

Glen Canyon Adaptive Management Work Group (AMWG)
Minutes of July 6-7, 2000 Meeting
Phoenix, Arizona

Presiding: Stephen Magnussen, USBR (Chairperson)

Recorder: Linda Whetton, USBR

FINAL

7/6/00: Convened: 9:40 a.m. **Adjourned:** 5:25 p.m.

Welcome and Introductions:

Stephen Magnussen introduced himself as the Secretary's Designee and Chairman of the AMWG. He welcomed the members, alternates, and visitors to the meeting.

Roll Call. With a quorum established, attendance sheets were distributed (Attachment 1). Steve made special mention that Denny Fenn (USGS) and Kathleen Wheeler (Office of the Assistant Secretary of Water & Science) were in attendance.

Administrative Items:

1. Steve announced two nomination letters working their way through the Department: 1) Rick Gold replacing Charley Calhoun (USBR) and 2) Pamela Hyde (Southwest Rivers) replacing one of the environmental groups (American Rivers).
2. Steve also announced that Rob Arnberger will be leaving as the Superintendent of the Grand Canyon National Park to accept a position as Regional Director of the NPS in Anchorage, Alaska. Rob said he has been at the Grand Canyon for six years and will be assuming his new position in August and will officially move the latter part of September. He said he has enjoyed his time with the AMWG and appreciated all the efforts in protecting the Canyon.
3. Rob introduced Dr. Jeffrey Cross who will be his alternate to the AMWG. Dr. Cross said he has been at the science center for a little over two months. His background is in fish biology, fish ecology, and fisheries. He received his Master's Degree at the University of Nevada at Las Vegas and worked on native fishes in the Virgin River. He received his Ph.D. in Fisheries at the University of Washington and for the last decade has been working primarily on coastal fishery issues. He was the director of a public research agency in Southern California and from there he went to the East coast and was the director of a research lab. He likes being back in the Southwest and looks forward to working with the AMWG.
4. Rob also introduced Mary Scott who is in the SES Candidate Development Program and is currently "shadowing" him.

Renewal of AMWG Charter. Steve said it was brought to his attention that this agenda item had not been listed in the Federal Register Notice and therefore could not be discussed at today's meeting. He suggested the members review the redline/strikeout version of the Charter (Attachment 2). He directed their attention to the following items:

- 1) scope and specifics of travel reimbursement
- 2) reimbursement for non-AMWG meetings
- 3) notifications of alternate attendance for voting purposes

Randy addressed the above items in more detail:

- 1) We would propose that all members be allowed to receive travel reimbursement.
- 2) We would propose replacing “per diem in lieu of subsistence,” with a directive to follow the Federal travel regulations. Also, instead of saying “approved business away from home,” we would more carefully define those activities that would be reimbursed (official AMWG meetings, ad hoc meetings, and protocol evaluation panel meetings).
- 3) In the January 2000 meeting, the alternate notification issue was discussed briefly and action was postponed on a motion that would allow a member’s alternate to attend an AMWG meeting and vote without prior notification. One of the concerns raised was that this had the potential for multiple alternates primarily participating in these meetings instead of AMWG members. If the motion were to read something like: “the designated alternate (meaning one person) can attend an AMWG meeting in lieu of the member and participate in voting” it might alleviate those concerns. In the Charter, we would propose that language about the involvement of alternates in AMWG meetings without prior notification to eliminate the day and a half advance notice time that is now required.

Randy reiterated that if there were comments on the redline/strikeout version or the specific changes he mentioned, to let him know. A revised draft will be sent out within the next month for further review.

Action: Comments on the Charter to be sent to Randy Peterson by the end of July. A revised draft of the Charter will then be sent to AMWG members for the August 31, 2000, phone poll on a motion to recommend the Charter.

AMWG Member Renewal. Steve also said the member terms expire in February. For ease of administration and to be able to process the names to represent the organizations as well as revise the Charter in one package, he asked each of the organizations submit the name of their representative to him (letter format) by August 31, 2000. The letters and Charter will then be sent to the Department for processing. A letter will also be sent to those members not present for their compliance.

