

Glen Canyon Dam Adaptive Management Work Group Draft Meeting Minutes

Wednesday, September 20, 2017

Start Time: 8:30 am

Chair: Brent Rhees, Alternate Secretary's Designee

Facilitator: Mary Orton, The Mary Orton Company, LLC

Recorder: Lauren Johnston, Galileo Project, LLC

Summary Actions

- Pending comments from AMWG committee members by October 5, 2017, Reclamation will close action items *2006.Dec.02* and *2012.Aug.01*.
- At its next meeting, AMWG will consider a process for working with DOI to (a) update and streamline AMP guiding documents to be consistent with the LTEMP and (b) to develop monitoring metrics for the goals and objectives outlined in the LTEMP ROD.
- The Pueblo of Zuni requested government-to-government consultation in the event Reclamation chooses to schedule an HFE for November 2017.
- GCMRC agrees to continue monitoring of adult HBC below Diamond Creek.
- GCMRC agrees to add monitoring for non-native mussels into current efforts.
- Arizona Game and Fish Department pledged to help address the budget shortfall in support of continued data collection.
- Reclamation will update GCDAMP Project C to include complementary language to that included in GCMRC Project N.
- AMWG will solicit expertise to address the group on hydropower in the greater context of regional energy.
- Colorado will submit a letter clarifying its position on Basin Fund expenditures and budget dissent.
- Due to her pending retirement, Lynn Jeka requested her name be removed from reappointment and replaced with Brian Sadler as the AMWG representative for WAPA.
- The next AMWG meeting is tentatively set for February 14-15, 2018 in Phoenix, Arizona.

Motions

Motion to Approve February 2017 Meeting Minutes

AMWG approved minutes from the previous meeting held February 15-16, 2017.

Steve Wolff moved, Vineetha Kartha seconded

MOTION PASSED BY CONSENSUS

Motion: AMWG recommends to the Secretary of the Interior the Glen Canyon Dam Adaptive Management Program Triennial Budget and Work Plan—Fiscal Years 2018-2020 (September 11, 2017 draft) with the following changes:

- Add to GCMRC project elements C4, D1, and F3: "All work associated with this element shall be designed to address matters related to dam operations or mitigation for dam operations."
- Add to Project J.1: "GCMRC staff will continue to work with the tribes to ensure this element will be beneficial to tribes as well as to the GCDAMP."

Chris Harris moved, Larry Stevens seconded

MOTION PASSED BY CONSENSUS

Recreational Anglers' Motion As Originally Proposed:

"The AMWG recommends that the Secretary of the Interior defer a HFE in the fall of 2017 based on new information from the US Geological Survey that repeated fall High Flow Experiments since 2012 may have contributed to recent increases in the brown trout population and deterioration of the aquatic food base in the Colorado River below Glen Canyon Dam. An increase in brown trout and a deteriorated aquatic food base pose a serious threat to the endangered humpback chub and the Lees Ferry blue ribbon rainbow trout fishery."

John Hamill moved, Larry Stevens seconded

MOTION WITHDRAWN

Final Recreation Anglers' Motion

"AMWG informs the Department of the Interior that it has concerns about the risks posed by brown trout to native fish (including the endangered humpback chub) and the rainbow trout fishery, and the potential connection between recent increases in brown trout catches and fall HFEs. AMWG encourages a decision-making process for the 2017 Fall HFE that considers all the new data from the brown trout workshop, and requests that the decision-making process give due weight to the risks associated with the possible expansion of brown trout when deciding whether a HFE should be conducted. AMWG also encourages the due consideration of tribal concerns in this decision-making process."

John Hamill moved, Larry Stevens seconded

MOTION PASSED BY CONSENSUS

Administration. A quorum was met with 23 of 24 voting members (including two on the telephone) present. Mr. Rhees introduced Ms. Andrea Travnicek, Deputy Assistant Secretary for Water and Science and Acting ASWS.

