

FINAL DISCUSSION PAPER

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Technical Work Group Meeting

Phoenix, AZ

POTENTIAL SPRING 1998 BEACH/HABITAT-BUILDING FLOW

INTRODUCTION

Colorado River basin runoff is anticipated to be at or above normal levels during Water Year 1998 (WY98). Both Lake Powell and Lake Mead are nearly full and a pronounced El Niño/Southern Oscillation pattern is developing that may result in high inflows to Lake Powell in WY98. The goal of adaptively managing the Colorado River ecosystem is to use the best scientific information to plan and accomplish preservation and enhancement of Colorado River ecosystem resources, and to mitigate the undesirable impacts of Glen Canyon Dam (GCD) releases on those resources. Given the potential that releases from GCD above 25,000 cfs may be required in WY98, the Adaptive Management Work Group (AMWG) has asked the Grand Canyon Monitoring and Research Center (GCMRC) to work with them in initiating early planning efforts aimed at preparing for managing these flows. In response, GCMRC has developed information regarding a Beach/Habitat-Building Flow (BHBF) alternative for GCD releases in WY98.

PURPOSE

The BHBF presented below is intended to provide information for use by the AMWG in discussing and planning for a Spring 1998 BHBF. While in some sense, the impetus for developing the BHBF is to provide the AMWG with a plan for releases from GCD that might mitigate the negative impacts on sediment resources of high steady flows, the initiation of this planning process is intended to result in a BHBF that has the potential to benefit physical, biological, cultural, socio-economic and recreational resources of Glen Canyon Recreation Area and Grand Canyon National Park. Implementing such a BHBF will allow the AMWG to test these hypotheses. Included in this document is a description of a likely WY98 hydrological scenario and a proposed iterative planning process and schedule.

BACKGROUND

Legal Framework. A provision for a BHBF was included in the preferred alternative of the Glen Canyon Dam Final Environmental Impact Statement (GCDEIS). As discussed in the GCDEIS (p. 40), the BHBF was intended to comprise releases in excess of powerplant capacity in low (8.23 maf) water years. The Record of Decision (ROD) on the GCDEIS signed by the Secretary of the Interior modified these conditions and established a framework for implementing BHBFs in high water years using releases in excess of powerplant capacity for dam safety purposes. Flows above the 25,000 cfs level established in the ROD can occur to avert emergency hydrologic situations, Beach/Habitat-Building flows, and Habitat Maintenance flows.

Water Year Scenarios. The Colorado River Basin is anticipated to be at or above normal levels during WY98, as both Lake Powell and Lake Mead are nearly full and a pronounced El Niño/Southern Oscillation pattern may increase streamflow runoff throughout the Colorado River basin. Based on correlations with past historical data for similar El Niño events, GCMRC believes there is an increased likelihood that WY98 may produce at or above normal late Spring runoff into an already full Lake Powell. Thus, the possibility exists that flows from GCD may exceed 25,000 cfs in 1998 and may include unplanned spills with flows of 45,000 cfs or higher.

Proposed Planning Process and Schedule. The AMWG may wish to implement the following planning process and schedule:

1. Develop "risk of spill" criteria (September-October 1997);
2. Draft a hydrograph for a BHBF (October - November 1997);
3. Refine the objectives of a BHBF (i.e., mitigate the negative effects of unplanned spills or high steady flows vs. an objective to enhance specific resources), evaluate the "draft BHBF hydrograph" for positive and negative resource effects, and revise the timing and shape of the draft BHBF hydrograph as appropriate (November - December 1997);
4. Determine compliance (environmental and cultural) requirements and initiate needed compliance activities (November 1997), and design 1998 releases to meet upstream storage needs and downstream obligations;
5. Evaluate forecast, winter snowpack development, and State-of-the-Colorado River Ecosystem Resources (December 1997 - February 1998);
6. Conduct a BHBF, if appropriate (January - June 1998);
7. Continue to monitor the forecast and inflows to assess potential for an unplanned spill in the Spring/Summer (March - July 1998);
8. Assess the State-of-the- Colorado River Ecosystem Resources and WY 1999 (August - December 1998).