Action: Each organization will send a letter to Steve indicating who will represent their organization on the AMWG by August 31, 2000.

AMWG Operating Procedures. Randy said a redline/strikeout version of the AWMG Operating Procedures (Attachment 3) was also provided in the meeting packet materials. Most of the changes are editorial and clean-up in nature, having to do with the advance notice for the agenda, location of meetings, and frequency of meetings.

Action: Members will provide comments to Randy by August 15, 2000.

GCMRC Institutional Home. Steve said discussions have taken place with both the House and Senate on the transfer of the GCRMC to the U.S. Geological Survey. The House supports the transfer but we are still waiting to hear from the Senate, hopefully within the next two weeks. There have been some preliminary discussions between the two agencies but official actions await approval from both the House and the Senate. If there are questions, he advised the members to talk with Kathleen Wheeler.

Management Objectives. Mary named the members who have been involved in working on the MO document: Kerry Christensen (representing Clay Bravo), Wayne Cook, Amy Heuslein, Rick Johnson (representing Geoff Barnard), Andre Potochnik, Ted Rampton (represented by Cliff Barrett since January), Mindy Schlimgen-Wilson (American Rivers), Bob Winfree, Gerald Zimmerman, Randy Peterson, and Barry Gold. She said in January 1999 the AMWG decided to adopt a nested approach to this piece of the Strategic Plan. It would have an over arching vision that was rather vague in language but would tell us where we were going in the Grand Canyon, a mission consistent with the vision but had some of the constraints and legalisms that we work under in this process, and goals that flowed from and were consistent with the mission and vision. All of these things were combined in one document. In July 1999 the AMWG approved the Mission and Vision Statement. The ad hoc committee on Strategic Planning was charged with developing goals and used the mission and vision as guidance. The AMWG gave interim approval of those goals in January 2000. It was acknowledged at that time that as the MO's were developed, they would help members more clearly understand what the goals meant and that some goals may have to be changed as the MO's were developed.

There have been some changes both to a principle and to some of the goals which further clarify our efforts. In January, the AMWG also charged the ad hoc committee to come up with the first set of MO's from the goals, get comments from the TWG on the MO's, go back and revise as necessary, take it back to the TWG for further comment, and then send it out to AMWG. They have done that (Attachment 4) and are ready for the next step. The MO's are not complete and in many cases, the current levels and the proposed target levels are not filled in. Many of them are Information Needs. However, the ad hoc committee would like the AMWG to give interim approval again to the MO's as an indication they are going in the right direction. The goal is to have the entire document completed in July 2001, noting that not every IN will be completed by then. If it is done by 2001, it will allow GCMRC to complete their strategic plan for their following five years, using the AMP strategic plan as their guide.

The document was reviewed and concerns and responses noted on flip charts (Attachment 5). The AMWG charged the ad hoc committee to review the comments and responses and revise the document as necessary in preparation for the next AMWG meeting.

- Action:** 1) Send additional comments to Randy Peterson for discussion by the ad hoc committee.
- 2) Charge the ad hoc committee to continue working on the document and make the necessary modifications and prepare a revised document for the next AMWG meeting.

Surplus Criteria Update: Jayne Harkins (LC Region of Reclamation) said she was asked to talk about interim surplus criteria, the process they are going through, what it is, and why they are doing it. The Boulder Canyon Project Act in 1928 required that those who receive mainstem water from the Lower Colorado River need a contract with the Secretary of the Department of the Interior for that water. They don't go to their State Engineer's Office like they do in the Upper Basin States. The Colorado River Compact apportions 7.5 maf to each basin. In the Lower Basin, there was a U.S. Supreme Court decree in 1964 (Arizona v. California) which defines surplus, normal, and shortage deliveries. Their process is to determine when there is sufficient mainstream water for release in excess

of 7.5 maf for Lower Basin users. They are not identifying nor are they trying to develop criteria for when surplus is available to Upper Basin users, nor trying to develop when surplus is available to Mexico in accordance with the U.S./Mexico Treaty.

