

**Minutes of Technical Work Group Meeting  
April 7-8, 1998**

**FINAL**

**Presiding:** Robert Winfree, NPS (Chairperson)

**Committee Members Present:**

Mark T. Anderson, USGS  
Clifford Barrett, RW Beck & Assoc.  
Kerry Christensen, Hualapai Nation  
Dave Cohen, Trout Unlimited  
Wayne Cook, UCRC  
Wm. Davis, EcoPlan Assoc./CREDA  
Kurt Dongoske, The Hopi Tribe  
Christopher Harris, ADWR  
Pamela Hyde, American Rivers

Gene Jencsok, CWCB  
Robert King, UDWR  
Phillip S. Lehr, CRCN  
Carlos Mayo, Southern Paiute Consortium  
Tom Moody, Grand Canyon Trust  
Bruce Moore, USBR  
Clayton Palmer, WAPA  
Bill Persons, AGFD  
Andre Potochnik, Grand Canyon River Guides  
Fred Worthley, CRBC

**Committee Members Absent:**

Joe Dishta, Pueblo of Zuni  
Alan Downer, Navajo Nation  
Owen Gorman, USFWS

Norm Henderson, GCNRA  
Amy Heuslein, BIA  
John Shields, Wyoming State Engineer's Ofc

**Alternates Present:**

Larry Sibala, BIA  
Wayne Cook, UCRC  
Don Metz, USFWS

Amy Heuslein, BIA  
John Shields, Wyoming State Engineer's  
Office  
Owen Gorman, USFWS

**Alternate For:**

**Other Interested Persons Present:**

Debra Bills, USFWS  
Greg Fisk, USGS  
L. David Garrett, GCMRC  
Barry Gold, GCMRC  
Julia Graf, USGS  
Peter Griffiths, USGS  
Bob Hart, USGS  
Joe Hazel, NAU  
Bill Jackson, NPS  
Matt Kaplinski, NAU

Ruth Lambert, GCMRC  
Tom Latousek, American Rivers  
Laurie Lewis, research assistant to A. Potochnik  
Steven Lloyd, USBR  
Ted Melis, GCMRC  
Tony Morton, USBR  
Randy Peterson, USBR  
Barbara Ralston, GCMRC  
Jack Schmidt, Utah State University  
J. Dungan Smith, USGS  
David Topping, USGS

**Recorder:** Serena Mankiller, GCMRC

**4/7/98:**      **Convened:** 9:33 a.m.      **Adjourned:** 4:30 p.m.

**4/8/98:**      **Convened:** 8:05 a.m.      **Adjourned:** 2:17 p.m.

## **MEETING OPENING AND ADMINISTRATIVE ITEMS**

**Welcome:** Robert Winfree welcomed committee members and guests.

**Review of Agenda:** The Chairperson distributed a revised agenda. The committee reviewed the agenda and added the item: "GCD Violation April 1, 1998".

**Attendance Sheet:** Distributed.

**Review of Minutes:** Minutes of the last meeting were not yet completed.

*Recommendation:* Draft minutes from the March 17-18, 1998 meeting will be completed as soon as possible, e-mailed to members and posted on the web site. TWG members shall contact the GCMRC Secretary regarding suggested revisions.

### **Other Administrative Business**

**Federal Register Notice:** Meetings are being noticed as required.

**Future TWG Meeting Schedule:** Chris Harris requested that the TWG consider scheduling monthly TWG meetings for one day only, or every other month for two days. Robert Winfree stated that we will review the upcoming meeting agenda items tomorrow which will determine the length of upcoming meetings.

**Membership Changes:** Pam Hyde will be terminating her employment with American Rivers as Associate Director of the Southwest Regional Office. Tom Latousek will be the alternate until an official member is named. The AMWG will need to decide on the new official member representative for its working group. Don Metz has officially replaced Owen Gorman as the USFWS TWG representative.