PLANNING SCENARIO

Description of Flow. In spring 1996, an experimental BHBF from GCD was initially tested. The BHBF consisted of a controlled constant release from GCD of 45,000 cfs for seven days during late March and early April. These constant releases were immediately preceded and followed by three days of steady 8,000 cfs releases from GCD. The constant 45,000 cfs flow was achieved through a combination of releases from the powerplant and river outlet works. Neither of the two spillways at GCD was used during the BHBF.

The BHBF being proposed for 1998 will consist of 2-4 days of flows less than or equal to 45,000 cfs sometime during between the months of January through June of 1998. No flows of 8,000 cfs are proposed to immediately precede or follow this 45,000 cfs flow. In addition, it is proposed that the duration of the BHBF be determined based on real-time monitoring of sediment deposition, biological and cultural resources, and that the experimental flow be concluded at the point of diminishing sediment suspension and deposition at critical sites in the sediment-starved Marble Canyon reach. The upramping will begin from the highest point in the existing daily powerplant release hydrograph at a proposed rate of 4,000 cfs/hr. The downramping will begin, once maximum sediment deposition has been achieved, at a proposed rate of 1,500 cfs/hr until flows rejoin the existing daily powerplant release hydrograph.

Adaptive Management Objectives. The 1996 BHBF was conducted as an experiment to study planned flooding as a management tool for restoration and preservation of Colorado River ecosystem resources. The primary goals of the 1996 BHBF were to learn about sediment transport under high flows and to mobilize and redeposit channel-stored sand as higher-elevation bars. Additional objectives included preservation of cultural resources, providing more natural flood-disturbance processes to riparian vegetation, rejuvenation of other important channel features such as backwater habitats, and flushing non-native fishes from critical areas in downstream reaches. Of the eight objectives generally listed in the GCDEIS, the 1996 BHBF achieved five that were mostly related to sediment transport and deposition.

1. The 1998 BHBF will provide scientific benefit by allowing researchers to test conclusions developed from the results of the 1996 BHBF regarding modes and rates of sediment deposition.
2. The 1998 BHBF is being proposed, initially as a management action to mitigate against the predicted negative effects on sediment resources of high steady releases or unplanned spills which could occur based on early forecasts in WY98.
3. Based on the "State of the Colorado River ecosystem" report, and subject to the acceptance of the recommendations of the "Risk of Spill" workgroup, the 1998 BHBF is also being proposed as a management action that can be designed to benefit natural, cultural, socio-economic, and recreational resources.

TIMING AND COMPLIANCE

Potential conflicts with the U.S. Fish and Wildlife Service Biological Opinion and National Park Service and Bureau of Reclamation cultural resource management needs may exist and should be addressed by the TWG and the AMWG. Of specific concerns are habitat and incidental take issues related to the endangered Kanab ambersnail, Humpback chub, and Southwestern willow flycatcher. In addition, the effect on other biological resources such as the Lees Ferry trout fishery, the aquatic food base, and riparian vegetation will need to be considered prior to making final decisions regarding the magnitude, duration, and timing of a BHBF. Compliance required under the National Environmental Policy Act, the Endangered Species Act, and the Historic Preservation Act will need to be determined and initiated, as appropriate.

ISSUES

1. The 1995 Biological Opinion was a one time opinion for the 1996 BHBF that had an element that required the establishment of a second population of Kanab ambersnail prior to any additional BHBFs being conducted. Section 7 consultation will need to occur.
2. It is assumed that a BHBF of 2-4 days in the March-April time frame is within the EIS and the Operating Criteria; therefore, further NEPA and cultural resource compliance would not be necessary if the 1998 BHBF is proposed in March-April.
3. The effects on other resources, such as the Lees Ferry trout fishery, will need to be considered (See Attached Matrix) prior to making final decisions regarding the timing of such a potential BHBF.
4. GCMRC estimates the cost to perform research and monitoring of a 1998 BHBF could be as high as \$1,000,000. This would be in addition to work planned in the current FY98 budget. Is the money available?

RECOMMENDATIONS

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 will be constrained to flows less than or equal to 45,000 cfs over a 2-4 day period sometime between the months of January through June of 1998.

-- 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.