

**Minutes of Technical Work Group Meeting  
November 4-5, 1997**

FINAL

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

**Committee Members Present:**

Mark T. Anderson, USGS	Robert King, UDWR
Clifford Barrett, RW Beck & Assoc.	Phillip S. Lehr, CRCN
Dave Cohen, Trout Unlimited	Carlos Mayo, Southern Paiute Consortium
Wayne Cook, UCRC	Tom Moody, Grand Canyon Trust
Wm. Davis, EcoPlan Assoc./CREDA	Bruce Moore, USBR
Kurt Dongoske, The Hopi Tribe	Clayton Palmer, WAPA
Owen Gorman, USFWS	Bill Persons, AGFD
Christopher Harris, ADWR	Andre Potochnik, Grand Canyon River Guides
Norm Henderson, GCNRA	John Shields, Wyoming State Engineer's Office
Pamela Hyde, American Rivers	Fred Worthley, CRBC
Gene Jencsok, CWCB	

**Committee Members Absent:**

Kerry Christensen, Hualapai Nation	Joe Dishta, Pueblo of Zuni
Alan Downer, Navajo Nation	Amy Heuslein, BIA

**Alternates Present:**

Richard Begay  
Larry Sibala, BIA

**Alternate For:**

Richard Downer, Navajo Nation  
Amy Heuslein, BIA

**Other Interested Persons Present:**

Tracy Baynes, Oracle, AZ	Robert Forrest, EcoPlan Assoc/CREDA
David Garrett, GCMRC	Steven Lloyd, USBR
Barry Gold, GCMRC	Ted Melis, GCMRC
Julia Graf, USGS	Don Metz, USFWS
Christine Karas, USBR	Randy Peterson, USBR
Dennis Kubly, AGFD	Mark Phillips, Trout Unlimited
Ruth Lambert, GCMRC	Timothy L. Recht, Law Firm of Robert S. Lynch
Mike Liszewski, GCMRC	Michael Yeatts, Hopi Tribe

**Recorder:** Serena Mankiller, GCMRC

**11/4/97: Convened:** 9:38 a.m. **Adjourned:** 4:50 p.m.

**11/5/97: Convened:** 8:00 a.m. **Adjourned:** 1:15 p.m.

**Welcome/Introductions:** Robert Winfree convened the meeting at 9:38 a.m. He welcomed the committee members to the first official Technical Work Group meeting.

**Attendance Sheet:** Two sheets will be utilized each day to record attendance; one for official TWG members or their alternates, and one for all other persons present.

## **ADMINISTRATIVE ITEMS**

**Review of Minutes:** Minutes of the last meeting were reviewed and revised.

**Recommendation:** Minutes were adopted with revisions (Attachment 1). GCMRC Secretary to revise the minutes and re-distribute final copies to the committee members.

**Official Member List:** Revised list was distributed for review (Attachment 2).

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**Recommendation:** Submit additions/corrections to GCMRC Secretary.

**Federal Register Notice:** The next meeting date published in the Federal Register says December 11-12, 1997. The date reported in the minutes was December 10-11, 1997. Bruce Moore inquired if we will revise the generic agenda.

**Recommendation:** USBR will change the meeting date to December 10-11, 1997 in the Federal Register. Contact Bruce Moore if the generic agenda is to be revised and republished.

**Meeting Rules:** Robert Winfree requested the following rules be followed during meetings: 1) be on time; 2) wait to be recognized before speaking; 3) be concise; 4) stick to the topic; 5) save new business for the end.

**Recommendation:** Meeting rules will be added to TWG's Operating Procedures.

**Distribution/Presentation of Information:** Agendas, minutes and other meeting information will be distributed to official members, Dave Garrett and the GCMRC Program Managers (B. Gold, R. Lambert, M. Liszewski and T. Melis) and Steve Lloyd. The agenda will be posted on the USBR web page. Agendas will be sent to persons requesting a copy. If a person requests a specific document, it will be provided to him/her. Committee members requested more time to review meeting materials. The committee discussed the feasibility of sending documents forward to AMWG for review 30 days prior to its next meeting, rather than 60 days. A 30-day distribution would allow more time to finalize documents. A recommendation is needed on a universal format for electronic transmission of documents. Overhead transparencies are difficult to read from the back of the meeting room.

**Recommendation:** The USBR will post agendas 1 week prior to the meeting on its web page.

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Steve Lloyd will investigate establishing an Adaptive Management home page with AMWG and TWG sections containing draft documents and access by password. The GCMRC Secretary will continue to distribute hard copies and electronic copies via e-mail. In the future, TWG meeting materials will be distributed 10 days prior to the upcoming meeting. USBR will forward substantive documents to AMWG 60 days prior. If other documents are not ready for distribution, the Chair will include a letter with the 60-day mailing notifying AMWG that more information will be forwarded 30 days prior to its next meeting. Robert Winfree will request approval for 30 days at AMWG's January, 1998 meeting. Dave Garrett stated that next year the GCMRC will be better able to meet the 60 day deadline. An ad hoc group was formed to decide on the electronic transmission format issue, which includes the following persons:

Michael Yeatts  
Michael Liszewski

John Shields  
Tom Moody

Mark T. Anderson

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Overhead transparencies should be large enough for all members to see during presentations.

**Chair/Vice-Chair:** Robert Winfree volunteered to chair the committee through the AMWG meeting in January. Any official committee member may be the Chair. The committee discussed term of Chair, and election of Vice-Chair.

*Recommendation:* Consensus: Chair's term will be one year. Robert Winfree will continue to serve as Chair through the AMWG meeting in January. The committee will elect a new Chair before the next AMWG meeting in January, 1998. Consensus: Robert Winfree's term will be extended from October 1997 through January 1999. The USBR will be the permanent Vice-Chair, and will independently select its representative.

