



United States Department of the Interior  
U.S. GEOLOGICAL SURVEY  
SOUTHWEST BIOLOGICAL SCIENCE CENTER  
GRAND CANYON MONITORING AND RESEARCH CENTER  
2255 NORTH GEMINI DRIVE, MS-9394  
FLAGSTAFF, ARIZONA 86001  
928 556-7094 Telephone  
928 556-7092 Fax

January 28, 2004

MEMORANDUM

**To:** Technical Work Group, Glen Canyon Adaptive Management Program

**From:** Jeffrey Lovich, Chief /s/

**Subject:** Addendum to GCMRC response to Proposed Non-Native Fish Suppression Flow Changes for January-March 2004

The USGS, Grand Canyon Monitoring and Research Center (GCMRC) received a request from the Technical Work Group (TWG) of the Glen Canyon Dam Adaptive Management Work Group to review a proposal by the Western Area Power Administration (WAPA) to institute changes in Non-Native Fish Suppression Flows (NNFSF) for 2004. The GCMRC response provided our best scientific judgment regarding the potential effects of the proposed WAPA flow modifications on sediment resources, non-native fishes (particularly rainbow trout), and the over-all experimental design of the flows currently underway.

Subsequently, GCMRC received an email dated January 23, 2004 from Clayton Palmer of the Western Area Power Administration (WAPA) requesting explicit responses to the following questions for further clarification on the impacts of the proposed flows:

1. What is the incremental impact of WAPA's proposal on HBC [humpback chubs] in the Grand Canyon ecosystem?
2. What is the incremental impact to "the food base" in the Grand Canyon ecosystem of WAPA's proposal?

This addendum is intended to provide our explicit opinion regarding the two resources identified in the questions above.

**Food base**

GCMRC does not believe that the food base would be materially affected (at least to a degree that we could discern) by the WAPA proposal. The modest fluctuation of 5,000-8,000 on Sunday should still provide some impetus for food drift to occur and that is preferred by those who fish for trout. Furthermore these lower flow levels and fluctuations are consistent with what GCMRC posited in our science plan for the experimental flows. Excerpts follow:

*"There is some likelihood that the food base was reset in September 2001 to a level commensurate with the 5,000 cubic feet per second (cfs) flows, allowed under the Record of Decision for an 8.23 million acre feet (maf) year. This level may represent the "carrying capacity" at which this fishery should be managed. It has been suggested that minimum flows of 8,000 cfs should be established to protect the food base. Existing data suggest there is not much area difference between 5,000 and 8,000 cfs flows...*

*In the discussion of carrying capacity, one should recognize that as water flows have decreased, carrying capacity has also likely decreased..... If our goal is to manage for a stable quality fishery we should base our objectives on a stable food base reflected by probable minimum flows allowed under the current Record of Decision of 5,000 - 8,000 cfs."*

### **Humpback Chub**

GCMRC does not believe that the proposed flow modifications will have any material effect on humpback chub survival or recruitment. These flow fluctuations are quite modest relative to what the chub has experienced in recent decades and it would be virtually impossible to predict or attribute any change in population or effects on individual fish to such flows.