34 AM PDT

Conducting: Wayne Pullan, Bureau of Reclamation, Acting Secretary's Designee to the AMWG

Designated Federal Official: Daniel Picard, Bureau of Reclamation

Facilitator: Terra Alpaugh, Kearns & West Inc.

Meeting Recorder: Beccie Mendenhall, SeaJay Environmental LLC

Welcome and Administrative

- **Opening Remarks: Wayne Pullan (Acting Secretary's Designee)**
Thank you for your engagement yesterday. We look forward to having a good meeting today.
- **Introductions and Determination of Quorum (13 members)** A quorum was reached.

GCDAMP Tribal Liaison Update:

Jamescita Peshlakai (GCDAMP Tribal Liaison) This group is tasked with protecting the holy people of this land. I want to thank you for keeping the Grand Canyon safe. Our annual meeting for the LTEMP Programmatic Agreement (LTEMP PA) is in April. This year we added a bi-annual meeting in October as well. We also have quarterly meetings with each of the 5 tribes, plus the tribal river monitoring trips. The Cultural Sensitivity training project is a key deliverable in the LTEMP PA. The tribal presentations at this meeting are helping us energize and refocus efforts on this project in 2025. Reference slides for a list of tribal projects that are part of the new TWP as well as on-going projects still active.

Q&A and discussion

Larry Stevens (GCWC) Do you maintain contacts with the Havasupai? **Jamescita Peshlakai** I do but mostly as a local leader. In my work, we send the cooperating agency letters to them. We have reached out numerous times. Their Vice President came to the introductory meeting for LTEMP PA, but they have not returned since. We do not know why they have not returned, possibly because they are a very small tribe. They are the tribe that lives here in the Grand Canyon, so I will continue to reach out.

AMWG/FACA 101:

Bill Stewart (BOR) There has been a lot of turnover in personnel over the years, which is why this presentation is timely. I am going to go over how we formed and the history of the last few decades. But before I do that, I am going to hand it over to Jill Nagode, who is our Group Federal Officer who oversees Reclamation's FACA committees.

Jill Nagode (BOR) Federal advisory committees have to adhere to the requirements established by the Federal Advisory Committee Act (FACA) as well as regulations of the General Services Administration (GSA). GSA has had responsibility over FACA since 1977. They are charged with monitoring the performance within the FACA committees. They conduct annual reviews and oversee compliance including the upload of reports, meeting minutes, actions and recommendations to the FACA database. When the FACA committees submit for renewal, the FACA database entries are reviewed to ensure compliance. There are 1000 Federal Advisory Committees with 60,000 participating members. DOI itself has 82 federal advisory committees. Reclamation has 7 committees, the AMWG which is the only committee authorized by a statute (GCPA), and 6 discretionary committees which are agency authorized. I work closely with the DOI committee management officer and Reclamation to ensure compliance of the committees. AMWG is the largest federal advisory committee in the DOI, and you are considered a role model. Thank you for making my job easier.

Bill Stewart (BOR) GCDAMP was preceded by the Colorado River Storage Project Act (1956) which triggered construction of the Glen Canyon Dam. After completion in 1964, there was concern about the impact of the dam on the Colorado River Basin, culminating in the GCPA in 1992. This is a statute which requires Glen Canyon Dam operations to be conducted in a manner that mitigates adverse impacts to the Grand Canyon. It also includes requirements for environmental studies, scientific monitoring and

stakeholder consultation. This is what launched the GCDAMP and AMWG as well as GCMRC and the TWG subcommittee. GCDAMP is one of 4 conservation programs on the Colorado river. What makes this program unique is the GCPA. It is also a federal advisory committee which is different than the other programs. Reference slide 8 for a list of Guidance, Compliance and Statutory obligations that govern this program. LTEMP is the framework we work under for adaptively managing the Glen Canyon dam, a 20 year program with 11 resource goals. At the top of the GCDAMP structure is the Secretary of the Interior, followed by the Secretary's Designee who participates in the AMWG, which is the parent committee within GCDAMP. The AMWG has representation from government bodies, tribes, states, and industries. Meetings are run using Robert's Rules of Order and attempt to seek consensus in voting. The Technical Working Group is a direct subcommittee of the AMWG. This group really does all the work, often through smaller ad hoc groups. GCMRC is a group of scientists dedicated to fulfilling the research and monitoring requirements of the GCPA. The Science Advisors Program was launched in 2000 to fulfill the GCPA requirement for an independent review panel. Reference closing slides for a list of the GCDAMP and AMWG reporting requirements and additional reference information.

Q&A and discussion

Heather Whitlaw (USFWS) Where does the P&I team fit in? **Bill Stewart (BOR)** Great question, that came out of the LTEMP with the flow experiments in mind. It is made up of the DOI agencies, WAPA, 7 basin states, Arizona Game and Fish and UCRC. We meet to address the experiments, track HFE, look at if we are meeting triggers for an HFE, create the technical reports and make recommendations for action. **Deborah Shirley (BIA)** Do we have a visual flow chart of that? **Rodney Smith (DOI)** It is somewhere in the appendix of the LTEMP ROD. It is a long, complicated chart that may not be helpful to you. As Bill said, it is a creature of the LTEMP itself with tribal and AMWG consultation obligations. **Bill Stewart** Part of that process is a notification to the tribes, as dictated by the LTEMP PA.

Kurt Dongoske (Pueblo of Zuni) (Chat) How does the DOI carry out its Trust Responsibility to Zuni and other Tribes within the FACA GCDAMP? Please do not solely identify trust assets because those tend to be narrowly defined by DOI agencies. Please be mindful of the Advisory Council on Historic Preservation's statement of trust responsibility to "encompass all aspects of historic resources, including associated indigenous knowledge and other intangible values." **Bill Stewart (BOR)** As part of the NEPA processes we send out consultation letters. **Rodney Smith (DOI)** When one of these processes is triggered, for example a NEPA process, there is a National Historic Preservation Act Section 106 process that goes with it. We also have tribal consultations both formal and informal that go with those proposals, including the consultation letters that Bill referenced. There are a number of other informal meetings and discussions to understand tribal interests and how the program is or is not meeting those.

Sheri Farag (CREDA) When Jill was speaking, she talked about how the agency goes through reviews and tries to put an end to some committees. Does the statutory nature of this committee give it some protection from these reviews? **Jill Nagode (BOR)** Sort of. AMWG is still considered a discretionary committee, even though it is authorized by a statute. There was debate about this, but since the GCPA does not specifically direct the Secretary to establish this committee, the Secretary decided it would remain a discretionary committee. **Rodney Smith (DOI)** To further clarify, the GCPA requires us to consult with a number of folks. If the folks are governments of some stripe, that is straightforward and does not trigger FACA. But if they are non-governmental interests that the GCPA requires us to consult with, then FACA is the best way to manage this.

