

Glen Canyon Dam Adaptive Management Program Adaptive Management Work Group Meeting May 18, 2022

Wednesday, May 18, 2022

Start Time: 8:00 AM Pacific Daylight Time (PDT)

Conducting: Wayne Pullan, Secretary's Designee to the Adaptive Management Work Group (AMWG) and AMWG Chair.

Recorder: Carliane Johnson, SeaJay Environmental, LLC.

Facilitator: J. Michael Harty, Kearns & West, Inc.

Welcome and Administrative Updates

[Wayne Pullan, AMWG Chair] This meeting's primary purpose is for subject matter experts to share the latest information on current projected conditions below Glen Canyon Dam and to utilize AMWG members' knowledge and expertise to ensure that the Glen Canyon Dam Adaptive Management Program (GCDAMP) is prioritizing the most critical and relevant work given current conditions.

- Since February, Lake Powell elevations temporarily declined below 3,525 feet, which is an important elevation for the drought contingency planning and Drought Response Operations Agreement (DROA). Runoff has now increased to bring the reservoir elevation above 3,525, and under DROA, more water will flow into the lake from upstream reservoirs, and in agreement with the states, less water will be released downstream; this should result in an increase of 16 feet of elevation over the next 12 months. These measures are designed to protect key infrastructure, hydropower generation, and water supply for Page, Arizona and the LeChee Chapter of the Navajo Nation, in addition to other downstream resources.
- Bug flows have been initiated under the Long-term Experimental and Management Plan (LTEMP).

Introductions and Determination of Quorum

[Michael Harty, Kearns & West Facilitator] quorum reached with 16 members represented.

Approval of February 2022 Meeting Minutes

[Wayne Pullan, AMWG Chair] The draft minutes were distributed on May 11. No edits or objections were received. **[Larry Stevens, Grand Canyon Wildlands Council (GCWC)]** Motion to accept the minutes. **[Candice Hasenyager, Utah]** Seconded. The [February 9-10, 2022 meeting minutes](#) were approved by consensus.

Review February AMWG Meeting Evaluation

[Terra Alpaugh, Kearns & West] Ten respondents provided feedback on the February AMWG meeting. Based on that input, adjustments related to the motions process are being considered.. Reclamation has also incorporated two topics of interest related to non-native establishment risks and LTEMP process updates into today's agenda.

Nominations and Appointments

[Wayne Pullan, AMWG Chair] Welcome to Laura Dye, the Technical Work Group (TWG) alternate for Nevada. AMWG membership nominations ended April 25 with eight AMWG nominees and six TWG nominees. Contact Tara Ashby, Bureau of Reclamation (Reclamation) if there are questions.

Action Item Tracking

- Grand Canyon Monitoring and Research Center (GCMRC) has drafted monitoring metrics that are currently under review by Reclamation and then forward for further review by the TWG.
 - Hydrologic conditions and reservoir elevations have accelerated the need to move the metrics forward. **ACTION:** Mike Moran and Helen Fairley, GCMRC, will provide the draft writeups at least two weeks in advance of the June TWG meeting.
- The budget prioritization effort is complete.
- The Stakeholder River Trip will occur July 13-22, 2022.

Non-native Aquatic Species Establishment Risk

[Charles Yackulic, GCMRC] [PRESENTATION](#) This work is the result of a collaborative effort with multiple agencies. Smallmouth bass are considered the biggest threat to native fish. There are some places they have not invaded where temperatures are suitable. They are present in Lake Mead and Lake Powell, but they are not yet established in Grand Canyon. It is believed this is because there is turbidity at the inflow and the Pearce Ferry rapid is serving as a barrier. On the upstream end, it is believed the cold releases from Glen Canyon Dam cause few to pass through the dam because the fish occur higher in the water column than where the water is pulled. Limiting establishment is crucial. A conceptual model to explain the potential amount of entrainment that might be seen at a range of different reservoir elevations has been developed; the probability of establishment was determined using the temperature predictions from the March 25-month study and the assumption that a population could probably be maintained with around 250 fish. Hypothetical entrainment risk scenarios were developed for different elevations. If elevations are fluctuating, then the risk is higher, and the most significant risk is at the minimum probable elevation levels. Limiting establishment is most important and certain approaches can reduce that risk.

