

Glen Canyon Dam Adaptive Management Work Group Meeting
February 22-23, 2012

Conducting: Anne Castle, Secretary's Designee
Facilitator: Mary Orton (The Mary Orton Company, LLC)

Start Time: 9:30 a.m.

Committee Members/Alternates:

Perri Benemelis, State of Arizona
Charley Bullets, Southern Paiute Consortium
Kurt Dongoske, Pueblo of Zuni
Alan Downer, Navajo Nation
Jennifer Gimbel, State of Colorado
Ann Gold, U.S. Bureau of Reclamation
Jayne Harkins, State of Nevada
Chris Harris, State of California
Amy Heuslein, Bureau of Indian Affairs
Loretta Jackson-Kelly, Hualapai Tribe
Leslie James, CREDA
Sam Jansen, Grand Canyon River Guides

John Jordan, Federation of Fly Fishers
Leigh Kuwanwisiwma, Hopi Tribe
LaVerne Kyriss, Western Area Power Admin.
Nikolai Lash, Grand Canyon Trust
Estevan López, State of New Mexico
Ted Rampton, UAMPS
John Shields, State of Wyoming
Sam Spiller, U.S. Fish and Wildlife Service
Larry Stevens, Grand Canyon Wildlands Council
Dennis Strong, State of Utah
Bill Stewart, AZ Game and Fish Department
Dave Uberuaga, National Park Service (GRCA)

Committee Members Absent:

Arden Kucate, Pueblo of Zuni

Interested Persons:

Janet Bair, USFWS
Jan Balsom, NPS/GRCA
Peter Bungart, Hualapai Tribe
Shane Capron, WAPA/TWG Chair
Lori Caramanian, DOI
Kerry Christensen, Hualapai Tribe
Rick Clayton, USBR
Marianne Crawford, USBR
William K. Dickinson, NPS/Lake Mead NRA
Craig Ellsworth, WAPA
Evelyn Erlandsen, AZ Dept. of Water Resources
Helen Fairley, USGS/GCMRC
Dr. Dave Garrett, M³Research/Science Advisors
Martha Hahn, NPS/GRCA
John Halliday, DOI
Beverley Heffernan, U.S. Bureau of Reclamation
Jack Houck, Federation of Fly Fishers
Lisa Iams, U.S. Bureau of Reclamation
Bill Jackson, NPS/Water Resources
Lynn Johnson, Regional Solicitor, SW Region
Vineetha Kartha, AZ Dept. of Water Resources
Robert King, Utah Division of Water Resources
Glen Knowles, U.S. Bureau of Reclamation

Ted Kowalski, Colo. Water Conservation Board
Dennis Kubly, U.S. Bureau of Reclamation
Jane Lyder, DOI/Fish, Wildlife and Parks
Ted Melis, USGS/GCMRC
Gerald Myers, Federation of Fly Fishers
David Nimkin, NPCA
Don Ostler, Upper Colorado River Commission
Clayton Palmer, WAPA
McClain Peterson, Colorado River Comm./NV
Larry Riley, Arizona Game and Fish Department
Jack Schmidt, USGS/GCMRC
Mark Sogge, USGS
Pam Sponholtz, USFWS
Justin Tade, DOI SW Regional Solicitor's Office
Jason Thiriot, Colo. River Commission/Nevada
Dave Trueman, USBR
Scott Vanderkooi, USGS/GCMRC
Keith Waldron, U.S. Bureau of Reclamation
Larry Walkoviak, U.S. Bureau of Reclamation
Martha Williams, DOI Solicitor's Office
Barry Wirth, U.S. Bureau of Reclamation
Michael Yeatts, Hopi Tribe

Recorder: Linda Whetton, USBR

Welcome and Administrative. Ms. Anne Castle welcomed the members and the public.

1. Introductions were made and a quorum was determined.
2. Approval of August 24-25, 2011, Meeting Minutes. Motion moved by John Shields and seconded by Larry Stevens. Without objection, the minutes were approved by consensus.
3. Action Item Tracking Report. (**Attachment 1**). This report was reviewed and updated by Mary Orton and Lori Caramanian. A rationale was provided for each older action item that was proposed for closure.

ACTION ITEM: AMWG Members will provide feedback on items proposed for closure on the Action Item Tracking Report to Linda Whetton (lwhetton@usbr.gov) by close of business Friday, March 9, 2012.

4. AMWG Operating Procedures. Following up on a motion passed at the February 2011 meeting, Ms. Castle distributed the new operating procedures (**Attachment 2**) and noted two significant changes: (1) A revision to paragraph 6 states that “any motions proposed by any member in meetings must be related to an agenda topic, and will be considered only if a simple majority of members present agree to hear it,” and (2) In order to pass a motion if efforts at consensus fail, the supermajority was reduced to 60% from two-thirds.

ACTION ITEM: AMWG members will provide any comments they have on the revised AMWG Operating Procedures to Linda Whetton (lwhetton@usbr.gov) by Friday, March 9, 2012.

