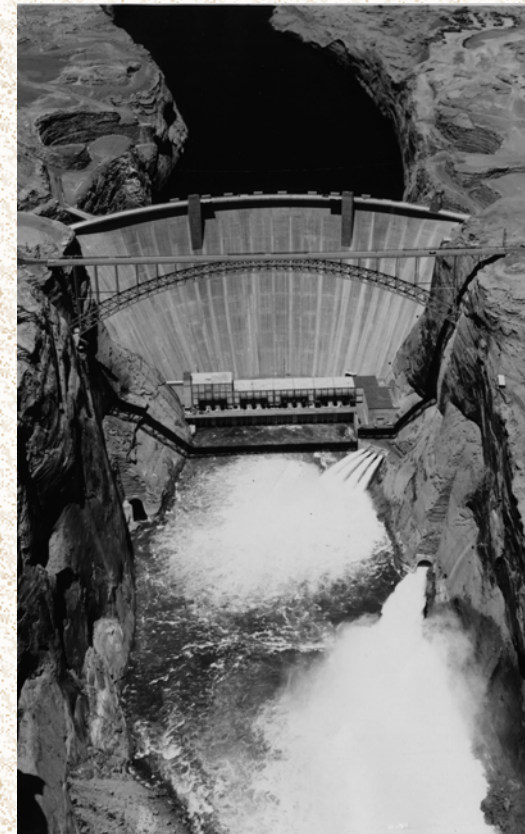
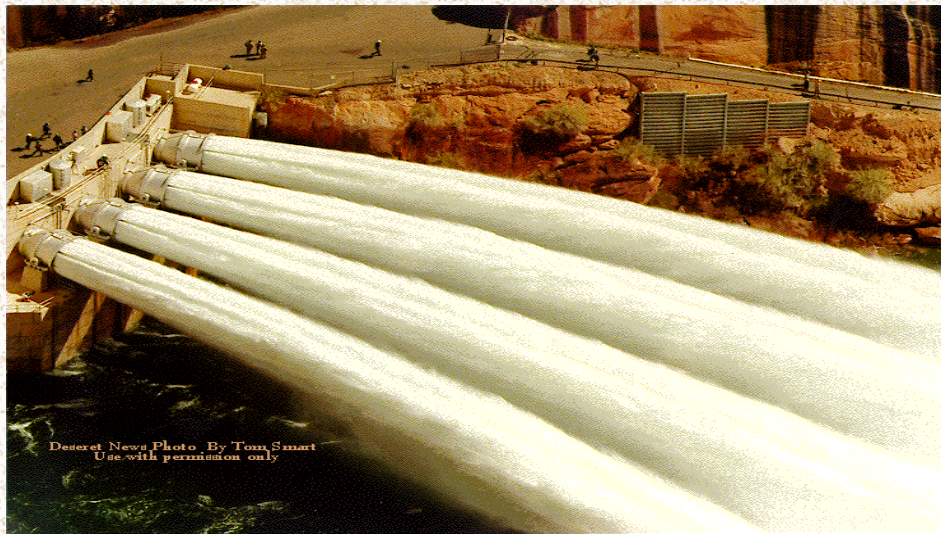