Q&A

[Larry Stevens, GCWC] Size must be an issue for passage through the dam. Is there any need to focus on the smaller size classes? What about the distribution in the forebay? **[Charles Yackulic, GCMRC]** Smaller fish tend not to do well with the pressure in the hydropower turbines. Based on reports from ten years ago and more recently, there is not much habitat near the reservoir for Age 0 fish.

[Christina Noftsker, New Mexico] What about spike flows as a way to limit smallmouth bass numbers in Lees Ferry? **[Charles Yackulic, GCMRC]** Spike flows are effective below Flaming Gorge for part of the cohort, but multiple spike flows over ten or more days would be needed to stop reproduction. Predicting that timing in our system would be tricky.

[Sinjin Eberle, American Rivers] What could be the impacts to humpback chub if smallmouth bass were to become established? **[Charles Yackulic, GCMRC]** Within a couple years of smallmouth bass showing up in Echo Park, humpback chub were reduced by more than 90% and are now functionally extirpated. In other areas, there is more overlap, and they are co-existing over the short term. It is expected there would be similar significant declines in the Little Colorado River and Western Grand Canyon.

[Matt Rice, American Rivers] Has there been any modeling based on the different scenarios in the presentation related to recovery of humpback chub? The risk is high, and the AMWG needs to act on a plan by this summer to get ahead of this issue. **[Charles Yackulic, GCMRC]** Have not done any formal modeling of humpback chub, but the risk is believed to be big.

[Ed Keable, National Park Service (NPS)] What is the comparative effectiveness of one-day-per-week versus multiple-days of bypass, as well as the appropriate timing of bypass focused on preventing spawning? **[Charles Yackulic, GCMRC]** There has been lab work to explore this, but there are multiple mechanisms by which temperature can affect smallmouth bass reproduction, including both survival of eggs and behavioral change with adult spawning (which was the biggest response seen in the Green River). If it's the latter, it might take a day to make an impact; if it relates to larvae and eggs it might take longer. Timing should be soon after temperature rises to 16 degrees Celsius.

[Brian Sadler Western Area Power Administration (WAPA)] Can you expand on the "mid-term" screens or other solutions for preventing entrainment? **[Charles Yackulic, GCMRC]** Reclamation is currently investigating this with the Technical Services Center (TSC).

[Jim Strogon, Fly Fishers International/Trout Unlimited (FFI/TU)] Where might the first sightings of smallmouth bass occur? Would it be downriver due to higher temperatures or in Lees Ferry? **[Charles Yackulic]** Smallmouth bass have been seen during monitoring in Lees Ferry for the past 10 years (between 0 and 3 per year). Would expect them there first if they come through in great numbers.

[Kelly Burke, GCMRC] The costs of dealing with this later would be significantly higher than the costs of taking preventative action. Given that the AMWG does not meet again until August, is there a way to have an emergency AMWG meeting to create a plan of action to prevent this? **[Wayne Pullan, Reclamation]** The information is concerning. The Smallmouth Bass Task Force has converged on dam operations as an important and necessary tool, but has not yet identified a specific hydrograph design or proposal. The TSC may have some information on this in a couple of months. Even if actions could be taken immediately the solutions would still be months or even years away. **ACTION:** GCMRC and Reclamation will work with the TWG to develop two to four operational alternatives to address smallmouth bass concerns while minimizing adverse effects to other resources. **ACTION:** GCMRC and Reclamation will work with the TWG to develop a larger strategy that may include monitoring; as well as a plan to prevent, detect, and respond to warmwater invasive fish establishment below Glen Canyon Dam. Recommend that unspent funds from LTEMP (C.5) be used to support staff time for this effort.