5. Response to Recommendation to the Secretary (**Attachment 3**) Ms. Castle said the two recommendations from the August 2011 meeting - for a proposed 2012 hydrograph and the FY2012 budget and workplan - were accepted by the Secretary.
6. Legislative Update. Mr. Glen Knowles provided the following updates:
- S.224, Bureau of Reclamation Fish Recovery Program Re-authorization Act. This would authorize appropriations for the Upper Colorado River Recovery Program and the San Juan Recovery Program for fiscal year 2012-2023 for base funding above the continued use of power revenues collected under the CRSP Act for operation, capital projects, and monitoring. This bill is still in committee on Energy and Natural Resources subcommittee on water and power.
 - S2109, Navajo-Hopi Little Colorado River Water Rights Settlement Act of 2012. This bill would approve the settlement of water rights claims of the Navajo Nation, the Hopi Tribe, and the allottees of the Navajo Nation and Hopi Tribe in the State of Arizona, to authorize construction of municipal water projects relating to the water rights claims, to resolve litigation against the United States concerning Colorado River operations affecting the States of California, Arizona, and Nevada, and for other purposes. The bill was approved by the Senate Committee on Indian Affairs.
 - H.R.1719, Endangered Species Compliance and Transparency Act, was referred to the House Committee on Natural Resources and a subcommittee on Water and Power in May 2011. The Act would require that WAPA and other power administrations report on estimates of each customer's share of the direct and indirect costs of ESA compliance. It would also direct the commissioner of Reclamation and any other federal agency to assist in identifying costs and require WAPA to submit an annual report of such costs to Congress. This bill is still in the House Natural Resources Subcommittee on Water and Power.
 - H.R. 1144, Transparency and Openness in Government Act, was referred to the House Committee on Oversight in Government Reform in March. This would amend the FACA to require appointments be made without regard to political affiliation or activity. It would also require agency heads to make specific information about FACA committees available on their websites and require the comptroller general to review compliance by agencies with FACA. This is still in the House Oversight and Government Reform Subcommittee.
 - H.R. 3124, Federal Advisory Committee Act Amendments of 2011. This bill would amend the Federal Advisory Committee Act to increase the transparency of Federal Advisory committees, and for other purposes. This bill is in the House Oversight Government and Reform Committee House Ways and Means Subcommittee.
 - Southwest Willow Flycatcher Update. On August 15, 2011, the FWS proposed revised critical habitat for the Southwest Willow Flycatcher. The proposed revision identifies 2,090 stream miles throughout the southwest for critical habitat for the SWWF. One segment is near the geographic boundaries of the GCDAMP. There is a segment that extends from the middle of Lake Mead about 46 miles upstream to RM 243. The lower geographic boundary of the GCDAMP and the upper boundary of the Lower Colorado Multi-species Conservation Program is RM 240, so essentially none of the critical habitat that's proposed for revision comes within the geographic boundaries of the GCDAMP. The comment period ended in October 2011. The FWS is supposed to complete a final review by July 31, 2012, according to a settlement agreement.
7. Litigation Update. Mr. Bob Snow reported on the status of the lawsuit of Grand Canyon Trust v. the U.S. Bureau of Reclamation, which has been appealed to the Ninth Circuit Court of Appeals. The Ninth Circuit expedited oral arguments but a date has not been set. [Now scheduled for June 11, 2012.] The Ninth Circuit issued an order stating it would not allow further discovery on the new

Biological Opinion but would ask the issues raised be addressed by the panel that ultimately hears the case. At that time, the court will review not only the AOP claims and the 5-year experimental plan claims, but also the effect of the new Biological Opinion.

8. **Progress on Nominations.** Ms. Castle welcomed the following individuals: Jayne Harkins (new member, state of Nevada), David Uberuaga (new member, NPS/GRCA), and David Nimkin (new alternate, Grand Canyon Trust). The nominations of Larry Riley as the AMWG member for Arizona Game and Fish Department, and Chris Harris as alternate for the State of California, are in process. The following TWG appointments were announced: Kevin Dahl and Meghan Trubee (alternates for Grand Canyon Trust).

Desired Future Conditions. (**Attachment 4** = AIF) At the August 2011 AMWG meeting, the Desired Future Conditions (DFCs) Ad Hoc Group was reconstituted, with co-chairs Larry Stevens and Perri Benemelis, and charged with reviewing the DFCs with a focus on changes made to the DFCs by the federal agencies. The group completed its assignment and a copy of the report was sent to the AMWG on January 23, 2012. Only two non-consensus issues remain: #2, Additional CRE information text to add; and #3, Funding responsibility for extirpated species. Also, text on the history of the DFC effort was added to Attachment A on page 19 in response to a request from Ms. Castle.

In addressing the first issue, Dr. Stevens said additional text suggested for the CRE Additional Information, Linkages section was offered by the State of Colorado (underlined text is the proposed addition):

“In addition to physical and biological interactions, the CRE is linked to Native American cultural resources such as archeological and cultural properties. Recreation benefits have resulted from both dam operations and healthy ecosystem conditions. It is critical to recognize the linkage between the body of law known as the “Law of the River,” the 1992 GCPA, laws pertaining to the NPS, and these DFCs. The “Law of the River” defines how the Secretary of the Interior must operate Glen Canyon Dam for water storage, water management, river regulation and hydropower. The ability to achieve the DFC’s identified herein depends in large part on the ability of the Secretary of Interior to find an appropriate balance given the competing legal mandates within the operational flexibility those laws provide.”

Ms. Benemelis said the second and more contentious non-consensus issue was disagreement among the stakeholders over responsibility for funding the restoration of extirpated native fish and non-fish species. Language referencing Goal 3 in the AMP Strategic Plan was inadvertently omitted from the final November 2010 DFCs forwarded to the Secretary from the DFCAHG. The proposed additional language, about which there was not consensus, was as follows:

“Restoration of extirpated species should be guided by Goal 3 of the GCD AMP Strategic Plan and AMWG agreements from its August 2003 meeting, and such activities are not to be funded by the Adaptive Management Program. While AMP funding may not be used for such activities, AMWG may still advise the Secretary about the feasibility of reintroduction activities, and may request monitoring and information integration about such reintroduction activities.”

Ms. Benemelis noted that while some are opposed to the AMP funding those activities, she believes the recommendation can go forward without resolution. If an action is proposed in the AMWG for reintroduction of extirpated species, then the issue will need to be resolved.

Ms. Castle clarified that the entire document, including the background section and the discussion of non-consensus issues, would go to the Secretary. The DFCs will not supersede the AMP Strategic Plan, but the DFCs may result in action taken by the Secretary.

Ms. Castle said there would need to be closure on the qualitative DFCs before going into the second phase of quantitative DFCs. One issue is the considerable amount of resources that would be needed from all stakeholders, and those same resources will be devoted to the LTEMP process. For a variety of reasons, she said it is not appropriate to delay the LTEMP process for a conclusion on the DFCs. She referred the members to the proposed motion in the AIF and asked for any concerns.

The following comments were noted:

- There are no verbs in the “Nonfish Biotic Communities” and “CRE Riparian Domain” sections on page 6. It is not clear what is supposed to happen. Can the word “restore” be inserted?
 - Ms. Lyder said because the group disagreed about using words like “restore, maintain, and improve,” she edited the section by removing the verbs. She said the objective was to identify the desired condition and not the action.
- There are 12 separate goals identified in the AMP Strategic Plan, and extirpated species should not be treated differently from the other goals. There should not be prohibitory language that would make it difficult to work on this issue.
 - Ms. Lyder said for the sake of completeness in the document, they chose to include extirpated species. The issue of “in or out” for some items will come up when they actually start to bring the items forward.
 - Ms. Orton reminded the AMWG they passed a motion in August 2003 making it clear that that one Information Need under Goal 3 (extirpated species) would not be accomplished by the GCMRC or paid for with AMP funds.
- Under Metrics on page 4, there should be mention of tribal monitoring.
- Tribal river recreation should be mentioned in the section on \ recreation DFCs (page 14, and page 16 under Metrics).
- While the State of Colorado can live with “Law of River” language in the appendix, the issue of including more language in the document was an important issue for the state.
 - Ms. Caramanian said it felt odd to put Law of the River language in the linkage for only one DFC. The background section includes the language from the court’s opinion about balancing a complex sediment interest. She felt citing Section 1802, a, b, and c in the background section strengthened the reference to the Law of the River, more than if it were isolated in one DFC.

