

## **PROPOSAL FOR GCD EXPERIMENTAL FLOWS WY 06**

Except for limited comparisons of steady flows in September and October, 2006, no experimental flows beyond MLFF have been discussed or recommended by the AMP committees or planned by Reclamation. On the other hand, recent findings presented at the GCMRC Science Symposium and during the recent TWG Knowledge Assessment Workshop, indicate that GCD flows different from the MLFF during certain times of the year are likely to move the CRE in the Grand Canyon closer to the stated purposes of the GCD-EIS' preferred alternative, and to protect and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established.

WY 06 represents an opportunity to continue the implementation of management actions on an experimental basis and to conduct additional "mini-experiments" with GCD flows. The following describes conceptually, the GCD flows that are proposed to be implemented in WY 06. Further details regarding these WY 06 flows will be completed by scientific experts, USGS GCMRC, the TWG and Reclamation (want to mention the SPG?).

### **Non-Native Fish Management Flows (NNFM):**

In the Winters of 2003, 2004 and 2005, increased daily fluctuations between 5,000 and 20,000 cfs were implemented in an attempt to reduce the recruitment of rainbow trout in the main channel, and also to reduce competition and predation of trout species on humpback chub. This was intended to reduce survival of trout eggs and young. As an incidental benefit, they were intended to increase the average size and health of trout in the Lee Ferry fishery by reducing their recruitment and density.

Evidence presented by Josh Korman at the GCMRC science symposium, suggests that there may be little mainstem spawning and recruitment of rainbow trout downstream of the Paria river, the area the AMP wants to manage for native fishes, in recent years. Korman also speculated, and some evidence suggests, that the source of high densities of trout near the Little Colorado River might be Lees Ferry. If emigration of trout from the Lees Ferry reach is the source of those downstream fish that may prey on and compete with humpback chub, it may offer other opportunities for non native control using GCD operations.

The work of Korman (2005) indicated that these flows had a measure of success. They didn't appear to strand and induce mortality on many adult fish, but they reduced the success of the fish hatch through an intolerable thermal water regime at some redds. They also likely disoriented and stranded some larval and juvenile fish. Korman (2005) reported that, based on these findings, further additional flow-related actions could significantly enhance the effectiveness of these flows.

Given the possible link between Lee Ferry trout production and trout abundance in HBC mainstem habitat continued implementation of Non-native Fish Management flows appears to be warranted (subject to the condition in bullet #3, below). Moreover, reduction in trout numbers may be at odds with another of the AMWG developed goals: to maintain a healthy sport fishery

at Lee Ferry. Therefore, more years of experimentation should occur to assure that GCD flows that are targeted at benefiting HBC do not cause a significant, adverse, permanent impact on the Lee Ferry sport fishery.

We propose that these Non-native Fish Management Flows in WY 06 consist of the following:

- Winter flows: Weekday flows of 5 kcfs to 20 kcfs. Sunday flows of 5 kcfs to 7 kcfs. The scientific analyses of NNFM flows indicates that the effectiveness of these flows may be improved by examining changes in:
  - that an extension of these flows into April
  - Sunday flows lower than 8 kcfs. However, since the AFB is a concern, the Sunday flows would be subjected to experimentation. This might include experimenting with Sundays that consisted of a steady 7 kcfs.
  - the 5 – 20 kcfs range of flows may be lower, reducing the impact on other resources while maintaining their biological purpose.
- Summer standing flows: Analysis indicates that juvenile stranding in the Summer may improve the effectiveness of Non-native Management Flows. These are an unproven action with possible adverse impacts to other resources. Therefore, we proposes only limited testing of this concept. On the other hand, the science indicates that the change from the high volume month of August to the one-day transition to September low flows is a successful example of this kind of flow. However, impact of these flows on other resources, especially the foodbase is poorly understood.
- These Non-native Management Flows for the past three Winters have been targeted at the trout populations in order to reduce competition with and predation on HBC. They are also intended to improve the Lee Ferry fishery. This fall, GCD has been releasing water with low levels of dissolved oxygen (DO). In addition, the AFB may be less abundant this year and this may be having a deleterious effect on the trout population. Therefore, the trout may not be in sufficient abundance or condition to provide the opportunity to reduce their recruitment with fluctuating flows, and reduced recruitment in the Lees Ferry reach may not be desirable. We propose that the NNFM flows be implemented contingent on field estimates of the numbers and health of the Lees Ferry trout population. AG&F will be surveying trout in December. Once the data are analyzed a decision on NNFM flows will be made.

### **Electrical Power Production Experiments**

The MLFF was intended to improve the state of a set of natural resources in the CRE with full knowledge that electrical power production would be adversely effected. The operational parameters of the MLFF were conservatively chosen in an attempt to ensure that the anticipated environmental benefits would be achieved. These were to be reexamined through an adaptive management process and changes were to be made as the scientific findings indicated. However, there has been very little directed experimentation at the operating parameters themselves. For

example: would an increase in the downramp rate have a measurable and deleterious effect on sediment retention of Marble Canyon beaches? Does an increase in the daily variation produce additional drifting food for trout and HBC? Can the New Zealand mud snails be reduced by a higher daily variation?

We propose, in coordination with the TWG and aided by GCMRC, to include in a long-term science plan, experimentation with the GCD operating parameters in WY 06. This likely includes the modification of more than one operating parameter at a time since recent analysis show very little power benefit from the liberalization of just one parameter.

These experiments could be conducted throughout WY 06. However, they may be concentrated in the Winter months when the most benefit to power resources might be achieved with little harm to other resources.

### **Aquatic Food Base Restoration Flows**

Since the BHBF of November, 2004, anecdotal evidence indicates that the AFB may have suffered. The AFB is an important feature in the CRE for the survival and health of both the HBC and the Lee Ferry trout. We propose that there be an increase in the minimum flows during important times of the year (the Spring, for example) in order to address this concern. Further development of the proposal for AFB flows would be completed by the TWG, in consultation with the GCMRC.