They are preparing an Environmental Impact Statement (EIS) and the Record of Decision (ROD) will be the implementing document. They are looking at interim criteria issued through 2015. Pursuant to the Colorado River Basin Project Act, they previously developed the long-range operating criteria, which looks at the operation and coordination of all the reservoirs on the system, to determine how much water would be available to the three lower basin states.

They completed the public scoping the end of June 1999 and in December 1999 issued a Notice of Intent to prepare an EIS. The Draft EIS will be mailed out on July 7, 2000, as well as be posted to their website. There will be a 60-day public comment period which will end on September 8, 2000. There are four public hearings scheduled: (Aug. 3) Phoenix, Arizona; (Aug. 8) Ontario, California; (Aug. 10) Salt Lake City, Utah; and (Aug. 15) Las Vegas, Nevada. They plan to file a Final EIS by the end of November with a Record of Decision by the end of December 2000.

AMP FY 2002 Budget. Randy Peterson stated that about a year ago, the administration of the Adaptive Management Program was clearly separated from the monitoring and research activities of the Grand Canyon Monitoring and Research Center to make sure that the science was independent and objective. The Bureau of Reclamation manages the program; Barry Gold and his staff manage the Center and the scientific work. Thus, Reclamation's program administration budget has had no interaction with the GCMRC budget. Randy directed the members to look at the AMP budget (Attachment 6) and refer to the footnotes for additional clarification.

He said there were several key things to note:

- 1) The tribal cooperative agreements, which had been funded under the Programmatic Agreement, were moved up to a separate category of Native American participation. Power revenues monies fund \$400,000 and an additional \$75,000 is expected from appropriated dollars to come through the five Federal agencies involved in this program, for a total of \$475,000.
- 2) Under the Programmatic Agreement (Line 3b on Atch. 6), there is no breakout of what cultural resource mitigation activities are required, awaiting results of the Protocol Evaluation Panels and preparation of the Historic Preservation Plan.
- 3) Despite the increasing costs to inflation, the Bureau of Reclamation's administrative costs are going down every year and it's Reclamation's goal to further reduce those costs. These are currently targeted for 2002 to be about 5% of the total Adaptive Management Program budget.

GCMRC FY 2002 Budget. Barry said there were two budget mailings sent from the GCRMC: the first included a memo, two budget sheets (Attachment 7a, 7b), and a narrative summary (Attachment 7c). The second one included a revised memo (Attachment 7d) and the same attachments. Before he started discussion of those, he wanted to review the budget protocol (Attachment 8). In April and

May, the GCMRC developed a bottom line budget estimate for two years out to seek a recommendation from the TWG supporting that bottom line and then brought the bottom line to the AWMG in July for discussion. They are here to seek a recommendation from the AWMG to support that bottom line number. The reason they need it at this point is to get that it into the Departmental budget process. Between July and October, they will work with the TWG to develop the details and fine-tune it. They will bring it back in January to the AMWG with a detailed FY 2002 budget for implementation.

He said they are asking for increases in the Biological Resources Program, the Information Technology Program, and some of the independent review panels. This differs from what was mailed out because subsequent to the mailing, they have had discussions with the USGS about the appropriated funding of administrative costs. While they were seeking an increase of \$250,000 for administration, the USGS now proposes to bring that support to the program as an *in-kind* contribution to support administrative operations and personnel as the GCRMC is transferred in to the USGS.

Barry was asked if there was a way of prioritizing the work so that AMWG members could delineate between the core monitoring program which might be supported by power revenues vs. additional work which could be delayed if the appropriations don't come through. For example, remote sensing activities. Barry responded that would be the work they would be doing between now and October, working out the prioritization and bringing that back to the AMWG in January. Rick Gold asked Denny Fenn if the USGS were in a position to request an additional \$1M. Denny said that while the Bureau of Reclamation is a little ahead of other DOI agencies in terms of budget schedule, they would be able to.

MOTION: Motion to approve the bottom line with a recommendation to work with the TWG to spell out the details and bring that back to the AMWG in January 2001 for final recommended adoption. Motion seconded.