### **REPORTS FROM AD HOC GROUPS AND OTHER OFFICIAL REPORTS:**

**Spillway Gates Extensions Ad Hoc Group Update:** Bruce Moore stated that he has not yet received any additional comments on the recommendation from the ad hoc group that the spillway gate extensions be available in case of emergency but not permanently installed. The paper will include criteria about potential circumstances necessitating installation of the flashboards. The draft document will be presented at the June 9-10, 1998 TWG meeting which will include a cover sheet to the AMWG, the ad hoc group's recommendation paper, and a draft federal register notice. The ad hoc group is seeking closure on this matter. The package will be forwarded to the AMWG in the 30-day mailing prior to its July 21-22, 1998 meeting.

*Recommendation:* Stakeholders to submit comments on specific parameters by the end of May, 1998.

**Out Year Budget Ad Hoc Group:** (Attachment 1) Dave Garrett reported that the ad hoc group met recently to develop the out year budget process and to draft general categories for the FY2000 budget. The first budget submission is due in April 1998. The USBR and GCMRC have separate responsibilities in the AMP process. The budget should be considered the Adaptive Management Program budget (rather than the GCMRC budget), because it is a combination of activities of the AMWG, TWG, USBR-administered programs, and the programs currently administered by the Assistant Secretary of the Interior (including the GCMRC). The process established in the overall Adaptive Management Program is: the stakeholders define their objectives and establish information needs and management actions to fulfill those objectives; the GCMRC conducts research and monitoring in order to provide the information needs on the stated monitoring and research objectives. The research and monitoring programs necessary to fulfill the information needs is what drives the GCMRC budget process. The administration necessary to support AMWG and TWG actions drives the UC USBR budget.

Dave Garrett reviewed the information needs schedule and process which needs to be accepted by the TWG. Every September the TWG will review current information needs in GCMRC research programs. Completed information needs will be identified and taken off the list, new ones established, and work initiated. The information needs are incorporated into the strategic plan, annual plan and budget proposals and submitted to the TWG by GCMRC for review and recommendation in December. In January, the TWG and GCMRC agree on the program and its budgets and submit them to the AMWG for a 60-day review. In March, the AMWG votes on the budget. It is anticipated that the five-year budget will be reviewed and passed annually due to changes in the program (i.e., selective withdrawal).

Dave Garrett reviewed proposed budgets for FY2000 which included FY2000A \$7,191,000; FY2000B \$7,996,000; and FY2000C \$9,356,000. The group discussed at length issues including the feasibility of providing requested information needs (which have not yet been prioritized) within the proposed budgets, and annual adjustments affecting the stability of the budget. The TWG supported the FY2000B budget. It is the USBR's responsibility to submit the FY2000 budget for AMWG's vote and revision or recommendation, and then the final decision is made by the Secretary of the Interior. The USBR accepted the input from the individual TWG members to submit to AMWG at its July 1998 meeting a budget of \$7,996,000 with Remote Sensing Technology and Lake Powell items identified as special initiatives. Ruth Lambert reviewed the details of the Cultural Resources Program and the Programmatic Agreement budgets. Bruce Moore reviewed in detail the Bureau Administration items reflected in the budgets. Dave Garrett discussed the problem of the high cost of logistics to accomplish the research and monitoring compared to the size of this program. The logistics costs will increase every year, and he reinforced the need for more remote sensing technology. Ted Melis gave a brief overview of current remote sensing cost and efficiency benefits. The TWG discussed at length possible overlapping of GCMRC, USBR and contracting agencies' overhead in administration of the program and its research (some of which may be necessary or desirable). A need was identified that in the future the ad hoc group make a continuing effort to investigate ways of reducing overhead, identifying alternatives and tradeoffs and present the results to the TWG. Ted Melis reinforced that the adaptive management process is accomplishing more than the previous process. Not only has the budget remained level since the EIS, but we are doing

more independent external review, remote monitoring technology, and the stakeholders are involved in the TWG and AMWG.

**Management Objectives Ad Hoc Group:** (Attachment 2, dated 3/27/98) Dave Garrett reported that the Management Objectives ad hoc meeting for biological resources will be held on April 9 from 8 a.m. to 3 p.m. at the Arizona Game and Fish Department Phoenix offices in the Hummingbird Room. An updated document will be forwarded to the TWG, comments accepted for a week and incorporated into the new draft. An updated document and process information will be distributed to the TWG before the prioritization meeting. The Information Needs prioritization process meeting will be held April 23 from 9:30 a.m. to 5 p.m. and April 24 from 8 a.m. to 4 p.m.) at the BIA offices in Phoenix. Dave Garrett requested the TWG review the information needs carefully and consider what their priorities are. The ad hoc group (which includes the full TWG membership) will vote on priorities at that meeting. The information needs are very broad now, and the budget is not large enough to cover all of the work. Work on information needs will need to be staggered over upcoming budget years.

