

# Glen Canyon Dam Adaptive Management Program Technical Work Group Meeting April 10, 2025

## Summary of Meeting Minutes

### Day 1: Thursday, April 10, 2025

**Start Time:** 8:33am PDT

**Conducting:** Seth Shanahan, State of Nevada and TWG Chair

**Designated Federal Official:** Kathy Callister (Bureau of Reclamation, Acting)

**Meeting Recorder:** Jeremy Hammen (Bureau of Reclamation)

### Welcome and Administrative

- **Introductions and Determination of Quorum (16 members)** A quorum was reached.
- **Next Meeting Date(s)** June 11-12, 2025. Location TBD.
- **Ad Hoc Group Membership and Updates** **Seth Shanahan (Chair)** We are going to hear from many of these groups later on the agenda. The only one missing is the SCAHG, which meets to help prepare for these meetings, so no report out needed. All the ad hoc groups are open for volunteer participation, if you are interested in joining one, please contact Tara or Jeremy.
- **Administrative Update** **Katrina Grantz (Bureau of Reclamation)** Katrina is the new Adaptive Management Work Group member for the Bureau of Reclamation. Secretary of the Interior Doug Burgum has been confirmed. Kate McGregor has been nominated as Deputy Secretary of the Interior. Committee hearing was conducted a week ago. David Palumbo is the Acting Commissioner for the Bureau of Reclamation with a new senior advisor to the Bureau of Reclamation Commissioner named Linnea Melby. Currently, the Acting Assistance Secretary of Water and Science is Scott Cameron. The nominated Assistant Secretary of Water and Science is Andrea Travnicek.
- **Review Action Items, Motions, and Votes Form** Review completed.
- **Update on Sediment Goal, B2E Funding for GCMRC, and Annual Reporting Document** **Mark Anderson (GCMRC)** GCMRC addressed updates to the Sediment Goal in the Annual Reporting Meeting. In the short, there are tradeoffs between High-Flow Experiments (HFE) in the fall and spring. Additionally, it is important to make every attempt to implement a HFE when triggered to reach the Sediment Goal in LTEMP. Additionally, projects funded through the B2E outside the program were shared with the TWG, however, concerns do exist among outside GCDAMP funding sources in sharing those projects. Finally, the Annual Reporting Document is in review through USGS and will be focused on the Monitoring Metrics as requested by Reclamation. This is a new approach that may be adjusted in the future.
- **Upcoming Monitoring and Research Trips** **Mark Anderson (GCMRC)** Two trips have gone out since the new year (2025). Next up are Humpback Chub monitoring trips at the Lower Colorado River confluence and a Cultural Resource Monitoring trip.
- **Federal Legislation Update** **Leslie James (CREDA)** Two bills have been introduced that involved the Glen Canyon Dam Adaptive Management Program. Senate Version is S887 and House version is HR1001. Along narrative title that says to provide for a memorandum of understanding to address the impacts of a certain record of decision on the Upper Colorado River Basin Fund. These pieces of legislation are quite brief. The bills instruct the Department of

Interior and Department of Energy through the Bureau of Reclamation and Western Area Power Association (WAPA) to consult with the Glen Canyon Dam Adaptive Management Workgroup. The directive is to enter into a memorandum of understanding to explore and address the impact that the Long-Term Environmental and Management Plan Supplemental Environmental Impact Statement (LTEMP SEIS) has on the Upper Colorado River Basin fund. The legislation does not have dollars attached to it. In the Bill it directs the parties to discuss three things: One is to address the effects that LTEMP SEIS Record of Decision (ROD) may have on the basin fund, 2) to address the impact that the LTEMP SEIS ROD has on hydropower production, including replacement costs and also grid reliability, and 3) to identify impacts that the LTEMP SEIS ROD has had on T&E threatened or endangered species under section four of the ESA.

- **Thermal Curtain, Slough Modification, and Website Update Bill Stewart (Bureau of Reclamation)** Value Planning Study that included the thermal curtain finished up this past winter. The document is controlled but hoping to get permission to present at a future meeting. Bureau of Reclamation Leadership team did a site visit to Northern California to observe a thermal curtain in use. Next steps will be moved to a feasibility study, modeling, and National Environmental Protection Act (NEPA) process. The slough modification is on its way. It started on March 12<sup>th</sup>. National Park Service did a consultation with the tribes. Additionally, care has been taken to mitigate the spring and salamander species found within the slough.

#### **Q & A and Discussion**

**Kelly Burke (GCWC)** Was there funding previously for the thermal curtain and has that been impacted? What is the funding environment right now for this?