Ms. Castle asked if there were any objections to passing the motion by consensus. Hearing none, the following motion was passed by consensus.

Motion (Proposed by Perri Benemelis, seconded by Larry Stevens): AMWG commends the Secretary of the Interior on his collaborative efforts to develop and clarify desired future conditions (DFCs) for the Colorado River ecosystem. AMWG recommends the attached review of the 24 August 2011 DOI DFC document, including the background information and discussion of non-consensus issues, to the Secretary for his consideration.

2013 Hydrograph Development. (**Attachment 5** = AIF and PPT). Mr. Dave Trueman reviewed the 2012 adopted hydrograph and the 2013 approach to hydrograph development. He noted that Reclamation expected equalization this water year and continues to make high equalization releases. If there had been a higher snowpack, there would have been more releases. The pattern of release will be more like 8.23 maf. They will present more information this summer on the 2013 hydrograph.

Farewell to Sam Spiller: Ms. Castle posed a “resolution upon the retirement of Sam Spiller” The resolution was adopted by consensus (**Attachment 6**). On behalf of the AMP, she thanked him for his many years of service and wished him well for the future. Ms. Balsom presented him with a gift in behalf of the NPS and Mr. Walkoviak gave him a picture, which was passed around for the group to sign. Mr. Spiller thanked everyone for their kind words and said it had been an honor working with so many dedicated people over the years.

TWG Chair Report, Part I: Socioeconomic Ad Hoc Group (SEAHG)

(**Attachment 7a** = AIF and PPT). Mr. Capron gave a PPT presentation, which provided background information on the SEAHG and the motion forwarded from TWG for consideration at today's meeting. Although this program would add considerable value to the AMP, it also has a substantial cost. This program, as envisioned, has implications with regard to the needs of the LTEMP EIS, as well as potential overlap with work being funded by the National Park Service. The implementation plan provides for a logical starting point for considering policy implications such as funding availability, overlap with other programs, and priorities for the AMP. Methods and detailed work plans would need to be developed, working with experts within and outside the program. In sum, the proposal provides the conceptual framework for a program that would be informed by policy and further refined.

Dr. Garrett gave a PPT presentation (**Attachment 7b**) outlining the proposed studies/activities, the related INs, and description of the activities. He noted that Ms. Castle had requested a first estimate of economic impacts and how the work would meld with the LTEMP EIS process, recognizing the timeline for the socioeconomic program is more long term. The SAs advised there might be a need to develop market and non-market analyses for all resources to inform the LTEMP EIS process. He reviewed Table 2, "Proposed Socioeconomic Plan for FY2012-2016, as recommended by the TWG Socioeconomic Ad Hoc Group (SEAHG)," in detail.

The following comments were recorded during discussion:

- There needs to be more clarity in the terms "market," "non-market," "use," and "non-use."
- A river economic analysis would provide better understanding of tradeoffs of flow variations.
- Decisions made without data and integrated into the LTEMP decision-making process could create problems.
- Because the tribes do not have the resources to engage in biological and natural sciences, will this effort create integration of existing data from the tribes in formulating conclusions?
- Rather than including specific dates, use "phase 1, phase 2," etc.

Ms. Castle felt there should be more discussion and a need to address the concerns. She said it would be important to have the socioeconomic analysis work for the LTEMP EIS process, and she expressed concern in accomplishing that in a timely manner. She asked if anyone wanted to make the motion.

Motion (Proposed by Larry Stevens, seconded by Jerry Myers): "AMWG recommends the SEAHG report to the Secretary of the Interior for consideration.

"After consideration by the Secretary and guidance from him regarding the role of the program in implementing socioeconomics studies, the AMWG directs the TWG to work with GCMRC to develop a workplan for this program.

"AMWG further directs TWG to, through the SEAHG, continue to provide, develop, and recommend information to the TWG regarding implementation of the socioeconomic program, including costs and timing of the program elements; and work with AMP stakeholders who will be conducting socioeconomic analyses in other forms to enhance collaboration to fulfill Information Needs."

Ms. Castle asked several members to work together to revise the motion to address members' concerns, and bring the language for consideration the next day.

TWG Chair Report, Part 2 (Attachment 7c = AIF and PPT).

Update on Fish Management Flows. Mr. Capron said the need for the AMP to develop non-native fish management flows and other actions was described in the Non-native Fish Control EA, as well as in the Biological Opinion as a reasonable and prudent measure and term and condition for humpback chub take. The TWG had a robust debate on next steps and the need to coordinate how the plan would fit into the NPS native fish management plan and the LTEMP EIS. Reclamation has agreed to consider the

plan, which would be developed by the TWG and then recommended by the AMWG in fulfillment of this commitment in the Biological Opinion. The TWG would establish an ad hoc group to facilitate the development of a plan that incorporates AMP stakeholders and other interested parties, such as the Marble Canyon business community. The ad hoc group was later disbanded on advice of DOI.

Mr. Uberuaga stated the National Park Service has an ongoing management plan for native and non-native fish downriver of Glen Canyon Dam in both the GCNRA and GCNP. He expressed concern his staff did not know anything about the TWG's intent to utilize an ad hoc group to feed into the Park's fish management plan until two weeks ago. He is committed to developing an open and transparent dialogue with all interested parties, and wants there to be an expectation of the AMWG as well. Ms. Castle added that it is Reclamation's job to carry out the directives in the BO. She suggested going to the Secretary is an unnecessary step, that that advice can be provided directly to Reclamation for its consideration.

Ms. Kyriss suggested a motion on this subject. The vote to consider a new motion was in favor by 16 ayes and 1 no. Several modifications were made to the motion, but because Mr. Walkoviak and Mr. Uberuaga expressed concerns regarding their respective responsibilities for the BO and the NPS fish management plan, the motion was tabled for further action at tomorrow's meeting.

Update on Humpback Chub Five-Year Status Report. The TWG was briefed by USFWS on progress made towards the recovery goals and the determinations in the review. In the HBC status review, the USFWS indicated progress has been made with regard to many of the criteria, while others, specifically the demographic criteria (population size and growth), have not been met.