- FACA committees within the DOI are currently under review. During the review, committee and subcommittee meetings and activities were suspended. Reclamation received a waiver to resume AMWG subcommittee activities to prepare for this meeting and the BT workshop that follows it. The suspension of FACA committee and subcommittee meetings and activities ended September 1, 2017. While FACA meetings have resumed, the DOI review is ongoing.
- Brenda Burman has been nominated for Commissioner of the Bureau of Reclamation but has not yet been confirmed.
- The new AMWG charter was signed on September 18, 2017 and filed on September 19, 2017, with the following changes from the previous charter:
 - The positions of DFO and Secretary's Designee will now be held by two different federal employees: the Secretary's Designee will continue to be the DOI ASWS, and the DFO will be the Regional Director of the Bureau of Reclamation Upper Colorado Region. Brent Rhees is the current DFO as well as the Alternate Secretary's Designee. (The Secretary has not yet appointed an ASWS or Secretary's Designee.)
 - Operating costs to manage the committee has been reduced from \$600,000 to \$400,000 per year.
 - FTEs to support the committee have been reduced from five to four.
 - Membership and alternate appointments will last for three years (previously, appointments lasted 4 years).
 - The process for soliciting nominations and finalizing appointees is still being determined and will probably include a Federal Register notice to solicit interest in serving on the committee. Reclamation will ensure that the Tribes and the States retain sovereignty in designating their AMWG representatives.
Under new DOI FACA procedures, Reclamation will submit a report within 30-days after each AMWG meeting, rather than one annual report to the Secretary.

These changes bring AMWG into alignment with other FACA groups around the country. The changes in funding and FTEs should not affect how the committee functions. The new Charter will be distributed to the AMWG mailing list.

- Action Item Tracking Report. Reclamation recommends closing action items *2006.Dec.02* and *2012.Aug.01*. AMWG members who believe there are elements within those items that could be acted upon in the coming year are invited to let Dr. Grantz know within the next two weeks. [Attachment 1: Action Item Tracking Report](#)
- Progress on Nominations and Re-Appointments. The following 16 nominations and re-appointments are in process. The paperwork may need to be re-submitted based on the new appointment process from DOI.

Nominations (new appointments) in process (alphabetical order):

Richard Begay, AMWG member, Navajo
Carlee Brown, AMWG alternate, Colorado
Clint Chandler, AMWG member, Arizona
Jessica Neuwerth, AMWG member, California
Peggy Roefer, AMWG alternate, Nevada
Kim Yazzie, second AMWG alternate, Navajo

Re-appointments in process (alphabetical order):

Cliff Barrett, AMWG alternate, UAMPS
Gary Cantley, AMWG alternate, BIA
Kerry Christensen, AMWG alternate, Hualapai
Leslie James, AMWG member, CREDA
Lynn Jeka, AMWG member, WAPA
Vineetha Kartha, AMWG alternate, Arizona
Chip Lewis, AMWG member, BIA
David Nimkin, AMWG member, NPCA
Ted Rampton, AMWG member, UAMPS
Brian Sadler, AMWG alternate, WAPA

Basin Hydrology and Dam Operations – Mr. Davidson. Lake Powell elevation is up 14 feet from last year at this time, to 3635.8 feet. Reclamation anticipates a release of 9.0 maf from Lake Powell in WY 2017, which fits within the Upper Elevation Balancing Operating Tier. The goal of this operating regime is to balance Lake Powell and Lake Mead contents by the end of the WY. The same operating tier is anticipated for WY 2018. The most recent science suggests that a fall HFE in 2017 is not likely, barring a significant sediment input event before the HFE technical team reviews relevant science to recommend whether or not to initiate a fall 2017 HFE.

Discussion/Q & A

- Approximately 200,000 metric tons of sand would be needed to trigger a minimum 1-hour HFE, potentially more to prevent a negative sand budget. As of this meeting, that trigger has not been met.
- While actual monthly dam releases may differ from the monthly targets, Reclamation aims to keep the same general monthly release distribution. In the end, hydrology dictates what is released and when.
- GCMRC is monitoring current resource conditions and will be monitoring future conditions after the fluctuating flow factors and adjusted ramp rates are implemented on October 1, 2017. This information can help determine how different flow regimes could affect select resources. GCMRC has the data in hand to evaluate effects of the new flow fluctuation factors and flow fluctuation cap on sand resources.