Larry Stevens (GCWC) There are more authorization issues to be presented than just what Bill shared in his presentation. I have always wondered why the Golden Bald Eagle Act is not considered in this program. We have them in the canyon, but we are not monitoring them anymore. They are a big deal for many reasons. Is this an act that should be considered for partial authorization in this context? **Rodney**

Smith (DOI) If there is something we are doing concerning dam operations that will have an impact here we will make sure we take care of that. It may be more of a park management topic. **Larry Stevens** One other question, when it comes to the review process, will the science advisors be assisting with that process, or will Reclamation go outside for that? **Wayne Pullan (Chair)** We will use the science advisors and pull in additional resources as appropriate.

Kristen Johnson (State of Arizona) You mention we strive for consensus. I want to point out we don't have a consensus formally defined here. It does not always mean unanimity. My idea of consensus is the broad majority.

Heather Whitlaw (USFWS) The P&I team already has a role in evaluation and monitoring of the cool mix, correct? **Bill Stewart (BOR)** Yes, I go into the details on that in my LTEMP presentation. **Larry Stevens (GCWC)**: Another question about the P&I team. Do their decisions override the recommendations that come out of AMWG? When there is a conflict how is that handled? **Bill Stewart** The P&I team makes recommendations to the Secretary. The Secretary would resolve any conflicts.

Deborah Shirley (BIA) We have a list of tribes that are in the program. Will there be an opportunity for other tribes to reconsider and be invited to join? What are we doing to engage more of the tribes? **Rodney Smith (DOI)** Jamescita has been involved with this for local tribes, there is opportunity for expansion. The distribution for tribal consultation related to a NEPA activity is wider than the AMWG tribal participant list. Beyond the AMWG, there is a larger Colorado River Basin effort for sovereign-to-sovereign engagement with all 7 states and 30 tribes that are in the basin. **Ed Keable (NPS)** It is before my time, but Jan has let me know we have reached out to Havasupai, and they have not engaged. **Erik Stanfield (Navajo Nation)** I wonder if it might be time to form a Tribal Ad Hoc Group as a way to explore outreach to other tribal groups. It might be a good way to coordinate some of these discussions. **Jamescita Peshlakai (BOR)** Thank you Erik for that suggestion. Although we have 5 tribes here, there are many more in the region that should be here at the table with us. One of the roles of my job is to educate the AMWG group. When it comes to engaging with the tribes we are not starting from a fair base. The tribes who are part of the AMWG, their ancestors were coming back from prison camps when the Grand Canyon Park was created. Also remember, we are not talking about dead cultures, it is alive now. It is doable to bring the rest of the tribes to the table. The questions are good, let's keep working towards fixing this issue. **Leslie James (CREDA)** To Erik's point, what about resurrecting the cultural resources AHG, it is already in the books. **Erik Stanfield** That would maybe be an administratively easier thing to do but I don't know that it would serve the same purpose. **Leslie James** I was just looking for an easy way, I think you guys could make it whatever you want to make it. **Deborah Shirley** I was thinking about the tribal prioritization and the fact these were unfunded. Perhaps this new group would help the tribes lobby for this funding. **Kristen Johnson (State of Arizona)** I want to thank Erik for his suggestion, I think it is a good one. We should consider what the role for this Ad Hoc group would and would not be. It would still be under the FACA process. And it would not take the place of consultation which is a separate process. **Wayne Pullan (Chair)** I would like to talk to a few others about that. I will report back later in the meeting.

Wayne Pullan (Chair) In closing here, I want to say there is always the temptation when you have a lot of work to do to let the administrative things slide. That is always a mistake because the administrative stuff will come back to get you. The real solution is to be really good at the administrative side of things, so it takes as little time as possible. I want to thank Jill who has been a great resource to the AMWG and very helpful in keeping us on task. Also, thanks to the Reclamation staff who responded to Jill and made it possible for us to be very successful.

Operation Planning Updates NEPA (Interim Guidelines SEIS, Post 2026, LTEMP SEIS):

Kathleen Callister (BOR) Last year at the AMWG we were talking about two SEIS and starting the Post 2026 EIS. Today I have only one update to share, Post 2026, due to the work and success of everyone here. The good news is, we are implementing the LTEMP SEIS and to date no YoY SMB have been found. We can call that a success, while acknowledging there is a cost to Hydropower. For the Post 2026 NEPA process, we are currently in the Alternatives Development phase. We are doing preliminary modeling on proposals received from the various stakeholders (upper basin, lower basin, NGO, tribal stakeholders). Preliminary results were presented in July and August. **Katrina Grantz (BOR)** We are submitting ideas for how to convert concepts into computer modeling that we can share back to the participating organizations. **Kathleen Callister** Alternative development will continue through the summer. Once the NEPA alternatives have been identified, the resource impact analysis will begin. **Rodney Smith (DOI)** I just want to chime in, to date there have been a number of proposals put forward at various levels of detail. We have not yet selected which proposals will be accepted in the SEIS.

LTEMP Experiments Updates:

Bill Stewart (BOR) LTEMP Flow Experiments Most of this presentation will be focused on the SMB flows. The purpose behind these experiments was defined by the LTEMP ROD in 2016. There are 3 types of flow experiments today:

- Sediment – High Flow Experiments for managing sediment
- Aquatic Resource – flows designed for a specific resource
- LTEMP SEIS – primarily SMB management but also some revision to HFE protocol

The LTEMP process has annual reporting requirements, notification and consultation requirements to tribes and PA parties, and defines the Implementation and Planning team, which then makes recommendations to the Secretary of the Interior for decision. Looking at the history of HFE since 2012, Fall HFE were triggered in 5 of the last 12 years. The Flow Ad Hoc Group came up with the revised HFE protocol in 2023, which provides more flexibility in responding to sediment. Macro Invertebrate flows were designed to give the bugs the weekend time without releases. SMB flows came out of the LTEMP SEIS. This defined Cool Mix alternatives to prevent SMB spawning below the dam. The ROD defined specific guidance for 2024 due to the urgent need to mitigate SMB propagation. There is a tremendous amount of coordination required to make these flows happen. We have been using a weekly, iterative process to fine tune the cool mix process. There are 4 river gauges that provide temperature monitoring to guide the response. Original modeling in April 2024 showed only small probability that SMB flow trigger would be met, and if so it would be late August or September. As more data came in, the temperatures started increasing earlier and higher than the April models. The trigger temperature was actually met at the end of June. The ROD was signed July 3rd, the SMB flow was started on July 9th. Reference slides for implementation details, including optimization of flows to reduce impact to hydropower. Water temperature measurements at Lees Ferry and RM61 show a clear reduction in temperature after the SMB flows started. There are several TWP workplan elements that address monitoring for the SMB flows. This monitoring is supplemented by Experimental Funds and NPS removal efforts. There are also fish monitoring trips supported by other organizations that will contribute to the monitoring (12 trips per year). In closing, there have been no YoY SMB captured to date!