**Review of Draft TWG Operating Procedures:** Steve Lloyd incorporated information from the last meeting into TWG's Operating Procedures. He has been reviewing AMWG Operating Procedures and extracting items pertaining to sub-groups to be sure TWG conforms to AMWG Operating Procedures. He will also review federal regulations. Closed meetings will be deleted from the TWG Operating Procedures and amended later if necessary. "Making Motions" will be included under the "Voting" section.

*Recommendation:* The revised document will be distributed to TWG next week. Please review, revise and return to Steve Lloyd within 1 week. We will plan to distribute the revised procedures with the November 26 mailing to TWG for review at the December 10 meeting. If adopted at TWG, the Operating Procedures will be sent with the 30-day mailing to AMWG.

**Report on FACA Requirements Related to TWG:** Bruce Moore reported that TWG is a FACA subcommittee and it is subject to FACA requirements. We are exempt from putting a charter through the Secretary of the Interior. TWG members do not have to be appointed. Requirements include roll call, having a quorum, and 15-day advance notice of meetings. TWG

ad hoc groups (consisting of two or more persons) may meet, gather information, conduct research for an advisory committee, analyze relevant facts, discuss issues, and make recommendations to TWG, but information must be brought back to this meeting for adoption and then forwarded to AMWG. Ad hoc groups are not FACA groups and may not make recommendations to the Secretary of the Interior. Groups formed outside of the TWG are considered to be obtaining independent advice and do not report to TWG. A question arose if official committee members may get reimbursed for TWG meeting attendance. The USBR is researching the issue. Money is not currently budgeted for it. Steve Lloyd stated that it is discretionary, and we were told the initial cost was too high. Some FACA committees pay members' salaries. The law says there is a choice whether or not to allow payment for various activities or members of the group. The AMWG may need to decide, since reimbursing TWG members for travel and per diem will increase costs. The EIS focus is that funding is to go to research and monitoring. Official TWG representatives (or alternates) of tribal nations are funded.

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*Recommendation:* USBR will ask the Solicitor's Office about reimbursement to official members for TWG meeting attendance. If payment for past meeting attendance is authorized, official members will be reimbursed.

**Report on the FY1998, FY1999, and FY2000 Adaptive Management Program Budgets:**

Bruce Moore distributed and reviewed the Proposed Program Budgets for Grand Canyon Adaptive Management Program. The budget was discussed at length by the committee (Attachment 3a). He distributed the USBR FY99 and FY2000 Program Formulation Calendar (Attachment 3b). The Colorado River energy distributors and WAPA scrutinize the revenues. In any year, we work with three budgets:

1. Current year (1998; we are into implementation and financial phase right now);
2. Next year (January, 1999; in February the President announces the budget);
3. Following year budget formulation (FY2000).

The budget is broken down into appropriated accounts and revenue accounts sections (revenue which we think we will generate):

**FY1998 Budget:** is already in place and cannot be changed. GCMRC Program Managers have identified 10%-15% of reduction areas for contingencies such as unsolicited RFP funding.

**FY1999 Budget:** We are in the process of commenting on GCMRC's FY99 budget. Adjustments can be made until March, 1998 but the bottom line cannot be changed (because that is what was sent to Congress). The committee wanted to see a study item estimated amount. GCMRC did not budget for the planned spike flow, which could cost \$500,000-\$1,000,000.

**FY2000 Budget:** We have been working on the 2000 budget for 6-7 months; these are estimated areas of expenditures, but target ongoing activities. TWG can still have some input to the FY2000 budget. 1998 meeting because we can only answer questions on the 2000 budget until late April, 1998. The AMWG would have to review it by May, but it does not meet until June or July, 1998. Therefore, the AMWG may have to review this budget at its January, 1998 meeting.

**Unexpended funds** are evaluated for use elsewhere in the program, returned to CRSP, or are credited towards repayment for this program.

***Recommendation:*** Bruce Moore will copy TWG on the FY99 budget sent to Congress. At the next TWG meeting, Bruce will report on when the budget gets presented at TWG and AMWG. The FY99 Program Planning Group will meet on December 3 to discuss/revise/re-submit the budget to TWG for decision at the December 10 meeting. We will develop a final budget for TWG's review and then will send the bottom line it forward to the AMWG (after the December 10 TWG meeting). Definitions of revenues and appropriations and their differences will be included. Bruce will develop decision deadline dates. It will also be covered in Chris Harris' time line flow chart. More detail will be provided on the Programmatic Agreement and program areas.

**TWG Management Objectives:** The current objectives will be used to formulate the 1998/1999 plans. Information needs input and concurrence is needed from TWG. We need to identify a process at the January, 1998 AMWG and get input about if the objectives need to be changed and if there are any other information needs we need to consider. The management objectives were never formally adopted by AMWG. We need concurrence from AMWG in January at least on beginning objectives because the FY99 plan is based on these. Then we can form a task group. The objectives can still be changed after they are adopted. The objectives are the foundation of the EIS.

***Recommendation:*** TWG adopted current management objectives for the FY98-99 plan. They will be included in the AMWG packet for the 60-day mailing. Bruce Moore will draft a recommendation to AMWG to accept the objectives and information needs for 1998 and 1999, and propose a review for drafting of the 2000 Annual Plan. USBR will report at the TWG meeting in the summer of 1998. The Secretary of the Interior does not have to adopt them (because the AMWG is a recommending body to the Secretary). Management objectives and information needs should be reviewed in the spring.

### **AOP/TWG**

Chris Harris is continuing to develop a comprehensive chart including roles, planning milestones and integration of AOP with the TWG planning calendar (Attachment 4a). The chart will include copies of the Acts as appendices. He requested comments and additions to the chart, and possibly a smaller group to refine it. Rob Arnberger had requested such a chart at the AMWG meeting. AOP/BOR/AMWG flow chart (Attachment 4b) and the April 25, 1997 memorandum on the

“White Paper” meeting synopsis (Attachment 4c) was previously distributed to TWG.

