Glen Canyon Dam Adaptive Management Work Group
Agenda Item Information
August 24-25, 2011

Agenda Item

Public Outreach Ad Hoc Group Report

Action Requested

- ✓ Motion requested. The following motion is recommended by POAHG. However, no motion is officially made unless and until an AMWG member makes the motion in accordance with the AMWG Operating Procedures.

  AMWG approves the High-Flow Fact Sheet as sent to AMWG, dated August 2011.

Presenter

Mike Yeatts, POAHG Co-Chair (Hopi Tribe)

Previous Action Taken

- ✓ By AMWG:

  At the March 2005 AMWG meeting, the following motion was passed:

  AMWG delegates to POAHG these specific authorities:

  1) Posting to and updating of GCDAMP website (AMWG retains review opportunities on new materials via email prior to posting),
  2) Identify new topics for Fact Sheets and start creating them,
  3) Finalize strategy for Glen Canyon Dam Display with Reclamation review and involvement,
  4) Speak to media on rapid response items via Secretary's Designee and/or Interior public relations, including the five-day AMWG review for the rapid response process, and
  5) Develop, finalize, and distribute guide resources.

  At the August 2007 AMWG meeting, the following motion passed by consensus:

  The Adaptive Management Work Group recommends that the Secretary of the Interior approve both the continued deployment and maintenance of the Phase I public outreach campaign products (web site, displays, fact sheets) and the Phase II public outreach campaign that includes development of additional outreach materials, media support, public education, and events development and participation.

  At the August 2010 AMWG meeting, the follow motion passed by consensus:

  AMWG requests that POAHG, working with Reclamation, GCMRC, and other appropriate parties, develop and forward to TWG a recommendation with regard to a prospectus that identifies goals and objectives, scope, lead agency, cost, and funding source(s) for an RFP for an annotated administrative history of the AMP to document the history of events, people, sites, issues, and documents that have contributed to adaptive ecosystem management of the Colorado River ecosystem in relation to Glen Canyon Dam. AMWG further requests that

TWG make a recommendation on the subject to AMWG by the summer 2011 AMWG meeting.

- ✓ By the Ad Hoc Group: At the February 2010 AMWG Meeting, the POAHG announced it would begin development of new fact sheets on High Flows and Native Americans.

Relevant Science

N/A

Background Information

Over the past year, the POAHG has continued with its Phase II activities, which include the development of additional outreach materials, media support, public education, and events development and participation. These have included a High-Flow Fact Sheet and work on the Administrative History Project.

Administrative History Project

The Ad Hoc Group has completed its work on this project, and it will be reviewed at TWG's next meeting for a possible recommendation to AMWG.

High-Flow Fact Sheet

Previously, the POAHG attempted to develop a high-flow fact sheet, but because of the controversial nature of the topic at the time, it was never formally adopted by the AMWG. Given that the AMP is likely to embark on a 10-year plan of high-flow experiments (HFE) and that the GCMRC has released a technical report detailing the findings of all of the previous HFEs (USGS Circular 1366), the time is ripe to have information regarding high flows for the public. The High-Flow Fact Sheet focuses solely on what an experimental high flow is and describes those that have occurred to date. It does not attempt to evaluate the results and whether they are positive or negative. This Fact Sheet will be presented for AMWG's approval at the AMWG meeting.

GLEN CANYON DAM ADAPTIVE MANAGEMENT PROGRAM
ADMINISTRATIVE HISTORY PROSPECTUS

L.E. Stevens (GCWC) and Michael Yeatts (Hopi Tribe)

AMWG Motion: (Proposed by Larry Stevens, seconded by Sam Jansen): AMWG requests that POAHG, working with Reclamation, GCMRC, and other appropriate parties, develop and forward to TWG a recommendation with regard to a prospectus that identifies goals and objectives, scope, lead agency, cost, and funding source(s) for an RFP for an annotated administrative history of the AMP to document the history of events, people, sites, issues, and documents that have contributed to adaptive ecosystem management of the Colorado River ecosystem in relation to Glen Canyon Dam. AMWG further requests that TWG make a recommendation on the subject to AMWG at the summer 2011 AMWG meeting.