Q&A and Discussion

Sara Price (State of Nevada) From a lot of the graphs you put up, it seems like we are not hitting the 15.5 degrees in the forecasting. I am trying to understand the inconsistency between the forecast and the actual. I am concerned we are not triggering based on the threshold as defined in the LTEMP. **Bill Stewart** When we get the observed data, it has already happened. That means we are in the zone we might be concerned about spawning. Once we see that trigger, we initiate the P&I meetings to start the

action. **Sara Price** When you mention trigger, are you referring to a forecast trigger? **Bill Stewart** It is based on observed temperature. We use the model to forecast when we might see a trigger. But when we get closer to trigger levels, model or observed, we start monitoring weather and other measurements to create a weekly forecast. **Sara Price** It will behoove us to carefully understand what the models are doing for us. It is concerning to me that we went out of the gate all the way to RM61 with the cool mix when it is not even looking like we are hitting the temperature triggers. **Bill Stewart** Bryce would say the experiment is working well. The longer term models need to be improved, but that is not pertinent to the actual management of the experiment. **Charles Yackulic (GCMRC)** The target is a daily mean. Focus on the mean, because it will vary across the course of the day. Also, part of the reason 15.5°C was chosen was to ensure we can stay below 16. The modeling is not perfect, but the weather man can't forecast accurately 3 days out either. I agree with Bill that the downstream warming component is behaving well but there is still work to be done on the months out forecast. **Ali Effati (State of New Mexico)** I want to highlight what Sara mentioned. I appreciate the explanation, but I encourage Reclamation to formalize the decision with respect to triggers. I think it warrants its own memo for AMWG, similar to other experiments in the past. Some of the responses could be documented in a more formal way. We get questions and the documentation would help. **Bill Stewart** Thank you. The time constraints this year for the ROD prevented that. Our intent is to use the P&I in future years to improve communication.

Leslie James (CREDA) Can you put the flow chart up again? I have two questions on this. We saw in one of your slides there have not been any YoY SMB caught. To me that is a different point than “are they reproducing”. On this chart, if you see evidence of reproduction you do all these things and if you see no evidence of reproduction you stop. I think that line cuts off prematurely. The question should be “why are they not spawning?” Second point, our ultimate objective is to protect the endangered Humpback Chub (HBC). I am not sure I see anything about the HBC. **Bill Stewart** I think you have a good point about the response to no evidence. It may take more than one season to analyze some of this. **Charles Yackulic (GCMRC)** First of all, you stole part of my presentation. But some of these things related to reproduction we can only study if there are fish. But there are a lot of questions and actions not related to reproduction that we will be studying this year. I don't think the science stops if there is no evidence of reproduction. Regarding your point about HBC, that is something we are trying to add to the 2026 modeling. We are going to continue to report what is happening to the HBC near the LCR as part of the Biological Opinion reporting.

Larry Stevens (GCWC) In 1970 I did my first kayaking expedition in the canyon, and I flipped over. The water was so cold I froze! That cold water in the canyon has been the reason the non-native fish have not moved into this system for the last 4 decades. I see the cool mix as the solution here. The warm water fish are already in the system. The only tool for managing them is temperature. These fish are an existential threat to the ecosystem. **Ed Keable (NPS)** I may now be repeating what Larry said. First, the temperature goal is the average daily mean. We are meeting those goals, so this experiment is doing exactly what it was intended to do. And it is successful based on evidence that there is no spawning. We learned in the upper basin that SMB are detrimental to HBC.

Jim Strogon (TU) In terms of monitoring downstream, is there sufficient monitoring to make sure there are no SMB populations down there? **Bill Stewart (BOR)** You can always have more monitoring. And there is monitoring by other organizations along the entire stretch of the river. The sampling efforts are concentrated in those first 23 miles because we know the SMB are there. I personally think we are monitoring the right locations at the right intensity.

Brian Sadler (WAPA) LTEMP SEIS Impact to Hydropower The estimated impact to hydropower from the LTEMP SEIS is \$15 Million per year. There is a wide range of potential outcomes however, which will be more evident over time. Another view shows the months from July to September will be most

impacted. The actuals for those months are running about \$5M – \$6M per month. How does this SMB experiment compare to the other experiments? We have been very accurate in predicting HFE and Bug flow impacts. It appears the cost for these experiments is much less per flow than the SMB flows, which also continue over a longer period of time. The Bypass Optimization tool allowed us to determine the best way to structure the bypass flows. This led to the dynamic flows that halt the bypass during top energy production periods in the afternoon. The estimated cost using a constant bypass flow was about \$300K per week more expensive than the optimized flow. They are tracking the actuals weekly, which look like they will be close to the estimates. The final slide shows status and projections for the Basin Fund. The current projection estimates the fund will need to be replenished in 8 years.

Q&A and Discussion

Leslie James (CREDA) I have been trying to come up with a good analogy to compare hydropower with another LTEMP resource. We have objectives for sediment. But these are not for sand itself but for the impact of the sand on vegetation, recreation, the ecosystem. We also have an objective for improving hydropower resources. Energy by itself is energy. But you look at what it is used for, it is to ensure human beings have electricity. The information Brian presented on financials is great, but it is just one piece of the picture. Other views are the impacts on the grid, on air quality, and on humans. I just wanted to make this point, because the SEIS does not get into those other impacts. **Kevin Garlick (UMPA)** I appreciate WAPA maintaining the contracts with the customers to ride through these experiments without impacting their customer costs. But with WAPA having to go to the energy market to find replacement power, it competes with utilities out there looking for energy resources. The result is elevated spot market prices, which are variable and hard to predict. These prices do impact other utilities and their customers. **Sheri Farag (CREDA)** I want to thank BOR and WAPA for ensuring we have full power from 2 – 5 pm. In the desert Southwest, we struggle during those hours to maintain power. We depend on the release from Glen Canyon dam during that period. People here need the power in order to stay alive and we appreciate this group taking that into consideration.

Nonnative Strategic Plan Action updates:

- Strategic Plan Review

Bill Stewart (BOR) I just have two quick slides. The strategic plan in Feb 2023 was worked on by this body and recommended for consideration to the Secretary. There are 3 main components to that plan to address non-native fish below the dam: Long-term fish exclusion, Mid-term operational flows and short-term rapid response actions. The Smallmouth Bass AHG is charged with evaluating these efforts and the effectiveness in mitigating the SMB. One highlight, we are thinking about the type of report we want to see relative to the SMB flows with the intent to share it at the annual reporting meeting.