*Recommendation:* Chris Harris will prepare an Executive Summary and chart and distribute it to the TWG in 2 weeks (not including appendices). Chris Karas recommended adding the final Biological Opinions for 1995, 1996 and 1997, and the Programmatic Agreement. Dave Garrett will coordinate GCMRC target dates with Chris’ chart. Also, he will work with Chris to develop one briefing booklet which encompasses all activities and is maintained in the TWG group. Chris Harris to draft a memo to AMWG which states that we are working on the chart.

#### **REPORTS ON THE NOVEMBER 1997 PLANNED EXPERIMENTAL FLOW**

**Operational Planning Issues:** Tom Moody and Randy Peterson reported that the test flow began on Tuesday, November 3. The starting volume was 23,000 cfs/hr.; upramp: 4,000 cfs/hr.; downramp: 1,500. Flow of 31,200 cfh/hr. was realized with no generator problems. Most of the system regulation has been shifted to Loveland, Colorado area. Hydrology: over 1 MAF. Inflows (of normal): August 175%, September 216%, October 189% (1,035,000 MAF). Randy reviewed 1997-1998 Glen Canyon releases (top, mid, and bottom line releases). Releases are over double the usual and there is no storage room upstream for water.

**Research and Monitoring Activities:** Ted Melis reported that the GCMRC’s planned field activities during the test flow are:

- ▶ Sunday-Wednesday stream flow monitoring
- ▶ Aerial videography (begun today) to document the 31,000 cfs stage

GCMRC planned field activities for post-test flow evaluation starting on Friday, November 7:

- ▶ Bathymetry (oar powered) 31,000 cfs up (RM 6; Badger Rapids). Three sites will be motorized and we will get depositional rate information
- ▶ Sandbar Changes: in channel margin bars (there was a lot of aggradation after the last test flow, and this will be monitored more closely) above 21,000 cfs
- ▶ Sandbar Sedimentology: to see how the internal bar structure and grain size changes and see if it corresponds (Lees Ferry to Mile 95)
- ▶ Fish stranding impacts
- ▶ Kanab ambersnail impacts

We cannot determine if the sediment was moved from above the Marble Canyon dam site because our only points of measurement are suspended sediment for RM 60 and Lees Ferry. There is a future possibility of installing a temporary/intermittent stream gauge at RM 38 to evaluate Marble Canyon’s long term sediment balance. We do not currently have a gauge installed at Marble Canyon. This additional streamflow/sediment-transport monitoring needs to be done at high discharges (especially above 25,000 cfs) to determine if sediment budget of marble Canyon is in

fact positive. If it is not, then the surplus sediment recorded near LCR confluence equals mining of sand from lower Marble Canyon.

This research will cost approximately \$50,000 plus logistics costs for one downstream trip.

Dave Garrett explained that Adaptive Management requests us to evaluate a flow and use a regime they specify. We research status of the resources. We hold a scientist group meeting and do a professional judgment assessment of potential implications of a flow. Using that information, we step down a science package which is tailored towards the most important aspects of the flow to the TWG and AMWG (because there is always more information specified than funding to do the research). This test flow cost \$107,000. Last year's long-term sustained flow assessment cost \$427,000.

Dave Garrett reported that GCMRC made an emergency request to the NPS which approved the helicopter overflight for aerial videography. The 31,200 cfs/hour is an important flow regime that is not on record for study (a point missing from the rating curve). GCMRC will develop this long history of video into a report. Barry Gold stated that there are four specific products which will be developed from the video.

Ted Melis stated that one of the key differences between this test flow and the 1996 BHBF is that we do not have the pre-imposed low constant flow period. We have normal operations/test flow/normal operations, which reduces the cost. Fixed-wing photography is logistically more complicated, so we used aerial videography instead. The original test flow date was October 6. Due to the delay, we can develop preliminary draft but not final reports for the January, 1998 AMWG meeting. They will be available by mid-January, 1998 and finalized by spring-to-September, 1998.

Andre Potochnik asked for an update from the amount of sand in the channel reported on at the last AMWG meeting. Ted stated that at that time the best information we had were model estimates from Dave Topping, USGS. He had estimated about 1.2 million cubic meters of sand/silt/clay had been deposited, which was about twice the mean average annual contribution. We went from 15%-20% of normal to about two times normal. A lot of fine sediment was deposited. We used that information to justify this test flow. Bathymetry surveys were done for the full channel from Paria River Confluence down to Navajo Bridge. One scour wave occurred just before the flood; sediment came in and did not deposit immediately down from that confluence. Mark Gonzales (GCMRC) is currently processing the data, and we have not yet seen the results. Preliminary results will go to the January, 1998 AMWG meeting in the form of a draft report.

### ENDANGERED SPECIES

Christine Karas reviewed the Endangered Species Consultation process (Attachment 5a). She explained why re-initiation of consultation was needed:

- ▶ There was a Federal Action
- ▶ The Action was not covered by a previous consultation
- ▶ The Action was not covered by existing NEPA
- ▶ Ramp rates follow the BHBF and BHMF descriptions in the FEIS on the Preferred Alternative for the operations of GCD. The concept of fall test flows was not addressed in the FEIS
- ▶ The Action did not fit the definition of BHMF (Lake Powell was not less than 19 MAF on January 1, 1997)
- ▶ The Action did not meet the definition of BHBF. (Action was not above power plant capacity, and was not 10,000 cfs greater than the allowable peak discharge.)
- ▶ Sediment inputs surpassed mean annual levels
- ▶ She reviewed consultation on the 31,200 cfs flow

Reclamation's biological assessment concluded that the action may affect endangered species, and requested a formal consultation. FWS prepared a Biological Opinion which found no jeopardy but incidental take would occur. Reclamation prepared a Categorical Checklist to document the action was evaluated under NEPA. She reviewed implementation of the Glen Canyon Dam operations Biological Opinion (Attachment 5b). Current status of biological opinion elements:

- ▶ Adaptive Management Program - completed
- ▶ High spring flows - completed
- ▶ Conceptual design of flows - ongoing
- ▶ Selective Withdrawal Program for Lake Powell - ongoing
- ▶ Native Fish responses to various temperature regimes and river flows - ongoing
- ▶ Humpback Chub population and habitat protection - ongoing
- ▶ Sponsor Razorback Sucker Workshop - completed
- ▶ Establish a second spawning population of humpback chub - preliminary work initiated

She reviewed the status of other Endangered Species work including the Kanab ambersnail, Southwestern Willow Flycatcher and fish data integration work (Attachment 5c).