Grand Canyon Monitoring and Research Center

Historical Timeline for USGS Experimental Flow Planning



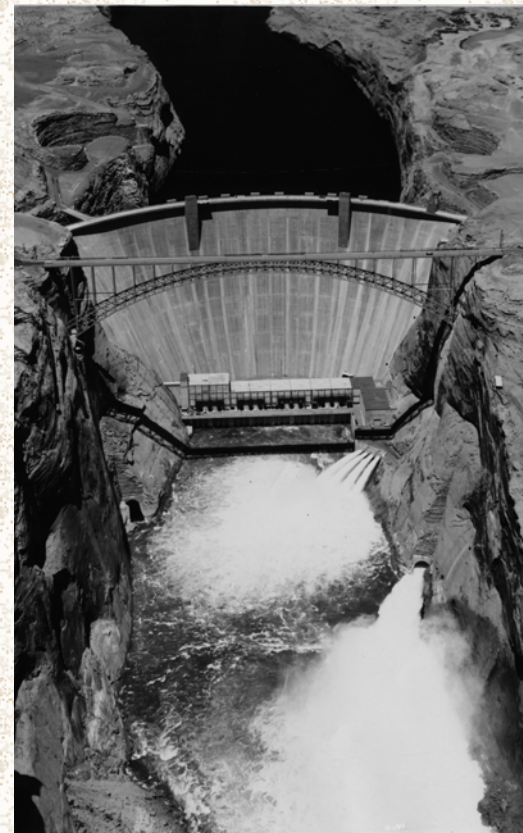


Southwest Biological Science Center

USGS Exp Planning 1991 - 1997

BHBF Testing The **Water Resources Discipline** of the USGS Co-leads an intensive planning process aimed at testing the concept of a Beach/Habitat-Building Flood. Planning is conducted jointly with Bureau of Reclamation Engineers and Various Stakeholders, prior to formal Adaptive Management, as part of EIS compliance process. The EA is done between Sep. 1995 and Mar. 1996, with the test implemented in Mar. & Apr. 1996.

Habitat Maintenance Flows August - November 1997, USGS and BuRec plan and implement a test of the 31,500 cfs HMF concept for 3 days as a potential strategy for conserving sizable sand inputs from the Paria River.



Southwest Biological Science Center

USGS Exp Planning 1998 - 2000



LSSF Testing BuRec and GCMRC work with science cooperators and USGS to plan the Low-Summer Steady Flow test of Summer 2000. Operations in this test are all within ROD, hence compliance is minimal.

Low+High-Flow Sediment Research Begins Despite being mostly a fishery treatment, USGS and GCMRC use the summer 2000, operational sequence as an opportunity for additional testing of the HMF concept in Jun. and Sep. under winnowed to only minimally enriched sediment supplies. Results confirm hypothesis that flows below 10,000 cfs are needed to conserve sand inputs.



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USGS Exp Planning 2002 - 2004

AMWG Motion Jan. 2002, in response to resource reports of ongoing decline, AMWG directs GCMRC to prepare an experimental plan for ongoing sediment research related to the Rubin et al. report, and further directs that the design consist of other ecological elements as well. GCMRC engages with cooperators and science advisors and presents a 16-year, factorial design that tests five treatments; TCD, stable flows, EXP Fluctuating flows, BHBF scenarios & Mechanical Removal. Some, but not all of the plan is recommended by the AMWG – GCMRC proceeds partial implementation under direction from the Secretary.



Water Year	Increased Fluctuations In Daily Flows (Jan – Mar)	Mechanical Removal of Rainbow Trout in GC (Jan-Mar, Jul - Dec)	Stable-Low Flows in Fall (Aug – Dec)	Temperature Control Device (Future)	Beach Habitat Building Flow (Jan – Jul)
WY2002-03					
WY2003-04					
WY2004-05					
WY2005-06					
WY2006-07					
WY2007-08					
WY2008-09					
WY2009-10					
WY2010-11					
WY2011-12					
WY2012-13					
WY2013-14					
WY2014-15					
WY2015-16					
WY2016-17					
WY2017-18					

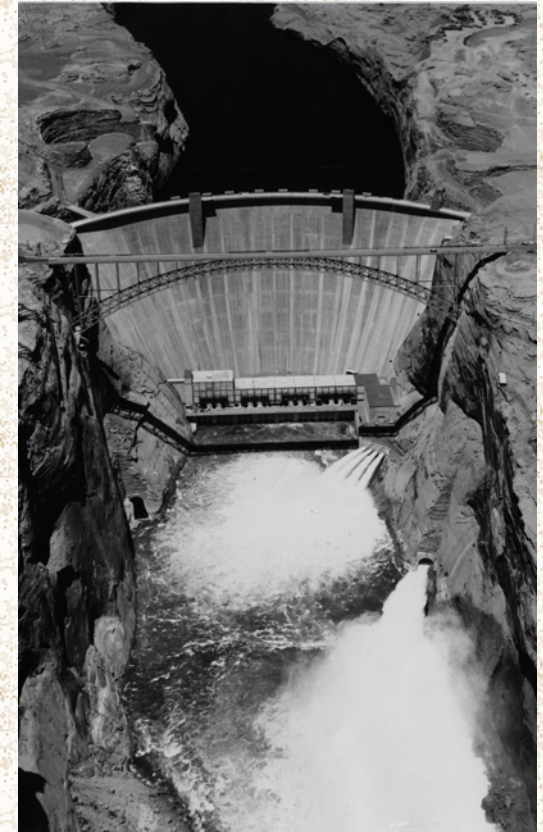
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USGS Exp Planning 2003 - Present

Treatments Underway Jan. 2003 - Present, Experimental Fluctuations and Mechanical Removal of exotic fishes are implemented according to the 2002 GCMRC plan, however, stable flows tests are not included in the treatment schedule for years 1 & 2, despite the fact that they were recommended in the plan.