INTRODUCTION

The Glen Canyon Dam Adaptive Management Program (AMP) is one of the most important tests of implementing a multi-stakeholder adaptive management program. Beginning in the decade prior to dam construction, management planning and research began, focused on areas both above and below the dam site. Topics were related to construction and operation of the dam and to the environment that would be affected by its installation. In 1982, awareness of the possible affects that dam operations were having on the downstream environment, even far from the dam itself, initiated Phase I of the Glen Canyon Environmental Studies (GCES). The findings of Phase I indicated that impacts were occurring downstream in Glen and Grand Canyon National Parks. Phase II of the GCES and a NEPA process were then initiated to better understand the affects and to develop an operational scenario that minimized the affects of the dam while still maintaining compliance with the multitude of legal and operational constraints on the system. The result of these studies and the outcome of the NEPA process was a change to the operations of Glen Canyon Dam and the formal initiation of the AMP.

The process of getting to and implementing the current AMP is the result of vast numbers of individual choices made by hundreds of administrators, politicians, tribal and non-governmental organizations, judges and solicitors, and researchers. Decisions are made drawing on knowledge of the past actions as well as new information. Many issues and topics have been addressed by the program, sometimes at great length and involving considerable expense. Not surprising given the duration that the program has been in existence and the average tenure of individual participants, topics tend to cycle through time with issues sometimes being partially resolved, reported upon, forgotten, then reintroduced a decade or two later as new issues. This occurs both in the management realm and, to a lesser extent, within the research realm. Some examples of this within the AMP in recent decades include:

1. Definition of "Desired Future Conditions";
2. The environmental benefits of steady vs. fluctuating flows;
3. The role of high flows in sustaining upper riparian zone vegetation;

4. The need to adopt an ecosystem approach to achieve integrated adaptive management; the role of Native American Tribes and traditional knowledge in adaptive management;
5. And many other topics.

Unfortunately, no mechanism currently exists in the AMP to adequately track of its own history. As time passes, personnel come and go from the program. As they leave, they take a bit of the collective knowledge that informs on the relationships among management and research topics, the history and chronology of participants, issues and concepts that have shaped the program. Since the program lacks a collective historical perspective and no briefing document exists to allow new members to readily learn about the AMP's history, we seem destined to repeat that history in a cyclic pattern.

Here we present draft concepts, justification, and a process through which to develop a comprehensive, integrated administrative history of the AMP, a process that will summarize past efforts and serve as an archive and learning tool for the future. We recognize that many elements of this project will require further discussion and refinement to maximize its usefulness to the AMP, and we hope this document stimulates productive discussion on the importance of this topic to the AMP.

JUSTIFICATION

Undertaking a comprehensive administrative history of the AMP will provide numerous potential benefits, including the following:

1. Improving understanding of inter-relationships among AMP issues and concepts;
2. Determining which CRE management questions have been resolved, why other questions remain unanswered, and the state of knowledge about resolved and unresolved questions;
3. Providing new and current members of the AMP with background information to help them become more quickly engaged and effective in discussions and decision-making;
4. Improving understanding of relationships between funding expended and management of the CRE as a human-dominated ecosystem;
5. Reducing redundancy in research and monitoring efforts among the several agencies and entities with parallel programs and related questions;
6. Create a focal point to access information about the AMP program, both administrative and scientific;
7. Begin documenting one of the founding adaptive management efforts while many of the original participants are still around.

DESIGN

The administrative history of the AMP should be developed as an unbiased, integrated, well-annotated historical program with the following features (not an exhaustive list):

1. It is a robust chronology of persons, concepts, decisions, actions, events, and reviews, likely from the early 1970's to the present, to address the questions of who the participants have been, their affiliations and perspectives, and the legislation and policies behind their participation;

2. It contains a robust, relational bibliography of agency and published documents, with strong linkage to agency and peer-review published scientific literature;
3. It can easily be expanded and added to over time;
4. It is very user friendly, versatile, relational, and readily capable of presenting synopses of the literature or concepts, as well as graphical displays of appropriate information;
5. It is designed to help AMP members quickly come up to speed on the background behind issues under discussion;
6. It provides new AMP participants with structured learning to help them become more effective advisors to the Secretary;
7. It provides relational linkage to understand how funding and projects relate to program goals, objectives, and information needs.
8. It relates projects by Reclamation to those of other agencies / entities conducting related research and monitoring.
9. It has a strong geographical framework relating projects and history to specific locations and reaches of the CRE. The advantages of this approach are that administrators and researchers can be quickly brought up to speed on the historical information available at study sites, reducing redundancy and quickly illuminating complicating issues, such as compliance;
10. It readily links to, is interactive with, but does not reinvent, elements of administrative history already constructed by Reclamation and GCMRC;
11. It is accessible to outside researchers, educators, and the general public.

