

# Glen Canyon Dam Technical Work Group Meeting

March 14, 2019

**Date:** March 14, 2019

**Start Time:** 8:30 am

**Conducting:** Seth Shanahan, TWG Chair

**Meeting Recorder:** Lauren Johnston

**Attendees:**

Committee Members/Alternates Present

Amy Ostdiek, Colorado Attorney General's Office\*  
Clifford Barrett, UAMPS\*  
Richard Begay, Navajo Nation  
Charley Bullets, Southern Paiute Consortium  
Shane Capron, WAPA  
Winkie Crook, Hualapai Tribe  
Kevin Dahl, NPCA\*  
Bill Davis, CREDA  
Craig Ellsworth, WAPA (Alternate)  
Charlie Ferrantell, Wyoming State Engineer's Office  
Jessica Gwinn, FWS (Alternate)  
Paul Harms, New Mexico Interstate Stream Commission  
Brian Healy, NPS, GCNP (Alternate)\*

Ken Hyde, NPS, GCNRA  
Leslie James, CREDA (Alternate)  
Ryan Mann, AZGFD  
Craig McGinnis, ADWR  
Jessica Neuwerth, CRBC\*  
Emily Omana Smith, Reclamation  
Bill Persons, Trout Unlimited (Alternate)  
Ben Reeder, GCRG  
Peggy Roefer, State of Nevada\*  
David Rogowski, AZGFD  
Seth Shanahan, Southern Nevada Water Authority  
Larry Stevens, GCWC  
Jim Strogon, Trout Unlimited, IFF  
Kirk Young, FWS

Committee Members Absent

Melinda Arviso-Ciocco, Navajo Nation  
Jan Balsom, NPS, GCNP (Alternate present)\*  
Kurt Dongoske, Pueblo of Zuni

Vineetha Kartha, ADWR  
Robert King, Utah Division of Water Resources  
Chip Lewis, BIA  
Steve Wolff, Wyoming State Engineer's Office

USGS/GCMRC

Helen Fairley  
Ted Kennedy\*

Michael Moran

Reclamation

Tara Ashby  
Bill Chada  
Heather Patno

Daniel Picard  
Chris Watt

Interested Persons

Kelly Burke, GCWC  
David Braun, Sound Science, LLC  
Ed Gerak, AZ Power Authority  
Alicyn Gitlin, Sierra Club\*

Kevin McAbee, FWS  
Lauren Johnston, Galileo Project (Scribe)  
John Jordan, Trout Unlimited & IFF  
Sarah Rinkevich, FWS

***\*Denotes attendees participating solely via Webinar***

### Summary of Actions Taken

- **Seth** will consult with TWG Meeting Co-Chairs to determine if the October 2019 meeting can be planned as an in-person meeting instead of a webinar.
- **Seth** will update the Ad Hoc Group list and present it for review at the beginning of every TWG meeting.
- **Emily** and **Reclamation staff** will follow up with Reclamation to determine TWG Membership status of uncertain members, including Kevin Dahl.
- **Emily** will distribute a new URL for the TWG website.
- **Participants** provide feedback on the TWG website to Emily/Tara.
- **Scott** will discuss with staff how best to show lives saved (of target species) per take of fish (non-native/problem species).
- **Emily** will pass along the TWG's suggestion to include small and larval fish as part of the Reclamation entrainment prize competition.
- **Seth** will confirm with Lucas Bair whether or not his work on Project N is completed.
- **TWG** members peruse Ad Hoc Group list and update membership as needed. [Link to Ad Hoc Group List on TWG website.](#)
- **Participants** will email budget requests for experimentation and monitoring to the BAHG.
- **Seth** and **Kelly** will further discuss the potential for a presentation from the public on future TWG agendas.
- **Participants** will use the action item tracking form to submit any important discussion topics or questions to Emily and Tara.
- **Scott** and his staff and other fish researchers will discuss ways to minimize take as part of research studies.
- **Leslie James** will meet with the chairs of the Administrative Ad Hoc group to discuss its charge (mission).

### Summary of Motions

- Seth called for comments or changes to the June 25-26, 2018 and October 10, 2018 meeting minutes. None were received. The minutes are considered approved.