- Status of smallmouth bass monitoring

Charles Yackulic (GCMRC) There are different ways temperature affects SMB. Hatching only occurs at temperatures over 16°C. Temperature also affects daily growth rates, with growth increasing with temperature above the hatching threshold. When you look at the growth rates from fall into spring when the temperature is low, there is no growth in the fish. The survival of YoY fish is determined by size and number of days under 10°C. Estimating the removal effectiveness of the cool mix will take more time. There is lots of research planned to monitor this.

- Rapid Response Efforts

Melissa Trammell (NPS) I put up this picture of HBC as a reminder of why we are doing these things. The first slide shows the many trips planned in 2024 for rapid response activity. Of note: We decided there would be no chemical treatment in the slough this year, very good news. Also, BOR was able to fund 3 trips in the later months for added monitoring. Reference slides for details on a fish spatial visualization tool, location of temperature loggers, artificial spawning beds. The spawning beds have been checked on a weekly basis and to date no fish have been found. Snorkeling observations also did not find

any fish. The temperature loggers for the slough locations are all below 16°C since the cool mix started. There was a block net installed in the main slough to block large fish from moving downstream. Again, found no adult SMB and one juvenile SMB in that slough. We do a lot of electrofishing, acknowledge that there are concerns with that, but we do about 60 nights per year. Sample 24 sites per night, takes 3 weeks to come around to the same site again. They perform netting every other month in the slough as well. I would like to acknowledge the loss of life through these mechanical removal efforts. But we believe it is necessary to protect the HBC and other native fish. We hope the efforts we are making to prevent reproduction will reduce or remove the need for mechanical removal in the future. Reference slides for a graphic view of non-native fish distribution along the river. In closing, we think the cool mix may be in time to control SMB and Walleye. Green Sunfish may be beyond our ability to control.

- Slough modification update

Michelle Kerns (NPS) Melissa just gave the perfect segway to talk about slough modification. It was just one year ago these changes were requested. Rob Billerbeck led the effort to evaluate the options, and the outcome was this project which we have undertaken. An Environmental Assessment (EA) was initiated at the end of May. We talked with 18 representatives at two open houses. The main themes at the open house were project design, benefits, why necessary, and any anticipated adverse impacts. There was an expression of concern on the timing of this project from commercial interests that use that stretch of the river. We intend to have a public comment period open by Sept 23. You will all receive an invitation to that as well as the planning website. Cassandra will be hosting a tribal meeting this Thursday as well as an early September visit to the slough for tribes of interest.

- Mid/Long Term Actions

Bill Stewart (BOR) I want to share information about Fish Exclusion and Temperature control. Ironically, 20 years ago the efforts were focused on increasing the water temperature to avoid impact to HBC. This was abandoned as the temperature controls proposed at the time were only able to increase temperature. As part of LTEMP SEIS, we revisited temperature control options. Thermal curtains trap the warmer water behind the dam so only cooler water goes through the penstock. Looking at fish exclusion options, there is a list of design considerations that need to be evaluated. Next Steps include a Value Planning Study, a Biofouling study, Hydrologic modeling and exploration of design considerations.

Q&A and Discussion

Jim Strogon (TU) Melissa, can you talk about the hidden slough, the warmer temps there and concerns about SMB there. **Melissa Trammell (NPS)** I think it is around RM6, a place where they have done a lot of vegetation work. We are concerned about it, Green Sunfish (GSF) are probably reproducing there. They snorkeled in this area but did not find SMB. It is shallow and muddy, so not great for SMB. Once we get the 12 mile slough fixed, this may be an area of focus.

Jakob Maase (Hopi Tribe) For Melissa, the Hopi tribe has already argued against electrofishing, please keep that in mind. On the heat map, what is the RM location that is the new spot for GSF and SMB?

Melissa Trammell I would have to dig into the data. It is not a slough, more an area along the shoreline.

Jakob Maase For Michelle, is there any update on that spring in the slough? **Michelle Kerns (NPS)** We had a researcher there in June and in August analyzing that. We are waiting for the report. **Jakob Maase** I look forward to that data, it is important for Hopi's decision.

Shana Rapoport (State of California) For Bill, I was hoping to understand better the reporting for the SMB experiments. **Bill Stewart (BOR)** As Charles said, it will take some time to pull this together. We are thinking the annual report meeting will be the place where we present that. **Shana Rapoport** Just to clarify, you are contemplating a written report as well as a presentation. **Bill Stewart** Yes.

Jim Strogon (TU) Regarding the fish exclusion, can you give a rough timeline, costs and who will be paying for that? **Bill Stewart (BOR)** I can talk about the timeline. We just did the value planning which is

the initial phase. We have been focusing on the thermal curtain as the highest potential. We need additional modeling to answer some of the design considerations, like how deep does it need to be. NEPA will need to happen for this, which has its own time constraints. Funding is a good question. I don't know if others have thoughts. **Wayne Pullan (Chair)** Could you take 2 minutes to talk about what value planning is? And where did exclusion versus temperature control line up? **Bill Stewart** Value planning is a highly facilitated exercise with a team of experts. You go through the background and examples of implementation at other places. You develop criteria for measuring the projects. Then you apply across the projects and score to determine the highest value projects to pursue. **Jim Stroger** Is this something that Congress would ultimately have to approve the funding for? **Wayne Pullan** There are some funds available under the Inflation Reduction Act (IRA). It would be worth looking at how those might be employed for this purpose. This project has a long way to go. There will be concerns about safety before we even get to NEPA.

Kristen Johnson (State of Arizona) I appreciate getting assurance we will see a written document on effectiveness of the cool mix flows. I would like to encourage us to plan for that time not just a report but a half day or longer workshop to get into the data and findings. I think that would be beneficial for stakeholders at the table. **Bill Stewart (BOR)** Thank you. I think that is a great suggestion.

Amy Haas (State of Utah) Will the data visualization tool you talked about be internal only or available to stakeholders? **Melissa Trammell (NPS)** That is a matter of discussion in the response team right now. We will discuss with the leadership team and decide.