- **Bill Stewart** Yeah, I think you know there hadn't been any specific funding. I think we're still kind of in the same boat we were this fall in terms of our funding. I'm not sure how much I can speak towards that, but other than we're looking at ways to fund the work fund this next phase.
- **Post-2026 EIS Update Katrin Grantz** The post 2026 EIS process is currently in the draft Environmental Impact Statement (EIS) development phase and Reclamation published an Alternatives Report on January 17<sup>th</sup> of this year and that is available on our Post 2026 website. That report outlines the no action and four action alternatives to analyze in the draft EIS. I should note that these alternatives should be considered preliminary or proposed and are subject to review revision during the development of the draft EIS, and that's particularly true given the new administration as and as we get our new administration up to speed. A key point about those alternatives, as they were crafted to provide a broad range of potential future operations for Lake Powell and Lake Mead and therefore a broad range of potential impacts due to those operations. Also, recall that the main purpose of an EIS is to disclose potential impacts on the natural and human environment of significant federal actions. Our short-term goal in terms of timeline is to release a draft EIS later this year. The Bureau of Reclamation ultimate goal remains to complete the final EIS and sign a record of decision in late summer of 2026, prior to determining operations for 2027.

## **Hopi Tribal Monitoring Activities Update**

**Jakob Maase (Hopi Tribe)** Every year the Hopi Tribe does a river trip through the Grand Canyon to assess the health of the archaeological sites along with all the other resources through the Grand Canyon. The trip is a diverse group of young and elderly tribal members. In 2024, the trip was conducted in the spring. Please see presentation for more information

#### **Q&A and Discussion**

**Bill Person (TU)** Where in the Little Colorado River did you observe Walleye? **Jakob Maase** There is a bench or little offshoot by the trail where the Little Colorado River starts near where the boats park.

**Shana Rapoport (State of California)** Can you tell us a little bit more about the mitigation work for the state? **Jakob Maase** I will let Stewart Koyiyumptewa speak to that. **Stewart Koyiyumptewa (Hopi Tribe)** The Hopi Tribe had an initial meeting with Glen Canyon Recreation National Park Service since the Hopi Tribe is opposed to the slough modification. There are concerns over the natural spring that was feeding the slough and whether it was an ancient spring. We did suggest they continue trapping salamanders and transporting them from the slough to a safe location. Hopi Tribe is still waiting for clarification on the spring feeding the slough. Protections are needed for the spring. There were also questions on what machinery was going to be used and how it was going to be transported to the slough. Springs are extremely important to the Hopi Tribe. Spring are a component of groundwater ocean life connection to the ocean. Here on Earth, and then up to the to the spiritual cloud realm. Hopi people feel that they are all interconnected and the springs are the main component of this community. Springs are the communication between the clouds and groundwater. So hopefully Hopi Tribe get answers. Understanding the type of springs would allow us to move forward on how we want to mitigate this highly adverse effect to Hopi culture.

**Ben Reeder (River Guides)** What have we learned about the spring at the slough? Is it an old or new spring? Are they opening the channel or filling the channel in at the slough? **Bud Fazio (GCNPS)** So as we worked through consultation for the slough channelization project, we did express a lot of concern about the spring and about the wildlife there. We have studies with different parameters that have shown it is a spring. Is it relatively old water or is it relatively new water is still unknown. NPS is working towards figuring that out. We do provide for some protections for the spring. Reclamation and Park Service have agreed to not fill the spring as the channel is constructed. The spring is in the northeast corner of the upper slough, as opposed to the center of the upper slough. So in short, the spring will still be allowed to flow. Reclamation and National Park Service be out more when they begin construction on the upper portion of the slough to delineate the area that is protected for both the spring and salamanders along the Left Bank. The channel will be constructed carefully in that way.

### **Southern Paiute Consortium Tribal Monitoring Activities Update:** **No Update.**

### **Hydrology, Glen Canyon Dam Operations, and Water Quality Conditions in Lake Powell and Below Glen Canyon Dam:**

**Heather Patno (BOR) Hydrology** Water Year (WY) 2025 began on October 1. It has been dry and continues to be dry. Lake Powell is at 33% elevation levels. We have below average precipitation in the forecast. Observed WY 2024 precipitation was 100% of Median, with the reservoir maintaining steady volume. For WY 2025 Lake Powell will operate in Mid-elevation Release Tier and Lake Mead is again in the Level 1 Shortage Condition. Reference slides for details on CRMMS projections. **Dam Operations** River Outlet Works (ROW) #2 completed maintenance this winter and they have begun maintenance for ROW #3 with anticipation for it to be completed in May. There was a spring High-Flow Experiment (HFE) triggered, that will be discussed later in the meeting. LTEMP Supplemental Environmental Impact Statement (SEIS) Smallmouth Bass (SMB) flows will be discussed later this year. Please see presentation for more information. **Bryce Mihalevich (BOR) Water Quality** Reclamation monitors Lake Powell four times per year and it is supplemented with monthly updates at Wahweap from GCMRC. Stratification is setting up in Lake Powell. Please see presentation for more information.

### **Q&A and Discussion**

**Dave Rogowski (AZGFD)** It looks like your daily average max is lower than your daily average minimum. Can you speak to that. **Bryce Mihalevich** That is the max probably and it is only updated in

January while the most and min were updated in March. The next month the Max will be updated and things should return to what would be expected with min, most, max.