[Attachment 2: Agenda Information Form and Basin Hydrology and Dam Operations PowerPoint](#)

Overview: Proposed Motion from Recreational Fishing Representatives – Mr. Hamill and Mr. VanderKooi. These two presentations were made in order to help the members prepare to address the proposed motion from the Recreational Fishing Representatives in the afternoon.

- Mr. Hamill. Recreational anglers are concerned the increase in BT in Lees Ferry is affecting HBC, aquatic insect, and RBT populations. The community around Lees Ferry relies on the blue ribbon RBT fishery. Angler interests request foregoing a fall HFE in 2017 in an effort to curb BT abundance in the Colorado River. John Hamill and others purport the fall HFEs have been the cause behind the observed increase in BT abundance in the CRE. Mr. Hamill expressed that spring HFEs more closely reflect natural conditions in the CRE and could have positive impacts on sand budgets and protection of archaeological sites. The positive foodbase impacts experienced from the spring 2008 HFE might also be repeated in the event that the GCDAMP switch its focus to spring HFEs.
- Mr. VanderKooi. GCMRC acknowledges there is some correlation between fall HFEs and recent increases in BT, but believes there is inadequate evidence at this time to identify that fall HFEs are the sole causal factor for the increase in BT. GCMRC views the decrease in RBT is a separate issue from the timing of HFEs. The data show fall HFEs have a neutral to potentially slightly detrimental impact on the aquatic foodbase. The scientific understanding of the relationship between RBT and HBC is evolving. The relation between juvenile HBC survival and RBT densities has been described with survival rates decreasing as RBT density increases. RBT impacts on HBC populations downstream may not be as detrimental as initially thought. GCMRC recognizes the experimental value of a spring HFE and acknowledges that HFEs conducted outside of existing compliance provided by the LTEMP ROD are a policy decision, not a scientific decision.

[Attachment 3](#): *Agenda Information Form and Proposed Motion from Recreational Fishing Representatives*

FY 2018-2020 Triennial Budget and Work Plan – Overview, Discussion, and Recommendation – Mr. Shanahan, Dr. Grantz, Dr. Braun, Mr. VanderKooi

- TWG Budget Recommendations – Mr. Shanahan reviewed the TWG’s process, recommendations, and challenges in finalizing the recommendation for the GCMRC Project budgets (Budget Shanahan). Mr. Dahl presented NPCA’s minority opinion that explained his vote not to approve the budget, citing lack of time to discuss project goals, reach voting consensus, and understanding of budget limits. Colorado wants a clearer tie between Basin-Funded GCMRC actions and GCPA goals and wrote an explanatory memorandum to that effect (Attachment 4d).
[Attachment 4a](#): *Agenda Information Form and FY2018-20 Triennial Budget and Work Plan*
[Attachment 4b](#): *TWG Input on the Triennial Budget and Work Plan PPT*
[Attachment 4c](#): *Minority Opinion Report on the Budget Resolution Aug. 31, 2017, GCDAMP Technical Work Group Meeting.*
[Attachment 4d](#): *Memo from State of Colorado dated Sept. 12, 2017, Subject: Colorado’s Comments on the Final Draft of the GCDAMP TWP*
- Reclamation Budget Overview – Dr. Grantz. The GCDAMP budget was developed based on the goals of the 2016 LTEMP ROD with updates to further compliance with the NHPA, and experimental contingency funds to further protect the HBC. They worked with an assumed 1% CPI. Reclamation made all TWG-recommended changes to the GCDAMP budget. The Reclamation annual budget total is approximately \$2.2 million.

[Attachment 4e: Reclamation's FY18-20 Triennial Budget and Work Plan PPT](#)

- Science Advisors Program Overview – Dr. Braun. The Science Advisors Program, directed by David Braun with Sound Science, LLC, provides neutral feedback on budget proposals and GCMRC experiments and monitoring regularly throughout the year. The Science Advisors Program budget also includes one to two independent review panels over the three-year workplan as well as a knowledge assessment once in the three year cycle.