Thus, the AMP administrative history would provide: 1) an unbiased archive of past program participants, concepts, actions, and achievements; 2) a relational educational resource to improve the efficiency of AMP discussions; 3) a learning kit for new-comers to the AMP; and 4) a strategic planning tool to help guide research and management projects.

COMPONENTS

Development of the AMP administrative history will involve the following elements, and other elements may arise during the formative stages of the project:

1. Design of an appropriate relational, user-friendly framework for locating and accessing archival information, including the AMP bibliography, briefs on the history of key topics, and chronological trees of participants and concepts. In concept, it could be something like a “Wikipedia of the AMP”. This database should include capacity to store text, images, videography, GIS data, and other data gathered by the team, and should be sufficiently flexible to be improved and updated in the future. It will not be a replacement data archive for the existing AMP and agency data management systems;
2. Compilation of existing literature, including linkage where possible;
3. Carefully crafted and executed interviews, including in-depth interviews of 25-50 living historical figures who have been responsible for the development of the AMP (e.g., Bruce Babbitt, Cliff Barrett, Steven Carothers, David Garrett, Rick Gold, Duncan Patten, David Wegner, and several past GRCA superintendents), as well as shorter interviews with past and present TWG and AMWG members and individuals in other agencies who are knowledgeable about CRE management issues.
4. Developing biographical sketches of individuals no longer living;

5. Development of the GIS-AMP project geographical linkage, likely with GCMRC and Reclamation involvement.

It should be reiterated that the intent is not for the system to become a primary data storage entity for the AMP. Instead, it should serve more as a "search engine" that points to where data resides (whether electronic or otherwise). Only in the case of new administrative history data will the system serve as the primary repository.

TIME FRAME AND BUDGET

The time frame of this project is moderately urgent, as many historical figures are nearing the ends of their careers. Therefore, this administrative history should be undertaken with Phase 1 starting in FY 2012 and completed in FY 2013, Phase 2 starting in 2013 and being completed in 2015, and Phase 3 starting in 2015 and being completed in FY 2016.

PHASE 1: $100,000

An overarching strategic plan will be produced detailing the steps to be taken in developing the Administrative History. It will include technical, logistical, and funding aspects of the project. A pilot implementation of the strategic plan will follow and is envisioned to include:

1. Develop a provisional database approach for information archival and retrieval;
2. Conduct 5 in-depth and 10 brief interviews with AMP historical figures;
3. Integrate literature;
4. Develop a chronological overview of participants and concept;
5. Develop the new-participants handbook to the history of the AMP;
6. Assess utility of the project to the AMP.
7. Develop a funding strategy for future Phases

This pilot phase will allows better definition of the project, allow refinement to the strategic plan and will enable future tasks to be prioritized in a more realistic manner.

PHASE 2: $250,000

If pilot Phase 1 is deemed useful to the AMP, Phase 2 would involve an effort to:

1. Refine the database structure;
2. Expand the number of interviews conducted; Integrate the interview data with the chronology;
3. Develop the geodatabase; Improve the new-participants handbook;
4. Develop the pilot relational analysis of AMP goals, objectives, funding to the CRE ecosystem structure;
5. Assess utility of the project to the AMP.

PHASE 3: $100,000

If the second phase is successful, Phase 3 would involve:

1. Refine the final database structure;

2. Complete historical interviews;
3. Complete the analytical process relating program actions to ecosystem management;
4. Conduct information addition studies for contribution of future information;
5. Assess utility of the project to the AMP.

Thus, the overall administrative history project may require $450,000 to complete, but each phase would depend on successful completion of the previous phase, and would guarantee the utility of the deliverables to the AMP.

FUNDING SOURCES

It is likely that funding will need to be sought through AMP, appropriated agency, and outside (grant) funding sources. It may be possible to greatly leverage limited internal funding through cooperation with academic institutions. This type of project provides a unique opportunity for educators, researchers, and their students to work on real-world topics.