Update on TWG Cultural Resources AHG. Pursuant to an AMWG motion passed at its August 2011 meeting, the TWG tasked the CRAHG to address the following issue: "How should the program fairly treat conflicts of cultural values, specifically those involving Native American perspectives; and how will tribal values be monitored and tracked in the AMP?" The CRAHG developed a draft report with the following recommendations regarding the first part of that issue:

- (1) AMWG/TWG should spend more time and effort at trying to achieve consensus among the stakeholders regarding issues,
- (2) Respect each other's perspective and position,
- (3) Listen – actually "hear" and understand what is being said, and
- (4) Acknowledge, accept, and respect philosophical differences that are represented by the various stakeholders regarding the ecosystem.

In response to the second part of the issue, the CRAHG offered the following:

- (1) Traditional ecological knowledge integration process should be initiated and integrated into GCMRC's science program,
- (2) Hold cultural sensitivity and/or training sessions,
- (3) Define metrics for determining success,
- (4) Consider holding meetings in Page or Grand Canyon National Park and do river trips with stakeholders and/or with tribal representatives,
- (5) Incorporate reflexivity into GCMRC's science program, and
- (6) Prepare an annual report that tracks efforts at sensitivity sharing of cultural values among stakeholders, tracks conflicts of cultural values that emerge within the program, and efforts at tribal consultation to resolve conflicts.

GCMRC Updates (**Attachment 8** = AIF and PPT). Dr. Schmidt provided updates on the Knowledge Assessment Workshops held in October 2011 and January 2012, current sediment and water quality conditions, and GCMRC's priorities for the next cycle of research and monitoring. He gave a PPT presentation, "Insights about the Colorado River Ecosystem," addressing two questions he feels most people are concerned about regarding Colorado River management:

- What is an appropriate rehabilitation goal for the physical habitat of the Colorado River—for the available sediment supply and the large-scale flow regime?
- How can a non-native trout sport fishery in Glen Canyon coexist with an endangered humpback chub population in Marble and Grand Canyons?

He explained how trout populations responded to various low and high flow experiments, the impact of warming on HBC, turbidity in the system, and how aquatic habitats and refugia areas respond to varying flow patterns. He also detailed sediment inputs to the system and effects on recreational areas.

Basin Hydrology and Operations. (**Attachment 9** = AIF and PPT). Mr. Rick Clayton said as of the day before, the snowpack above Lake Powell was at 73%, well below average but better than January. The reservoirs above Lake Powell are at normal operations. There is 5.1 maf of storage above Lake Powell, and 20.7 maf including Lake Powell.

The projected elevation for Lake Powell as of the August 24-month study last August was 3,646 maf, over a foot above the equalization trigger elevation, setting the operational tier for WY 2012 to equalization. There is no provision for shifting downward under dry conditions, but equalization is flexible and adjusts with changing hydrology within limits. If there were 8.5 maf of inflow this year, the release would be 9.46 maf. In a typical equalization year, there is a minimum release of 8.23 maf; however, because of carryover of some releases from 2011 into 2012, 2012 will have a higher minimum volume. There is uncertainty about inflows, so release volumes for the remainder of this water year are uncertain.

This September will be the last year of the steady flows experiment. Currently, the volume is 8,000 cfs based upon the amount of water remaining to be released this year.

Maintenance at Glen Canyon Dam. Mr. Clayton said there would be significant maintenance at the dam in March with five units available, and then seven units would be available until September. The range of fluctuations in February, and the most likely range for the next three months, is between 7,000-13,000 cfs.

He previewed the maintenance schedule for 2013. Unit 3 will be replaced in 2014. In response to a stakeholder concern, Reclamation will avoid maintenance during the high power-use months of December-January and July-August.

Release Temperatures. Based on a request from Dave Trueman, Mr. Clayton showed a slide depicting projected release temperatures for the remainder of the water year. Because of the high volume of the inflow during 2011, the release temperatures are significantly higher than would normally be expected.

FY 2013-14 Budget Workplan. (**Attachment 10a** = AIF and PPT) Mr. Capron reviewed the documents TWG would be using to develop the FY 2013-14 budget and provided a timeline for completing it:

- March – draft work plan to AS-WS for review, consider AMP comments
- Mid-March – BAHG review of draft budget
- April 16-17 – TWG review, technical issues to DOI and policy issues to AMWG
- April – post-TWG meeting response by DOI on technical issues
- May 10 – AMWG webinar to consider initial budget issues (policy)
- May (late) – BAHG to review work plan provided by DOI, response by DOI on technical issues
- June 20-21 – TWG recommendations to AMWG with policy issues
- August 29-30 – AMWG review and recommendation to the Secretary of the Interior

Reclamation Budget (**Attachment 10b**). Mr. Knowles said the Reclamation budget would be based in part on the two EAS, the FWS 2011 BO, and compliance with NHPA documents. He reviewed potential changes in specific line items: EFF Carryover, PA & Treatment Plan, AMWG facilitation contract, AMWG personnel costs, AMWG and TWG travel, and Compliance Documents.

GCMRC Budget (**Attachment 10c**). Dr. Schmidt said there would be significant carryover from the GCMRC budget into FY12. He reviewed the percentages allocated to each of GCMRC's programs. Based on a 3% CPI rate, the FY13 and FY 14 budgets are being developed at \$8.5M and \$8.8M, respectively.

TWG Budget Update (**Attachment 10d**). Mr. Capron said the TWG developed 51 issues of concern along with four policy issues. Two of the four policy issues relate to extirpated species, which the TWG requested AMWG to address.

Ms. Castle noted the TWG has been diligently avoiding a "Christmas Tree" budget, and asked Mr. Capron how that issue has been addressed. Mr. Capron said there are many issues DOI can consider but cautioned the program will not have the funds to do all the projects that all stakeholders desire. The TWG will not be able to work on the technical issues until they see DOI's budget.

Concerns:

- It is a difficult task of prioritizing goals and it would be easier if we had an ecosystem model to better understand what information is needed.
- What line item addresses the LTEMP EIS funding?
- There is a lack of tribal information. The tribe contributed to the original EIS and ROD, as did the Park Service and Reclamation, and feel those reports could help in the budget considerations.

Public Comment: None

Closing Remarks: In order to deal with the two proposed motions, Ms. Castle suggested rearranging the next day's agenda and addressing them before lunch.

Adjourned: 5:05P

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Conducting: Anne Castle, Secretary's Designee
Facilitator: Mary Orton (The Mary Orton Company, LLC)

Start Time: 8:10 a.m.