**Betsy Morgan (State of Utah)** I know on past calls you provide the output from the CE Qual W2 model and then here you provide the Eppenhimer et al. 2024 model. How do they compare and contrast? Could you provide a little bit of insight on that? **Bryce Mihalevich** Last month I ran both models in the March 2024 month study Glen Canyon OPS Call. The CE qual W2 model was not performing well there. There's something going on in it that and I'm still trying to debug it. It was predicting release temperatures up to like 13°, which in my expert opinion is not realistic. Luckily, we have the ability to evaluate temperatures with two different models. Drew Eppenhimer's model is providing realistic predictions right now that I feel more comfortable reporting than the CE Qual W2 model.

## **Long-Term Experimental and Management Plan (LTEMP) Biological Opinion Conservation Measures Update:**

**Matt O'Neill (BOR)** provided a quick overview on how Reclamation is meeting our Endangered Species Act objectives under several different Biological Opinions. Please see presentation for more information.

### **Q&A and Discussion**

**Shana Rapoport (State of California)** Will the Value Planning Study be shared with the public? **Bill Stewart (Bureau of Reclamation)** Typically those documents are controlled and internal to Reclamation. However, Reclamation is working on trying find a way to share it or present it at the next meeting.

**Craig Ellsworth (WAPA)** Could you spend some time talking about the next steps for the thermal curtain? **Bill Stewart** The next step will be looking at different designs along with beginning to form a team made up of Engineers, Hydrologists, Biologists and other experts. There currently is a “30%” design that was conducted by TSC, however, we will need to start thinking about more detailed modeling to determine the feasibility and costs associated with a thermal curtain. We also would need to start the NEPA process. **Craig Ellsworth** Is there a timeline? **Bill Stewart** No, there is no timeline and currently we don't have the resources.

**Christina Noftsker (State of New Mexico)** Would the thermal curtain designs be physical designs or modeled? **Bill Stewart** These would be modeled designs, however, we haven't ruled out physical designs at TSC.

## **Breakout Group Discussion and Report Outs:**

**Seth Shanahan (Chair)** broke the participants into 5 groups to discuss three questions: 1) what are your perspectives on the health of the Colorado River Ecosystem (CRE) and/or whether the LTEMP FEIS goals and objectives are being met; and 2) what input can you provide to the developers of the next triennial workplan and budget that will help support a healthy CRE and/or meet the goals and objectives of the LTEMP FEIS; and 3) what suggestions do you have for the upcoming ten-year review. Groups reported out after lunch. A summary of those reports was provided to TWG members for reference.

### **Q&A and Discussion during the reporting out**

**Emily Omana (GCNPS)** We kind of generalize with the native fish populations idea. Certainly Humpback Chub and some native sucker populations are doing well but Razorback Suckers are not. Additionally, not a lot is known about some other native fish species.

**Dan Leavitt (FWS)** I'm sure you all who have been in the program much longer than I have. I have heard the statement before that this program is too fishy or there are too many fish projects. My only thought and reaction to that since I've been with the program has been it has to be fishy.

It's a dam and it's a river. I understand that there are other impacts. Also, I don't want anybody to forget that the first consultation between Reclamation and the National Park Service was a jeopardy determination on the existence of the dam, jeopardizing the Colorado Pike Minnow and Humpback Chub. There are pieces of the program that are inherently “fish heavy” due to ESA and compliance. If there were a way to separate out the compliance piece so that from the GCDAMP science aspect so that we can understand more about all the other important resources that might be a way to loosen up the funding. What Matt O'Neal presented on today was for Reclamations compliance that are just by law requirements of the program and so it's easy to say that there's just way too much stuff going to fish, but at the same time, there's a reason for that. So if there a way to create a break between the compliance aspects of the program and the other really important aspects that don't have everything to do with compliance it would help show those distinctions.

**Craig Ellsworth (WAPA)** It would help to deadlines on some of the projects or timelines to see when projects should be completed. This would help avoid projects getting kicked down the road and not ending. **Seth Shanahan (Chair)** That's a good point Craig and you are right. Sometimes this program suffers from shiny object syndrome too much.

### **Updates from the Budget, Trout, Socioeconomic, and Smallmouth Bass Ad Hoc Groups:**

**Erik Skeie (State of Colorado) – Budget Ad Hoc Group** AMWG gave a charge to the BAHG to take a look at the Triennial Work Plan process, evaluate it, and give a recommendation on how to improve the moving forward. The BAHG is currently evaluating the 2016 budget process document. That process has slowed as the federal agencies wait to get the new administration updated on the AMWG. The deadline for the evaluation is at the Annual Reporting Meeting in calendar year 2026. We hope to get the process started soon to make that deadline. Additionally, we are nearing the end of year 1 of the current FY25-27 TWP. We need to have recommendations by the June TWG for any modifications for year 2 of the current TWP. We hope to have a meeting in May to start those discussions on year 1 projects of the FY25-27 TWP. The federal agencies ask for flexibility on the process as we catch the new administration up to speed.