### Presentations and Discussion

#### **Welcome and Administrative**

Presenter: Seth Shanahan, TWG Chair & others, as assigned

Presentation & Discussion Summary:

- Quorum Established with 22 members or alternates present, and an additional 4 alternates present with primary members.
- Future Proposed Meetings for 2019:
  - May 1 webinar
  - June 11 & 12 in-person meeting
  - October 16 webinar
  - *Shane Capron requested that TWG consider the October 2019 meeting as in-person with the potential to be a webinar, instead of as a webinar with the potential of being in-person. This makes it easier for participants to plan travel and attendance. Seth offered to consider this option.*
- New Members include Charlie Ferrantell for the State of Wyoming, and Craig McGinnis from the Arizona Department of Water Resources for the State of Arizona, and Amy Ostdiek for the State of

Colorado. In Reclamation, Tara Ashby is temporarily replacing Linda Whetton, and Emily Omana Smith is temporarily replacing Katrina Grantz until her position is filled. There are still some individuals, including Kevin Dahl, whose membership status is unclear or unfinished. Emily offered to follow up to confirm membership statuses.

- Craig has been updating the Wiki site, however there are still some broken links. Reclamation is updating websites and making sure everything is 508 compliant. USGS is also updating their websites to meet new national standards. Once the websites are settled, Tom Gushue will present an update to the GCMRC via webinar or otherwise to orient everyone to the new USGS website for GCMRC.
- For Project C.9 - Technical Services at Reclamation is establishing a potential \$750,000 cash prize for public input on an innovative solution to prevent fish passage at GCD. This is Reclamation's first step in addressing the project. Emily has a briefing paper on the project that she can distribute. The competition will be open for entries for 60 days and judging period will take 90 days.
  - *Larry Stevens requested that the competition instructions should include a look at dam spillways as a means of fish passage.*

Ryan Mann updated that AZGFD decided to stock fish in Lees Ferry in response to low catch rates at the walk-in. Five hundred twenty-five fish were stocked in November 2018. AZGFD plans to stock up to 6,000 triploid, clipped, and PIT-tagged fish from May - June 2019 in four biweekly stockings. AZGFD will conduct a persistence survey to measure longevity, survival, and immigration. AZGFD will implant 60-80 acoustic transmitters in stocked fish to monitor persistence. AZGFD is coordinating with Rob Billerbeck (NPS). There are also ongoing Creel Surveys at Lees Ferry. Ryan concluded his presentation by stating that the restocking effort was only authorized for years 2018 and 2019, and any additional stocking efforts beyond this year would need separate approval.

- *Jim Strogon asked how data is collected from PIT or acoustic tags after the fish is caught. Ryan answered that with acoustic tags, outside of anglers returning the tags, data transmission for that fish stops. AZGFD is mostly interested in how long the fish stay in the system anyways. AZGFD has ongoing surveys, and plans to put up notices and flyers for anglers so they know what's going on with the tags if they catch one. There is currently no incentive for returning any tags.*
- *Jim added that it's a priority to not lose data. With the NPS's potential plan for incentivized harvest, the more often groups can engage anglers in activities that are citizen science related, the more they should.*
- *Scott added that monitoring trips a month ago recaptured three tagged fish caught 4 miles upstream. GCMRC will continue to monitor for these, and will share any information with the group. GCMRC has not had any downriver trips since the fish were released.*
- *Larry asked how AZGFD accounts for the performance of these types of actions, as they are not widely accepted. Larry would like to see how these stocking efforts are valued in terms of studying fish movement. Ryan answered that all stocking and active management actions are discussed internally within the aquatics branch of AZGFD. General management action reports are distributed externally, and any decisions and actions are done within the scope of management plans, which also have target goals and metric. Often the reports are written as manuscripts for scientific publication with peer review. In addition, decision-makers are available by phone. Jessica Gwinn added that the current BO calls for reporting, and agencies have agreed to provide those reports prior to any future consultation on similar management actions.*
- Seth encouraged participants to utilize the action item tracking form to keep track of directives from AMWG, motions, and other important questions for the TWG. These can include requests for action.