Committee Members/Alternates:

Perri Benemelis, State of Arizona
Charley Bullets, Southern Paiute Consortium
Kurt Dongoske, Pueblo of Zuni
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Committee Members Absent:

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Interested Persons:

Janet Bair, USFWS
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Rob Billerback, NPS
Karen Breslin, NPS
Peter Bungart, Hualapai Tribe
Daniel Bunk, USBR/Glen Canyon Dam
Tom Buschatzke, ADWR
Shane Capron, WAPA/TWG Chair
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David Nimkin, NPCA
Don Ostler, Upper Colorado River Commission
Clayton Palmer, WAPA
McClain Peterson, Colorado River Comm./NV
Glenn Rogers, Paiute Indian Tribe of Utah
Marty Rozelle, member of the public
Jack Schmidt, USGS/GCMRC
Pam Sponholtz, USFWS
Ronica Spute, Kaibab Band of Paiutes
Justin Tade, DOI SW Regional Solicitor's Office
Jason Thiriot, Colo. River Commission/Nevada
Dave Trueman, USBR
Scott Vanderkooi, USGS/GCMRC
Keith Waldron, U.S. Bureau of Reclamation
Larry Walkoviak, U.S. Bureau of Reclamation
Dave Weedman, Arizona Game and Fish Department
Martha Williams, DOI Solicitor's Office
Barry Wirth, U.S. Bureau of Reclamation
Michael Yeatts, Hopi Tribe

Recorder: Linda Whetton, USBR

Introductions and Administrative. Ms. Anne Castle noted that the new AMWG Charter designates DOI AMWG representatives as non-voting. She said that in her view, non-voting members should not

propose motions, but can participate in discussions about motions and propose amendment language and alternate motions. Members were invited to let her know of concerns.

Report on Two Environmental Assessments. (Attachment 11a = AIF).

Report on HFE Protocol EA (Attachment 11b). Dennis Kubly said the Final EA on the Protocol for High-Flow Experimental Releases was published December 30, 2011. It is a 10-year experiment and not a policy change; they are engaged in a learning process. He reviewed recurring comments received and updated the group on current activities. He concluded with a graph depicting how things might be different under the HFE protocol and showed how additional HFEs could have occurred under the protocol over the last decade and what effect that might have had on beaches in Grand Canyon.

Report on Non-Native Fish Control EA (Attachment 11c). Mr. Glen Knowles noted that humpback chub have a life expectancy of 40+ years and produce lots of young. The work done to increase their numbers includes trout suppression flows, mechanical removal, and translocation in the LCR and to other tributaries. This work will continue through the EA and the BO. Two things drive the EA: the need to build on past successes, and sensitivity to tribal concerns about killing fish. Because of tribal concerns, Reclamation prepared a revised proposed action that addresses the tribal concerns in two ways (1) Non-native fish would be removed alive and moved to other waters for sportfishing, and (2) Non-native fish control is now a research effort, not a management action.

During discussion, a concern was raised about the possibility of increased power rates for the disadvantaged community of Zuni, and a question was posed about whether the rates would be tracked over the experimental period. Ms. Kyriss said WAPA tracks the costs of all the experiments at the wholesale level. She said she would work with stakeholders to find ways to track costs at the retail rate.

USFWS Biological Opinion. Mr. Knowles said the USFWS Biological Opinion evaluated Reclamation's proposed action of implementing the Modified Low Fluctuating Flow, the HFE Protocol, and Non-native Fish Control through 2020. He noted that it is a non-jeopardy biological opinion, and it continues a program of monitoring, research, and conservation measures that has likely contributed to improvement in HBC status since 2003. Reclamation continues to move toward completion of NHPA compliance and to work towards resolving adverse effects to cultural resources in the process of completing the two EAs.

Mr. Knowles said the non-native fish control procedures described in the EA and the actual process of removing trout from the system would occur after the MOAs are signed and the EA process is completed. Reclamation plans two test trips in 2012 in the reach between the Paria River and Badger Creek. A stakeholder suggested inviting tribal members on the trips, and Mr. Knowles said that is a stipulation of the MOA for Non-native Fish Control.

Glen Canyon Dam National Historic Preservation Act (NHPA) Compliance Update (Attachment 12 = AIF). Ms. Mary Barger addressed the three parts of the motion passed by AMWG in August 2011.

Achieving compliance with NHPA section 106 and the GCPA. During a three-day meeting in September 2001, there was agreement the group would put together an annotated bibliography related to the NHPA and the GCPA. Much of the information has been gathered, including SHPO consultation letters, tribal letters, and consultations for eligibility and effect that were done between 1991 and 2008. Reclamation will meet with NPS staff to complete the document. At the same meeting, the group agreed to rewrite the PA, which Reclamation will address after the MOAs are completed. Reclamation continues to work on completing the MOAs.

USBR Compliance with 2007 Treatment for Operation of Glen Canyon Dam. Ms. Barger stated that Utah State University developed a treatment plan for 151 sites in the canyon under contract with Reclamation. Forty-eight sites were chosen to be treated first. Two seasons of treatment were completed. In the

meantime, there was ongoing consultation with the tribes. Treatment has been on hold for several reasons, including

- the Hopi Tribe's concerns that the research designs were unacceptable because they didn't incorporate tribal values or concerns,
- the Hualapai Tribal Council's objection to further archaeological or geomorphological work in the river corridor,
- the Navajo Nation's desire that natural processes like erosion should continue even if they cause historic properties to lose integrity, while appropriate mitigation should occur if the loss of integrity was human caused,
- the Navajo Nation's recommendation of a reformulation of the research design to include identification of early Navajo presence in the Canyon,
- the Kaibab Paiute's support for the comments of the other tribes, and
- the Zuni Pueblo's request that the research design be re-worked to reflect questions of tribal interest.

Mary concluded that the treatment plan will be revised to incorporate tribal concerns.

Treatment of Cultural Values and Tracking of Tribal Values. This issue was addressed in Mr. Capron's presentation yesterday as part of the CRAHG update. Ms. Barger said that Tribal Ecological Knowledge (TEK) could be better integrated into the monitoring and work being done in the Canyon.