**Kelly Burke (GCWC)** Could we have an update in the May meeting on the projects that were prioritized but not funded as well as B2E projects for the current TWP? **Mark Anderson (GCMRC)** Yes, we can provide that update.

**Dave Rogowski (AZGFD) – Trout Ad Hoc Group** The Trout Ad Hoc Group is charged with reviewing the factors negatively impacting the Lees ferry Rainbow Trout fishery and then proposing strategies that could be pursued and considered to help achieve LTEMP Rainbow Trout fishery goal. There have been several meetings and the TAHG is loosely following a modified version of Structured Decision Making to achieve the TAHG objective.

**Larry Stevens (GCWC)** How much involvement of the fishing guides is in the TAHG? **Dave Rogowski** There's quite a few but some are more active than others. Additionally, there are some tribes participating as well. There has been a lack of Rainbow Trout recruitment. We are spending a lot of time discussing possible reasons why low recruitment is occurring. In the future we hope to start suggesting solutions to those reasons.

**Jeremy Hammen (BOR) – Socioeconomic Ad Hoc Group** The socioeconomic group has been pretty quiet last fall after it convened to discuss possible Hydropower Workshop agenda ideas. Since then, it has been in a waiting period to see how the Hydropower Workshop works out and to get further guidance once that is finished. Reclamation has secured an agreement with Udall for the hydropower workshop.



There were two tasks developed. 1) facilitate among WAPA, Reclamation, and GCMRC to propose monitoring metrics for the Hydropower Resource Goal and 2) facilitate a Hydropower Workshop with stakeholders. Task 1 has almost been completed and will be presented at during the May AMWG. Task 2 will begin soon and Udall will be reaching out to stakeholders to start developing an Agenda for the Hydropower Workshop this summer.

**Emily Young (State of Arizona) – Smallmouth Bass Ad Hoc Group** There wasn't a lot to report out on for the SBAHG. The SBAHG is waiting to see a draft of the Cool Mix report from last year. After that report the SBAHG will likely get together to discuss that report. Please feel free to reach out to Emily if there are any suggestions for needed meetings.

**Seth Shanahan (Chair)** Is there anything on that list from the strategic plan that's due early in the year?

**Emily Young** The Cool Mix report is the only thing that is on the list needed at this time.

### **Discussion of Possible LTEMP Experimental and Management Actions that May be Implemented Over the Next Year along with other AMWG Items:**

**Bill Stewart (BOR)** presented on the LTEMP experimental process and decision making for the this past fall/winter and upcoming spring/summer. This process was updated about a year ago through the 2024 LTEMP SEIS ROD. Additionally, this presentation and discussion will act as the consultation with the TWG on the spring HFE recommendation from the Planning and Implementation Technical Team. Please see presentation for more information.

### **Q&A and Discussion**

**Ben Reeder (River Guides)** I'm really encouraged that slough project is underway. I think that's really, important. Maybe with this new rollover that even a smaller monsoon season could push us over the edge for the fall. I'm one of the folks who think that the timing of the spring is really something that we would like to see the results of for a number of biological reasons. The timing is right for the commercial boating season too. If we have an opportunity this fall, I think we need to jump on it because as we've seen it's easy to find and excuse to not implement, we've got to take the opportunity when triggered. Paul and David have shown in their great presentations yesterday parts of the Canyon are doing really well and some are not doing as well. **Paul Gram (GCMRC)** We do have within LTEMP this idea to conduct this downramp rate experiment to try and make beaches with a little less deep slope and see if that makes a difference. Given the maybe increased likelihood of being able to implement, that might be a good time to plan for doing. You know, one of the problems with that kind experimental approach is it becomes an optional menu table for experiments in LTEMP and that we haven't managed to implement because when it comes to that decision making process, we're just scrambling with making the decision to implement or not and adding in the complexity of tweaking for this experiment has proved difficult. It's something to think about if we ever actually get around to implementing those experiments or if you will ever want us to implement those experiments we should start thinking about how to get that into the process soon.

**Larry Stevens (GCWC)** I just want to say that the GCWC is deeply disappointed that we're not going to have this high-flow experiment that we were promised. We do understand all the contingencies here and I guess our hope would be that there's enough learning that's going on with how long this process has taken as an emergency response. It takes four years to get something as relatively simple as modifying a highly unnatural feature known as the slough in this landscape. I think you know this is further evidence of how this program works. Very slowly. Yes, we finally get things done (modifying the slough) but the unintended consequences are in halting critical experiments (HFE) in the spring time.

**Craig Ellsworth (WAPA)** In regard to Smallmouth Bass Flows, is there an opportunity to learn something new by doing something new, that might be valuable? **Bill Stewart** no matter what experiment

we do or if we choose not to do an experiment the environment is different. Therefore, we are always learning something new. No matter what the recommendation is and what is implemented we plan to monitor it to determine the effectiveness of the decision on the resource.