Stakeholder Perspective:

Ed Keable (NPS - Grand Canyon National Park Superintendent) I want to start by sharing some statistics on the park:

- 1.2 million acres, 278 miles of CO river, 595 miles of trails, 272 miles of roads, 1182 structures
- Grand Canyon National Park is larger than Rhode Island and if you flatten it, it is larger than Texas. We average around 5 million visitors per year, have over 400 staff members and 500 volunteers. Priorities for the park are Indigenous Affairs, Climate Change, Infrastructure and Historic Preservation and Operations.
- 1) Indigenous Affairs: We have an intertribal working group that is the voice of the 11 tribes that call this their homeland. We meet with them regularly with the goal of listening and then doing. One example of this was our name change and rededication of Havasupai Gardens. We are now working with the tribe to tell the true story of what happened to that tribe. We also share a large border with the Hualapai tribe along the Grand Canyon and Lake Mead. We are working with them on how to steward this land together.
 - 2) Climate Change: Three impacts of climate change we are studying; human health, forest health and river health. Increasing temperatures in the park have a direct impact on human health. To date in 2024 we have had 223 search and rescue operations and 11 fatalities. We average 400 rescues per year. The Kaibob National Forest is on both the north and south rim of the Canyon. The health of the forest has been deteriorating since 2000 due to the effects of climate change. As far as the river, it is good to remind ourselves that we have already lost a number of fish. One of the laws I am responsible for managing as park superintendent is the Endangered Species Act. Approximately 95% of the HBC in the world are in Grand Canyon Park. SMB presents the highest danger for the non-native species. The good news is, we are at a point where we can still prevent SMB establishment. Finally, we have launched a communication campaign to help educate the public about impacts of Climate Change at the park.
 - 3) Infrastructure and historic preservation: The water system was implemented in the 1970's with a 25 year shelf life intended to service 2.5M visitors. We have exceeded all those design constraints and are in the process of replacing all the waterlines. We will spend between \$500 - \$750 million over the

next 7 years on infrastructure. We have a \$208M contract for adding a water treatment plant at Bright Angel Creek to diversify our water source. Another project is upgrading the North Rim Infrastructure at a cost of \$180M. Once complete, the North Rim location can remain open for winter activities.

- 4) Operations: Visitation takes a heavy toll on the park, including the river. We have trail crews that fix trails, prune vegetation, move rock, build bridges, add steps and rails. Another operation, compost toilet management, evacuates and recycles tens of thousands of pounds of compost each year.

Heather Whitlaw (USFWS) I just want to say thank you. What you do for Fish and Wildlife ESA related projects is a huge component of our recovery accomplishments. And it doesn't even make the slide because of all the many critical things that you do.

Technical Work Group Chair Report:

Seth Shanahan (TWG Chair) We had three meetings in July to finish the recommendation. There will be one more meeting this year, a webinar on October 29-30. There is a lot of information at AMWG that overlaps with TWG, I will not touch on that here. Just know that your TWG representatives are involved in a lot of the same conversations we are having today. We had elections in July and the leadership will remain the same. Ad Hoc Groups continue to meet and do work for the program:

- Steering Committee AHG is behind the scenes really leading the TWG In their work.
- Budget AHG is going to have a new charge which is about improving the TWP process
- Socioeconomic AHG has been recharged to lead forums for tools and modeling
- Smallmouth Bass AHG is focused on effectiveness of the SMB actions
- Trout AHG was suggested at the July TWG to focus on issues with trout fishery health

Some highlights from the July meeting include:

- A report on rainbow trout population health.
- Discussions around Glen Canyon Dam dissolved oxygen, both the studies looking at augmenting oxygen as it exits the dam and impact of the cool mix flows which have raised the DO naturally.
- A presentation from the Salt River project, the fastest growing utilities company in the country, which provided information about the rapidly growing and changing dynamics of power.
- A report on some positive results from efforts to restore the razorback sucker into the ecosystem.

Reference the closing slide for a list of future TWG agenda items.

Ed Keable (NPS) I just want to complement you and the whole team that you lead. The volume of work you deliver is amazing.

Stakeholder Updates (2-3 minutes each):

Wayne Pullan (Chair) Before we start, I want to comment. The 7 basin states are working very hard on the Post 2026 effort and coming up with their alternatives. They are in the process of figuring out what annuals are going to be. We are not annual makers we are annual takers. Whatever the annuals are, we will deal with them.

- States: ADWR, AZGFD, CA, CO, NM, NV, UT, WY

Kristen Johnson (State of Arizona) This is not directly related to the program, but I want to report on some broader water related issues in the basin. The Northeastern Arizona Indian Water Rights Settlement Act (HR 8940) was introduced into congress on July 8th. This will settle some of the largest outstanding tribal water rights claims in Arizona. We recognize some stakeholders have lodged concerns, which are being worked through. Arizona also had an interesting legislative session this year. There were 75 bills related to water, 6 of those directly impacting DWR and a dozen others indirectly. In the vast majority of this state ground water is not regulated. It is a very hot topic. There are people in the rural areas begging for regulation, and there are legislators who do not want it. We look forward to seeing the slough EA.

Julie Carter (AZGFD) I want to thank Park Service, Reclamation, and everyone involved in the implementation of these SMB flows, they are incredible. It will be interesting to see if there is an impact to the Lees Ferry rainbow trout. I would be interested in updates on trout at future AMWG meetings.

Ryan Mann (AZGFD) We have a couple of upcoming trips that will be looking for non-native fish. Looking forward to integration of our work at Lees Ferry with the USGS turgid trips. We are excited to be in the final stages of a collaborative agreement for fish monitoring at Lees Ferry rapid. We will be happy to report on that at future TWG and AMWG.

Shana Rapoport (State of California) The Imperial Irrigation district just completed a conservation agreement to leave a cumulative 700 kaf in Lake Mead over the next 3 years. That is the last of the California's contracts under the lower basin plan. We have already created over 600 kaf (thousand acre-foot) to the plan and are on track to reach our goal of 1.6 million acre feet by 2026. The Lower Colorado River multi species conservation program is in the final stages of completing a large property purchase from a private landowner that has the potential to complete all the habitat acquisition needed for the program. One last item, our executive director Chris Harris is retiring at the end of this month with Jessica Neuwerth stepping in as our interim director while we are conducting a search.

Michelle Garrison (State of Colorado) Colorado Parks and Wildlife did find zebra mussels in the mainstream of the Colorado River in the Grand Junction area for the first time. There are some off stream locations being treated for zebra mussels, but we do not believe that is the source. It is more likely watercraft coming from other areas. I would expect renewed concern on intercepting watercraft coming into the state. We are participating with other stakeholders in the Upper Basin System Conservation pilot program, which is continuing for 2024, with potential authorization into 2026.

Ali Effati (State of New Mexico) I agree with Kristen that HR8940 is historic legislation. This particular settlement also affects New Mexico, so we are working with stakeholders to resolve concerns. We have a lease agreement with Hickory Apache Nation that allows us to lease water from the Navajo Reservoir. We are in the second year of this lease, which allows up to 20 kaf to be released per year. In April 2024 there was a signing ceremony with several upper basin tribes for an MOU to pursue shared goals and priorities. <http://www.ucrccommission.com/wp-content/uploads/2024/03/UCRC-UB-Tribes-MOU.pdf>

As the Chair referred to, New Mexico is participating with the leaders of the 30 tribes, basin states, principals and federal government on the Post 2026 efforts. That group is commonly referred to as the "30 Sovereigns". Finally, we provided comments on the slough EA process, and we look forward to engaging more with NPS and GCDAMP on that effort.