Second Review by Science Advisors April 2004, SAB provided additional input on experimental design – encouraging that the number of treatments be reduced if possible, also, consider whether treatment block lengths should be lengthened.



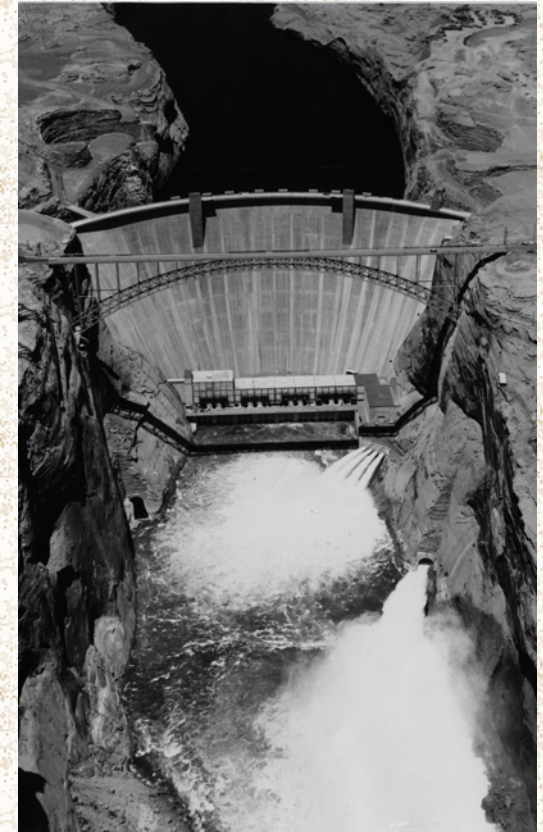
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USGS Exp Planning 2004

AMWG Motion Creates ExpFlow Ad-Hoc March 2004, GCMRC begins participating in TWG ExpFlow ad-hoc planning process.

GCMRC Offers a Revision of 2002 Design A four-treatment factorial design is developed by GCMRC as a revision of the original 2002 factorial approach. The two flow treatments are integrated into one, while Mechanical Removal, TCD and the BHBF treatments are retained as originally described in the 2002 plan. Block lengths can be extended, but requires a 24-32 year schedule for replication to occur. The revised design is offered to the ExpFlow ad-hoc for discussion and consideration in early May 2004.



Water Year	Flow Treatment (Jan – Apr, Aug– Dec)	Mechanical Removal of Rainbow Trout in GC (Jan-Mar, Jul - Dec)	Temperature Control Device/Low Reservoir Releases	Beach Habitat Building Flow (Jan – Jul)
WY2002-03	Fluctuating	Remove Fish	Random	Event Driven
WY2003-04	Fluctuating	Remove Fish	Random	Event Driven
WY2004-05	Stable	Remove Fish	Random	Event Driven
WY2005-06	Stable	Remove Fish	Random	Event Driven
WY2006-07	Fluctuating	Do Not Remove Fish	Random	Event Driven
WY2007-08	Fluctuating	Do Not Remove Fish	Random	Event Driven
WY2008-09	Stable	Do Not Remove Fish	Random	Event Driven
WY2009-10	Stable	Do Not Remove Fish	Random	Event Driven
WY2010-11	Fluctuating	Remove Fish	Random	Event Driven
WY2011-12	Fluctuating	Remove Fish	Random	Event Driven
WY2012-13	Stable	Remove Fish	Random	Event Driven
WY2013-14	Stable	Remove Fish	Random	Event Driven
WY2014-15	Fluctuating	Do Not Remove Fish	Random	Event Driven
WY2015-16	Fluctuating	Do Not Remove Fish	Random	Event Driven
WY2016-17	Stable	Do Not Remove Fish	Random	Event Driven
WY2017-18	Stable	Do Not Remove Fish	Random	Event Driven

Southwest Biological Science Center



USGS Exp Planning 2004

GCMRC Recommendation for Onset of Stable Flows The suggestion that a block of “hybrid” Experimental Fluctuating Flows combined with seasonal stable flows should begin in WY 2005 is not embraced by the ad-hoc members.

WY 2005 Treatment? GCMRC awaits a decision from the DOI for how to proceed with experimental treatments in WY 2005.