- GCDAMP was able to continue monitoring trips, however some were late due to the government shut down. There is a Lees Ferry Monitoring trip out right now, and several trips are planned for April, including the downstream trip. Stakeholders are encouraged to participate. [See Attachment 1 for trip listings](#). The GCMRC logistics coordinator retired and Scott VanderKooi is in the process of hiring a replacement.
- Brian Healy updated that NPS performed electrofishing at Bright Angel Creek prior to the government shut down, and took the fish weir out on February 21. NPS also supports monthly razorback sucker larval and small body fish seining trips. There is a Havasu Creek HBC monitoring trip scheduled in May, and a Shinumo Creek HBC monitoring trip scheduled in June.
- Tribal representatives have requested previously that GCMRC provide an accounting for the number of organisms killed intentionally and unintentionally as part of research activities. GCMRC needs to report on this for several of its permits. [See the table in Attachment 1 for the total list of takes](#). There was some high incidental take due to inexperience on sampling crews this year. GCMRC is making an effort to learn from this event and to improve in the future.
  - *Larry Stevens commented that taking of life is a serious issue. Larry offered that the Museum of Northern Arizona is happy to house both fishes and invertebrate species as a repository. Larry requested that GCMRC look into ways of showing the benefit provided, scientifically, per each unit of take. In other terms, how many lives have been saved due to actions by the committee? Scott responded that this is difficult to quantify, but GCMRC could look into it.*
  - *Shane Capron asked if GCMRC has considered stopping tagging flannelmouth sucker, and if there is any value in handling so many fish that are not the target species. Scott responded that GCMRC has cut back on tagging, but that there is still the problem of bycatch. Being selective while netting fish is not easy, and there are a lot of non-target species. Fish cooperators have agreed to ratchet down the amount of tagging. Kirk added that the Service has a certain number of nets to collect for their sampling, and they are time limited.*
  - *Dave Rogowski added that LTEMP requires that all native fish be monitored. David Braun added that hybrids between flannelmouth and razorback suckers are also a possibility when looking for evidence of razorback spawning. This requires looking closely at each flannelmouth.*
  - *Ken Hyde added that the GSF take needs to be updated to about 4,000 for NPS. Scott clarified that GCMRC and NPS are reporting take separately.*
- Seth requested members bring forth any items in consideration that are of interest to this group:
  - *Larry Stevens stated that his group has to paint the tree stems prior to an HFE in order to prevent beavers from cutting the trees down. Kelly Burke added that the Grand Canyon River Outfitters Association provided funding for paint.*
- Ad Hoc group member lists, charges, and statuses need to be reviewed. Seth would like the chairs of each of these groups to pay particular attention to the charges of the Ad Hoc group so they can be use properly and efficiently.
  - *Leslie James requested an opportunity to look at the charge of the Administrative Ad Hoc group. Seth suggested she meet with the chairs of that group.*
- Larry Stevens requested an update on quantification of desired future conditions. This has been an outstanding item since 2011. Seth replied that AMWG and TWG have been working towards this effort. Emily added that Reclamation made the commitment to have monitoring metrics in place by the end of 2019. This effort is currently on hold while Katrina's position is filled. Once Katrina's replacement is in place (hopefully in May), this work will start up again. TWG does not need to make a further recommendation to look at this item as it is an action item for the AMWG.

## **Update on Hydrology, Operations, and Reservoir/Release Temperatures**

*Presenter:* Heather Patno, Reclamation

*Presentation Summary:* This has been a wet year, with 64% of average water supply for the season reached in January alone. February snowpack was high on the record, and first week of March was above average as well. Already, the Basin has received 122% of Snowpack and 87% of precipitation for the season. The rest of March is looking at below average rainfall and below to average temperatures. What will happen in the rest of the season is uncertain, however, because Reclamation has not seen a year like this in recent memory.

Reclamation is currently in the Upper Elevation Balancing tier for operations, requiring between 8.23 and 9 maf of water released from GCD. Reclamation produces a minimum, maximum, and most probable release for each month. These are updated based on the most current month available from the 24-month study. Reclamation is working on a 24-month study for March, which will be completed in the next few days. The February 24-month study is completed, and all modeling in this presentation reflects data from the 24-month study.

Reclamation has been on the line between the Upper Elevation Balancing Tier and the Mid Elevation Balancing Tier. This hasn't happened since 2013/2014. Reclamation is working with WAPA to follow the LTEMP as closely as possible with adjusting water release patterns based on inflows and projections.

Reclamation has unit maintenance and replacement outages scheduled for 2019 and 2020 (details on slides 15 & 16 of the presentation) that could limit what releases are available for studies. In April/May there will be four units out of use. Eight units are available as of right now in August for a Fall HFE.