Comments recorded during discussion included:

- There was no oversight by Reclamation on the Utah State University contract that was mishandled. As a result, one tribe refused to sign an MOA for treatment.
 - Ms. Barger said she was aware of the problems with the contract and feels that with the tribes' help, their concerns can be addressed and the problem fixed.
- Reviewing what has been done on the treatment plan and the PA does not address the sites that are being impacted. Writing a new PA may not lead to implementation.
- The current PA has not been fully implemented, so there is reluctance to work on another one.
- Reclamation should provide a work plan detailing how they will remain in compliance with the PA and the two MOAs, for consideration on the biennial work plan and budgets.
 - Ms. Barger concurred and said she hopes to begin those tribal consultations soon. Reclamation was funding part of the PA and also providing funding to the Park Service to continue monitoring. They recognize there are gaps and working toward fixing those.
- Mr. Uberuaga stated that treatment should be a priority. It is embarrassing and unacceptable that more has not been accomplished. It is critical the resources in jeopardy be protected.

Mr. Uberuaga said the Park Service is fully committed to doing whatever needs to be done to make progress. Ms. Ann Gold said Reclamation has brought on Ms. Barger to identify the problems and apologized for the delay. Mr. Larry Walkoviak added that Reclamation is committed to working with all the different entities to ensure progress.

DOI Tribal Consultation Policy. (**Attachment 13** = AIF) Ms. Castle said, starting in 2003, there were several attempts begun to write a tribal consultation plan for the AMP. Tribes and other stakeholders developed a draft plan. Another, known as the DOI/DOE Draft Consultation Policy, was circulated in 2008-2009. The Department of the Interior recently issued a Tribal Consultation Policy, with which agencies' plans must be consistent. She proposed asking the CRAHG, through the TWG, to review the draft plans, compare them to the DOI policy, incorporate the requests and issues that have been circulating through the AMWG, and then bring back a policy that could be adopted by the AMWG.

Motion (Proposed by Alan Downer, seconded by Chris Harris): AMWG requests the Cultural Resources Ad Hoc Group compare the existing draft tribal consultation documents with Secretarial Order 3317 and the DOI tribal consultation policy, and make a recommendation through the TWG to the AMWG by its August meeting for an AMP tribal consultation policy.

Motion passed by consensus.

Tribal Liaison Report. (**Attachment 14** = AIF and PPT). Mr. Halliday thanked everyone who helped work on the report, and especially Helen Fairley for her work on the TEK, the mission statement with the tribes, and the proposal for coordinating the monitoring reports with Reclamation and the other federal agencies. Some of the items discussed were a need for a fisheries management plan, establishing population numbers, handling escapement and harvesting, and considering the possibility of live removal translocation. He reviewed the process for engaging the tribes and then elaborated on the integrated tribal resource monitoring program. He presented the focus and purpose of a TEK mission statement and concluded with those tribes involved in the LTEMP consultation process.

Grand Canyon National Park Fishery Management Planning Process (**Attachment 15** = AIF and PPT). Ms. Hahn said Grand Canyon National Park is in the pre-scoping process of an environmental assessment for its Fish Management Plan. When an agency proposes a major federal action, it is required to identify potential impacts and develop a plan for those impacts. The work in GCNP ranges from translocations to removal of non-native fish. GLNRA has been addressing fish management, working closely with AGFD. The two park units will jointly address compliance to cover the next five to ten years of activities. She reviewed the planning and NEPA timeline for 2012.

Recreational Fishing. Mr. Jordan said in parallel to the Park Service and independent of it, the angling interests and the guide and economic interests in the Marble Canyon area have been evolving a fish management planning concept for some time. He was pleased at the encouragement and openness of the Park Service to obtain input from outside sources at these early stages of planning. He feels this is a great example of the coalition among interested parties and wants to encourage as much input and participation at the beginning of the process.

Questions and comments from stakeholders included:

- Grand Canyon Wildlands Council hopes to participate and discuss a possible change in the paradigm of how the fish became threatened in the system. One stream not mentioned in the study is the Paria River, which formerly supported the second largest concentration of HBC in the river system. Part of the emphasis on chub is to reestablish the range of HBC, and the Paria should be considered in these deliberations. This can be done without negatively influencing the trout fishing.
- How will the fish management plan meshes with the EAs, the LTEMP, and other planning processes?
 - Ms. Hahn said the HFE Protocol EA addresses effects of dam operations. If the goal were for a trophy trout fishery in Lee's Ferry, NPS would need to understand how operation of the dam would affect establishing such a fishery. The plan will set the goals of desired conditions, and then will identify actions NPS will have responsibility over. Actions beyond their control would be addressed through the LTEMP or in the EAs. Mr. Jordan said they envision those as independent actions. There will be a comprehensive fishery management plan whose goals will be impacted by a series of outside actions, i.e., high flows, non-native fish control, or dam operations. Therefore, the fishery management plan would envision what steps would be taken to mitigate the impacts of those activities in order to further the goals of the plan.
- How will the DFCs mesh with the fish management plan?
 - Ms. Lyder said the DFCs were developed to be comprehensive and inclusive, and were focused on how Reclamation would be asked to operate the dam in order to achieve those conditions for the AMP. The parks, in their management plans, will identify desired future conditions for park resources and what management actions they need to take – outside of the AMP – to protect park resources and provide a quality visitor experience.
 - Ms. Castle pointed out that the GCNRA has a goal of a recreational trout fishery, which is one of the AMP's DFCs. Everyone has the same goals with respect to recovery of the HBC and keeping them out of danger. The goals are consistent though there may be different degrees. In specific, NPS will determine what actions to take to achieve their goals within the constraints of dam

operations, which are determined by the Secretary with advice from the AMWG. If people identify inconsistencies, she requested members bring them to the AMWG for further discussion.

- Martha Hahn explained the plan sets the goals for what desired conditions they want to achieve and that the Park Service will determine the actions they have responsibility over. For example, if a goal is for a trophy trout fishery at Lees Ferry, then they would need to understand how operation of the dam would affect establishing a trophy trout fishery. If there are other actions beyond their control, they would have to be addressed in the LTEMP or already identified in the environmental assessments.

Stakeholder Perspective. (**Attachment 16** = AIF). Mr. John Jordan said fishing and rafting are the two designated recreational entities on the AMWG. Along with the environmental groups (GCWC and GCT), they occupy a slightly different position than most of the other AMWG members in that they are not associated with any governmental organizations. He and Jerry Myers participate as volunteers on their own time; their reward is the satisfaction from doing what they enjoy. They represent the Federation of Fly Fishers, which is an international organization created by fly fishing clubs on the west and east coasts who decided there were benefits to be derived from coming together in a common interest.