She brought the following documents for the committee's information:

- ▶ Federal Register - Interagency Cooperation--Endangered Species Act of 1973 (Final Rule) (Attachment 5d)
- ▶ Biological Assessment of a One Time Test of Beach/Habitat-Building Flow from Glen Canyon



- Dam, Spring 1996 (Attachment 5e)
- ▶ Categorical Exclusion Checklist (Attachment 3f)
- ▶ Memo (undated) from Charles Calhoun (USBR/SLC Regional Director) re: Review of Sufficient Progress in Implementation of the Elements of the Reasonable and Prudent Alternative from the December 21, 1994, Biological Opinion on the Operations of Glen Canyon Dam (not restricted to the RPA) (Attachment 5g)
- ▶ Memo dated January 7, 1995, from FWS Regional Director, Region 2 re: Final Biological Opinion on the Operation of Glen Canyon Dam (Attachment 5h)
- ▶ Memo dated April 6, 1995, from FWS Regional Director, Region 2 re: Response to Final Biological Opinion on the Operation of Glen Canyon Dam (Attachment 5i)
- ▶ Memo dated February 16, 1996, from FWS Field Supervisor re: Biological and Conference Opinions on Operation of Glen Canyon Dam Controlled Release for Habitat and Beach Building (Attachment 5j)
- ▶ Memo dated April 3, 1997, from FWS Field Supervisor re: Review of Sufficient Progress in Implementation of the Elements of the Reasonable and Prudent Alternative from the December 21, 1994, Biological Opinion on the Operations of Glen Canyon Dam (Attachment 5k)
- ▶ Memo dated October 30, 1997, from FWS Field Supervisor re: November 1997 Fall Test Flow from Glen Canyon Dam (Attachment 5l)
- ▶ Implementing regulations (Attachment 5m) are specific to interagency consultation

**Sufficient Progress; Experimental Flows:** Ms. Karas reviewed a Sufficient Progress flow chart. She also reviewed a program of experimental flows. The first part instructs Reclamation to conduct experimental test flows which include high spring flows. A spring flow was completed. On the second part, FWS wanted to see a test of low steady summer flows for a low water year. The deadline is April, 1998. The Spike Flow Task Group met on October 29 and decided a 8.23 MAF water year would be advisable, so it will not occur this year. The information will go through additional analysis, and written information will also come out of today's meeting. Elements must be well planned and have appropriate research associated with them. Budgeting will be developed. These will be accomplished through GCMRC scientists and other group coordination. FWS felt that we were not making sufficient progress on it and we are working with them on this. Goals, characteristics and process to accomplish a low steady flow need to be determined and brought to TWG for recommendations. We do not have a time frame on this process.

**Penstock Modification:** Dave Trueman (USBR) developed a conceptual model to modify the penstocks. Reclamation has been unable to accelerate the design planning of this major construction project. It is less expensive than a multi-level intake. It is funded by CRSP Section 8 funds (not power revenues). It will require its own NEPA which will likely focus on operation rather than development. Installation will require some NEPA action. A plan needs to be developed before making those decisions. First NEPA, then an environmental assessment, then EIS. Feasibility is subjective, and Congress authorizing the project will be the determiner. A

group of people are still meeting and planning. Dave Trueman was unable to bring the information to AMWG due to time constraints. The process is moving forward.

*Recommendation:* For further clarification or questions, call Christine Karas or Dave Trueman.

**Responses of Native Fish to Temperature Regimes:** The GCMRC is letting FY98 contracts to reduce data gaps.

**Humpback Chub Protection:** In the transition period of GCES to GCMRC the contract expired and we had only a preliminary draft document, which was not finalized. The contract was with the Navajo Nation and SWCA had written comments. Dave Garrett said it should cost \$2,500-\$3,000 to complete, but it was not planned in the GCMRC budget (it was originally from the GCES budget). Power revenues are the funds. We will circulate it and obtain comments, and depending on the comments, the cost may be higher. Reclamation, with the aid of GCMRC, will do the work required to implement the biological opinion.

**Razorback Sucker Workshop:** This has been completed.

**Second Spawning of Humpback Chub:** Preliminary work has been done. The conclusion on the final element of the Biological Opinion is that the second population will have to be developed in the mainstem and will be dependent on warming of the flows through selective withdrawal or a combination of both (warmer water temperatures). We will need to plan the budget accordingly.

**Kanab Ambersnail Work Group:** Christine Karas reported that for the 1996 BHBF, we had to have a FWS consultation and do NEPA (this was prior to the ROD). We consulted with FWS on a one-time 45,000 experimental test flow. FWS stated in its opinion that we were not to run another 45,000 until a second population of KAS was established. This has not happened for 1.5 years now. There is a Kanab Ambersnail Work Group that meets regularly. It is a self-funded group of agencies and interested individuals. It has evaluated and monitored the KAS habitat and compared it to numerous other habitats. Larry England (Salt Lake City) is the lead of the official recovery team which is officially organized and set up by FWS and takes their charge from FWS. Larry Stevens does the pre- and post-work. Different plans have been developed and they looked at 135 sites in Grand Canyon, upper Kanab Canyon, the reservoir, etc. They plan to implement FWS' twelve-step process and introduce a second population. They have funded a study through NAU to culture snails and their foodbase (plants). They are working with the Phoenix Zoo, who has agreed to house a population of KAS at no charge. There will be another experimental population which needs a secure environment. Larry Stevens identified the top of the powerplant at GCD as a reliable water source, and we will experiment there to try to establish other populations. They have developed a contingency protocol. It was not funded through power revenues, but from FWS Section 6 funds, AGF matching funds, Reclamation appropriated funds, and other resources. The GCMRC only does work which was directly stated in the Biological

**Opinion.** Barry Gold asked if this is a change in FWS' position as evidenced by the language contained in the Biological Opinion for the November 1997 Test Flow. Don Metz stated that he was not involved in writing this, and had no comment. Any TWG member may attend or request to be added to the mailing list by contacting Christine Karas. Work is continuing on this element.