Water temperatures coming out of the dam are higher than normal.

**Additional details and are in Attachment 2.**

### *Discussion:*

- *Jim Stroger asked if transformer maintenance and replacement would preclude a Spring HFE. Heather is not sure if it is possible to rearrange the maintenance schedule. Heather added that it is possible to do an HFE with only six units available. Seth added that maintenance doesn't preclude HFEs, it just changes the volume of water available for power generation.*
- *Larry Stevens questioned whether the El Niño year impacted the models at all. Heather replied that most of the variability is explained by using minima and maxima in the models, and by updating the models every month. Seth added that data from the Grand Canyon doesn't really show impacts from El Niño.*

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

*Presenter:* Emily Omana Smith, Reclamation; Scott VanderKooi, GCMRC

*Presentation Summary:* There are two tiers of actions taken to benefit the HBC: early intervention and more drastic actions. During the LTEMP, a BO was developed with conservations measures that could be implemented by a variety of agencies and organizations to address HBC concerns. Currently, HBC numbers are higher than levels set to trigger more drastic conservation actions. Additional information on HBC conditions and conservation measures are in **Attachment 3**.

### *Discussion:*

- *Jim Stroger asked if the population in the Western Grand Canyon and successful translocations there have any impact on triggers for the HBC population in the LCR. Scott said the triggers are not structured that that should have an impact. Jim commented that this is an adaptive document, and*

*that this could be considered. Kirk Young commented that the higher HBC numbers for the last four years are still a new phenomenon. The LCR HBC population is still important to the species. Larry commented that the lower water levels in Lake Mead created pre-dam river conditions, which could be important to look at to recover the population in the reach.*

- *Larry Stevens said it's clear that conservation measures are working to recover the LCR HBC population, but it's not clear why. HBC are still excluded from Marble Canyon and the Grand Canyon Reach. AMWG should look at why this is the case, and work to recover the entire historic HBC range. Scott replied that the closest aggregation to the LCR is roughly 30 miles downstream, and shows evidence of larger fish and of reproduction, which could suggest a Marble Canyon population is possible. In the Western Canyon, it's a recent phenomenon that in the last five years that juveniles and other size classes have started showing up in those areas. GCMRC is trying to understand why this is happening.*
- *John Jordan asked if there is a feasibility within the process of compliance, to supplement populations in the river. Seth clarified that John was talking about mainstem stocking at HBC aggregation areas. Scott noted that 6-7 years ago this group started the discussion of mainstem HBC stocking, as there was evidence of HBC near Diamond Creek. GCMRC wanted to look at why there were no longer fish in that area, and if GCMRC could help kickstart populations through stocking. Prior to the proposal being funded and implemented, the fish range started to expand on its own. This could happen again. Still, FWS added 22 sonic-tagged fish in the Western Grand Canyon to track survival and movement. FWS has a poster presentation on this and would be happy to share the results from this small study. It did not appear that the fish left the mainstem system. FWS could release sonic-tagged fish again, but there are currently no plans to stock HBC in the mainstem.*

#### **Discussion of Possible Experimental and Management Actions that May be Implemented for CY19 and Opportunities for Monitoring Background Conditions that May Mimic Experimental Actions**

*Presenter:* Seth Shanahan, TWG Chair; Emily Omana Smith, Reclamation; Scott VanderKooi, GCMRC

*Presentation Summary:* AMWG follows procedures in the LTEMP to determine which studies and experimental and management actions may be implemented each year. This year TMFs and bug flows are possible. The idea behind the TMF is to disrupt the decadal population swings by stranding and killing fish. This effort is on hold due to problems with contracting and experimental study design challenges. It could also potentially be very expensive. GCMRC wants to do more experimentation prior to implementing a TMF.

