

Adaptive Management of Glen Canyon Dam and the Colorado River

Glen Canyon Dam has proven to be a mixed blessing for the Colorado River ecosystem in Glen and Grand Canyons. Positive environmental effects of the dam, such as power generation, improved recreation and expanded wildlife habitat, have been countered by the loss of camping beaches, lack of native riparian tree germination, decimation of native fish populations, and impacts to the Canyon's wilderness values. Before the dam, Lees Ferry was little known, but now more than 40,000 people join daily runs from the Dam to the Ferry, 25,000 river runners launch downstream trips, and thousands of trout anglers visit there each year. So too, before the dam, the river was a sea of churning mud, a memorable but uninviting spectacle in flood, and only a trickle during dry times. Now this portion of the cold and often clear river is enjoyed by nearly 100,000 people annually, many of whom would likely not traverse it, were it running mud (Myers et al. 1999). The river ecosystem is now decoupled from climate, and almost entirely regulated to ensure delivery of flow and electricity to downstream users.

With many clamoring constituents, the solution to managing the CRE for conflicting societal environmental and economic values has become adaptive ecosystem stewardship, in this case adaptive management of dam operations. Such a strategy involves applying an holistic ecosystem approach, using management actions as scientific experiments, learning by doing and adjusting actions to new findings (Lee 1993, Walters 1986). The Glen Canyon Dam Adaptive Management Work Group (AMWG) was convened as a Federal Advisory Committee in 1997 to provide recommendations to the Secretary of the Interior on balancing environmental and economic values in the management of the dam (Fig. xx; Stevens and Gold 2002, US Bureau of Reclamation 2013) The AMWG consists of a body of 27 stakeholder groups and federal agencies, including: the Bureau of Reclamation (the lead agency), the National Park Service (which has just become a co-lead), the US Fish & Wildlife Service, the Bureau of Indian Affairs, five Native American Tribes, the Colorado River Basin states, trout fishers, river runners (Grand Canyon River Guides), and two environmental groups. Members of the public are welcome to attend AMP meetings, which usually take place in Phoenix several times/yr.

AMWG's vision and mission statement was composed during a week-long river trip in 1999: (US Bureau of Reclamation 2013)

The Grand Canyon is a homeland for some, sacred to many, and a national treasure for all. In honor of past generations, and on behalf of those of the present and future, we envision an ecosystem where the resources and natural processes are in harmony under a stewardship worthy of the Grand Canyon.

We advise the Secretary of the Interior on how best to protect, mitigate adverse impacts to, and improve the integrity of the Colorado River ecosystem affected by Glen Canyon Dam, including natural biological diversity (emphasizing native biodiversity), traditional cultural properties' spiritual values, and cultural, physical, and recreational resources through the operation of Glen Canyon Dam and other means.

We do so in keeping with the federal trust responsibilities to Indian tribes, in compliance with applicable federal, state, and tribal laws, including the water delivery obligations of the Law of the River, and with due consideration to the economic value of power resources. This will be accomplished through our long-term partnership utilizing the best available scientific and other information through an adaptive ecosystem management process.

Two AMWG achievements over the past several years include agreement on desired future conditions (DFCs) for the river corridor, and establishment of criteria to trigger high flow experiments to better manage the Canyon’s sand budget. The DFCs include consideration of the river ecosystem, cultural values, hydroelectric power production, and recreation, and are consistent with the directives of the Grand Canyon Protection Act. Approved triggering criteria for high flows allows for better management of tributary-derived sediment inputs in relation to Grand Canyon sediment mass balance management. AMWG is deeply involved in development of the Long-term Experimental Management Plan, an on-going Environmental Impact Statement that will revise the operating regime of Glen Canyon Dam.

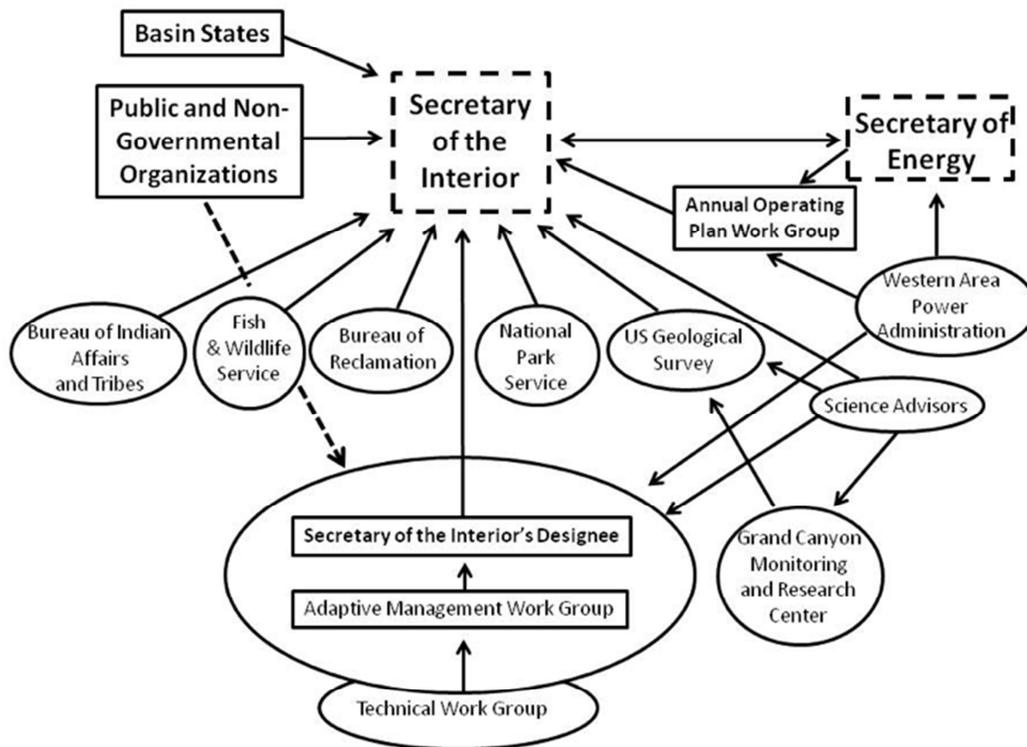


Fig. 1: Administrative structure of the Glen Canyon Dam Adaptive Management Program (reproduced with permission from Stevens 2014: The Colorado River in Grand Canyon).