**Fish Data Integration Work:** After GCES Phase I (the Brown Report), there will be a similar report prepared on physical data. Duncan Patten is in charge of the other non-physical resources. Reclamation let a contract for fish data integration for endangered species--Humpback Chub findings and research of the low steady summer flow issue. Issues: benefits to non-native fish versus native fish. The report is in preliminary draft form. Barry Gold stated that SWCA's data integration proposal was reviewed externally and substantial changes were recommended, including work integration across studies and more critical assessment of the data. We have extended the deadline until February 1, 1998. Duncan Patten's GCES Phase II draft is due on February 15, 1998. Jack Schmidt's final report on physical resources is due March 31, 1998.

**TWG Coordination to Integrate ESA-related Issues with Dam and Flow-related Planning:** Clayton Palmer suggested that a TWG member who is well-informed of the law be appointed to act as a liaison to coordinate between Adaptive Management and USBR's responsibilities to ESA and NEPA, and to facilitate coordination between FWS, USBR or other agencies and the TWG. The committee discussed forming a task group instead.

**Recommendation:** A NEPA Issues task group was formed, consisting of the following members:

Amy Heuslein	Christine Karas	Bill Persons
Barry Gold	Clayton Palmer	Chris Harris
Pam Hyde (Chair)	William Davis	FWS representative (tba)

The group will meet and report (written or oral) back to this meeting regarding what to address and how. A written or oral report will be given at the next TWG meeting. The group will focus on coming to consensus decisions.

**Public Comment:** The Chair asked for public comment. A member of the public requested that copies of the information presented be available on the back table (in the meeting room).

**SPRING 1998 WEATHER SERVICE FORECASTS, FLOOD PLANNING AND COORDINATION:**

**Hydrologic Forecasts and El Niño Phenomena Update:** Randy Peterson stated that National Weather Service forecasting procedures strongly bias winter forecasts of spring runoff toward normal or average. Their ESP procedure uses multiple traces of future climate scenarios starting with current streamflow and groundwater conditions. The resulting basin runoff values are averaged and then compared with regression equation results to produce a forecast. This process has a tendency to underforecast high runoff years and overforecast low runoff years.

Randy showed frequency curves of historic January and April forecasts of January-July runoff compared to actual runoff to illustrate this problem. The underforecasting of high runoff years is the more serious of the two, since it has the potential to cause structural and environmental damage. The forecast errors of several El Niño years (1973, 1985, 1995) was discussed from the perspective that above normal spring precipitation is the primary cause of underforecasted runoff.

Ted Melis presented overhead transparencies and commented on the "Incorporation of Long-range Climate Variability Forecasts in Colorado River Operations" (Attachment 6).

- ▶ Glen Canyon Unregulated Inflows. Randy and Ted Melis presented this last week at the USBR-sponsored meeting "Climate Change, Climate Variability and Water Management in the West" in Colorado Springs, CO.
- ▶ Incorporation of long-range climate variability forecasts in Colorado River operations (this was a Peterson/Melis/Pulwarty study). They plan to evaluate how climate data are being used at present in management of reservoirs in the Colorado River Basin.
- ▶ Adaptive Management. Where does the climate variability fit in related to hydrology?
- ▶ Historical overview of above or below average annual flows for the last 100 years (1896-1997) which is total inflow (streamflow) from the upper basin. He noted that there were more years above normal from 1900-1934. Below average years were 1934-1967. Equal occurrence of above or below from 1967-1998. He concluded that climate change and variability has been changing on a decade-scale in the past two centuries.
- ▶ Lower Basin Precipitation over the past century. About 355 of the El Niño events correspond with the wettest 20 years in the Lower Colorado Basin, and also corresponds with high spring flow. La Niña corresponds with the drier years.
- ▶ Upper Basin Precipitation over the past century. The upper basin streamflow relates to long term forecast. The wettest years in winter correspond better with La Niña rather than El Niño (and vice versa). El Niño results in wetter spring seasons. The lower basin tends to be wetter in the ENSO phase.

January to March in El Niño years a normal snowpack is expected; it comes late in the year from May to June. It may be considered a wetness anomaly, but is more of a timing anomaly. If it is coming late consistently, you are not set up for it. If you have normal conditions 1-4 months in a row and an anomaly comes late in the season, then water must be evacuated from the dam.

- ▶ Upper Colorado River Inflow at Lees Ferry. This must be reviewed in more detail because there is not necessarily a correlation of inflow.

- ▶ **San Juans Snowpack.** The San Juan River showed a strong relationship between El Niño. In the future, we need to look at every tributary in the upper basin to assist with predicting long-term forecasts.

**Preliminary Conclusions:** on work done in the past 2 months, there are complex spatial and temporal relations between climate variability and Colorado River hydrology; implications of late-spring high wetness following normal winters; importance of back-to-back eastern Pacific ocean warm/cool anomalies.

- ▶ **Upper Basin Inflow:** 1 year is the El Niño and the next year is La Niña and intermediate conditions. When these occur back-to-back there is potential for a late spring anomaly followed by La Niña, resulting in a wetter than normal January/February. More study is needed when these two different anomalies occur consecutively and the dam is at near capacity levels.

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- ▶ **Ongoing Work:** we need to keep working to quantify the findings so it is not mainly an academic exercise. Further study is needed on: historical spatial and seasonal relations between Upper Colorado River inflows and anomalies (seasonal/decadal time scales); uses of climate information in Adaptive Management of Colorado River resources; managing climatic risk in the Colorado and Columbia Rivers. The Columbia basin tends to have an influence.