The FFF is about 47 years old, has a membership of 10,000, and their goals are conservation, restoration, and education. Their education arm focuses on helping people become involved in fly-fishing. They have active conservation and restoration programs. They see themselves as representatives of fishers and people interested in fishing. In order to broaden their knowledge and understanding, they have provided information on AMWG issues to Trout Unlimited and individual fishing clubs in Arizona. He said the greatest single threat to the future of the Colorado River resident trout population is the native fish in the river. It is the native fish, HBC in particular, that has brought about mechanical removal and drives one scheme after another to reduce the trout population. He believes the only way to address that threat is by restoring and maintaining the healthiest population of native fish possible. The future of the trout population and the native fish are intertwined.

Motions Deferred from Yesterday's Meeting.

Fish Management Flows

Motion (Proposed by LaVerne Kyriss, seconded by John Jordan): To direct the TWG to set up an inclusive ad hoc group to assist Reclamation with responding to the Biological Opinion regarding fish management flows that recognizes the management responsibilities of NPS and AGFD and includes participation of all interested parties.

Mr. Walkoviak offered the following to assist the members to understand Reclamation's responsibility: Reclamation committed to a proposed action analyzed in the December 2011 Biological Opinion developed with GCDAMP and stakeholder involvement that includes a commitment to evaluate flow-based non-native fish suppression options during the first two years of the proposed action. While Reclamation has not completed its environmental compliance process for the non-native fish control action, Reclamation fully anticipates that if the proposed action is adopted, this work will fully consider tribal interests and be coordinated with the ongoing NPS management plan for native and non-native fish from Glen Canyon Dam and other pertinent information. Reclamation will seek input from a wide range of sources that includes AMP stakeholders and other individuals who have pertinent information and expertise.

Ms. Kyriss withdrew her motion and Mr. Jordan withdrew his second.

Socioeconomics Ad Hoc Group Recommendation from the TWG. Ms. Castle said yesterday's discussion revolved around whether the attachments, particularly Table 2, were complete. In addition, there were questions about whether particular guidance was being requested from the Secretary, and what direction

would be given to the SEAHG for development of the implementation plan. She said a group of members discussed those concerns and asked for the results.

Motion (Proposed by Larry Stevens, seconded by Jerry Myers):

“AMWG recommends the SEAHG Report to the Secretary of the Interior for consideration.

“After consideration by the Secretary and guidance from him regarding the role of the program in implementing socioeconomics studies, the AMWG directs the TWG to work with GMCRC to develop a workplan for this program.

“AMWG further directs TWG to, through the SEAHG, continue to provide, develop, and recommend information to the TWG regarding implementation of the socioeconomic program, including costs and timing of the program elements; and work with AMP stakeholders who will be conducting socioeconomic analyses in other forums to enhance collaboration to fulfill Information Needs.”

A stakeholder noted concerns about the Table 2, in that if there were activities to be initiated this year, costs needed to be identified, and proposed alternate language, as follows:

“The AMWG requests the Secretary’s Designee transmit the SEAHG report to the Secretary and advise him that the AMWG supports implementation of socioeconomic impact assessment studies to further our understanding of adaptive management decisions within the GCDAMP. The AMWG requests that the Secretary advise the AMWG regarding those elements of the proposed socioeconomic implementation plan that will be developed within the LTEMP development process.

“The AMWG directs the Technical Work Group to work with Grand Canyon Monitoring and Research Center (GCMRC) to refine and develop a work plan for those elements of the socioeconomic program that will not be addressed through the LTEMP process.”

Mr. Capron said he removed the dates from Table 2, substituting Year 1, Year 2, etc.; and worked with Dr. Garrett to include cost estimates.

Mr. Myers withdrew his second to the motion. Mr. Stevens said the socioeconomic program needs to go forward, and feels the plan the SEAHG has prepared is comprehensive and well done. He wants to ensure the AMP has a chance to have an economics plan in five years before he considers withdrawing his motion.

Dr. Schmidt said the motion almost sounds like GCMRC will do what the TWG tells it to do. Ms. Castle said she thought there was no intent to interfere with the Secretary’s decision-making about what programs are most needed at GCMRC.

Ms. Castle asked Mr. Capron to speak to how far the TWG felt it had gone in determining priorities. Mr. Capron said the TWG has gone as far as it can in developing a robust, comprehensive program. He said AMWG should make a policy decision regarding which components ought to be part of the socio-economic program and which are implemented through other avenues, such as LTEMP. The TWG can then prioritize items within the AMP list.

Ms. Castle said it was important to have some socioeconomic results that could inform the LTEMP and the evaluation of its alternatives. She was concerned the timeline in this plan may not produce the needed data when needed for the LTEMP. At her request, Dr. Garrett suggested how DOI could receive some first best estimator type information that could inform the LTEMP process.

The following motion was passed by consensus:

Motion (Proposed by Larry Stevens, seconded by Jerry Myers): “The AMWG requests the Secretary’s Designee to transmit the revised SEAHG report to the Secretary and advise him that the AMWG supports implementation of socioeconomic impact assessment studies to further our understanding of adaptive management decisions within the GCDAMP. The AMWG requests that the Secretary advise the AMWG regarding those elements of the proposed socioeconomic implementation plan that will be developed within the LTEMP development process.

“The AMWG directs the Technical Work Group to identify information needs and research priorities not addressed through the LTEMP process so that GCMRC can refine and develop a work plan.”

LTEMP EIS Update (**Attachment 17** = AIF and PPT). Mr. Billerback said the Long Term Experimental and Management Plan EIS is jointly led by NPS and Reclamation. Given the complicated science involved, Argonne National Labs has been brought on as the EIS contractor. Their science team will interface with GCMRC as well as scientists from the agencies, cooperators, and other interested parties. The LTEMP EIS will utilize the past 15 years of scientific information gathered on Glen Canyon Dam operations and comply with the ongoing requirements to protect resources and meet GCPA compliance. Ms. Heffernan provided some of the suggested alternative considerations from scoping and concluded with the timeline for upcoming activities, as follows:

- Feb 24: cooperating agency meeting
- Mid-March: complete and post scoping report
- End of March: Present scoping results to public in webcast
- Mid-March: DOI Alternative development meeting
- April 4 & 5: Alternative input sessions with the public
- Finalize Alternatives: end of April
- Newsletter/website rollout of alternatives to public

She provided the following website link for more information on the LTEMP EIS: <http://ltempeis.anl.gov/>

Ms. Jackson-Kelly suggested the LTEMP team consider holding a public meeting at the Hualapai reservation in Peach Springs, Arizona. The Hualapai Tribe could host a public forum there for the benefit of the community members. She would also like to see the LTEMP traveling exhibits include the tribal perspectives in a poster or other art form on the tribes who are cooperating agencies. Ms. Heffernan told her the tribes may want to consider posting audio or visual products on the LTEMP EIS website. Ms. Jackson-Kelly also suggested a link could be made from the LTEMP website and the AMP as well to Native Voices on the Colorado River (<http://nativevoicesgrandcanyon.org/aboutprogram.htm>).