[Attachment 4f: Science Advisors program FY18-20 Work Plan and Budget PPT](#)

- GCMRC Budget Overview–Mr. VanderKooi. The GCMRC budget was developed based on research and monitoring of the eleven resource goals identified in the 2016 LTEMP ROD and Science Plan. GCMRC incorporated all TWG-recommended budget changes with the exception of the recommendation to remove Element D4 from the budget. Mr. VanderKooi expressed GCMRC's responsibility to ensure they are addressing all resource goals identified in the LTEMP and that includes monitoring impacts to archaeological and cultural resources. GCMRC is facing budget challenges as USGS prepares to move to a new, but yet to be built, facility; the expected increase in overhead due to higher lease costs has been included in the budget.

[Attachment 4g: GCMRC FY 2018-20 Triennial Workplan and Budget PPT](#)

Discussion/Q & A

- Science Advisors were identified in the Grand Canyon Protection Act (GCPA) and provide feedback on the overall GCDAMP as well as the GCMRC-specific projects.
- Mr. VanderKooi clarified that cultural sites are known and monitoring is ongoing, and offered to discuss sites of interest with tribes as needed.
- Colorado's requested language additions to project elements C4, D1, and F3 (approved in the motion noted on page 1) were offered to address concerns that Basin Fund should be used for projects that address matters related to dam operations or mitigation for dam operations.
- GCRG asked what specifically about those projects did Colorado feel was not related to dam operations. Colorado reiterated its point, restating its opinion that the projects were not related to dam operations and therefore were outside the authorities of the GCPA.
- Ms. James echoed Colorado's comments that Basin Fund revenues should not be used for regular management actions, or actions under the LTEMP that are not tied directly to dam operations (such as visitor use, section 106 outside the CRE).
- The Navajo Tribe stressed dam operations are part of the ecosystem within the Grand Canyon and, as such, affect the entire system.
- Several AMWG members agreed Basin Fund expenditures need to clearly align with GCPA and LTEMP ROD goals. Reclamation clarified the projects they support help GCMRC provide baseline data that informs Glen Canyon Dam flow operations, and are, as such, related to the GCPA and the LTEMP ROD.
- The LTEMP ROD is complete, yet monitoring metrics and long-term ecosystem goals are still not clear. Identifying monitoring metrics and an ecosystem perspective should be discussed further.
- Mr. deVos noted that some monitoring trips by AGFD had been cut to meet budget constraints, and said his agency would make up the shortfall with their current staff.

Action Taken

After discussion, AMWG reviewed and approved the GCDAMP Triennial Work Plan and Budget for FY2018-2020. See the "Budget Motion" on Page 1 of these notes and the proposed budget (September 11, 2017 version) for additional details.

In addition to the two amendments to the September 11, 2017 version of the budget that were approved as part of the motion, the following items were also considered during this agenda item:

- There should be a mechanism to develop a 20-year plan to articulate what we hope to achieve at the end of 20 years of LTEMP.
 - After discussion, AMWG agreed that this could be addressed at the next AMWG meeting.
- GCMRC should include adult HBC sampling below Diamond Creek.
 - Mr. VanderKooi said GCMRC reported on this at the Annual Reporting Meeting in January 2017, and would continue to do so. The group agreed that this did not need to be part of the budget motion.
- Reclamation should add language to the introduction of Reclamation's Project C that is complementary to GCMRC Project N language: "working with collaborators, Reclamation, and others..."
 - Dr. Grantz agreed to do so. The group agreed that this did not need to be part of the budget motion.
- Project N needs clarification, and there needs to be a conversation about hydropower in the broader context of the GCDAMP.
 - There was a desire to broaden the scope of what is being considered, including looking at hydropower in the larger context of energy production in the region. Mr. Rhees committed that AMWG would have outside speakers on this subject. The group agreed that this did not need to be part of the budget motion.
- GCMRC should add to an existing project, the monitoring of non-native mollusks distribution at tributary mouths, with no new expenditures.
 - Mr. VanderKooi said GCMRC could accomplish this as part of ongoing activities without adding to the budget.

Joint Tribal Liaison Report – Ms. Pasqual. Tribes want to maintain tribal lands. Current science used to capture impacts of GCDAMP actions on tribes and resources important to tribes is not effective. Loss of internal tribal funds continues to strain tribal participation in the GCDAMP and could limit future participation.