**Preliminary Conclusions:** if normal conditions December-February, anomalies can occur in late spring when those occur back-to-back. Complex spatial and temporal relations between climate variability. We can develop indices in January with some degree of certainty that May-July will have an anomaly. Considering El Niño, a forecast today would predict a dry winter and wet spring. NWS says we are in a warming phase and are predicting anomalies, but they don't know where it will occur (Mexico, California, or somewhere else).

**Risk-of-Spill Flood Trigger Task Group:** (Wayne Cook and Tom Moody) The BHBF trigger subgroup evaluated alternative spill avoidance operations and risk thresholds to enable them to recommend specific criteria for determining when a BHBF can be prescribed in accordance with the Secretary of the Interior's decision contained in the 1996 Annual Operating Plan. The report of this subgroup describes the role of spills in downstream resource management, historic characteristics of powerplant bypasses, how GCD spill risks are modeled, alternative BHBF triggering criteria, and recommendations for BHBF triggering criteria and additional studies.

Tom Moody reported that the subgroup evaluated criteria in response to spring inflow forecasts. When these forecasts reach a certain level, the risk associated with potential unplanned flood events would be high enough to allow a BHBF to occur. This would attempt to comply with both the 1968 and 1992 Acts. However, even if a BHBF were triggered, the actual decision to

conduct such a flow would also depend on whether or not it was environmentally appropriate.

The BHBF triggering criteria were presented to the TWG (overhead transparency). They are (1) if the January 1 forecast of the January - July unregulated Lake Powell inflow were greater than 13 MAF (about 140 percent of normal), or (2) if any forecast causes the release of a monthly volume of greater than 1.5 MAF (25,000 cfs average daily flow). The combined frequency of BHBF and unplanned spill releases was discussed. Under current operating practices, the frequency is about 1 year in 10. Using the proposed criteria, the long term frequency is about 1 year in 6. When the reservoir is relatively full (January 1 contents of 21.5 MAF) the frequency is about 1 year in 3.

Two additional issues (~~Attachment 7~~) were raised that were outside the constraints of the GCDEIS ROD were identified:

- 1) ~~Broader fluctuation limits on a daily basis that would allow fluctuations above 25,000 cfs and/or greater than a daily differential than 8,000 cfs.~~
- 2) BHBF's with a magnitude greater than 45,000 cfs.

*Recommendation:* Subgroup findings and proposed triggering criteria to be presented at next AMWG meeting. A request will be made of AMWG to charge TWG and GCMRC to investigate the scientific and institutional ramifications of greater powerplant fluctuations and BHBF releases above 45,000 cfs. Tom Moody's paper describing these two additional issues will included in 30-day mailing to AMWG.

**Contingency Planning Process for Potential High Flows in Spring/Summer 1998:** Randy Peterson reviewed the strategies analyzed (~~Attachment 8~~) under the Proposed, Moderate and Aggressive conditions, assuming that Lake Powell was at the target storage level of 21.5 MAF on January 1. To varying degrees, these strategies create storage space in Lake Powell to control the spring runoff by making high releases in the winter, thus reserving additional release capacity or a storage buffer to accommodate spring forecast increases. The aggressive approach was used in the late-1980's to greatly reduce the risk of unplanned spills. The moderate approach recognizes recent concerns about the sediment transport that occurs with high powerplant releases. The proposed approach limits January releases to 1.2 MAF unless a BHBF was released according to the triggering criteria.

The number of unplanned spills that each of these three strategies would produce was presented. For the 32 years that were modeled, the aggressive strategy resulted in 3 spills, the moderate strategy resulted in 5 spills, and the proposed strategy resulted in 6 spills. In addition to these occurrences, additional years would occur in which BHBF's would occur even though no actual spill would have occurred. A total of 10 unplanned spills and BHBF's in the 32 modeled years would result from the proposed criteria.

The triggering criteria are to be evaluated each month of the January-July period as new forecast information becomes available. The release of a BHBF in months other than March or April should be evaluated with respect to all resources. It is important to note that regardless of the decision to release a BHBF, if the triggering criteria were met, monthly releases would be very high.

Wayne Cook discussed the use of the 0.5 MAF storage buffer and the spillway extensions in controlling spring runoff. They would add flexibility on managing the runoff with consideration for canyon resources, either very high releases that occur with unplanned spills or more moderate releases (thus avoiding spills) by storing a small amount of the inflow behind that extensions.

Wayne presented a revised Table 1 (~~Attachment 8a~~ that replaces Table 1 in the Report of the Spike Flow Subgroup) which is a summary table showing months in which unplanned spills and BHBF's would occur, categorized by the aggressive, moderate, and proposed strategies cited above.

*Recommendation:* The BHBF subgroup proposal should be forwarded to the AMWG, including the histogram of the monthly distribution of unplanned spills and BHBF's.

**Resource Matrix:** Barry Gold distributed a Discussion Paper (~~Attachment 9~~) and blank Resource Matrix (~~Attachment 9a~~) which lists resource categories and individual components evaluated in the EIS. TWG needs to develop a process to evaluate them and a rating to establish the effects between January-June 1998 of a 45,000 cfs high flow, to assist the decision process of what month to run a BHBF. If a recommendation comes back that the GCMRC, USBR or TWG use this process to evaluate which months we would consider doing a 45,000, we should ask a group of scientists to fill out the matrix and use a 7-point rating scale (positive, negative or no effect). The TWG group should balance competing effects and make a decision (rather than the scientist group). Barry stated that GCMRC does not have the funds to support research for a 1998 high flow. TWG would need to decide and make a recommendation for GCMRC to take action. Some members felt that the matrix needed to be more comprehensive. Kurt Dongoske stated that we should discuss triggering mechanism and budget issues first. Clayton Palmer suggested that resource impacts of a BHBF should be considered relative to the hydrological trigger before and after the BHBF, since most of the spills will occur during high flow years. He stated that AMWG's charge to TWG meant that given an agreement on a hydrological triggering mechanism and state for the resources conducive to a BHBF, that AMWG voted for this to occur provided these conditions were met. We are charged with attempting to agree on triggering mechanisms on hydrological power and resources and see if we can arrange a budget to fund the research to accommodate it should it occur. Dave Garrett agreed and stated that we are in the process now unless TWG finds there is no sediment or unless there is an opportunity to trigger. Bruce Moore reminded the group that compliance activities are not initiated until a description of the flow is decided on and the task group designs it. Robert Winfree confirmed that we will obtain additional information about GCMRC's program for this year and decide what our spike

flow recommendations will be related to resources effects matrix and the 1997 State of the Natural and Cultural Resources Report.