**Science Advisory Board Ad Hoc Group:** Barry Gold reported that an RFP on the SAB was drafted and sent to the ad hoc group for comment. Evaluation criteria will be added to the RFP. Mike Ward (UCR USBR Contracting Office) will receive the draft package by April 13, 1998. The RFP will be issued separately from the other FY99 Program RFPs, and distributed. Currently, we are waiting for the Solicitor to determine if the process and language for establishing the group is acceptable. Persons responding to the RFP will submit a letter stating the reason they desire to serve on a panel and the SAB will review the information for recommendation. The RFP will be finalized and distributed to GCMRC's mailing list of about 700 (including the TWG) and notices in some professional journals (a 90 day process). The TWG may also distribute it to others they wish to review it. It will go through the peer review and evaluation process to determine the final list of names. These will be provided to the AMWG and the Secretary's Designee for recommending nominees to the SAB. If possible, it is planned to be presented at the AMWG's July meeting.

**Draft TWG Operating Procedures Change for SAB:** (Attachment 3) Bill Davis stated that the TWG wants review information that the SAB forwards to AMWG for decision making before those decisions are finalized. It was suggested that when the SAB forwards the materials to the AMWG, the AMWG member immediately assigns his/her TWG member the role of reviewing and advising on the information. The AMWG will receive the original SAB viewpoint and may also benefit from the TWG's input and advice. Also, the TWG may seek additional information from the SAB regarding advice they (the SAB) submitted. Minor revisions would be made to the TWG Operating Procedures (under "Voting") to reflect these changes.

*Recommendation:* On motion duly made, seconded and carried, the TWG Operating Procedures will be amended to reflect the TWG's involvement in reviewing and providing advice to the AMWG on information forwarded from the SAB to the AMWG.

**BHBF Resource Criteria Ad Hoc Group:** (Attachment 4) Barbara Ralston reviewed the Resource Effects Matrix process since November, 1997. At the March 1998 meeting, the TWG had requested information including: (1) assumptions used in developing the matrix and who participated in developing it; (2) an explanation of the flow chart and diagram and the approach to using the resource criteria; (3) a draft decision criteria which can be modified and adopted in the event of a hydrologic trigger in May; (4) a model of hydrologic trigger criteria which we can use to develop our criteria. Utilizing the products from this ad hoc group and the Management Objectives Ad Hoc Group, a final report needs to be drafted which includes legal mandates and outlines anticipated resource effects if a specific flow is implemented. The GCMRC must be able to use this report in an expedient manner in the event of a hydrologic trigger. If time permits, the TWG would adopt the report and recommend it to the AMWG. It would go to the Secretary's Designee for USBR recommendation for a spike flood in the event of a trigger. The TWG felt the Management Objectives need more stakeholder specificity regarding short-term resource loss or gain values (spike flow "tradeoffs"). Not all management objectives will be relevant to a certain size of flow in a particular month. A suggestion was made to request the scientists provide the TWG with specificity on short- and long-term resource impacts for a May, June, or July hydrologic trigger to assist us in current and future decision making. Barbara Ralston stated that may be difficult for the scientists to ascertain because they have data reference for a March flow only.

*Recommendation:* Barbara Ralston will prepare a draft final report including the biological narrative, resource flow chart, etc. The TWG will provide to Drs. Ralston and Winfree and the members of the ad hoc group recommendations on specific management objectives which the stakeholders consider to be "show stopper" criteria. If possible, the stakeholders will also include specificity regarding acceptable take or timelines associated with the criteria. Submit comments to Barbara Ralston by April 22, 1998. The ad hoc group will prepare a draft set of criteria. The report shall be included in the 10-day materials distribution to the TWG prior to the May 1998 meeting.

**Glen Canyon Dam Issues Ad Hoc Group:** (Attachment 5) Tom Moody distributed a draft of responses to proposed alternative dam operations (flows above 45,000 cfs and load following between 25,000 cfs and powerplant capacity) for information purposes. An update will be presented at the next TWG meeting for review and comment.