[Attachment 5: Agenda Information Form and Joint Tribal Liaison PPT](#)

Non-Native Fish Update – Mr. Billerbeck. NPS management actions to control green sunfish in the Glen Canyon National Recreation Area have been effective so far, but more research and engineering is needed to inform a long-term solution. The controls employed so far have resulted in a marked reduction in green sunfish. NPS is developing an Environmental Assessment (EA) for an Expanded Non-Native Fish Management Plan. NPS plans to use the whitepaper developed by the GCMRC and external experts as best available science in developing the EA. A workshop to discuss BT management concerns is scheduled for Sept. 21-22, 2017, immediately following this AMWG meeting.

[Attachment 6: Agenda Information Form and Non-Native Fish Update, and Expanded Non-Native Fish Management Project Background PPT](#)

Discussion/Q & A

AGFD is discussing whether or not to stock RBT to maintain the economic benefits of the Lees Ferry fishery. This would be a connected action under the NPS EA.

2017 High Flow Experiment Update – Dr. Grantz. There is currently not enough sediment to trigger a Fall 2017 HFE. The decision steps and timeline are available for review in the HFE Update Grantz presentation. The DOI Assistant Secretary for Water and Science makes the final decision on whether to implement an HFE. GCMRC noted that HFEs are a tool to manage finite sand resources downstream of Glen Canyon Dam and rebuild beaches and sandbars. Differences between the sand budget model results and field data suggest a potential model recalibration is needed. A review of the status of fish and sand resources as well as action triggers for the HBC can be found in the HFE Update VanderKooi presentation.

[Attachment 7a](#): *Agenda Information Form and 2017 High Flow Experiment Update and PPT*

[Attachment 7b](#): *Status of Fish and Sand Resources Related to Potential High Flow Event PPT*

Proposed Motion from Recreational Fishing Representatives – Mr. Hamill. Some groups do not feel they have a voice in the HFE decision process. Anglers are concerned a BT population will establish in the mainstem of the Colorado River, at which point they will be impossible to eradicate. Hamill feels deferring a fall HFE this year will prevent continued increases in BT abundance. The LTEMP ROD embraces adaptive management. Deferring a Fall HFE for one year is an opportunity to adapt to current conditions.

Discussion/Q & A

- While the scope of this motion is to defer for one year, several members agree additional research into a shift to spring HFEs is warranted.
- Pueblo of Zuni reiterated that the taking of life in the Grand Canyon is a major tribal concern. Consultation with tribes does not amount to mitigation for this impact.
- Some opposed to the motion noted that the decision-making process for conducting an HFE already takes into consideration all relevant science and resource goals. In addition, uncertainty in whether there is causal relationship between HFEs and the recent increases in BT should be given due weight and new data should be considered.
- There were no public comments on the motion.
- See Recreational Anglers Motion on Page 2 for the initial proposed and final passed motion.

Public Comment: None

Meeting Adjourned: 5:30 pm

Meeting Attendees

AMWG Committee Members and Alternates

Melinda Arviso-Ciocco, Navajo Nation

Jan Balsom, NPS/GRCA

Eric Bobelu, Pueblo of Zuni

David Brown, Grand Canyon River Guides

Charley Bullets, Southern Paiute Consortium
(on phone)

Kathleen Callister, USBR

Chris Cantrell, AGFD

Kevin Dahl, National Parks Conservation
Association

James DeVos, AGFD

John Hamill, Trout Unlimited

Jayne Harkins, State of Nevada

Chris Harris, California

Dawn Hubbs, Hualapai Tribe

Vineetha Kartha, State of Arizona

Leigh Kuwanwisiwima, The Hopi Tribe

Christine Lehnertz, NPS/GRCA

Chip Lewis, BIA

John McClow, Colorado (on phone)

Eric Millis, Utah

David Nimkin, National Parks Conservation
Association

Don Ostler, New Mexico

Daniel Picard, USBR

Ben Reeder, Grand Canyon River Guides

Brent Rhees, Reclamation
Brian Sadler, WAPA
Steve Spangle, USFWS

Larry Stevens, Grand Canyon Wildlands
Council
Andrea Travnicek, DOI
Steve Wolff, State of Wyoming