Discussion and Proposed Amendment: Approve the bottom line as a ceiling, not a target, with the philosophy that core monitoring be funded by power revenues incorporated into the proposal to be brought to the AMWG in January 2001.

Voting results on the Amendment:
Yes = 9 , No = 10

Amendment failed.

Vote on main Motion: Approve the bottom line of \$7.8M.
Voting results on the motion:
Yes = 16, No = 0, Abstained: 3

Reason for the abstention: Given the discussions today as indicated in the proposed amendment.

MOTION: Approve the AMP Budget of \$1,399,000

Motion carried by unanimous consent.

Meeting adjourned: 5:30 p.m.

**Glen Canyon Adaptive Management Work Group (AMWG)
Minutes of July 6-7, 2000 Meeting
Phoenix, Arizona**

Presiding: Stephen Magnussen, USBR (Chairperson)

Recorder: Linda Whetton, USBR

7/7/00: Convened: 8:10 a.m. **Adjourned:** 12:00 p.m.

Welcome and Introductions:

Stephen Magnussen introduced himself as the Secretary's Designee and Chairman of the AMWG. He welcomed the members, alternates, and visitors to the meeting.

Roll Call. With a quorum established, attendance sheets were distributed (Attachment 1).

Administrative Items:

1. Peter Evans has left the State of Colorado and will be relocating to New York.
2. Jeff Fassett has left the State of Wyoming.
3. The next AMWG meeting will be held on January 11-12, 2001 (Thu-Fri).
4. Regarding the telephone poll on the Revised Charter, the comments are due July 31st to Randy Peterson. By August 7th, a new draft of the Charter will be sent to the AMWG members. The telephone poll will be done on August 31st at 1 p.m. (MST) and it will be announced in the Federal Register Notice. A message will be sent out for the members/alternates to call in to an 800 number for the purpose of adopting the Charter.
5. Steve received a request to have a report from the Kanab ambersnail work group. Propose that it be added to the agenda under "Expected TWG activities." Rick Johnson will report.

MOTION: Approve the minutes from the AMWG Meeting held on January 20-21, 2000 (Attachment 9).

Motion carried.

Downstream Ad Hoc Group. Barry reported that he prepared a 45-page response to the findings and recommendations. A decision was made that they focus on their response to the key findings and produce a much briefer report. He will prepare a draft within the next few weeks, send it back to the Downstream Group for their review, and then bring it back to the AMWG in January.

Update on Hydrology and Low Steady Summer Flow Test: Tom Ryan displayed an overhead depicting the precipitation over the last 12 months (Attachment 10a). The months of Jul-Aug-Sep of last year were very much above average precipitation, then there was a very dry period from Nov-Dec. A wetter pattern followed in Jan-Mar, and then after March, another dry period. This made for difficult water management planning activities. Additional overheads showed how the snowpack and the forecast evolved in WY 2000 (Attachment 10b) and the unregulated inflow (Attachment 10c). At this

point in time, the spring runoff is basically over and about 8,000 cfs are coming into Lake Powell. The elevation of Lake Powell is 3,684 feet and it probably won't get any higher unless there is significant monsoonal activity this summer. The water is about 10 feet below where it was a year ago. The July 1 preliminary forecast was 4.7 maf which is 61% of average, about the same as it was in February.

When the January 2000 forecast of 52% of normal was issued, LSSF discussions began since we expected a 8.3 maf water year release volume from Lake Powell (Attachments 10d and 10e). The flow test was patterned after the SWCA hydrograph that Rich Valdez presented to the TWG in September 1999. There are four components to the hydrograph: 1) relative high releases in April and May that produces ponding down at the LCR, 2) four-day 31,000 cfs spike in the Spring, 3) summer period of 8,000 cfs that is steady, and 4) followed by a 31,000 cfs fall spike of four days. They adjusted the releases a little in May to better comply with the long range operating criteria.

There have been concerns on the power system side in terms of the 8,000 cfs and transmission capabilities. Dave Sabo reported that this was an interesting year. A lot of talk on the deregulation of the utility industry and quite a bit of movement to set up these small operating areas, like those in California. California has a marked effect on the total electricity market in the United States because it tends to set the market standard for pricing. Leslie James added it is not price that is completely the issue but also the supply, the quantity, and where they can get it.

