

**Proposal to Develop a Research Plan to Analyze the Response of Natural Resources below Glen Canyon Dam to a Beach Habitat Building Flow Greater than 45,000 cfs and Fluctuations During Periods of High Powerplant Releases.**

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The objectives of a Beach Habitat Building Flow described in the Glen Canyon Dam EIS are to "...rebuild high elevation sandbars, provide water for vegetation, deposit nutrients, restore backwater channels, and provide some of the dynamics of a natural system." (GCDEIS) Specific research questions addressed by the test flow included (BHBFEA):

- 1) Displacement of non-native fish,
- 2) Rejuvenate backwater habitats for native fish,
- 3) Increase height and area of existing sandbars, followed by erosion at rates that decrease with time,
- 4) Reduce nearshore vegetation,
- 5) Preserve and restore camping beaches,
- 6) Protect cultural resources from erosion,
- 7) Result in more navigable rapids, and
- 8) Not cause significant adverse effects on the aquatic food base, trout fishing, endangered species, cultural resources, and economics.

While benefiting many natural, cultural, and recreational resources, the experimental Beach Habitat Building Flow (BHBFB) conducted in 1996 failed to achieve several of these objectives (GCMRC, 1997). Following that test flow, many researchers suggested that a BHBFB of these magnitude and shorter duration could achieve greater sediment deposition and additional rejuvenation of backwater habitats without significant adverse impacts (GCMRC, 1997). In addition, subsequent steady high powerplant releases appeared to accelerate beach erosion (Moody, 1998). Researchers hypothesize that moderate fluctuations may decrease this rate of erosion at high flows (Kaplinski, 1998) while increased ability for the hydropower resource to follow electrical loads has economic value (Palmer, 1998).

This paper proposes a process for determining the parameters for flows that would better achieve the objectives of the Beach/Habitat-Building Flow, determine a research strategy to assess these test flows, and evaluate the potential impacts of implementing such a test. This information will be used by the TWG and AMWG in deciding whether to carry out the proposed research.

**The Proposal:**

The Grand Canyon Monitoring and Research Center (GCMRC), in consultation with the TWG, is to:

- A. Recommend the magnitude, timing, duration, and pre and post flow regimes for a test flow between January and July that best meets the objectives of a BHBFB. This should include flows greater than 45,000 cfs.
- B. Define a test flow regime to reduce beach erosion rates during periods of high powerplant releases (>1.5 maf/mo). These should include fluctuating flows, (within current daily, upramp, and downramp limits) above 25,000 cfs up to powerplant capacity.
- C. Assess the advisability of conducting research on A and B sequentially and/or separately, and,
- D. Evaluate, based on best current knowledge, the positive and negative impacts of implementing the proposed test flows.

**Issues to consider:**

- ESA consultation requirements
- NEPA compliance
- NHPA compliance
- Impacts to unlisted native fish
- Impacts terrestrial biological resources
- Impact on sediment resources
- Impact to cultural resources
- Impacts to aquatic resources
- Impacts to trout resources
- Impacts to water quality
- Recreational resources including boating and fishing
- Economic impacts including power production and recreation
- GCMRC budgetary impacts
- And others as appropriate

Based on the GCMRC evaluation and suggestions, the TWG will recommend to the AMWG whether this proposal should or should not be implemented. If the AMWG approves the implementation of this proposal, the Monitoring Center will be asked to develop a detailed research proposal, Reclamation will pursue ESA and NEPA compliance, and adequate funding will be arranged.

**References:**

Kaplinsky, M. 1998. Verbal communication. Northern Arizona University, Flagstaff, Arizona.

Grand Canyon Monitoring and Research Center (GCMRC), 1997. Symposium on 1996 Beach Habitat-Building Test Flow, Flagstaff, Arizona.

Moody, Tom. 1998. Verbal communication. Grand Canyon Trust, Flagstaff, Arizona

Palmer, Clayton, 1998. Verbal communication. Western Area Power Administration, Salt Lake City, Utah.

U.S. Department of Interior. 1996. Operation of Glen Canyon Dam Final Environmental Impact Statement (GCDEIS). Bureau of Reclamation, Salt Lake City, Utah.

U.S. Department of Interior. 1996. Glen Canyon Dam Beach/Habitat-Building Test Flow Final Environmental Assessment and Finding of No Significant Impact (BHBFEA), Bureau of Reclamation, Salt Lake City, Utah.