The potential for elevated temperatures might not have as significant an impact on studies as previously thought. GCMRC has a robust monitoring program in place in addition to Project E, which is to study temperature and nutrients as ecosystem drivers. GCMRC is looking at primary production and food base of the systems as well. **Additional details on this presentation are in Attachment 4.**

#### *Discussion:*

- *Shane Capron stated he would like to work with GCMRC to look at how flow peaks impact trout movement. He would like to look at this in August/September. This would be inexpensive for WAPA.*
- *Scott suggested that going from high to low flows is looking at behavior in the wrong direction. It may present an opportunity to look at behavior to provide information on how to design the flows and what durations to test.*
- *Larry stated he will email his experimental suggestions, but wanted to point out that this year presents possibly the only year for the next 5-10 years for a sediment-triggered spring HFE. Larry would also like to see experiments that create backwaters to study above and below the LCR. Scott stated GCMRC is staged well to do that, and this year might present a good year to compare to lower runoff years.*

- *In response to whether a TMF could also help control GSF, Scott stated that due to different life histories and dispersal patterns, this would likely not help.*
- *Ben Reeder asked if there was a trigger for TMFs. Scott replied that there was not, but that the LTEMP allows for initial testing to determine what external factors might spur trout production, and thus necessitate a TMF. Ben added that watching impacts of bug flows could be helpful too. Scott agreed and stated that GCMRC wants to do bug flows for three consecutive years to look at ecosystem responses to increased food base.*
- *Bill Davis stated that Reclamation is proposing a barrier at the dam, and in order to do this it would be a good idea to understand the temporal demography of what exists in Lake Powell. Scott stated there is a good understanding of what is in Lake Powell, but less understanding seasonally, geographically, and at depth what that composition looks like. Bill added that larvae should be taken into consideration. Scott agreed that a better understanding of the fish community needs to be taken into consideration. Emily Omana Smith stated that larval and small fish concerns could be considered in the Reclamation entrainment prize competition. Ken Hyde added that a study 10 years ago examined fish movement. NPS has considered the idea of acoustic fish guidance systems as a barrier. Ken added that most GSF coming through the dam are adults. Kevin McAbee added that FWS is screening Upper Basin reservoirs to keep fish from getting out, with most solutions at the size on a quarter inch to 3/32nds of an inch. Ryan Mann added that larval fish die at a high rate due to pressure in the dam. He further added that in the Pacific Northwest, they use SONAR to monitor and steer away fish.*
- *Ryan asked if GCMRC knew how the HFEs impacted trout. Scott stated GCMRC has not monitored fish during an HFE, but it is something to consider.*
- *Ryan stated that the highest impact from a TMF is likely at Lees Ferry, where the highest trout reproduction is. It would be a good idea to monitor the resultant pulses downstream. Scott replied that the pulses would likely be buffered. Monitoring the entire system is difficult, however, as it is difficult to setup infrastructure in the entire system. Access is just easier at Glen Canyon. Brian Healy added that the flow is not as attenuated as one would think. In analysis for the LTEMP Biological Assessment and the BO, the flows were left as an uncertainty. NPS is hoping to build up a database over time to tease out dam effects with its monthly small bodied and larval fish monitoring.*
- *Craig Ellsworth suggested looking at historical literature for information on SONAR and other fish straining techniques.*
- *Shane commented that for experimentation, WAPA is supportive of another year of bug flows, and has more ideas about additional experimental changes to further reduce the potential cost of the bug flow experiment. Conversations with GCMRC are already planned. WAPA is also considering how they can help with questions regarding substrate. Because of bug flows, there is more emergent substrate available on lower levels. WAPA feels the half TMF would be problematic with this experiment because that could potentially stimulate big growth and could confound the understanding of bug flows. Jim Strogon and Ryan Mann support bug flows as well.*
- *Larry Stevens added that bug flows increase the number of black flies, which is a biting species and carries river blindness in Mexico. Since the 1990s black flies have increased as a function of more stable flows and HFEs. Ted Kennedy added that GCMRC's monitoring does not show an increase in black flies in the mainstem. They do appear in side creeks. The black flies in this system are mostly looking for deer. Larry added that biting flies in Diamond Creek are different than the black flies in the mainstem.*
- *Kirk Young stated that this group needs to determine if a TMF would work, especially as additional invasive species make their way into the system. It would be good to know if the TMF is a usable tool. Scott replied that GCMRC has been thinking about this question and about how knowledge in*

*the system has evolved over time. There is some knowledge that did not get incorporated in the LTEMP EIS. GCMRC is now in a place to experiment and determine what is driving change. That can help inform new management actions. Kirk added that needing to know how to control invasive species might be the impetus for testing a TMF. Brian Healy stated it may be time to test alternative actions. The group should continue looking into means of controlling brown trout, as they are dispersing through the system. Scott concluded that it's time to determine how to take the knowledge this group has and come up with an appropriate management response.*