**BHBF Science Plan Funding Ad Hoc Group:** David Garrett reported that the ad hoc group has prepared information on the science for a BHBF if the triggering mechanism is met and the resource criteria evaluations indicate that a flow can be implemented. Each area of research is included with budget detail (see Attachment 1). We will expend \$1,000,000 only, if the event does not occur. According Randy Peterson's forecast today, it appears that a hydrological trigger is not likely for this year. However, if a 1983-type situation occurs and we receive notification of a trigger, the GCMRC staff must be prepared to react to an emergency situation and be in the field within 2 weeks. The science plan captures much of what was done in 1996 at a much lower budget. In the event of a spill, GCMRC will conduct post-evaluations of a 45,000 cfs flow (at no further cost). Bruce Moore reviewed the budget. GCMRC has reprogrammed \$60,000 rather than the previously reported \$50,000 for the budget. The total budget is now \$1,110,000.

Should notification of a trigger occur between TWG meetings, a notice will be posted on the AMWG/TWG web site, GCMRC will do the assessment of resources to assure compliance, the BOR will make its notifications, the Center will set its meetings with the scientists, and we would implement immediately. The mechanisms and process is in place.

### **BHBF ISSUES**

#### **BHBF Science Plan Ad Hoc Group** (see "Reports from Ad Hoc Groups")

**Hydrologic Forecasts:** (Attachment 6) Randy Peterson reviewed snowpack, the forecast, release patterns, and risks associated with El Nino. Basinwide snowpack is 95%, which reflects a gradual increase. The NWS forecast dropped ½ MAF although the snowpack increased, which is viewed by the USBR as inconsistent. The forecast should be 100% of normal also. The forecast would have to increase 30% to trigger a spike flow for May, which is not likely. March inflow to Lake Powell was 110% of normal, and the snowpack was 95.5%. 2.8 MAF (represents 5-10% exceedance level). We can control the maximum probable runoff with no loss of control of GCD. A spike flow may be triggered, but we currently are not in a 1983 scenario. The end of the runoff season is approaching and the errors are decreasing. Theoretically the forecast is getting better, but we are also running out of flexibility. On April 2, the flows were decreased to an average 13,000-14,000 cfs. If the forecast does not change, we will decrease to 10,000 cfs (600,000 AF) in May. Randy Peterson reviewed the decision-making process for releases. Releases from now through July will be averaged as much as possible because the status of the reservoir in July will help determine the January 1, 1999 target. Dave Garrett requested information on future expected releases.

*Recommendation:* The USBR will contact the NWS on April 8, 1998 to discuss concerns about the NWS April forecast. Clayton Palmer will produce some expected releases and scenarios for three months in advance will be presented at each TWG meeting in the future.

**GCD Violation April 1, 1998:** A lengthy discussion ensued about the range allowed for WAPA releases under the specific ROD criteria versus the "spirit" of the ROD, and how fluctuations such as the April 1<sup>st</sup> 5,000 cfs overnight flow adversely affects and re-sets the aquatic foodbase to a long-term lower level. The TWG felt that WAPA should step the flows down over a few days rather than a few hours when transitioning from one month to the next. Clayton Palmer felt it was a preventable error of a scheduler that the transition from March to April flows occurred over such a short time period. Clayton Palmer will re-review the specificity contained in the operating criteria and the MOU signed by the USBR and WAPA. Dave Garrett stated that the GCMRC wants advance notice on future planned low flows in order to restructure a science plan including aerial overflights to capture the data points. The forecasts go out in advance on email and are posted on the WAPA web site. It was suggested that an email go out a couple of days before the end of the month stating what the releases will be if the forecast does not change. Clayton Palmer stated that the May releases are planned at 10,000 cfs, so the nighttime releases would be 5,000 cfs.

*Recommendation:* Randy Peterson will make an effort to give a 1-2 day lead time regarding changes in flow levels. WAPA will consider stepping the monthly transition over a few days. The issue of weekend flows (stepping down on Sunday) will be addressed by WAPA and the USBR. Clayton Palmer will investigate and report back to the TWG.