Tom displayed an overhead with the projected operation of Glen Canyon Dam (Attachment 10f). With this year being a 7.9 maf inflow year, we will be pretty close to our target content on January 1, 2001. After the LSSF test, in Oct-Nov-Dec, they plan to begin a 8.23 release pattern for WY 2001 but that doesn't mean it will be an 8.23 year. They will begin the year scheduling low releases as you would do in a 8.23 maf release year. If they get a forecast that is near average or even a little below average, releases will be increased.

LIDAR Presentation. Barry introduced Steven Mietz, the GIS Coordinator at the GCMRC. Steven provided copies of the "March 2000 LIDAR and Color Infrared Orthophotography Data Collection" (Attachment 11) and pointed out that there were larger prints posted on the walls. LIDAR is an acronym, like radar, but using light instead. It's a laser which is on a fixed wing of an aircraft that shoots down to the ground and returns a value of topography. This can generate contours and individual elevation points automatically from the plane. Orthophotography refers to photography that is being scanned and digitized into a computer and then tied into an elevation model. In this case, it was tied into the LIDAR that was collected. If you were to look straight down at a photo, you would get a lot of distortion because the canyon walls are very steep. This will correct for those distortions and give you true areas and volumes when you calculate those in a GIS or similar software. He explained that this type of data collection provides a continuous data set throughout the canyon and includes several tributaries as well. He explained the various images and demonstrated via a 3-D movie concept some of the images in the Glen Canyon.

Preliminary Results of LSSF Test - Barry Gold reported the GCMRC started planning for the LSSF Test in February 2000. He passed out copies of the Executive Summary of the Science Plan (Attachment 12) and the FY 2000 LSSF Science Activities Report (Attachment 13). The GCMRC

started with the proposal prepared by SWCA in response to the Biological Opinion of the U.S. Fish and Wildlife Service and then de-constructed it into a set of assumptions that scientists used to construct the hypotheses. Monitoring and research studies were formulated which addressed the hypotheses. Based on those assumptions, they developed a series of hypotheses to test the assumptions. They began implementing the studies in mid-March with the aerial overflights. The first product is due back July 15, 2000. This work is going to continue into FY 2001. The majority of reports are due by December 31, 2000. Barry stated there is no analyzed data available at the present time as the researchers are still doing field work, and consequently the findings he presented were based on trip reports and field observations and cautioned that once they are looked at against the quantitative data, may change (Attachment 14).

Sediment Studies. Barry asked Ted Melis to speak for a few minutes on the sediment studies. Ted reported that there are two parts of what they're doing in the physical program around the LSSF test. The first one was mostly looking at the effects of the spring high flow and the spring spike at 34 sandbar sites that the NAU geology team has been surveying since 1990. Hopefully they will have those results by the August-September time frame. The second part is what they are listing as an integrated effort on the parts of many scientists to come up with a refined, detailed fine sediment budget for the entire summer season during both the 8,000 cfs flows and the impact of the 31,000 spike in September. The GCMRC looked at this as not only a way to test out the remote sensing initiative topics that Steve Mietz talked about but also to try and bring scientists together in one unified research and monitoring proposal. They are hoping to have the preliminary results by the end of the calendar year and the complete synthesis report in 2001.

Cultural Resources PEP. Ruth Lambert reported on the Cultural Resources PEP, the process they used to arrive at panel members, and the recommendations of the PEP. She distributed copies of her presentation (Attachment 15) as well as copies of Lisa Leap's report, "Data Synthesis of Eight Years of Archaeological Monitoring and Remedial Actions Along the Colorado River Corridor, Grand Canyon National Park, Arizona" (Attachment 16) that the National Park Service did on their monitoring activities from 1992-1999.