### **Plans for Preparing a Colorado Pikeminnow Reintroduction Feasibility Study in CY19**

Presenter: Kirk Young, FWS

Presentation Summary: FWS is in the first phase of determining whether or not to reintroduce pikeminnow into the Colorado River System, which consists of looking for suitable habitat and assessing risks of reintroduction. Phase Two is the experimental phase, and Phase three is the plan development and recovery action phase. This effort was kicked off to address the species status concerns in the pikeminnow SSA. USGS will publish an open file report in Winter 2019/2010 that will assist Phase One of this effort. **Additional details from this presentation are in Attachment 5.**

Discussion:

- *Larry Stevens commented that this is a smart approach for determining actions. There are not a lot of concrete records of pikeminnow in the system, however this could be researched by looking for a migration story in historic literature.*
- *Bill Davis commented that reintroduction could be controversial, and the timing of such a reintroduction could jeopardize progress made with the razorback sucker and the HBC. Kirk responded that there is no timeline for potential reintroduction, but after the USGS report in the winter FWS will have better data to discuss a potential timeline.*

### **Recommendations to Downlist Razorback Sucker and Humpback Chub to Threatened Status**

Presenter: Kevin McAbee, FWS

Presentation Summary: The FWS performed a SSA on the razorback sucker. Some progress has been made in boosting the species populations in the system, however the species is still management-dependent for survival due to low recruitment levels. The science team preparing the SSA came up with five future management action scenarios and projected how the fish would fare in each scenario. The most likely scenario, maintaining current management actions, leads to an increase in future population conditions, and in each of the scenarios, now and in the foreseeable future, it does not appear that the razorback sucker would be in danger of extinction. For these reasons the Service is recommending to downlist the species from endangered to threatened. The proposal to downlist and the 4(d) rule are set to publish in the federal register in September 2019. Public comments on the proposal will be open for 60 days. A final rule would be published in 2020, and a recovery plan revision in 2021. FWS is using the same process and reasoning with the SSA to propose downlisting the HBC as well. **Additional details from this presentation are in Attachment 6.**

Discussion:

- *Larry stated he thought that any decisions to downlist would have to include a five-year period to make sure recovery was stable. Kevin responded that the way the rules are written for several species, the adult abundances have to be at a certain level, the species is stable, and there are certain demographics over a five-year period. That's not a statutory part of ESA; that is built into the recovery plans. The recovery plans are a bit outdated, because there wasn't enough honor given to the variability of the system. The species are long-lived, and environmental conditions fluctuate. Rather than wait for a perfect five years, the SSA looks at viability of each population for a set of*

*given conditions. Demographic goals and timelines will be important for determining how to write the recovery plan.*

- *Ben Reeder stated he was confused that downlisting a species with one self-sustaining population would be an option. Kevin replied that this decision wasn't taken lightly. There is one part of the life history that is exceedingly rare, but as long as management continues, this species won't become extinct. The Service will continue to manage the population for improving condition. There was a lot of discussion about applying policy.*
- *Bill Davis stated that the possibility for stocking pikeminnow down the road, which could impact razorback sucker populations, was not included in the razorback sucker SSA. Kevin replied that this would need to be taken into consideration for the pikeminnow SSA. SSAs are living documents, and if the status quo that serves as the basis for an SSA changes due to a major management action, the SSA needs to change too.*

### **Non-Native Aquatic Species Control Plan**

Presenter: Ken Hyde, NPS

Presentation Summary: The EA is in progress, and formal consultation with the Zuni and Hopi Tribes is in the planning stage for this March. NPS will consult informally with the Navajo. As of right now, the EA proposes six control mechanisms, with incentivized harvest as the top commitment. There are several action tiers in terms of severity of an action, and the lowest tier will always be utilized first. NPS is no longer committed to 100% kill of GSF, but rather 97% removal, and translocation if not diseased.

NPS has never offered incentivized harvest, and is looking for input on study program implementation to determine whether or not this is a good tool for NPS to use. Next steps to finishing the EA are to complete NHPA Section 106 consultation, release the FONSI, have a meeting with AZGFD and anglers, and implement measures in EA. **Additional Details from this presentation are in Attachment 7.**

No follow up questions or discussion

### **Southern Paiute Consortium 2018 Monitoring Program**

Presenter: Charley Bullets, Southern Paiute Consortium

Presentation Summary: Over time the Southern Paiute Consortium has compiled a lot of data, especially via photography. Right now, damage to trails and damage from visitors creating their own trails is impacting plants, animals, and archaeological sites. This damage includes hiding trinkets in certain locations, writing on rocks, damaging plants, etc.