At a minimum, the strategic plan guiding the development of the program needs to occur in the near future. With an appropriately worded RFP, much of this plan could be obtained as the winning proposal. Development of the nascent database structure and interviews with critical players in the development of the AMP should also be of high priority.

GLEN CANYON DAM
ADAPTIVE MANAGEMENT PROGRAM
Using science to manage river resources in Grand Canyon

High Flow Releases at Glen Canyon Dam

Construction and operation of dams results in numerous physical and ecological changes to river systems. Among them is the sediment carrying capacity of the river downstream of the dam. With the construction of Glen Canyon Dam, seasonal flooding that once moved sand from the riverbed to the shoreline, no longer occurs. Because more than 90 percent of the sediment that historically moved through the Grand Canyon is trapped behind the dam, the primary sources of new sand to the river system are two downstream tributaries: the Paria and Little Colorado rivers.

The Operation of Glen Canyon Dam Final Environmental Impact Statement, completed in March 1995, hypothesized that controlled high-volume releases of water could be important for restoring ecological integrity downstream from the dam. Testing that hypothesis would help determine whether experimental high flows could be used to benefit important physical and biological resources in Grand Canyon National Park and Glen Canyon National Recreation Area. Such flows would also be consistent with the objectives of the 1992 Grand Canyon Protection Act (Public Law 102-575).

Water being released through river outlet tubes

Because controlled experimental high-flow releases to some extent mimic natural flooding, conducting such releases would provide the opportunity to evaluate the potential benefit to sediment-dependent resources including sandbars and camping beaches, marsh and riverside vegetation, and backwaters, which are near-shore areas of low-velocity flow which may be used as rearing habitat by native fish.

The framework and flexibility to adapt the dam's operations to facilitate scientific experimentation and research including conducting controlled experimental high-flow releases, was provided through the Glen Canyon Dam Adaptive Management Program established by the 1996 Record of Decision on the EIS for operation of the dam.

Starting in 1996, Reclamation and its collaborators within the Glen Canyon Dam Adaptive Management Program have conducted several controlled experimental high-flow releases from Glen Canyon Dam. The first experimental release took place March 26, - April 2, 1996, and was described as a beach/habitat-building flow that released 45,000 cubic feet per second of water for seven days to rebuild high elevation sandbars, deposit nutrients, restore backwater channels, and provide some of the dynamics of a natural system. Releasing that volume of water was achieved through a combination of the eight hydroelectric powerplant generators and the four river outlet tubes which bypass the powerplant and do not generate hydroelectric power.

The total combined capacity of the eight hydroelectric powerplant generators is 32,000 cfs. The ability to release this volume of water depends on the reservoir level and the full operability of each unit. The total combined capacity of the four river outlet tubes is 15,000 cfs. Because water released through the river outlet tubes bypasses the powerplant, it does not generate hydropower.

(over)

Scientists and managers used the information gained from the 1996 release to refine the timing of subsequent controlled experimental high-flow releases to better take advantage of episodic tributary floods, particularly the Paria River, that supply new sand to the Colorado River downstream from the dam.

Prior to the next controlled high-flow experiment in 2004, three habitat maintenance flows took place. HMFs are short-term high releases in the spring within powerplant capacity, intended to transport and deposit sand for maintaining beaches and fish and wildlife habitat. The duration of each of these flow events was 72 hours.

The 2004 controlled high-flow experiment was a 60-hour release that took place November 21 – 23, at 41,000 cfs. This HFE was conducted shortly after a large amount of sediment was delivered by the Paria River and it helped test the hypothesis that maximum sediment conservation would occur with a high-flow shortly after the sediment was deposited in the mainstem of the Colorado River.