Ruth explained that the Cultural Resources PEP was kind of a hybrid because it combined two legally separate programs and evaluated them both. In February 1999 there was a request from the TWG members that because the GCMRC had a cultural resource PEP, would they consider including an evaluation of the Programmatic Agreement in that PEP as well for cost, effectiveness, coordination, and integration. The request was approved by the PA parties. The Cultural Resources PEP also included Reclamation's programmatic agreement program as well as the GCMRC's, which is different from other PEP's conducted in the past which were solely GCMRC programs.

Terrestrial PEP. Barry reported that the process used by the Terrestrial PEP was very similar to the Cultural Resources PEP. They have prepared a draft report, presented findings and recommendations to the Technical Work Group, and received questions and comments from the TWG. The PEP believes that work to date has characterized vegetation in the canyon but not created a monitoring program that can detect change and develop trends of change in response to the effects of dam operations. They recommended major components of the monitoring program which deal with monitoring for model development, plant and animal inventorying, and long-term monitoring of

the mainstem corridor. They argued that we need to be more careful in planning in a statistically robust fashion.

The GCMRC has already started mapping and inventorying vegetation with remote sensing of the river corridor. They've been testing whether the color infrared signatures will be sufficient to allow them to map the vegetation or if they need more multispectral bands. They are also moving to a more spatially explicit sampling regime not just focusing on the GIS sites. They are going to include an initiative in the 2002 work plan which will respond to the PEP recommendations. They will develop that with the TWG and bring it back to the AMWG in a more detailed fashion. The riparian system is so large that we should really think about the issue of indicators. Ultimately, their recommendation is to settle on some indicator species and use change in those species to evaluate the effects of dam operations on terrestrial resources.

Trout PEP. Barry reported they are still waiting for the results of the Trout PEP. Once the GCMRC gets the draft report, they will make a presentation to the TWG and then bring the panel's recommendations forward to the AMWG.

Physical Resources PEP. Ted Melis said the PEP process for the physical resources was completed in August. It was a two-part process, with a meeting held in 1998 and another one in August 1999. They received a final report from the PEP in October 1999. A copy of that final report was sent to the AMWG and TWG members in November 1999. In January 2000, Dr. Ellen Wohl, made a presentation to the AMWG of the results of the review process. Ted presented a brief overview of the process (Attachment 17).

Kanab Ambersnail Work Group (KAWG) Update. Rick Johnson reported that the KAWG met and talked about how to incorporate the recommendations from the expert panel. They have the panel report, a recovery plan that was completed in 1995, and numerous research and monitoring projects. They are suggesting the creation of a recovery implementation plan sometime this year which would have two major parts to it: 1) further work on genetics and taxonomy, and 2) interim research and monitoring.

Expected TWG Activities. Rick passed out copies of expected "TWG tasks FY 2001" (Attachment 18).

Dr. Cross questioned whether AMWG members need to see the deliberations of the TWG on their assignments, specifically the PEP reviews, and how PEP recommendations are incorporated into the adaptive management program. Steve asked the AMWG members for their comments. It was felt that if the AMWG members had concerns, they should work through their agency's TWG representative. We should also consider a formal description of the process used to evaluate PEP recommendations. It was suggested the TWG be involved in the PEP processes earlier and that the GCMRC needs to notify TWG members when the reviews and open meetings are held so as to encourage TWG members to participate in them.

Action: The issue will be placed on the agenda for the next TWG meeting (Sept. 20-21, 2000) and a

report provided to the AMWG at the next meeting (January 11-12, 2001).

Rob Amberger said that an opportunity was probably lost yesterday regarding the GCMRC budget and wondered if it could still be addressed. The USGS is going forward to seek an additional \$1M in support of the GCMRC and its budget. Suggest that the AMWG highly support the USGS' efforts to supplement the GCMRC's budget. If the AMWG can't do, then he questioned whether it could be incorporated into the August 31st phone poll and have it voted on or a motion passed.

Action: Rob Amberger and Randy Peterson will frame a motion to include as part of the language in the Federal Register Notice for the August 31st conference call.