Barry reviewed action items contained in the Discussion Paper.

*Recommendation:* Following presentation of this paper, and subsequent discussion, the TWG adopted the following recommendations:

- ▶ GCMRC initiate needed planning to be ready to implement a 1998 BHBF should the appropriate water conditions materialize and the AMWG recommend such an action occur.
- ▶ Similarly, the Bureau of Reclamation and the U.S. Fish and Wildlife Service should initiate appropriate compliance activities.
- ▶ ~~GCMRC should initiate evaluation of the effects on resources of conducting a BHBF between January and June 1998 by compiling the expert opinion, and research citations supporting that opinion, of scientists with experience working in the Colorado River ecosystem.~~
- ▶ The design and evaluation of a 1998 BHBF should be constrained to flows less than or equal to 45,000 cfs over a 2-4 day period.
- ▶ Any decision regarding providing additional funds to GCMRC for monitoring and research activities regarding a Spring BHBF should be postponed until the December 10, 1997 TWG meeting. This will allow the FY99 Working Group to meet and review GCMRC's proposed FY99 program and budget.
- ▶ Delete #7 on page 2 of Attachment 8 (Discussion Paper).

**Public Comment:** Robert Winfree asked for public comment. There was none.

#### **GRAND CANYON MONITORING AND RESEARCH CENTER PROGRAMS**

**FY1998 Monitoring and Research Program:** Dave Garrett distributed a Schedule for Development and Implementation of FY98 Program (Attachment 10a). The schedule for targeted activities (Attachment 10b) was previously mailed to TWG.

**Status of FY98 RFPs:** (Attachment 10c) Barry Gold reported that all proposals recommended for funding were sent to the Principal Investigators for revision. Revisions have been received by GCMRC and are being reviewed by the Program Managers. The GCMRC will provide the SLC Contracting Office with details by November 14. GCMRC will issue agreements or letters of intent by the end of November, 1997. Dave Garrett identified an issue about delays in the process due to budget processing. We cannot make an award until October 1. The best-



and-final offer negotiations require an additional month before we can let the contract. Dave also indicated that this process will be changed next year because GCMRC cannot afford to lose 1/12 of a year in an administrative process. Cultural, Physical, and Socio-economic Resources RFPs were not reviewed due to time constraints.

**Report to Congress (Attachment 10d):** Dave Garrett stated that the report contains fiscal years 1997 and 1998, and a briefing section on historical factors contributing to development of the Adaptive Management Program. Attached also is the Annual Plan of Operations (UCBOR) (Attachment 10e) which is not required for the Report to Congress. The document includes information on GCMRC and AMWG 1997 and projected 1998 activities. There are contacts noted to obtain copies of documents. Bruce Moore said that including the budget in the Report to Congress and the AMWG Appropriations is a duplication of effort. USBR has to report out years up to 5 years in advance. They are approximate figures and whether or not it is deleted from the Report to Congress, it is still reported to Congress by USBR. It was noted that the Report to Congress requires budget reporting as well as budget reporting in annual and long-term plans.

*Recommendation:* For all future years, include in the Report to Congress a short synopsis of the State of Natural and Cultural Resources Report (the full report will be referenced specifically), and a copy of the Annual Plan of Operations as appendices. The 1997/1998 budget information will remain in the document, but must stay consistent with the AMWG Appropriations budget information. The 2000 budget will not be included. Verbage will be added that the budget in out years may change; it is a projection. TWG members to review the budget and submit comments by November 14. Bruce Moore will add the GCD AOP comments and forward them to GCMRC by November 14. For FY98, the Report to Congress with the appended State of Resources information will be reviewed for adoption at the TWG meeting on December 10. It will be included in the 30-day mailing to AMWG.

**State of the Natural and Cultural Resources Report: (Attachment 11a)** Dave Garrett distributed the current State of the Resources report and a possible new outline (Attachment 11b) for the document. He requested comments from the TWG. He would like to schedule a meeting with the FY99 Program Planning Task Group before December 10. Baselines are variable for the different resources and GCMRC does not want to chose those relative baselines without interaction and decisions points in a group setting with TWG. We have new sets of information that give new perspectives and add definitions. Resource-by-resource definition on baselining should be developed by TWG in cooperation with GCMRC. Tom Moody stated that exploring alternative baselines could give the best information regarding the resource conditions. Dave wants to close on the document by December 10.

*Recommendation:* TWG to send comments to GCMRC by November 14. The FY99 Planning Group will meet as necessary to develop new baseline and other criteria for revision of the State of Resources report. Add Tom Moody to the group. The revised report will be distributed to

TWG in the November 26 mailing. Information will be provided to the FY99 Program Planning Task Group on restructuring a new outline. The outline will be sent to AMWG with the 30-day mailing. The State of the Resources Report will be combined with the Report to Congress in FY98.

**Long-term (Strategic) Plan: (Attachment 12)** The report was previously mailed to TWG for review. Dave Garrett requests that TWG accept the long-term 5-year strategic plan for FY98 and FY99 with a planned revision for FY2000. The revised Strategic Plan will include at the minimum potential new management objectives and information needs, and a proposed Lake Powell Program and possibly other additions.