Sara Price (State of Nevada) Looking back at the last few years of this program and our presentations this week I feel like we have really moved the mark. I have good news in the lower basin, we have moved legislation in DC called the Help Hoover Dam Act which authorizes Reclamation to spend \$45M of stranded funds. We are very hopeful to get this bill passed by the end of the year.

Amy Haas (State of Utah) In Utah we are devoting substantial capacity to facilitate activities under the IRA act. The upper states have been allocated about \$450M dollars from this fund. The states play a role in providing a red flag review for projects requesting these funds. We are also gearing up for Drought Impact Mitigation Funding, which are longer term drought mitigation activities under the IRA which we received directly from Reclamation. Finally, we are involved in the receipt and prioritization of bill funding through the Upper Colorado River Commission for the implementation of the 2019 Drought Contingency Plan.

▪ Tribes: Hopi, Hualapai, Navajo Nation, Pueblo of Zuni, Southern Paiute

Jakob Maase (Hopi Tribe) This is one of the best AMWG meetings I have attended, thank you. For the Hopi update, we have finally hired resources to get our projects underway after 5 years of funding limbo.

Erik Stanfield (Navajo Nation) A couple people have already mentioned the water rights settlement as well as the upcoming legislation that could be worth up to 5 billion dollars in infrastructure. I think the character of Northeastern Arizona will be changed for the better. It will be good to see how this improves

the quality of life for people in the Navajo Nation. The LCR vegetation project grant that we proposed has been submitted. We appreciate the support from all the stakeholders in this program.

Kurt Dongoske (Pueblo of Zuni) Councilman Wemytewa wanted me to convey that he has submitted comments on the proposed alteration to the slough in Glen Canyon and is preparing a proposal for the Bureau of Reclamation. There will be another Zuni wetland tour in October, and he would like to invite GCMRC.

▪ NGOs: Environmental (x2), Federal Power Purchasers (x2), Recreation (x2)

Larry Stevens (GCWC) We would like to thank NPS for all their restoration efforts at Paria beach. Some of the trees are now 20 feet tall, a beautiful patch of riparian restoration. With the success of these and other restoration projects upstream, we are submitting a proposal for a 10 acre riparian restoration on the other side of the river. We would appreciate any letters of support people want to offer. The proposal is due next week. On a larger scale, we are interested in applying for B2E funding to conduct restoration across the reach from the dam at Lees Ferry and Paria Beach. We may be soliciting letters of support for that effort as well.

Sinjin Eberle (American Rivers) American Rivers has participated with 6 of our conservation partners in developing the Cooperative Conservation Alternative for Post 2026 operations. It has been a fun and exciting project to put this together, collaborating with the other organizations and working directly with Reclamation and GCMRC. We are really excited to see what alternatives come out of that.

Kevin Garlick (UMPA) One of the challenges myself, CREDA, and other power users face is educating our customers on the challenges and importance of environmental programs. We have an upcoming meeting with CREDA in a few weeks and we are planning a river trip to educate this group on the slough. We commend NPS on their assistance with that effort and on what they are trying to do at the slough. The efforts of this group in trying to protect these species is appreciated.

Jim Strogon (TU) We appreciate the hit the power companies are taking to mitigate the threats from SMB. We appreciate the good things this is doing for the trout fishery as well. It has been a welcome relief. Seth mentioned the Trout AHG, we have a wealth of information about this fishery, we need a format to take that information and put it to use. I look forward to expediting solutions that prevent fish entrainment. I also hope we get to a point with more water in Lake Powell.

Lynn Hamilton (GCRG) Whenever I get updates from GCDAMP I pass that on through our newsletter and the community appreciates that communication. We have our guides seminar next spring in the last week of March. I cordially invite you all to come join us and perhaps speak at this forum. It will be a fabulous opportunity to connect with the river community.

Federal Agency Updates (2-3 minutes each):

Andrew Schultz (GCMRC) We have one main update. We have a new Center Director. Lew Coggins has accepted the position and should be starting next month. He has a history with the program, so he won't start from scratch. And thanks to everyone filling the interim role.

Heather Whitlaw (USFWS) I have a new awareness for what it takes to run the program after this meeting. I really appreciate the history from Bill and knowledge of all the actions in this office required to keep everything running. With respect to the bass flows, FWS is very appreciative of everyone planning and implementing these actions, very appreciative of the adaptability. The creativity of Reclamation and WAPA working together to optimize the flows and the staff at GCMRC who look at the data weekly to understand what it means. **Jess Newton (USFWS)** Next week we launch our survey for HBC in western Grand Canyon. On this trip, we are adding an additional boat to do seining with the intent to identify SMB spawning. Several weeks ago, we completed an additional seining trip for SMB. A side benefit of conducting these paired trips is it allows us to do mark/recapture-type population estimates that will increase accuracy and tighten confidence intervals in our annual estimates for HBC.

Kathy Callister (BOR) Tara and I started working with Jan Balsom from NPS 6 months ago to put this meeting together. It has been a great experience to be this close to the canyon. We will probably be asked

to do it again. I want to thank my staff, because we get home from this meeting, submit the reports and then start planning the next meeting. One more announcement, Mark McKinstry was part of this program early on and is best known for the San Juan River endangered fish recovery program. He is now fully retired, and we wish him the best. I want to recognize the work he has done for this program and for the Upper Colorado Basin.

Ed Keable (NPS) I want to start by thanking my staff for doing such an outstanding job supporting this event. Melissa and Michelle gave outstanding presentations, so I don't have anything to add. I will close by thanking Tara Ashby for her support for this event.

Deborah Shirley (BIA) Thank you for welcoming me to the AMWG. I look at this trip as coming home. I also want to thank the tribal partners. They have shared a piece of their culture, language and traditions. Our BIA director in DC will be retiring at the end of September. There will be a new director announced shortly. Same with the BIA Navajo region, an announcement will be coming out soon.

Brian Sadler (WAPA) It has also been a really good meeting for the discussions going on these last few days. There were a few comments made by Arizona and California about a workshop diving into the SMB experiment. I want to highlight that as something very important that we need to do before we get into next spring.

Public Comment:

Amanda Podmore (Grand Canyon Trust) You heard from my colleague Jen yesterday. The Grand Canyon Trust works to safeguard the land and waters in the Colorado River plateau while supporting the rights of the native communities of the plateau. First I want to thank everyone that helped to make this such a welcoming event. I want to mention how critical the tribal workshop was on Tuesday. I hope you continue to make this a part of future meetings. From our perspective, the tribal interests need to be brought into the budget process much earlier. The trust really supports the cool mix flows that have started. We need to have patience and see them all the way through. We believe this will save us money in the long run. Pivoting to Post 2026 guidelines, we have been having discussions with Katrina, but we would like more transparency into the Post 2026 process with webinars. We realize there will be a gap between LTEMP 2.0 and the TWP, so we hope you will plan to mitigate that gap.