**Section 7 Compliance Process:** (Attachment 7) Tony Morton distributed and reviewed the draft EA package. He will mail it to TWG absentees. The decision on a FONSI will depend on comments received and the results of the Biological Assessment and Biological Opinion. He will meet with the USFWS regarding its comments on the Biological Assessment, as well as its formal response to the request for consultation. The draft Biological Opinion will be distributed to the TWG via e-mail. Section 7 will be completed for the Biological Opinion and incorporated into the NEPA document, and it will be ready for a go/no decision on a BHBF. It will probably be a go if we get a hydrologic trigger (with some mitigation factors regarding RPAs). It was suggested to make it a three-month programmatic EA (applicable to that period of time). Tony Morton stated that it was planned to incorporate this data into the programmatic EA for January-July. It will depend on the detail applied to the resource matrix detail and specific antecedent conditions for May-June. Variable antecedent conditions will be incorporated into the January-July document.

*Recommendation:* Review and submit comments to Tony Morton by April 24, 1998.

Tony Morton distributed an issue paper (Attachment 8) on options to involve the TWG in advising on the Section 7 consultation process. He reviewed justifications for the TWG's inclusion in the process. He related concerns regarding the possibility of violating the federal American Indian trust responsibilities because the public process may compromise sensitive tribal information. Tony Morton suggested that we may want to try Option A (page 2 of handout) in which the USBR would produce draft documents and make them available for public comment and AMWG/TWG review and comment. Option B would be to establish an AMWG ad hoc "consultation team" group. Clayton Palmer stated that an executive order might exist that allows states to be consultants in an ESA consultation.

*Recommendation:* Clayton Palmer will investigate the ESA/state consultant possibility and report back to the TWG.

**KAS Stocking:** Robert Winfree gave an update on the status of interagency discussions regarding the KAS. The process is ahead of schedule. The NPS is incorporating text received from AGFD and developing an EA, which is scheduled for completion by April 15. The EA will be released for a 30-day public comment period. Assuming that a draft FONSI is developed, early June would be the earliest possible stocking date. There is a need for tribal consultations and a decision on who will conduct those consultations. The KAWG will hold its next meeting April 29, 1998. Robert Winfree is not sure yet if an NPS representative is available to attend. The KAWG recommends a couple of lifecycles need to pass to rid the population of parasites. Vicky Meretsky had recommended moving a portion of the natural habitat with the snails, but that will also move parasites and weed species. The current hydrologic forecast will allow us more time to work out the issues.

**Scientific Permits:** Robert Winfree requested a summary of permitting requirements of the various agencies. The purpose of this discussion is to attempt to streamline the process by identifying application needs and problems encountered by the agencies during the process. Also to be sure GCMRC's program complies with permitting timetables and requirements.

**NPS:** A "Research and Collecting Permit" is required for field research along with a study plan and application. The study plans go through an internal review process which takes 45-90 days to complete, depending on the accuracy of the submitted application. This review process does not duplicate GCMRC's peer review process. NPS requires access permits which involve boat launches, back country trips, etc., which takes 45 days or less to process. Permits may be applied for as much as five years in advance. There is a federal archaeological permit which is occasionally required. Their scientific review process sometimes exposes fraudulent archaeological proposals. Glen Canyon has delegated its permit process to Grand Canyon (for this program). Contact: Robert Winfree, GRCA Senior Scientist.

**Problems Identified:** Late submittal of permits, availability of peer reviewers, unexpected efforts to obtain additional information, more in depth identification of work to be done which may actually include endangered species work (which requires a USFWS permit). NPS lost their permit processing person and will be unable to replace him/her.

**AGFD:** A collection permit package is required which goes through a 30-day process including an internal review process and is then accepted or rejected. The researcher must submit a detailed description not to exceed three pages. Contact: Jeff Howland, Permitting Coordinator.

**Problems Identified:** There is no way to speed up the process.

**USFWS:** All applications are submitted to the Regional office which consists of one staff person in Albuquerque. They require a research proposal or a study plan including numbers of animal take. They are noticed in the federal register for 30 days to allow the public review. If no comments are received, the permit is issued. Currently, all endangered species permits have to be process through a law enforcement computerized application system (that system is being replaced). It takes approximately 90 days to complete the entire review and approval process. Contact: Sandra Duran-Poole, Permitting Coordinator, Endangered Species.