[Seth Shanahan, Southern Nevada Water Authority (SNWA) and TWG Chair] What is the breadth of the two to four operational alternatives? Is the purpose to address the immediate concern of non-native fish pass-through and establishment throughout the lower river? **[Wayne Pullan, Reclamation]** These would be alternatives within the realm of possibilities given the difficulties. We need to know the strategy and what the actions are going to be if there should be establishment of smallmouth bass.

[Kelly Burke, GCMRC] See Kurt Dongoske's comments in the chat about being mindful of Zuni concerns regarding lethal management actions. If the plan is to present this at the August meeting, have we met the window of opportunity for this summer? There is a timescale pressure.

[Bill Persons, FFI/TU] What is the AMWG asking the TWG to accomplish? **[Wayne Pullan, Reclamation]** **ACTION:** Reclamation will draft this request in writing.

Basin Hydrology and Operations, Water Quality, and Drought Response

[Heather Patno, Reclamation] [PRESENTATION](#) Significant hydrology in October and December increased snowpack, but this flatlined in the second week of January with almost no further snow accumulation until February, which saw normal amounts, and was followed by very warm temperatures in March. There is now a trend of spring forecasts decreasing incrementally. There is less than a 10% chance of reaching average hydrology this year. Runoff has increased storage as expected, with elevations now above 3,525 feet. The Lake Powell end of May elevation target was 3,533 feet but have not yet seen the inflows. Two separate Drought Response Actions have been implemented: the Drought Contingency Plan includes additional water released from Flaming Gorge Reservoir from May 2022 through April 2023, which is the “DROA Year.” The other action is to leave 480-thousand-acre feet in Lake Powell by reducing Glen Canyon Dam’s annual release volume, which assumes the water will be moved to Lake Mead. The presentation also provided detailed graphs on the modeled projections and the outage schedule for 2023, including patterns associated with implementing bug flows.

Q&A

[Jim Strogon, FFI/TU] What is the power pool for Lake Mead and the anticipated power generation? Is Lake Powell being prioritized to retain more water than Lake Mead? **[Heather Patno, Reclamation]** Lake Powell is expected to remain above the minimum power pool. The actions implemented are to make sure that Lake Powell stays above minimum for the near term. There is likelihood that additional adjustments between Lake Powell and Lake Mead will occur, which will depend on enhanced monitoring. Reclamation is expecting a continued downward trend, but no decision has been made. Both Lake Powell and Lake Mead are at critical elevations. Lake Powell minimum power pool is being protected right now, but continued changes and adjustments are likely to happen. This is a rapidly changing system.

[Kelly Burke, GCWC] Is there any way to assess the footprint of acceleration in these changes that can be seen in the modeling? **[Heather Patno, Reclamation]** Have seen dryer conditions over the past 30 years by looking at the probabilistic model and its 30 traces. Seeing similar conditions as the drought that occurred in 2001 to 2004, but the difference is the system now is at 50% of capacity rather than at 100%, which means half the storage is available to cushion the drought.

Water Year 2022 LTEMP Experiments and Proposed Process Updates

[Lee Traynham, Reclamation] [PRESENTATION](#) The Water Year 2022 LTEMP experiments are intended to be adaptive, starting with the annual reporting in January and TWG meetings to understand resource conditions.

- Sediment conditions did not trigger a spring High Flow Experiment (HFE).
- Reclamation is now in the fourth year of implementing the bug flows experiment. The approximately 8-week schedule for bug flows is compressed because of the May 1 implementation window. Feedback on this would be appreciated. Reclamation will also include any written comments in the technical package. Tribal partners can request consultations. An action item from the Planning & Implementation (PI) Team recommends GCDAMP refine the hypothesis, specify measures of success, and explore potential design improvements.

[Mike Moran, GCMRC] [PRESENTATION](#) Provided background on bug flows, which will occur from May to August 2022. The PI Team will be meeting periodically to determine if there are any adverse impacts

from bug flows to other resources. The presentation also provided monitoring updates and a summary of 2018-2020 bug flow findings. It is believed that bug flows have had an effect on midges, and maybe also on caddisflies but that relationship was not statistically significant.