Kestrel Kunz (Southern Rockies Protection Director, American Whitewater) I just want to thank all of you for providing an opportunity for the public to be present and hear all the good work you are doing. When the GCPA was passed and the LTEMP put in place it greatly improved the recreational user's experience. I think this work is going to become even more important in the Post 2026 process and beyond. We hope that you can bring LTEMP 2.0 into play as quickly as possible. The annual volumes are critical for the states, critical for water conservation, and critical for Post 2026 operations. Thank you for making the extra trip to the Grand Canyon for this meeting. I think the value of connection to place is really important.

Lynn Hamilton (Executive Director, Grand Canyon River Guides) The GCPA is why we are all here, which speaks to improving the values for which the Grand Canyon was created. I want to share the scoping comments GCRC wrote for Post 2026. "GCRG and the broader public view the Colorado river through GCNP not as a pipeline between two reservoirs but as a sacred place and a living river with complex and interrelated resources and associated values that must be protected in perpetuity." On Tuesday night we had that gorgeous moon over the canyon. I saw the reflection of the moon on the canyon walls. It was just glowing. It made me say – I hope we can do right by you. What it comes down to is taking care of this place. We all are the caretakers. When it comes to the challenges of Post 2026, I want you to think back to the experiences that have moved you here in the canyon and let that feed into what you are doing for the future of the Colorado River.

WRAP-UP:

▪ **Next AMWG Meeting Dates:** February 26-27, 2025

Wayne Pullan (Acting Secretary's Designee to the Adaptive Management Work Group)

Regarding a new FACA subcommittee for tribal matters. In discussions earlier today we heard concerns that issues identified by tribes are not always fully explored or resolved at the point they are presented to the AMWG to be considered for recommendations to the Secretary. The new FACA subcommittee was proposed to address this issue. As the Acting Secretary's Designee, I am very interested in this specific topic and the more general topic of ensuring each tribes viewpoint is fully considered by the program. To better understand how these tribal viewpoints can be more integrated into AMWG recommendations I will direct the Reclamation staff to meet with each of the participating tribes by the end of the calendar year to hear their views and recommendations. I hope to incorporate these tribal viewpoints into a proposal that can be considered at our Feb 2025 meeting. Please be prepared to consider this topic the next time we get together. In assessing this topic, I am mindful of the federal government's trust and consultation responsibilities to each tribe. Any addition to the FACA process on this point will be additive to tribal consultations which are always available, whether formally or informally, as part of the federal government's sovereign to sovereign relationship with each tribe. Any questions or concerns?

Jakob Maase (Hopi Tribe) I will support a tribal AHG if the other tribes support it as long as that does not become the main venue for tribal consultation. **Wayne Pullan** Thank you Jakob.

Let's talk now about additional tribal involvement. As also discussed this morning, the Havasupai tribe is one of the local tribes that could be affected by our program. I am committing to reach out to the Havasupai tribe leadership to assess if they would have more involvement. We have also discussed the potential involvement by other tribes, the 30 total tribes affiliated with the Colorado Basin. I will work with my staff to assess whether involvement in the FACA process would be appropriate. I will report back on that in February. Any questions? (No questions)

In the coming months we will have important decisions to make about if cool mix or some other experiment is warranted in 2025. I am concerned that we have the right data and information to make that decision. As I talk with GCMRC, I am impressed with the thought that has been put into this and I look forward to using the P&I procedure to help us move forward with a decision when the time is appropriate. One thing to be concerned about, it is late to find out what kind of year we are going to have. Mother Nature can be a trickster, we will need to keep that in mind.

With respect to the 10 year review, the staff will be working on a scope of work for that. We will reach out for input to make sure we have not missed anything.

I want to congratulate all of you and thank you again for the hard work on the TWP. All of us having lived a few years should not be surprised that there is not enough money. But there are some important things that have not been funded. We need to monitor if there are projects that cannot be implemented for some reason, we identify and free up funds as soon as possible to allow other important work to be done.

Ed Keable, after that presentation highlighting all that you do, I can't believe you found 3 days to spend with us. I also want to thank Jamescita, she was critical in making sure we had those workshops on Tuesday. I want to thank our staff and Terra Alpaugh who runs the meeting. Anyone have anything else?

Meeting adjourned at 3:41 PM PDT.

Participants

AMWG Members, Alternates, and Leadership

Ali Effati (State of New Mexico)	Kelly Burke (GCWC)
Amy Haas (State of Utah)	Kevin Garlick (UMPA)
Ben Reeder (GCRG)	Kristen Johnson (State of Arizona)
Betsy Morgan (State of Utah)	Kurt Dongoske (Pueblo of Zuni)
Brian Sadler, WAPA	Larry Stevens (GCWC)
Charlie Ferrantelli (State of Wyoming)	Leslie James (CREDA)
Christina Noftsker (State of New Mexico)	Mel Fegler (State of Wyoming)
Cliff Barrett (UMPA)	Michelle Garrison (State of Colorado)
Daniel Bulletts (Southern Paiute Consortium)	Michelle Kerns (NPS)
Daniel Picard (BOR)	Richard M Begay (Navajo Nation)
Ed Keable (NPS)	Sara Price (State of Nevada)
Edward Wemytewa (Pueblo of Zuni)	Shana Rapoport (State of California)
Emily Zmak (CWCB)	Shane Capron (WAPA)
Erik Stanfield (Navajo Nation)	Sheri Farag (CREDA)
Heather Whitlaw (USFWS)	Sinjin Eberle (American Rivers)
Jess Newton (USFWS)	Stewart Koyiyumptewa (Hopi Tribe)
Jessica Neuwerth (State of California)	Warren Turkett (State of Nevada)
Jim Stroger (TU)	Wayne Pullan (Chair)
Julie Carter (AZGFD)	Ka-Voka Jackson (Hualapai Tribe)
Kathy Callister (BOR)	

Other GCDAMP Members and Interested Persons

Aaron Russell (USGS)	Craig McGinnis (SRP)
Andrew Schultz (USGS)	Dale Fonken (AZGFD)
Anya Metcaffe (USGS)	Dan Leavitt (USFWS)
Brian Healy (USGS)	Dani Greene (State of Nevada)
Bridget Deemer (USGS)	Dave Worthington (Grand Canyon Conservancy)
Bryce Mihalevich (USGS)	David Braun (Sound Science)
Charles Yackulic (USGS)	David Brown (GCRG)
David Topping (USGS)	David Ward (USFWS)
Drew Eppheimer (USGS)	David Wegner
Emily Palmquist (USGS)	Deb Williams (USFWS)
Gerard Salter (USGS)	Deborah Shirley (BIA)
Helen Fairley (USGS)	Dennis (AZ Raft Adventures)
Joshua Caster (USGS)	Ed Gerak (Irrigation and Electrical Districts of AZ)
Kate Behn (USGS)	Emily Halvorsen (State of Colorado)
Katie Chapman (USGS)	Emily Omana Smith (NPS-GRCA)
Kim Dibble (USGS)	Eric Balken (Glen Canyon Conservancy)
Lauren Tango (USGS)	Erik Skeie (State of Colorado)
Lew Coggins (USGS)	Erika Pollard (NPCA)
Lucas Bair (USGS)	Jakob Maase (Hopi Tribe)
Mark Anderson (USGS)	Jan Balsom (NPS)