**Dave Rogowski (AZGFD)** We should be thinking about HFE as something that should always occur. They should be planned ahead. In the fall when we knew we deferred to spring, that should have been on the books and other projects should be planned around the HFE until we decide otherwise. The way it works now and has for a long time is the other way around. You know, we try to plan the HFE around maintenance and power schedules. We need to be better about planning for things (HFE) in the future. This is our one opportunity for the spring. Spring HFEs are rare and we had the sediment and had the ability to do it and we aren't doing it because of poor planning.

### **Discussion of TWG Practices Including a Discussion About Knowledge Assessments:**

**Seth Shanahan (TWG Chair)** discussed how knowledge assessments were historically used in the GCDAMP and how they may apply to the future of this program. Please see presentation for more information.

### **Q&A and Discussion**

**Larry Stevens (GCWC)** That was a great review of all that effort and progress. The general approaches seem quite adequate. My only comment on it though is that we don't know how the various resources interact with each other, and if there's, I don't know, metric of interactivity that could be included. If we had some kind of way of seeing how interactive some of the individual resource variables are, that might help structure the way that they are considered in in this knowledge assessment.

**Rob Billerbeck (GLNPS)** Just one thought we would put out there based on some concerns that came up last time we used this. You know, it's a great effort, a great way to pull together a lot of info, but we do have a very different types of information and types of metrics. And so that the trick here is always the rolling up. For one resource, you may have four different submetrics and you roll them up. If you weight them all equally, things get weird. The Humpback Chub is a good example. Would all experts agree that all four submetrics should be equally weighted in order to roll it up into one overall trend? Doubtful. For instance, you know the quality or the confidence of each submetric could be different, but also the contribution to the overall population could be different. And when you roll it all up, all of that nuance is lost and your overall trend can actually point in a different direction. Experts might consider one metric to be the most important submetric and that one should be weighted the highest. So that's just one of the things to be really careful about for this knowledge assessment. You know the circles can be codified for different confidence levels once you roll it up. If you have one metric that's high confidence level because it was based on really hard science for something that we can measure really well or easily and if it's combined it can mask the submetric that may be considered the most important but hard to measure. You know, based on kind of a survey of stakeholders or something that's a might be a low confidence level and you roll them together and you get a medium confidence one. You lose that distinguishing between the hard science and the other. So that's not to discourage doing this, but it just it's one of those things where the more you simplify it, the more information you lose about what dynamics are contributing to it.

**Larry Stevens** We could benefit from a multi-metric analysis to keep all the individual subcomponent variables in there. Maybe they get weighted and that would be great if they did. Then run metrics through some kind of cluster algorithm to see where things are correlated or just multivariate. Like a nonmetric multi-dimensional scaling analysis to see how they play out in the landscape. One of the preliminary kinds of statistical tools sometimes to use is a correlation analysis, Pearson correlation analysis to look at all of variables and see which are correlated with each other. You can do this in a qualitative and quantitative way. These become a very powerful kind of risk assessment tools. To be able to engage a

statistician in such an analysis here might be very productive. I think that we have multiple pillars of concern in the program that are either independent or in some cases competing with each. Certainly we have a strong economic pillar running through the program. We have a strong environmental pillar as well. Trade-offs and interactions amongst those two is crucial to understand. We also have a policy pillar. And those three are not perfectly aligned by any means, but being able to kind of understand their relationships amongst all the different variables we've got playing out here would be what might be an interesting statistical goal for the for the analysis.