Q&A

[Leslie James, Colorado River Energy Distributors Association (CREDA)] Do the findings imply that midges declined because of bug flows, or were there other reasons for that decline? **[Mike Moran, GCMRC]** There is no definitive answer. It will be interesting to see what happens this year especially if there is a big spike in midges. There are other factors (such as turbidity) that need to be untangled.

Federal Agency Updates

Staffing Updates

[Kathy Callister, Reclamation] Working with Human Resources to get the GCDAMP group chief hired as soon as possible. Will continue to provide updates. Until then, Reclamation staff will rotate through the position. Clarence Fullard will be the acting program manager through June. **[Mark Lamb, United States Fish and Wildlife Service (USFWS)]** New staff include Heather Whitlaw, who is the field supervisor for the Arizona USFWS office and has also been nominated to be on the AMWG. Dan Levitt is being nominated as the alternate for the TWG. Kirk Young and Jess Newton are also recognized for their continued work with USFWS. **[Scott VanderKooi, GCMRC]** The description for the GCMRC chief has been approved and should be announced soon. Will continue to inform the group and engage the GCDAMP stakeholders.

GCDAMP Program Funding

[Kathy Callister, Reclamation] Reclamation has received Fiscal Year (FY) 2022 funds. The President's FY 2023 budget has been released. Now the appropriations process will begin. **[Brian Sadler, WAPA]** Rodney Bailey has been announced as the new Colorado River Storage Project (CRSP) manager (replacing Tim Vigil). WAPA is hoping to use \$110 million in funding from the Bipartisan Infrastructure Law. Bug flow expenses and some other adjustments need to be added to the model.

Endangered Species Act (ESA) Updates

[Mark Lamb, USFWS] No updates to listings related to ESA species or their habitat. There will be some planning starting soon on the Interim Guidelines.

Expanded Non-native Aquatic Species Plan

[Rob Billerbeck, NPS] Have been meeting weekly with Reclamation, GCMRC, USFWS, and the Arizona Department of Game and Fish about options for each agency and compliance requirements. Next actions are being contemplated if more non-natives are seen through the dam. **[Taryn Preston, NPS]** The slough was pumped and green sunfish were removed. There were technical difficulties with the pumps so only 60 green sunfish were collected, which are under quarantine and will be released back into Lake Powell. The plan is to go back out as soon as possible to complete that project.

LTEMP Litigation

[Rod Smith, Department of the Interior Solicitor's Office] The LTEMP litigation was filed in the District Court in Arizona. It is a National Environmental Policy Act (NEPA)-based challenge that alleges Reclamation's climate change analysis done in 2016 did not comply with NEPA. The briefings are being

filed now. Next thing is for the plaintiffs to take up their brief, then the federal government and intervenors will take their last brief on June 10. Expect oral arguments followed by a ruling.

Technical Work Group Chair Report

[Michelle Garrison, TWG Vice Chair] [PRESENTATION](#) on upcoming meetings. The TWG will complete its discussions on the budget at the June meeting. TWG has been grappling with a number of issues of concern related to the drought's impacts on resources, including non-native fish, dissolved oxygen, and elevated river temperatures. Next steps include an expanded charge to the Steering Committee Ad Hoc Group to better track emerging issues and share them with TWG members on a more reliable and frequent basis. The TWG is also planning a tabletop exercise to help identify areas of potential importance to the AMWG. The Scope of Work for a water quality study is under development now and will be reviewed at the next TWG meeting.