Matt Kaplinski (USGS)
 Meredith Hartwell (USGS)
 Paul Grams (USGS)
 Robert Tusso (USGS)
 Shannon Sartain (USGS)
 Ted Kennedy (USGS)
 Tom Gushue (USGS)
 Alex Pivarnik (BOR)
 Alex Walker (BOR)
 Amanda Becker (BOR)
 Becki Bryant (BOR)
 Bill Stewart (BOR)
 Brian Hines (BOR)
 Dave Speas (BOR)
 Gus Levy (BOR)
 Heather Patno (BOR)
 Jamescita Peshlakai (BOR)
 Jill Nagode (BOR)
 Katrina Grantz (BOR)
 Kerri Pedersen (BOR)
 Marcie Bainsom (BOR)
 Matt O'Neill (BOR)
 Nick Williams (BOR)
 Noe Santos (BOR)
 Rob Manning (BOR)
 Tara Ashby (BOR)
 Teo Melis (BOR)
 Tom Ashley (BOR)
 Alyx Richards (UCRC Commission)
 Amanda Fessler (Grand Canyon Conservancy)
 Amanda Podmore (Grand Canyon Trust)
 Annalise Porter (SNWA)
 Beccie Mendenhall (SeaJay Env)
 Bill Persons (FFI/TU)
 Brandon Loomis (Arizona Republic)
 Bud Fazio (NPS-GLCA)
 Cassandra Reed (NPS)
 Christina Kalavritinos (DOI)
 Colleen Cunningham (State of New Mexico)
 Conor Clancy (NPS)
 Craig Ellsworth (WAPA)
 Jen Pelz (Grand Canyon Trust)
 Jeremy Hammen (BOR)
 Jess Gwinn (USFWS)
 John Dillon (GCROA)
 John Fennell (AZGFD)
 John Weisheit (Living Rivers)
 Josh Korman (Ecometric Research)
 Kestrel Kunz (American Whitewater)
 Kurt Shollenberger (NPS)
 LaShwn Couey
 Lori Taitano (SRP)
 Lynn Hamilton (GCRG)
 Lynne Westerfield (GCWC)
 Malcom Bokeway, (Pueblo of Zuni)
 Marc Wicke (Salt River Project)
 Mary Plumb (NPS)
 Max Randels (NPS Partner)
 Maya Clifford
 Melissa Trammell (NPS)
 Michellesey Benally (Grand Canyon Trust)
 Peggy Roefer (CRCNV)
 Pilar Wolters-Rinker (USFWS)
 Rob Billerbeck (NPS-GLCA)
 Rod Buchanan (FFI/TU)
 Rodney Bailey (WAPA)
 Rodney Smith (DOI)
 Rudy Keedah (BIA)
 Ryan Mann (AZGFD)
 Sanober Mirza (NPCA)
 Sarah Haas (NPS)
 Scott McGettigan (State of Utah)
 Seth Shanahan (State of Nevada)
 Shalyn Nelson (NPS Partner)
 Taylor McKinnon (Center for Biological Diversity)
 Ted Rampton (CREDA)
 Terra Alpaugh (Kearns and West)
 Tildon Jones (USFWS)
 Trevor Upderaff (WAPA)
 Vincent Diaz (NPS)

Acronyms

ACHP - Advisory Council on Historic Preservation	HFE – High Flow Experiment
ADWR – Arizona Department of Water Resources	KAF - Thousand Acre Feet
AHAHG – Administrative History Ad Hoc Group	LCR - Little Colorado River
AHG - Ad Hoc Group	LTEMP – Long-Term Experimental and Management Plan
AMWG – Adaptive Management Work Group	MAF - Million Acre Feet
AZGFD – Arizona Game and Fish Department	mm – millimeter
BAHG – Budget Ad Hoc Group	MOU – Memorandum of Understanding
BIA – Bureau of Indian Affairs	NEPA – National Environmental Policy Act
BO - Biological Opinion	NMISC – NM Interstate Stream Commission
BOR – Bureau of Reclamation	NPCA - National Parks Conservation Association
C° – degrees Celsius	NPS – National Park Service
CBRFC - Colorado Basin River Forecast Center	NPS-GLCA – NPS Glen Canyon National Recreation Area
CFS – Cubic Feet per Second	NPS-GRCA – NPS Grand Canyon National Recreation Area
CRBC – Colorado River Board of California	P&I Team – Planning and Implementation Team
CRCNV – Colorado River Commission of Nevada	PDT – Pacific Daylight Time
CREDA – Colorado River Energy Distributors Association	Reclamation – Bureau of Reclamation
CRSP – Colorado River Storage Project	RM - River Mile
CWCB – Colorado Water Conservation Board	ROD - Record of Decision
D.O. – dissolved oxygen	SC - Specific Conductivity
DOI – Department of the Interior	SEAHG – Socioeconomic Ad Hoc Group
DROA – Drought Response Operations Agreement	SEIS – supplemental environmental impact statement
DSA - Deliverable Sales Amount	SHPO - State Historic Preservation Office
DWR – Department of Water Resources	SMB – smallmouth bass
EA – environmental assessment	SNARRC – Southwestern Native Aquatic Resources and Recovery Center
EIS – environmental impact statement	SNWA – Southern Nevada Water Authority
FACA - Federal Advisory Committee Act	SWE - Snow Water Equivalent
FFI – Fly Fishers International	TRGD – Trout Recruitment and Growth Dynamics
FLAHG – Flow Ad Hoc Group	TU – Trout Unlimited
FY – Fiscal Year	TWG – GCDAMP Technical Work Group
GCD - Glen Canyon Dam	TWP - Triennial Work Plan
GCDAMP – Glen Canyon Dam Adaptive Management Program	UCRC – Upper Colorado River Commission
GCMRC – Grand Canyon Monitoring & Research Center	UMPA – Utah Municipal Power Agency
GCPA – Grand Canyon Protection Act	USFWS – United States Fish & Wildlife
GCRG – Grand Canyon River Guides	USGS – United States Geological Survey
GCROA - Grand Canyon River Outfitters Assoc.	WAPA – Western Area Power Administration
GCWC—Grand Canyon Wildlands Council	WY - Water Year
GSF - Green Sunfish	YoY – Young-of-Year
HBC - Humpback Chub	