**Craig Ellsworth (WAPA)** We need to keep knowledge assessments as a common tool for the GCDAMP.

**Helen Fairley (GCMRC)** It could be valuable in having each individual stakeholder give their opinion on the submetrics individually, rather than trying to do this in a team setting where you're sort of all negotiating to come to agreement about what the answer is. It might be interesting to see what individual stakeholders think about the submetrics. And scientists perhaps come up with their own and then compare those results and see how well they align independently of each other versus doing it in a group setting. Additionally, it could be valuable to have each individual stakeholder give their opinion on the submetrics and then meet as a team afterward to discuss the "scores" or opinions to come to a solution. **Seth Shanahan** Some people may have an understanding of an issue and feel strongly based on their understanding of it. What you know is happening and whether it be a driver or status item. Some might call that a more qualitative or heuristic type of input. Others may use all the work GCMRC is doing for the performance metrics with very clear mathematical descriptions of what they're meaning. I think there's perhaps place for both of that and you offer a good suggestion where maybe there's an element that's well, what's the pulse of the group at the time as members and stakeholders as one element and then what's maybe the more objective evaluation using some measurements like the performance measures as a different approach. **Larry Steven** Providing some weighting of the participants by their familiarity with the program could be done. The level of information confidence that they've got for submetrics would be another way to weight. Again, there are kind of pretty straightforward methodological ways of dealing with confidence in answers. I did want to reiterate this topic that came in up in our discussion group of understanding what the assumptions and perspectives are by the individual stakeholder. TWG and AMWG representatives have different assumptions and perspectives due to different organizational standpoints. I think is also quite a valuable way to get at some of those individual, you know, perspectives on the program. I think that seems like a really great suggestion that that the Navajo Nation came up with on. **Seth Shanahan** It might be useful as well to understand where there may be points of disagreement even evaluations of the health of the ecosystem that if we start to see opinions diverge broadly on some of these goals. Then clearly there's something there, and that might be a gap that we can focus some attention on as well and try to deduce out what might be able to be done to narrow that understanding or opinion. **Helen Fairly** agree. **Paul Gram (GCMRC)** TWG could take the metrics each year and consider how they take that metrics report to produce something that's a bit more like what you're showing here in the knowledge assessment report to determine how well the GCDAMP is achieving each goal. **Seth Shanahan** So not using the metrics themselves to establish a symbol of any kind, but instead using it as information for us to develop the symbols ourselves. **Paul Gram** There's a necessary step between the metrics that are the quantitative measures relative to the goals and sometimes the goals maybe have some elements of judgment that need to be applied before you put an arrow on it. That, I think is more in their in the stakeholder context, something that we might as scientists might be less able to do because some of the goals are a bit vague. **Helen Fairly** Yeah, it strikes me also that there are these cultural differences, and I'm using in a very broad sense here not just tribal versus Western science. How do we capture that? If we don't do it on an individual basis. **Larry Stevens** So Helen, it may not be appropriate to weight everything. It comes to differences among stakeholders or tribes on desired approaches or desired results. Those probably can't be weighted. They have to be treated as individual standalone assessments. Additionally, through listening to the Annual Reporting Meeting about the different temporal frames of



reference for the metrics, I think that needs to be clearly stated. Yes, we go for time immemorial for archaeological resources. Pre-dam for sediment. Post-dam for other resources like trout. **Craig Ellsworth** Those stakeholders who represent a resource need to be involved with the development of the metric.

**Leslie James (CREDA)** Paul, could you clarify what you met by changing the metrics annually. Did you mean GCMRC would be providing the analysis for the metrics each year? **Paul Gram** Yes, GCMRC will be providing that analysis and reporting not changing the metric annually.

**Seth Shanahan** There are a lot of historical documents that were well prepared, but yet never fully implemented. What I've learned a little bit over recent past is that we've allowed that to happen in some ways as a collective group. You know, some of us have been around and some have been recently added and we just kind of move a little bit from year to year with new thinking, new ideas, new approaches. Forgetting the past efforts. It's good to keep moving forward but reviewing past efforts can also be beneficial. Craig brings up a good point about learning, by doing and adapting, that's a positive thing. We sometimes ignore lots of great, thoughtful work that has been done in the past but it's difficult to implement. Figures like strategic science plans and questions because it's something that is really useful to conceptualize but difficult to implement. These concepts of assessing what we know and using it for the purpose of implementing future practices to help us meet our goals. The strategic science plan is outdated but they are good for perspective building instead of necessarily directionality. It does beg a long-term issue we've been discussing which is to bring forth historical information into the LTEMP setting, to review past documents like the strategic science question, strategic science plan, and the monitoring and research plan, all these things that were done over a decade ago. There are some past suggestions or plans that are ongoing or in development, liked the development of the metrics and the annual report and the combination of that with annual report. We might be getting there and we just need to keep on talking about it to have it have it more guaranteed.

### **Discussion of Emerging Issues, Updates on Items of Interest That Are in Consideration for Implementation Before Next TWG Meeting, and Request for Agenda Items for Next Meeting:**

**Seth Shanahan (Chair)** There are few things that we need updates on for the next TWG: Trout Ad Hoc Group, Budget Ad Hoc Group with a recommendation for any changes to the FY25-27 TWP, and Hydropower Workshop update. **Deb Williams (FWS)** Federal Agencies can give an update on how transitions to the new administration are going and how any changes may affect the GCDAMP. **Leslie James (CREDA)** An assessment of risk to Humpback Chub in the Grand Canyon Reach of the Colorado River specifically from the threat of Smallmouth Bass. **Jeremy Hammen (Bureau of Reclamation)** Thanks Leslie and Reclamation is working on that risk assessment. Charles presented a little on it yesterday and GCMRC plans to dive deeper into that question. It just take time. Ghe Cool Mix Report will be out soon that touches on how the Humpback Chub were affected by these Cool Mix Flows. Additionally, if a discussion on downlisting Humpback Chub is needed that is beyond this program. This program's reach only covers one population while a downlisting covers an entire range of the species. We would need someone from Fish and Wildlife or the Recovery team to have those discussions. **Seth Shanahan** As we all know, risk has an element of where we tolerate it or not in the range of toleration. I think very clearly, we can think about risk in terms of probability of impacts and potential consequences but where people think the tolerance of that vulnerability is often in debate. So maybe Jeremy, as you provide this message to the authors of the report, you might be able to frame it with all components of risk kind of attended to so that it gets to maybe what Leslie's interests are. **Jeremy Hammen** That's a good point and I will try to relay those messages. **Bill Stewart (Bureau of Reclamation)** In regards to the Cool Mix report, that report will focus on the outcomes of 2024 and what happened to specific