A stakeholder asked how adaptive this EIS plan could be, if this EIS replaces the 1995 EIS, and would it interrupt the AMWG’s efforts. Mr. Billerback said they recently talked about lessons learned with people who had been involved in the 1995 EIS. Ms. Castle said there is no intention to interrupt the AMWG’s role.

Public Comment: None

Closing Remarks. Ms. Castle said this meeting embodied significant achievement. After ten years of effort, and intense work for two years, the AMWG has forwarded DFCs to the Secretary. She thanked Dr. Stevens and Ms. Benemelis for their work in bringing it to closure, and suggested everyone pat themselves on the back. The two EAs are close to being completed, and much progress is being made.

Next meetings:

- May 10, 2012 = AMWG WebEx
- August 29-30, 2010 = AMWG Meeting in Flagstaff, Arizona

Adjourned: 1:35 p.m.

- Attachment 18:** Memo from AS-WS Anne Castle to AMWG Members and Alternates Dated February 29, 2012, Subject: Follow up from February 22, 2012 Meeting
- Attachment 19:** Memo from AS-WS Anne Castle to Secretary Salazar Dated April 26, 2012, Subject: Report and Recommendations from the Glen Canyon Dam Adaptive Management Work Group Federal Advisory Committee Meeting, February 22-23, 2012
- Attachment 20:** Memo from Secretary Ken Salazar to AS-WS Anne Castle Dated April 30, 2012, Subject: Report and Recommendations from the Glen Canyon Dam Adaptive Management Work Group Federal Advisory Committee Meeting, February 22-23, 2012

Respectfully Submitted,

Linda Whetton
U.S. Bureau of Reclamation
Upper Colorado Region

General Key to Adaptive Management Program Acronyms

ADWR – Arizona Dept. of Water Resources	HBC – Humpback Chub (endangered native fish)
AF – Acre Feet	HMF – Habitat Maintenance Flow
AGFD – Arizona Game and Fish Department	HPP – Historic Preservation Plan
AIF – Agenda Information Form	INs – Information Needs
AMP – Adaptive Management Program	KA – Knowledge Assessment (workshop)
AMWG – Adaptive Management Work Group	KAS – Kanab ambersnail (endangered native snail)
AOP – Annual Operating Plan	LCR – Little Colorado River
BA – Biological Assessment	LRRMCP – Lower Colorado River Multi-Species Conservation Program
BAHG – Budget Ad Hoc Group	LTEP – Long Term Experimental Plan
BCOM – Biological Conservation Measure	LTEMP – Long-Term Experimental and Management Plan
BE – Biological Evaluation	MAF – Million Acre Feet
BHBF – Beach/Habitat-Building Flow	MA – Management Action
BHMF – Beach/Habitat Maintenance Flow	MATA – Multi-Attribute Trade-Off Analysis
BHTF – Beach/Habitat Test Flow	MLFF – Modified Low Fluctuating Flow
BIA – Bureau of Indian Affairs	MO – Management Objective
BO – Biological Opinion	MRP – Monitoring and Research Plan
BOR – Bureau of Reclamation	NAU – Northern Arizona University (Flagstaff, AZ)
CAHG – Charter Ad Hoc Group	NEPA – National Environmental Policy Act
CAPA – Central Arizona Project Association	NHPA – National Historic Preservation Act
GCT – Grand Canyon Trust	NPS – National Park Service
CESU – Cooperative Ecosystems Studies Unit	NRC – National Research Council
cfs – cubic feet per second	O&M – Operations & Maintenance (USBR funding)
CMINs – Core Monitoring Information Needs	PA – Programmatic Agreement
CRBC – Colorado River Board of California	PEP – Protocol Evaluation Panel
CRAHG – Cultural Resources Ad Hoc Group	POAHG – Public Outreach Ad Hoc Group
CRCN – Colorado River Commission of Nevada	Powerplant Capacity = 31,000 cfs
CRE – Colorado River Ecosystem	R&D – Research and Development
CREDA – Colorado River Energy Distributors Assn.	RBT – Rainbow Trout
CRSP – Colorado River Storage Project	RFP – Request For Proposals
DAHG2 – Desired Future Conditions Ad Hoc Group	RINs – Research Information Needs
DASA – Data Acquisition, Storage and Analysis	ROD Flows – Record of Decision Flows
CWCB – Colorado Water Conservation Board	RPA – Reasonable and Prudent Alternative
DBMS – Data Base Management System	SA – Science Advisors
DOE – Department of Energy	Secretary – Secretary of the Interior
DOI – Department of the Interior	SCORE – S tate of the C olorado R iver E cosystem
DOIFF – Department of the Interior Federal Family	SHPO – State Historic Preservation Office(r)
EA – Environmental Assessment	SOW – Scope of Work
EIS – Environmental Impact Statement	SPAHG – Strategic Plan Ad Hoc Group
ESA – Endangered Species Act	SPG – Science Planning Group
FACA – Federal Advisory Committee Act	SSQs – Strategic Science Questions
FEIS – Final Environmental Impact Statement	SWCA – Steven W. Carothers Associates
FRN – Federal Register Notice	TCD – Temperature Control Device
FWS – United States Fish & Wildlife Service	TCP – Traditional Cultural Property
FY – Fiscal Year (October 1 – September 30)	TES – Threatened and Endangered Species
GCD – Glen Canyon Dam	TMC – Taxa of Management Concern
GCT – Grand Canyon Trust	TWG – Technical Work Group
GCMRC – Grand Canyon Monitoring & Research Center	UCRC – Upper Colorado River Commission
GCNP – Grand Canyon National Park	UDWR – Utah Division of Water Resources
GCNRA – Glen Canyon National Recreation Area	USBR – United States Bureau of Reclamation
GCPA – Grand Canyon Protection Act	USFWS – United States Fish & Wildlife Service
GLCA – Glen Canyon National Recreation Area	USGS – United States Geological Survey
GRCA – Grand Canyon National Park	WAPA – Western Area Power Administration
GCRG – Grand Canyon River Guides	WY – Water Year (a calendar year)
GCWC – Grand Canyon Wildlands Council	