



## **Additional Comments on the Long-Term Experimental and Management Plan Environmental Impact Statement**

*July 2, 2012 – The following comments amplify those made in our earlier Scoping Comments letter, dated January 31, 2012.*

Resources in Grand Canyon National Park continue to decline under current dam operations. Under the existing operating criteria, cultural sites have lost much of their foundations; beaches have shrunk; many native plants and animals have been reduced in number; and 10,000 endangered humpback chub compete for limited food with over 1 million non-native trout. It is critical that the LTEMP alternatives consist of alternative dam operating criteria (in concert with other management actions) designed to improve these and other resource conditions, consistent with the Grand Canyon Protection Act.

It is also important that flexibility for future experimenting be attained by providing compliance for a broad range of flows—including high flows, steady flows, non-native suppression flows—and actions—including sediment augmentation and temperature control device.

The loss of sediment from Grand Canyon has resulted in fewer and smaller beaches. It has also eliminated significant critical habitat for native fish. Sediment deposits create complex shorelines and underwater features that are used by native fish for spawning and rearing. Four of the eight species of native fish that once plied the waters of Grand Canyon have already been lost. A fifth species, the endangered humpback chub, is vulnerable to being lost from Grand Canyon because virtually all spawning and rearing habitat has disappeared from the mainstem.

The continual loss of sediment from Grand Canyon has also resulted in archaeological sites being exposed to erosion and impacts from visitors. Historically, these sites were protected with a regularly renewed layer of sediment derived from the beaches and transported by the wind. Without the influx of new sediment, we constantly lose these irreplaceable features of our cultural heritage.

The way in which water is released from Glen Canyon Dam has profound effects on the river corridor, the species living there, and the abundant cultural sites. Simply stated,

water can be released as either steady flows or fluctuating flows. Neither flow regime impacts water supplies or water deliveries by the Colorado River; however, over the last 15 years, science has shown that fluctuating flows damage all the key resources in Grand Canyon—the beaches, the backwater habitats for native fish spawning and rearing, the native shoreline plants and animals, and cultural and archaeological sites. At the same time, scientists have concluded that steady flows are very likely to be optimal for all sediment-related resources. A recent report from Grand Canyon Monitoring and Research Center concluded that fluctuating flows following the last high-flow experiment quickly eviscerated the benefits created by the high flow.

Speaking broadly, two types of flows are needed: 1) regular high flows under sediment-enriched conditions to deposit sediment from tributaries and to scour sediment from the bottom of the river to rebuild beaches and near shore habitat for native fish, and 2) seasonally-adjusted steady flows, based on the natural rhythms of the pre-dam river, which would preserve beaches, protect native fish habitat, and stabilize centuries-old cultural sites.

### **Steady Flows Conserve Sediment and Warm Water**

Most of the resources of concern in Grand Canyon are reliant upon sediment in one way or another. Sediment conservation should thus be a key component of all alternatives considered in the LTEMP EIS. The best flows for conserving sediment are steady flows. A USGS Fact Sheet (Publication #2009-3033) summed up the science position on steady flows in Grand Canyon this way:

*For a given volume of water to be released from Glen Canyon Dam, the optimal dam operation for accumulating tributary-supplied sand is a constant, steady flow over the entire year.*

Steady flows also warm river water, especially near the shoreline. This is important as native fish need warmer temperatures to successfully reproduce. A specific type of steady flow regime that should be considered in the EIS is Seasonally-Adjusted Steady Flows (SASF). This flow regime closely resembles pre-dam flows and will conserve sediment better than fluctuating flows. SASF includes low steady flows in the summer and fall, which may cause water temperatures to rise to a level that supports spawning and rearing of humpback chub. GCMRC should be asked to develop an SASF alternative, consistent with sediment conservation and improved native fish habitat.

### **Four-Year Experimental Blocks**

Because of the uncertainties attending any new flow regime, one possible alternative would be a 12-year series of three four-year experimental blocks that test the pros and cons of different flow regimes, including Seasonally-Adjusted Steady Flows. Because SASF has never been implemented at Glen Canyon Dam, if four-year experimental blocks are implemented, the experimental series should begin with SASF.

## **2007 Interim Guidelines**

Modified Low Fluctuating Flows plus equalization flows equals massive destruction of Grand Canyon. Because of the guidelines adopted in the “Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations of Lake Powell and Lake Mead” (Interim Guidelines), huge equalization flows were released in 2011, transporting a record amount of sediment from Grand Canyon, dramatically eroding beaches and damaging Grand Canyon resources.

The Interim Guidelines as adopted has set back sediment conservation in Grand Canyon several years. Higher flow volumes have a direct effect on sand transport, a fact corroborated in the modeling simulations of sand transport for hypothetical annual release volumes as published in USGS Open File Report 2010-1133, “Evaluation of Water Year 2011 Glen Canyon Dam Flow Release Scenarios on Downstream Sand Storage along the Colorado River in Arizona” (Wright and Grams, 2010).

To remedy this situation, the Interim Guidelines should be amended to include consideration of the requirements of the GCPA. It should also explicitly be acknowledged that when equalization is required, larger flows can and should be released over a two- or three-year period. This longer term of releases would still satisfy the criteria for moving water from Powell to Mead, but would do it in a manner that better protects the resources in Grand Canyon.

## **Summary**

The following alternatives and concepts should be included in the Draft EIS:

- Well-timed high-flow experiments, including both Spring and Fall high flows;
- A Seasonally-Adjusted Steady Flows alternative (of at least four years duration);
- Reconfiguration of the 2007 Interim Guidelines to allow for consideration of impacts to humpback chub and other resources in Grand Canyon;
- Development of sediment augmentation and temperature control devices; and
- Resolution of compliance issues so that more aggressive and timely experiments can be implemented in the future.

Thank you for the hard work all of you have done and for this opportunity to provide additional comments on the Long-Term Experimental and Management Plan EIS.

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