USGS and GCMRC Staff

Scott VanderKooi
Lucas Bair
Charles Yackulic
Ted Kennedy
David Ward

Mike Moran
Helen Fairley
Joel Sankey
David Lytle

Interested Persons

Mark Anderson, GLCA
Rob Billerbeck, NPS
David Braun, Sound Science, LLC
Carlee, Brown, Colorado Water Conservation
Board
Shane Capron, WAPA
Bill Chada, Bureau of Reclamation
Marianne Crawford, USBR
Paul Davidson, USBR
Kurt Dongoske, Pueblo of Zuni
Grace Ellis, Galileo Project, LLC
Scott Garlid, Trout Unlimited
Katrina Grantz, USBR
Jessica Gwinn, USFWS
Rabi Gyawali, ADWR
Corinne Horner, USBR
Ken Hyde, GLCA

Lauren Johnston, Galileo Project, LLC
Stewart Koyiyumptewa, The Hopi Tribe
Ryan Mann, AGFD
Mary Orton, The Mary Orton Company, LLC
Theresa Pasqual, DOI
Bill Persons, public
Sarah Rinkevich, DOI
Peggy Roefer, State of Nevada
Seth Shanahan, Southern Nevada Water
Authority
William Shott, NPS/GLCA
Rodney Smith, DOI
Shana Tighi, USBR
Melissa Trammel, NPS
Richard Valdez, SWCA
Linda Whetton, USBR

Abbreviations

ADWR – Arizona Dept. of Water Resources
AF – Acre Feet
AGFD – 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
ASWS – Assistant Secretary of Water and Science (DOI)
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
BT – Brown Trout
BWP – Budget and Work Plan
CAHG – Charter Ad Hoc Group
CAP – Central Arizona Project
CESU – Cooperative Ecosystems Studies Unit

CFMP – Comprehensive Fisheries Management Plan
cfs – cubic feet per second
CMINS – Core Monitoring Information Needs
CMP – Core Monitoring Plan
CPI – Consumer Price Index
CRAHG – Cultural Resources Ad Hoc Group
CRBC – Colorado River Board of California
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
DFO – Designated Federal Officer
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
FTE – Full Time Employee
FWS – United States Fish & Wildlife Service
FY – Fiscal Year (October 1 – September 30)
GCD – Glen Canyon Dam
GCDAMP - Glen Canyon Dam Adaptive Management Program
GCES – Glen Canyon Environmental Studies
GCMRC – Grand Canyon Monitoring & Research Center
GCNP – Grand Canyon National Park
GCNRA – Glen Canyon National Recreation Area
GCPA – Grand Canyon Protection Act
GCRG – Grand Canyon River Guides
GCWC – Grand Canyon Wildlands Council
GLCA – Glen Canyon National Recreation Area
GRCA – Grand Canyon National Park
GSF – Green Sunfish
HBC – Humpback Chub (endangered native fish)
HFE – High Flow Experiment
HMF – Habitat Maintenance Flow
HPP – Historic Preservation Plan
IG – Interim Guidelines
INs – Information Needs
KA – Knowledge Assessment (workshop)
KAS – Kanab Ambersnail (endangered native snail)
LCR – Little Colorado River
LCRMCP – Lower Colorado River Multi-Species Conservation Program
LTEMP – Long-Term Experimental and Management Plan
LTEP – Long Term Experimental Plan
MA – Management Action
MAF – Million Acre Feet
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
Reclamation – United States Bureau of Reclamation
RFP – Request for Proposal
RINs – Research Information Needs
ROD Record of Decision
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
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 – GCDAMP Technical Work Group
UAMPS – Utah Associated Municipal Power Systems
UCRC – Upper Colorado River Commission
UDWR – Utah Division of Water Resources
USBR – U.S. Bureau of Reclamation
USFWS – United States Fish & Wildlife Service
USGS – United States Geological Survey
WAPA – Western Area Power Administration
WY – Water Year