The Consortium has been able to use DStretch photographic enhancements to better see tribal cave and wall writings.

Discussion:

- *Charley stated that his group is not doing any monitoring for Tapeats Creek, above Deer Creek due to the extreme amount of visitation. Charley appreciates the closure of the narrows; however, the trail is still open. Right now, Larry's group is more concerned about the major trail. Larry understands and appreciates the importance of the sites and thanks the tribes for their patience in addressing this issue.*

### **Annual FY18 Reporting on Expenditures**

Presenter: Tara Ashby, Reclamation; Mike Moran, GCMRC

Presentation Summary: Because Reclamation is now operating on appropriated funds, all funding received needs to be spent or under contract by the end of FY 2019. Reclamation does not get to keep unused funds. **Additional details from this presentation are included in Attachment 8.**

Discussion:

- *Craig Ellsworth asked about the source of bug flow funding. Scott replied that this funding came from the experimental fund, and was available due to GCRMRC's lower than anticipated overhead rate.*
- *Tara clarified that Reclamation does not have access to experimental funds. Reclamation is waiting to hear if Reclamation will have access to those funds in the future. AMWG needs to find ways to spend, or obligate, all funds. They cannot go into emergency or other rollover funds. Reclamation and GCRMRC are looking for backburner research efforts that could use the funds that were initially directed to rollover funds.*
- *Leslie James suggested this was a good time for GCDAMP to look at alternative funding sources for this group's activities.*
- *Craig Ellsworth asked if the experimental fund still exists. Tara replied that Reclamation received \$1.5 million back but can only spend it in an emergency. Scott added that the experimental fund is \$400,000 each year, but the rollover from previous years is what's in jeopardy. The contingency fund is also in limbo as to how Reclamation could access the funds.*
- *Ryan Mann questioned the cost of the overflight at \$75,000. Mike Moran clarified that the group has been saving \$75,000 for several years to reach the overall overflight cost by year 2021. Scott clarified that under appropriated funds AMWG cannot propose to save that \$75,000 this year.*

**Review Initial Results and Findings from TWP, Identify Potential TWP Changes, and Give Direction to BAHG for Developing Annual Budget Recommendation**

TWG Member Discussion:

- *Seth summarized that TWG received approval from AMWG to use their desired process for recommending a budget at the June meeting. Seth added that this upcoming budget year is the start of a new TWP. In addition, the knowledge assessment is coming up.*
- *The Section 2.7 criteria provide three reasons for TWG to recommend changes to the budget. These are whether or not there is a research/scientific need, an administrative need, or new initiatives that need to be considered. New initiatives need to be endorsed by Reclamation prior to TWG recommending them to GCRMRC. TWG needs to be discussing these initiatives with Reclamation now, so that Reclamation is involved early on in the process.*
- *Ken Hyde stated NPS GLCA would like \$400,000 for a three-year study on incentivized harvest proposed in the Nonnative Invasive Species EA. David Rogowski questioned whether there was a trigger for this action and for determining when brown trout are no longer a problem. Ken responded that the triggers are in the Non-Native Invasive Species Plan, and the trigger is somewhere between a population of 5,000-10,000 fish. Seth added that it is difficult to determine a trigger with any level of confidence. This is one reason why all fish that are stocked are tagged – in order to gather data.*
- *Ryan Mann requested money for monitoring trips that got dropped from the budget. Scott VanderKooi stated the dropped trip that Ryan is concerned about was added back into budget considerations. Ryan added that AZGFD also wanted to do a Spring 2019 trip to Lees Ferry.*
- *Craig Ellsworth stated an additional trip to evaluate TMFs vs. Fall HFEs could be important. Scott stated GCRMRC needs to make sure that action isn't already covered in another trip.*
- *Richard Begay referenced additional trip funding requests submitted by Melinda Arviso-Ciocco. Those requests need to be resubmitted, as they did not fit under the current TWP.*
- *Larry Stevens requested funding to get at the questions of desired future conditions and funding to develop models to track LTEMP success and goals. A workshop could address this issue. Larry also requested funding for riparian vegetation restoration, studying phragmites and quagga mussels in the river system, developing a repository for specimens in the Museum of Northern Arizona, and for better understanding tribal values. Seth questioned whether Lucas Bair's study was looking at tribal*