Downstream view of 2008 controlled high flow experiment at night – photo by: T. Ross Reeve

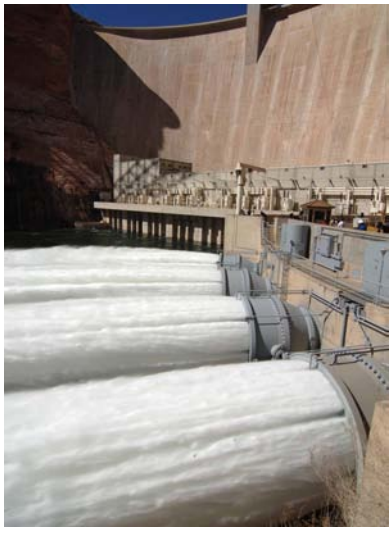
Lessons learned from both the 1996 and 2004 HFEs were incorporated into the third HFE which occurred in 2008. This 60-hour, 41,500 cfs release which took place March 5 – 7, was timed to take advantage of the highest sediment inputs in a decade which allowed for a better assessment of HFE's effectiveness for rebuilding sandbars and beaches that create backwaters which may provide habitat for endangered fish as well as campsites for river runners in the Grand Canyon.

On-going research and long-term monitoring since the first controlled high flow release in 1996 have allowed scientists to unravel many, but not all, of the uncertainties that exist about how HFEs might affect downstream resources. The current state of knowledge is summarized in the report released in February 2011, by the U.S. Geological Survey's Grand Canyon Monitoring and Research Center on the effects of the 1996, 2004, and 2008 high-flow experiments on the Colorado River ecosystem downstream from the dam.

In December 2009, the Department of the Interior, acting through the Bureau of Reclamation, proposed the development and implementation of a protocol for controlled high-flow experimental releases from Glen Canyon Dam to gain a better understanding of whether and how sand conservation can be improved in the downstream Colorado River corridor.

Building on the results of prior high flows, the 10-year protocol for HFEs (between 2011 – 2020) takes a multi-year, multi-experimental approach to using short-duration, controlled high-volume releases from the dam during sediment-enriched conditions in the downstream channel.

Understanding the complexities of the interrelated ecosystem downstream of Glen Canyon Dam is a long-term challenge. The adaptive management model which emphasizes an on-going cycle of learning through experimentation, refinement, and improvement over time, provides the appropriate framework to achieve this understanding. Through the Glen Canyon Dam Adaptive Management Program, continued implementation of HFEs as a key operational strategy will yield invaluable knowledge about the response of, and benefit to downstream resources.



Water being released through river outlet tubes – 2008

ADAPTIVE MANAGEMENT PROGRAM

Public Outreach Ad Hoc Group Report

AMWG Meeting – Phoenix, AZ

August 2011

Topics

1. High-Flow Fact Sheet
2. Administrative History Project update
3. Ongoing Activities

High-Flow Fact Sheet

- Second attempt at a High-Flow Fact Sheet
- Program will likely be embarking on a ten-year experiment with high flows
- Release of USGS Circular 1366 documenting the three previous High-Flow Experiments
- Focus of fact sheet is on what a high flow is and the history of HFEs, not the results
- The general content was agreed to at the April 5th POAHG meeting and then two subsequent rounds of comments and revisions were conducted

Proposed motion

"AMWG approves the High-Flow Fact Sheet as sent to AMWG, dated August 2011"

Administrative History Prospectus

- AMWG requests that POAHG, working with Reclamation, GCMRC, and other appropriate parties, develop and forward to TWG a recommendation with regard to a prospectus that identifies goals and objectives, scope, lead agency, cost, and funding source(s) for an RFP for an annotated administrative history of the AMP to document the history of events, people, sites, issues, and documents that have contributed to adaptive ecosystem management of the Colorado River ecosystem in relation to Glen Canyon Dam. AMWG further requests that TWG make a recommendation on the subject to AMWG at the summer 2011 AMWG meeting.

Need and Proposed Scope

- Duration of program
- Turnover of participants
- Lack of comprehensive or coordinated information maintenance and retrieval

- Provide a framework for locating information about the AMP, both administrative and science
- Likely a web-based system – something like a “Wiki-AMP”
- Record information from early influential participants in the development of the AMP

Next Steps

- Feedback on draft prospectus
  - Recommend considering concept and scope separately from funding.
- Modification and TWG approval
- AMWG approval
- Recommend using some AMP funding to develop a detailed “strategic implementation plan” through a procurement process in FY 2012

Ongoing Activities

- Traveling display
  - Displayed at AZGF
  - Displayed at GTS
  - Currently at Pueblo of Zuni
- Web updating
- New Materials
  - FAQs from river guide community. Can serve as the basis for other river guide products