*Recommendation:* TWG accepted the long-term plan.

**FY1999 Monitoring and Research Program: (Attachments 13a, 13b, 13c)** Dave Garrett presented an outline of Chapter 3 of the FY99 Monitoring and Research Program activities. The members discussed areas requiring revision, including BHBF contingency funding.

*Recommendation:* The FY99 Planning Group will meet again to revise the FY99 Annual Plan. It will be included in the TWG mailing on November 26 and the AMWG mailing on December 15.

**GCMRC Data Management Protocols Advisory Group: (Attachment 14)** Kurt Dongoske was asked by GCMRC to chair this advisory group. Its task is to develop and discuss protocols and procedures for GCMRC data (sensitive and restricted information). Its function is to develop protocols for internal management of data ownership. They will also develop protocols for confidential and non-confidential external data. We expect to have legal comment (mail-in or in person at meetings) occasionally regarding protocols so we write up information in a legal manner. Issues from the October 1 meeting were: what data is considered sensitive; restricted to whom, and the legal basis for that restriction. The Advisory Group would like to broaden its scope of representation, and extends an invitation to agencies, tribes, etc. Meetings will be held following the monthly TWG meetings to save on travel expenses. The next meeting will be 9 a.m. to 3 p.m. tomorrow, November 5, at La Quinta in Phoenix. They will review information some groups have supplied regarding protocols, ordinances, procedures, legal restrictions, interactive development of draft protocol. We are getting a broad range of state and federal agencies, and memorandums of understanding between the entities.

*Recommendation:* If you are unable to attend the meeting and can provide documentation about information you have access to or information you would like to receive, forward it to Ruth Lambert at GCMRC. You may also request to be added to the mailing list.

## **NEW BUSINESS**

**Native American Sovereignty Issues:** Kurt Dongoske had discussed important aspects of Native American sovereignty at the last AMWG meeting.

*Recommendation:* Kurt will investigate the possibility of getting a speaker to make a presentation at an upcoming TWG meeting to enhance understanding of the Native American sovereignty issues and the basis of Federal Indian Law and the "trust responsibility" of federal agencies.

**Programmatic Agreement Funding:** Dave Garrett stated that the PA program is currently administered under the GCMRC cultural resources program. The PA document has legal mandates and responsibilities. Any research GCMRC does for the PA has to come through the AMP protocols, and GCMRC cannot do the work unless directed by the AMWG. The GCMRC Cultural Program includes a category for PA program activities. However, the PA portion of the Cultural Resources program and the associated budget were not specified and included in the FY99 Plan because they were not formulated. Ruth Lambert stated that there is a scheduling concern because the PA plan is the result of the previous year's field activities. For example, work scheduled for FY99 results from FY98 field work. The PA stipulates the reporting schedule. The reporting schedule cannot be changed unless the PA document is amended because the PA is a legal agreement which was in place in 1993/1994.

*Recommendation:* Kurt Dongoske will coordinate a presentation at the December 3, 1997, FY99 Program Planning Task Group meeting on the schedule of NPS reporting on the results of their annual monitoring and their proposed actions for the next fiscal year, pursuant to the PA.

**Environmental Report Cards:** Barry Gold reported that GCMRC provided a list of 150 reports received from Heinz Center which is funding an 18-month study on environmental report cards on the nation's ecosystems.

**AMWG Agenda: (Attachment 15)** Bruce Moore distributed a draft of the agenda for the January 15-16, 1998 meeting.

**Action Items and Deadlines:** Robert Winfree reviewed action items and deadlines:

1. Finalize draft operating procedures
2. Request 30-day advance mailing to AMWG rather than 60 day
3. Report on payment for TWG members (Moore)
4. Finalize FY99 Budget (Garrett)
5. Send TWG next meeting announcement for travel planning (GCMRC Secretary)
6. Draft recommendation to adopt management objectives for FY98/99 and charge TWG to review and revise for FY2000 (Moore)

**Future Meeting Agenda Items:** For January, 1998:

1. Review AMWG response to TWG recommendations (Chair)
2. Review new AMWG assignments to TWG (Chair)
3. Form a task group to review and update management objectives and information needs (if directed by AMWG). Products should be presented to TWG and finalized 60 days prior to mid-year AMWG meeting
4. Report on preliminary findings from the November 1997 BHTF 31,200 experimental flood (Melis)
5. Report from GCMRC FY99 Program Planning Task Group regarding their review and recommended format for the annual State of Resources report (Moody)
6. Report on activities of LCR Multi-species Conservation Plan (LCRMSCP group) (Hyde/Harris)
7. Presentation regarding the basis for tribal/federal relations (speaker TBA)
8. Hydrologic forecasts (every month, January-June) (Peterson and/or Melis)

**Public Comment:** Robert Winfree requested public comment. There was none.

There being no further business, the meeting was adjourned by Robert Winfree.

Respectfully submitted,

Serena Mankiller  
GCMRC Secretary

## Key to Acronyms

ADWR - Arizona Department of Water Resources  
AGF - Arizona Game & Fish Department  
AMP - Adaptive Management Program  
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  
cfs - cubic feet per second  
CRBC - Colorado River Board of California  
CRCN - Colorado River Commission of Nevada  
CRSP - Colorado River Storage Project  
CWCB - Colorado Water Conservation Board  
EIS/FEIS - Environmental Impact Statement/Final Environmental Impact Statement  
ENSO - El Niño Southern Oscillation  
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  
hr - hour  
KAS - Kanab ambersnail  
MAF - Million Acre Feet  
NEPA - National Environmental Policy Act  
NPS - National Park Service  
NWS - National Weather Service  
PA - Programmatic Agreement  
Reclamation - Bureau of Reclamation  
RFP - Request For Proposal  
RPA - Reasonable and Prudent Alternative  
SWCA - Steven W. Carothers Associates (Environmental Consultants)  
TWG - Technical Work Group (Glen Canyon)  
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