**Problems Identified:** Currently there is a large backlog and permits have been delayed as long as four months.

***Recommendation:*** The GCMRC needs to integrate rather than attach to its RFPs relevant information from the permitting authorities which is easily identified and extracted by the permitting authorities. Although the researchers are responsible for their permits, the GCMRC Program Managers should track the entire application process and timeline to be sure the scientists have not missed a step. Applications need to be made six months in advance. Researchers need to be very thorough when completing their applications including number of animals, number of people (including volunteers), etc. GCMRC should send a package of

collection permits along with the notice of award of an RFP.

**Physical Science Review and Panel Discussion:** Ted Melis arranged for presentations to the TWG by scientists participating in the GCMRC program. Jim Smith (USGS, Boulder, Colorado) and Jack Schmidt (Utah State University) presented several group's work including USGS, NAU, USU, L. Kearsley campsite data, and data collected by GCES and analyzed by Ned Andrews on results from the 1996 45,000 cfs BHBF. David Topping (USGS, Denver, Colorado) and Joe Hazel (NAU) presented results of the 1997 31,000 cfs test flow (Attachment 11). Mark Anderson (USGS, Tucson, Arizona) presented on future high flow research related to flows efforts. Steve Wiele discussed integration of physical and cultural resources, including preservation of resources. A review of projects over the next two years was given. A panel presentation was held and some advice for the resource managers included:

- A need to manage for the behavior of specific important sites rather than the average behavior of the river. Management decisions have to be made on "winners" versus "losers."
- When deciding on what to manage for, if it is to maintain sand, a short, very high flow followed by lower flows is advisable.
- Suspended sediments across an entire cross-section must be measured accurately during all high flow events.
- Initial coarsening of the bottom sediments is desirable (via a flood flow) to decrease the downstream transport from later flows. Coarsening occurred in the 1996 flood event.
- About 10-20% of the finest sediment washes out within a few weeks of deposition from 1997 Paria and LCR floods. About 80% of sand from a tributary flood is retained from a few weeks to about 2 years. Managers should consider not only how many years of input is being moved in a 7-day flood, but how much is being conserved along shoreline sites over the next 3-4 years.
- Sediment transport response to the 31,000 cfs two-day test flow was very similar to that documented during the 1996 45,000 cfs seven-day flow.

Jim Smith reported that it was desirable to assemble the 1996 experimental flood data in one document. The AGU will be publishing a book which includes a history of research in the Grand Canyon, decisions regarding implementation of the 1996 BHBF and economic impacts of the flood. Scientists who participated in the flood were given an opportunity to assemble papers which are currently out for blind peer review. The finished product will be forwarded to the AGU in the next two months. The Secretary of the Interior will write the preface. Also, Ecological Applications has received a synthesis of the chapters which have gone out for review. If selected, the articles will be published next year as a special feature.

**Programmatic Agreement/AMP Program:** Kurt Dongoske reported that comments will be accepted regarding PA/AMP integration through the end of April. No comments have been received yet.

*Recommendation:* Kurt Dongoske will request that the item be added to the May 18-19, 1998 TWG agenda if comments are received.

## **MEETING REVIEW AND WRAP-UP**

### **New Business:**

**Field Trip to Glen Canyon Dam in May:** (Attachment 9) Barry Gold announced plans for a TWG field trip on Lake Powell on May 16, and a GCD tour by the new Facility Manager, Ken Rice, and day raft trip on May 17. The river trip will include beach sites and monitoring/research sites. Official TWG members/alternates and their AMWG members are invited. A sign-up sheet was distributed.

*Recommendation:* Reply to GCMRC within 10 days if you are interested in participating and are not signed up.