resources. I don't think there's an intent to take it into consideration of risk to Humpback Chub from Smallmouth Bass. I think that is part of the discussion that'll happen as part of the P and I team process, which is going to look at the overall effects of the potential of doing something this year. I think we really wanted to capture what happened in 2024 in this document. Just from the standpoint of how operations happen, the water quality, all the things that I mentioned earlier. This expectation of this report is documenting what happened this past year. **Larry Stevens (GCWC)** First, the Colorado Pike Meadow release in October. Yes, you're going to talk about that, but might that be an opportunity for a TWS river trip? That's a very short trip to go down and see what's going on there and get a better handle in the field of what's actually taking place. I would like to suggest that as an option, and if so, then arranging that with the National Park Service and Hualapai Tribe would be important to do promptly. Second, I spoke recently with folks from the River Connectivity Systems who have received approval for their award of their contract, whether it's going to be funded or not, we don't know, but it has to do with the thermal curtain and the blocking of non-native fish passage through the dam and wondered if we could actually hear a presentation by them about that. Third, for the Post 2026 review process, is that something that the AMWG is going to be engaged in, or once again will the Bureau Reclamation not pay attention to AMWG and just have individual stakeholder suggestions about it, which would mean very diffuse in a discussion about these? **Kelly Burke (GCWC)** Would like to see broader regional context of the fluvial geomorphological changes. The whole intersection of hydrology in physical form and in biology and botany and all that sort of thing that really comes together around fluvial geomorphology. You know how the banks get steepened and how channels are more sinuous or less sinuous or narrower or wider? Whether it's aggregation or you know or degradation erosion. The larger dynamics of fluvial geomorphology that can be region wide. **David Topping (GCMRC)** GCMRC is doing that work but doesn't generally report out on it in the TWG or AMWG since this is outside the scope of the GCDAMP. However, they would be glad to present on it if needed. **Larry Stevens** The restoration of Paria Beach is still very much ongoing process. The National Park Service has taken over that effort and the Cottonwood trees are growing up to nice heights, some almost 20 feet high now, after just a couple of years and it's kind of inspiring to see. Native vegetation along the river looks great. It's now the biggest beach in Arizona. It's because there's so much sediment that's come in and stored in that any not unusual to see a dozen families playing with Frisbees or having their dogs chase out in the water or fishing or whatever from that beach. It's a really successful project. Thanks in large part to the assistance of the National Park Service in Arizona Water Protection Fund

### **Public Comment:**

None

**Meeting adjourned at 4:17 PM PDT.**

## Participants

### TWG Members, Alternates, and Leadership

|  |   |
|--|---|
| Ben Reeder (Grand Canyon River Guides)   | Jerry Wilhite (WAPA)                      |
| Betsy Morgan (State of Utah)             | Joe Duncan (State of Wyoming)             |
| Bill Persons (TU)                        | Kelly Burke (GCWC)                        |
| Brent Powers (Navajo Nation)             | Kurt Dongoske (Pueblo of Zuni)            |
| Brian Hines (BOR)                        | Larry Stevens (GCWC)                      |
| Colleen Cunningham (State of New Mexico) | Leslie James (CREDA)                      |
| Craig Ellsworth (WAPA)                   | Marc Wicke (Salt River Project)           |
| Dan Leavitt (USFWS)                      | Mel Fegler (State of Wyoming)             |
| Danielle Collins (State of Nevada)       | Michelle Garrison (State of Colorado)     |
| David Rogowski (AZGFD)                   | Noftsker, Christina (State of New Mexico) |
| David Ward (USFWS)                       | Rob Billerbeck (NPS-GLCA)                 |
| Deb Williams (USFWS)                     | Rudy Keedah (BIA)                         |
| Emily Omana (NPS-GRCA)                   | Ryan Mann (AZGFD)                         |
| Emily Young (State of Arizona)           | Seth Shanahan (TWG Chair)                 |
| Erik Skeie (Navajo Nation)               | Shana Rapoport (State of California)      |
| Erik Skeie (State of Colorado)           | Sinjin Eberle (American Rivers)           |
| Jakob Maase: Hopi (Hopi Tribe)           | Stewart Koyiyumptewa (Hopi Tribe)         |
| Jeremy Hammen (BOR)                      | Ted Rampton (UMPA)                        |