Stakeholder Updates

- **[Candice Hasenyager, Utah]** The Utah Legislature provided \$500 million to support water projects.
- **[Jakob Maase, Hopi Tribe]** A river trip was just completed.
- **[Eric Stanfield, Navajo Nation]** The Navajo Nation's river trip is May 24 to June 2. Elections will also be held this year.
- **[Larry Stevens, GCWC]** Been working on riparian restoration at Paria Beach, one of the most visited sites along the Colorado River system.
- **[Leslie James, CREDA]** Prices of natural gas continue to go up. Everyone is watching the temperatures for this summer. Supply chain issues continue to create havoc for solar installations and other electric grid needs.
- **[Kevin Garlick, Utah Municipal Power Agency (UMPA)]** Many municipalities are struggling. UMPA added more than 80 megawatts of solar in last eight months, but it is hard to replace lost hydropower energy with natural gas and other sources.
- **[David Brown, Grand Canyon River Guides (GCRG)]** In early April, Guides Training Seminar participants and NPS staff conducted a work project at Clear Creek Camp to remove invasive plants where recreational camping had been lost due to vegetation encroachment. In addition, the Guides Training participants visited other campsites along the river corridor and collected data to inform future vegetation encroachment mitigation actions. This work supports experimental vegetation treatments as described in the LTEMP. There are many reports of extremely poor beach conditions due to vegetation encroachment, high wind events, and last year's monsoon season.

Tribal Liaison Report

[Jamescita Peshlakai, Reclamation] River trips are coming up. Will be holding the LTEMP programmatic meeting with the tribes on August 4. Also working with the tribes on their expenditures, budgets, and another five-year programmatic agreement at the end of September.

Q&A

[Larry Stevens, GCWC] Funding for the tribes has not increased in past 20 years. Will there be a discussion on whether that funding is adequate? **[Jamescita Peshlakai, Reclamation]** That is a concern.

It has not increased with the cost of living; however, there seems to be a large balance of unused funds, which is one of the problems that needs to be addressed.

Proposed FY 2023 Budget and Work Plan

[Michelle Garrison, TWG Vice Chair] The planning for 2021-2023 was done in 2020. In 2022, have been looking back at 2021 and assessing how 2022 is going in order to determine whether there should be any changes recommended for the budget. The TWG will take this up in June for the AMWG to take up in August. The Budget Ad Hoc Group had recommended that: 1) items that were cut or scaled back for budget reasons might be put back in if funds are available, and 2) the AMWG should provide direction to the TWG on a water quality study. In 2023, the TWG will have to start the process again for the next three-year planning process. **[Mike Moran, GCMRC]** [PRESENTATION](#) is an overview of the FY 2023 budget. Details are in the Triennial Budget and Work Plan. FY 2023 is expected to have a \$42,000 shortfall that may be made up with end-of-year funds. The Lake Powell Water Quality study is proposed for \$244,000, which would likely come outside of GCDAMP funds. **[Lee Traynham, Reclamation]** Not seeing any suggested revisions for Reclamation's FY 2023 budget. Projects A and B cover the AMWG and TWG, respectively. Project C will have slight adjustments as costs are increasing. Element C.5 is the Experimental Management Fund, which is available to monitor for unexpected management actions. This might be used to support non-native fish management. Project D (related to cultural resources) includes a cost increase for monitoring at Grand Canyon. One thing to flag is that some funding is coming in late. Most of the tribal partners are at end of their five-year agreement. Some of these projects might slip for a year because if funds are not spent they would need to be de-obligated.

Public Comment

[Lynn Hamilton, GCRG] GCRG is feeling the effects from not having an HFE since 2018. HFEs are the primary tool for building sandbars. GCRG is strongly advocating for a spring HFE. There is much talk about nimbleness, and these are unprecedented times. There needs to be an action plan in place and to also set up for experiments next year. There are real consequences if we are not nimble or proactive.

[John Dillon, Grand Canyon River Outfitters Association] Would echo Lynn's comments. There is also a visitor component with 22,000 to 23,000 people visiting Grand Canyon National Park each year. The lack of an HFE has a huge negative effect on camping beaches and the white-water rafting trips. COVID also resulted in a small influx of visitors that rolled over their trips to the subsequent year and resulted in slightly larger group sizes to make up for the previous year's losses. The efforts of AMWG and agency staffs are much appreciated.