**Other Upcoming Field Trips:** Dave Garrett announced that a similar trip has been arranged for Dr. Mark Schaefer, Stephen Magnussen and county, NPS, UC USBR and LCR USBR representatives. The trip will be held April 20-21, 1998 on Lake Powell and monitoring and research sites on the river. Discussions regarding how the USBR and NPS are responding to stakeholders' needs, and protection of management resources. On May 1-2, 1998 the NRC Grand Canyon Review Committee will conduct its first meeting to review the GCMRC program, tour the GCD and participate in a day raft trip. After completion of the stakeholders' Management Objectives and Information Needs, a week-long Interagency Cooperative river trip is planned for June 1998 to expose the representatives to research activities involved in resource management. Most of the funding for these trips will come out of the AMP budget. In the fall, Stephen Magnussen wants to involve the entire TWG and AMWG in a structured, week-long river trip to discuss stakeholder issues and satisfaction of the program's effectiveness, process, and response to their needs. GCMRC will provide logistics support, but will not necessarily be involved in the trip. Mark Schaefer may be involved. The main purpose of these trips is that since the AMP is a special program and is an experiment in resource management in the west, the DOI and USBR management teams need to be fully cognizant of the program's process, progress, effectiveness and achievements.

### **Upcoming TWG Meetings:**

May 18-19: Day 1: 12:00 pm-5:00pm; Day 2: 8:00am-12:00pm

Location: USGS Flagstaff Field Center - Flagstaff.

May 19, 1:30 p.m. to 5 p.m.: Joint/overlap meeting with conceptual modeling workshop.

June 9-10: Day 1: 9:30am-5pm; Day 2: 8am-4pm

Location: ADWR - Phoenix

July 23, 1998: 8:00am to 4:00pm (one day meeting)

Location: Embassy Suites (44<sup>th</sup> & McDowell Roads) - Phoenix

**Review:**

Action Items: The Chairperson reviewed action items identified at this meeting which are stated under "Recommendations" following the topic and discussion items in these minutes.

Agenda Items:

June 9-10, 1998:

- Finalize documents for AMWG.
- Conceptual Model presentation.

Public Comment: The Chairperson asked for public comment at the end of each major topic. No comments were received.

There being no further business, the Chairperson adjourned the meeting.

Respectfully submitted,

Serena Mankiller, GCMRC Secretary

## Key to Acronyms

ADWR - Arizona Department of Water Resources  
AGFD - Arizona Game & Fish Department  
AGU - American Geophysical Union  
AMWG - Adaptive Management Work Group  
AOP - Annual Operating Plan  
BHBF - Beach/Habitat-Building Flow  
BHTF - Beach/Habitat Test Flow  
BIA - Bureau of Indian Affairs  
BOR - Bureau of Reclamation  
CAPA - Central Arizona Project Assn.  
CRBC - Colorado River Board of California  
CRCN - Colorado River Commission of Nevada  
CREDA - Colorado River Energy Distributors Assn.  
CRSP - Colorado River Storage Project  
CWCB - Colorado Water Conservation Board  
DOI - Department of the Interior  
EA - Environmental Assessment  
EIS - Environmental Impact Statement  
ESA - Endangered Species Act  
FACA - Federal Advisory Committee Act  
FWS - United States Fish & Wildlife Service  
FY - Fiscal Year  
GCD - Glen Canyon Dam  
GCMRC - Grand Canyon Monitoring and Research Center  
GCNRA - Glen Canyon National Recreation Area  
GCPA - Grand Canyon Protection Act  
HBC - Humpback Chub (endangered native fish)  
IEDA - Irrigation and Electrical Districts Association of Arizona  
KAS - Kanab Ambersnail (endangered native snail)  
KAWG - Kanab Ambersnail Work Group  
LCR - Little Colorado River  
MAF - Million Acre Feet  
NAU - Northern Arizona University (Flagstaff, AZ)  
NEPA - National Environmental Policy Act  
NHPA - National Historical Preservation Act  
NPS - National Park Service  
PA - Programmatic Agreement  
Reclamation - United States Bureau of Reclamation  
RFP - Request For Proposal  
RPA - Reasonable and Prudent Alternative  
SAB - Science Advisory Board  
TCP - Traditional Cultural Property  
TES - Threatened and Endangered Species  
TWG - Technical Work Group (Glen Canyon)

UCR - Upper Colorado Region (of the USBR)  
UCRC - Upper Colorado River Commission  
UDWR - Utah Division of Water Resources  
USBR - United States Bureau of Reclamation  
USFWS - United States Fish & Wildlife Service  
USGS - United States Geological Survey  
WAPA - Western Area Power Administration