values. Richard stated Lucas' study looks at economic cost values. That is not a complete look at other tribal issues. Sarah Rinkevich added that Lucas' study is separate for efforts to document tribal values and indigenous knowledge. This program could benefit from ethnographic research. The Haulapai Tribe is doing good ethnographic research. Richard added that NPS also has some traditional ecological knowledge studies they need to do, and this would need to be coordinated with other tribal knowledge efforts. Bill Chada stated that studies in Section D of the current TWP are funded, but once that knowledge is incorporated Reclamation can move forward in mitigating adverse effects. Seth added that there is ongoing work on vegetation and revegetation. Brian Healy stated NPS just got an agreement signed to allow NPS to start planning those treatment actions. Ken Hyde added that NPS is utilizing tribal youth groups for addressing vegetation issues in Glen Canyon.

- Kirk Young would like to look at how AMWG can rethink triggers for management actions and look at the entire HBC population. The Service will also be looking for additional funding for mark and recapture efforts associated with this effort.
- Leslie James stated she would like to see more efforts, as with the Project N bug flows, where GCMRC and WAPA work together to design experiments in a way that gets at required knowledge and also minimizes costs to hydropower. Craig Ellsworth added that he really appreciated Ted Kennedy's efforts with Project N.
- Jim Stroger requested looking at the potential for doing studies during HFEs. Jim also recommended looking at HFEs or powerplant flows during the spring as a means of identifying potential new studies. Seth added that there is a potential to make a spring HFE in FY2020 available.
- John Jordan requested studies along the edges during bug flows. Ryan Mann added that FWS could cover this under normal operations, and only additional logistics costs would be needed for the trip. John also suggested using experimental funds for incentivized harvest. This would not add any new costs to GCMRC.
- Larry stated he would like Reclamation to look into completing compliance in a timelier manner to allow for a spring HFE. Emily Omana Smith clarified that the compliance is done in LTEMP but that the accounting windows and the timeframe under which the implementation process needs to take place can be challenging and not allow for the full sediment window to be open. Scott added that the decision process for holding a spring HFE is the same as for a fall HFE and any other flows. There is the possibility of looking at power plant flows in the spring. Ryan stated he would like to see discussions on how to open up the accounting window, as there may never be enough accumulated sediment based on the current window.
- Scott added that GCMRC staff has a lot of data, but utilizing that data to its full capacity is time consuming. Scott stated he is being mindful of the burden on his staff and asked that the TWG be conscientious of that as well.
- Shane Capron is continuing as the BAHG co-chair and is in charge, as Carlee Brown is no longer a TWG member. BAHG meetings are scheduled for April 11 and 23, 10 am – noon MST.

### **Discussion of Emerging Issues and Request for Agenda Items for the next meeting**

#### TWG Member Discussion:

- Larry Stevens proposes to give a 10-15-minute presentation on diatoms as the real food base for the river system.
- Scott VanderKooi stated that Tom Gushue would provide an update on the GCMRC website. This may take the format of a webinar. Scott also noted it may take a few weeks to get PowerPoints from this meeting approved by USGS and on the Reclamation website.
- Charlee Bulletts requested another update on the Wiki page from Craig Ellsworth, potentially as a presentation at a meeting; it is already presented during the poster sessions.

- *Leslie James requested a memoriam for Jason on the Wiki page. Craig stated this is on the Wiki page already.*
- *Shane noted that the scientists will have to work on the knowledge assessment coming up. Craig added that there is an entire page on the Wiki dedicated to this as well.*
- *Sarah Rinkevich requested adding TEK to the May Webinar agenda.*

**Public Comment**

Comment/Discussion:

- *Kelly Burke requested that future agendas have a slot for presentations for the public in an effort to increase public involvement. It might be a way to get people more directly involved and to get feedback from the public or insight into public perception of the program. Seth offered to discuss this further with Kelly.*

**Meeting Adjourned at 3:26 pm**

Key to Glen Canyon Dam Adaptive Management Program Acronyms

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