Science Advisory Board - Barry reported they are in the process of forming the SAB. It has been a rigorous process and quite a few people were unable to participate because they were unable to commit to participating 10 days a year. He is looking to have a board of at least 10 people. By the end of July he is going to send the AMWG a roster of the candidates they are recommending along with the names of two alternates. The goal is to invite them for a first meeting in September or October.

Next AMWG Meeting:

Thursday, January 11, 2001 (9:30 a.m. - 4:00 p.m.)

Friday, January 12, 2001 (8 a.m. - 12 noon)

Public Comment/Wrap-up:

No comments. Steve thanked Kathleen Wheeler and Denny Fenn for attending.

MOTION: Move to adjourn.

Motion carried.

Adjourned: 12:00

General Key to Adaptive Management Program Acronyms

ADWR - Arizona Department of Water Resources	IT - Information Technology (GCMRC program)
AF - Acre Feet	KAS - Kanab ambersnail (endangered native snail)
AGFD - Arizona Game & Fish Department	KAWG - Kanab Ambersnail Work Group
AGU - American Geophysical Union	LCR - Little Colorado River
AM - Adaptive Management	LCRMCP: Little Colorado River Multi-Species Conservation Program
AMP - Adaptive Management Program	MAF - Million Acre Feet
AMWG - Glen Canyon Adaptive Management Work Group (a FACA committee)	MA - Management Action
AOP - Annual Operating Plan	MO - Management Objective
BA - Biological Assessment	NAAO - Native American Affairs Office
BE - Biological Evaluation	NAU - Northern Arizona University (Flagstaff, AZ)
BHBF - Beach/Habitat-Building Flow	NEPA - National Environmental Policy Act
BHMF - Beach/Habitat Maintenance Flow	NGS - National Geodetic Survey
BHTF - Beach/Habitat Test Flow	NHPA - National Historical Preservation Act
BIA - Bureau of Indian Affairs	NPS - National Park Service
BO - Biological Opinion	NRC - National Research Council
BOR - Bureau of Reclamation	NWS - National Weather Service
CAPA - Central Arizona Project Assn.	O&M - Operations & Maintenance (USBR funding)
cfs - cubic feet per second	PA - Programmatic Agreement
CRBC - Colorado River Board of California	PEP - Protocol Evaluation Panel
CRCN - Colorado River Commission of Nevada	Powerplant Capacity - 31,000 cfs
CREDA - Colorado River Energy Distributors Assn.	Reclamation - United States Bureau of Reclamation
CRSP - Colorado River Storage Project	RFP - Request For Proposals
CWCB - Colorado Water Conservation Board	RPA - Reasonable and Prudent Alternative
DBMS - Data Base Management System	SAB - Science Advisory Board
DOI - Department of the Interior	Secretary('s) - Secretary of the Interior
EA - Environmental Assessment	SWCA - Steven W. Carothers Associates
EIS - Final Environmental Impact Statement	TCD - Temperature Control Device (for Glen Canyon Dam water releases)
ESA - Endangered Species Act	TCP - Traditional Cultural Property
FACA - Federal Advisory Committee Act	TES - Threatened and Endangered Species
FEIS - Final Environmental Impact Statement	TWG - Glen Canyon Technical Work Group (a subcommittee of the AMWG)
FRN - Federal Register Notice	UCR - Upper Colorado Region (of the USBR)
FWS - United States Fish & Wildlife Service	UCRC - Upper Colorado River Commission
FY - Fiscal Year (Oct 1 to Sept 30 each year)	UDWR - Utah Division of Water Resources
GCD - Glen Canyon Dam	USBR - United States Bureau of Reclamation
GCMRC - Grand Canyon Monitoring and Research Center	USFWS - United States Fish & Wildlife Service
GCNP - Grand Canyon National Park	USGS - United States Geological Survey
GCNRA - Glen Canyon National Recreation Area	WAPA - Western Area Power Administration
GCPA - Grand Canyon Protection Act	WY - Water Year (a calendar year)
HBC - Humpback Chub (endangered native fish)	
HMF - Habitat Maintenance Flow	
HPP - Historic Preservation Plan	
IEDA - Irrigation and Electrical Districts Association of Arizona	
IN - Information Need (stakeholder)	