AMWG Next Steps

- **Jim Stroger's question in chat as to whether the TWG might consider items outside the LTEMP Record of Decision.** **[Wayne Pullan, Reclamation]** The answer is "yes" with the caveat that it would require new NEPA compliance, which limits exercising that tool for the short term.
- **Next AMWG Meeting August 17-18.** Topics will include 2023 budget and workplan, hydrology and operations updates, tribal liaison report, and hearing back from the TWG on the requests made today. Any suggestions on additional agenda items should be sent to Kearns & West by June 30 with a copy sent to Reclamation. The meeting will be held virtually.

- **Lee Traynham's Departure. [Wayne Pullan, Reclamation]** Lee started with the group on May 12, 2019, and has done a tremendous job. She is highly capable, trustworthy, has integrity, and believes in the process. We wish her all the best.

Meeting adjourned at 12:03 PST.

Meeting Attendees

AMWG Members, Alternates, and Leadership

Arden Kucate (Pueblo of Zuni)	Kelly Burke (GCWC)
Brian Sadler (WAPA)	Kevin Garlick (UMPA)
Candice Hasenyager (Utah Division of Water Resources)	Larry Stevens (GCWC)
Charles "Chip" Lewis (Bureau of Indian Affairs)	Leslie James (CREDA)
Charlie Ferrantelli (State of Wyoming)	Michelle Garrison (State of Colorado)
Cliff Barrett (UMPA)	Richard Begay (Navajo Nation)
Clint Chandler (AZDWR)	Rod Buchanan (FFI/TU)
Daniel Picard (Acting Designated Federal Officer, Reclamation)	Scott Mcgettigan (State of Utah)
Jessica Neuwerth (CRBC)	Wayne Pullan (Acting Secretary's Designee)
Jim Stroger (FFI/TU)	William "Billy" Shott (NPS-GLCA)
John McClow (State of Colorado)	David Brown (CCRG)

Department of the Interior

Christina Kalavritinos
Rod Smith

TWG Members and Alternates

Ben Reeder (GCRG)	Erik Stanfield (Navajo Nation)
Brian Healy (NPS-GRCA)	Jakob Maase (Hopi Tribe)
Christina Noftsker (State of New Mexico)	Kirk Young (USFWS)
Clarence Fullard (Vice Chair and Reclamation)	Kurt Dongoske (Pueblo of Zuni)
Craig Ellsworth (WAPA)	Ryan Mann (AZGFD)
Daniel Bullets (Southern Paiute Consortium)	Seth Shanahan (TWG Chair and SNWA)
David Brown (GCRG)	Sinjin Eberle (American Rivers)
David Rogowski (AGFD)	William "Bill" Persons (FFI/TU)

USGS/GCMRC Staff

Bridget Deemer	Kim Dibble
Drew Eppehimer	Michael Moran
Emily Palmquist	Paul Grams
Helen Fairley	Scott Vanderkooi
Joel Sankey	Ted Kennedy

Reclamation Staff

Alex Pivarnik	Jamescita Peshlakai
Becki Bryant	Jenny Erickson
	Kathy Callister

Dave Speas
David Isleman
Ernie Rheaume

Lee Traynham
Nicholas Williams
Heather Patno

Acronyms

AMWG – Adaptive Management Work Group
CREDA – Colorado River Energy Distributors Association
CRSP – Colorado River Storage Program
DROA – Drought Response Operations Agreement
ESA – Endangered Species Act
FY – Fiscal Year
GCDAMP - Glen Canyon Dam Adaptive Management Program
GCMRC – Grand Canyon Monitoring & Research Center
GCRG - Grand Canyon River Guides
GCWC—Grand Canyon Wildlands Council
HFE – High Flow Experiment
LTEMP – Long-Term Experimental and Management Plan
NEPA – National Environmental Policy Act

NPS – National Park Service
PI Team – Project Implementation Team
PST – Pacific Standard Time
Reclamation – Bureau of Reclamation
Secretary – Secretary of the Interior
SNWA – Southern Nevada Water Authority
TSC - Technical Service Center
TU - Trout Unlimited
TWG – GCDAMP Technical Work Group
UMPA - Utah Municipal Power Agency
USFWS – US Fish & Wildlife Service
WAPA – Western Area Power Administration