### Other GCDAMP Members and Interested Persons

|                         |                                  |
|-------------------------|----------------------------------|
| Alex Pivarnik (BOR)     | Kathy Callister (DFO-BOR)        |
| Alex Walker (BOR)       | Katrina Grantz (BOR)             |
| Alyxandra Richards      | Kurt Shollenberger (NPS)         |
| Amy Schott              | LaShawn Couey                    |
| Andrew Peters           | Laura Martin                     |
| Becki Bryant (BOR)      | Lisa Kim                         |
| Ben Zukowski            | Lisa Meyer                       |
| Bill Stewart (BOR)      | Lucas Bair (GCMRC)               |
| Brandon Loomis          | Mariah Giardina                  |
| Brian Healy (GCMRC)     | Mark Anderson (GCMRC)            |
| Bryce Mihalevich (BOR)  | Matt Kaplinski (GCMRC)           |
| Buddy Fazio (NPS-GLCA)  | Matt O'Neill (BOR)               |
| Cassandra Reed (NPS)    | Michael Squires                  |
| Clarence Fullard (BOR)  | Michelle Kems (NPS)              |
| Conor Clancy            | Mike Pillow (USFWS)              |
| Craig A McGinnis        | Nicki Gibney (NPS)               |
| Craig Dengel            | Noe Santos                       |
| Dale Fonken             | Paul Grams (GCMRC)               |
| David Topping (GCMRC)   | Pilar Rinker (USFWS)             |
| Ed Keable (NPS)         | Richard M. Begay (Navajo Nation) |
| Emily Palmquist (GCMRC) | Ronda Newton (NPS)               |

Ernest Rheaume (BOR)  
Heather Patno (BOR)  
Heather Whitlaw (USFWS)  
Helen Fairley (GCMRC)  
Jan Balsom (NPS)  
Jeff Arnold (NPS)  
Jen Pelz  
Jess Newton (USFWS)  
Joel Sankey (GCMRC)  
John Carol  
Katherine Behn

Sarah Haas (NPS)  
Seth Cohen  
Sheri Farag  
Tara Ashby (BOR)  
Ted Kennedy (GCMRC)  
Thomas Ashley  
Tiffany Love-Chezem (USFWS)  
Warren Turkett (State of Wyoming)  
Wegner, David  
Zac Nelson (BOR)

## Acronyms

ACHP - Advisory Council on Historic Preservation  
ADWR – Arizona Department of Water Resources  
AHAHG – Administrative History Ad Hoc Group  
AHG - Ad Hoc Group  
AMWG – Adaptive Management Work Group  
AZGFD – Arizona Game and Fish Department  
BAHG – Budget Ad Hoc Group  
BIA – Bureau of Indian Affairs  
BO - Biological Opinion  
BOR – Bureau of Reclamation  
C° – degrees Celsius  
CBRFC - Colorado Basin River Forecast Center  
CFS – Cubic Feet per Second  
CRBC – Colorado River Board of California  
CRCNV – Colorado River Commission of Nevada  
CREDA – Colorado River Energy Distributors Association  
CRSP – Colorado River Storage Project  
CWCB – Colorado Water Conservation Board  
D.O. – dissolved oxygen  
DOI – Department of the Interior  
DROA – Drought Response Operations Agreement  
DSA - Deliverable Sales Amount  
DWR – Department of Water Resources  
EA – environmental assessment  
EIS – environmental impact statement  
FACA - Federal Advisory Committee Act  
FLAHG – Flow Ad Hoc Group  
FY – Fiscal Year  
GCD - Glen Canyon Dam  
GCDAMP – Glen Canyon Dam Adaptive Management Program  
GCMRC – Grand Canyon Monitoring & Research Center  
GCPA – Grand Canyon Protection Act  
GCRG – Grand Canyon River Guides  
GCROA - Grand Canyon River Outfitters Association  
GCWC—Grand Canyon Wildlands Council  
GSF - Green Sunfish  
HBC - Humpback Chub  
HFE – High Flow Experiment  
KAF - Thousand Acre Feet

LCR - Little Colorado River  
LTEMP – Long-Term Experimental and Management Plan  
MAF - Million Acre Feet  
mm – millimeter  
MOU – Memorandum of Understanding  
NEPA – National Environmental Policy Act  
NMISC – NM Interstate Stream Commission  
NPCA - National Parks Conservation Association  
NPS – National Park Service  
NPS-GLCA – NPS Glen Canyon National Recreation Area  
NPS-GRCA – NPS Grand Canyon National Recreation Area  
P&I Team – Planning and Implementation Team  
PDT – Pacific Daylight Time  
RBT - Rainbow Trout  
Reclamation – Bureau of Reclamation  
RM - River Mile  
ROD - Record of Decision  
SC - Specific Conductivity  
SEAHG – Socioeconomic Ad Hoc Group  
SEIS – Supplemental Environmental Impact Statement  
SHPO - State Historic Preservation Office  
SMB – Smallmouth Bass  
SNARRC – Southwestern Native Aquatic Resources and Recovery Center  
SNWA – Southern Nevada Water Authority  
SWE - Snow Water Equivalent  
TRGD – Trout Recruitment and Growth Dynamics  
TU – Trout Unlimited  
TWG – Technical Work Group  
TWP - Triennial Work Plan  
UCRC – Upper Colorado River Commission  
UMPA – Utah Municipal Power Agency  
USFWS – United States Fish & Wildlife  
USGS – United States Geological Survey  
USU – Utah State University  
WAPA – Western Area Power Administration  
WY - Water Year  
YoY – Young-of-Year