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It is Time to Expand the Geography of the Glen Canyon Dam Adaptive Management Program

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Summary

The Glen Canyon Dam Adaptive Management Program (GCDAMP) currently focuses primarily on downstream resources, particularly in the Grand Canyon, without fully accounting for the diverse environmental and societal values affected by reservoir operations upstream from Glen Canyon Dam. As water storage in Lake Powell has declined in the 21st century, new challenges and opportunities have emerged in Cataract Canyon and in other parts of Glen Canyon National Recreation Area. These changes, including the return of river ecosystems

in previously inundated areas, highlight the need for broader management that considers upstream resources. Expanding the GCDAMP's geographic scope would allow for a more comprehensive evaluation of both upstream and downstream resources, aligning with evolving environmental conditions and societal values. The post-2026 process provides a critical opportunity to reassess and potentially broaden the geographic focus of the GCDAMP to better protect and manage the region's complex river ecosystems and recreational resources.

Introduction

The Colorado River has landscape and infrastructure attributes that are nationally significant. The relative importance of these resources depends on an individual's values and can differ from person to person and from decade to decade. Some of these environmental and societal resources are relicts of the distant past, others are artifacts of more recent dam construction. Some artifact resources are in their most desirable condition when the reservoirs are relatively full, and others are in better condition when the reservoirs are relatively empty.

The resources in each part of this spectacular region are unique. Cataract Canyon was known to river runners as the "graveyard of the Colorado" because of its challenging rapids. Glen Canyon held sublime beauty amid the tranquility of its countless side canyons until they were inundated, and those side canyons are now reemerging. Grand Canyon is one of Earth's greatest

geological statements and is sacred to many native American tribes. In the eyes of the Bureau of Reclamation in the 1960s, and to millions of visitors today, Lake Powell is the "Jewel of the Colorado." Lake Mead, visited by four million people each year, is the largest reservoir in the United States and allowed transformation of much of the American Southwest.

In 2025 we have an opportunity to establish policies for the Colorado River that honor these diverse and evolving environmental and societal values.

The legal and administrative foundations that guide river and reservoir management in Cataract Canyon/Lake Powell/Glen Canyon/Grand Canyon/Lake Mead appear to encourage, and perhaps even require, consideration of the many environmental and societal resources throughout this diverse region. These foundations include the Grand Canyon Protection Act (GCPA), other laws, Records of Decisions (RoDs), and



administrative agreements. Presently, the Glen Canyon Dam Adaptive Management Program (GCDAMP) and its Adaptive Management Work Group (AMWG) focus on the resources of the Grand Canyon and the effects of operations of Lake Powell and Glen Canyon Dam on the resources downstream from the dam. The post-2026 process provides an opportunity to more broadly consider the resources of a larger part of the region.

Why broaden the region considered by the GCDAMP and the AMWG?

We argued In [White Paper 8](#) that as we develop new post-2026 operating rules for the Colorado River implementation of annual releases from Lake Powell ought to consider the effects those releases have on environmental and societal resources throughout Cataract Canyon/Lake Powell/Glen Canyon/Grand Canyon/Lake Mead. Presently, the effects of monthly, weekly, and daily releases on the Colorado River downstream from Glen Canyon Dam are primarily considered. We also argued that Reclamation ought to take a flexible approach to implementing each year's annual release, because the status of environmental resources affected by releases is likely to change over time and may necessitate changes in management strategy. Additionally, management goals may change as societal values about the relative importance of resources upstream and downstream from Glen Canyon Dam change. The resources affected by operations of Glen Canyon Dam are different now than they were when the GCDAMP was created in the mid-1990s. The uncertainty in predicting environmental changes and the ever changing nature of societal values about resources is at the heart of the philosophy of adaptive management.

How might environmental and societal resources, old and new, be considered in decisions about annual releases? The Secretary of the Interior has the ultimate authority to make decisions about releases from Lake Powell, because she is the watermaster of the Lower Basin. Formal recommendations about monthly and daily flow releases from Lake Powell are now provided by the AMWG, but annual releases are determined by Reclamation, primarily in consultation with the states.

We advocate that the AMWG advise the Secretary about annual releases and target elevations of Lake Powell. We also advocate that those recommendations consider the effects of reservoir and dam operations on resources upstream and downstream from Glen Canyon Dam.

A Brief Administrative History

Environmental river management in Cataract Canyon/Lake Powell/Glen Canyon/Grand Canyon/Lake Mead began in the mid-1980s when Reclamation initiated the Glen Canyon Environmental Studies. That program continued until the Environmental Impact Statement for Operations of Glen Canyon Dam was completed in 1996. Adaptive management was a common element in every alternative considered in that EIS. The RoD of the EIS was signed in October 1996 and committed Interior to the “establishment of an Adaptive Management Workgroup, chartered in accordance with the Federal Advisory Committee Act” (Record of Decision, section VI:1). The RoD referenced the final EIS (p. 34-38) that included an extended description of the Adaptive Management Program. That description included reference to the effects of Glen Canyon Dam operations on “downstream resources”

It is intended that the RoD will initiate a process of “adaptive management,” whereby the effects of dam operations on downstream resources would be assessed and the results of those resource assessments would form the basis for future modifications of dam operations. Many uncertainties still exist regarding the downstream impacts of water releases from Glen Canyon Dam.

The final EIS stated that the Adaptive Management Program “would meet the purpose and strengthen the intent for which this EIS was prepared and ensure that the primary mandate of the Grand Canyon Protection Act ... is met ...” The GCPA had become law in 1992 and directed the Secretary to “operate Glen Canyon Dam ... in such a manner as to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established ...” [Section 1802(a)].



The GCPA makes occasional reference to the effects on resources “downstream” from Glen Canyon Dam [i.e., Section 1804(d)], but elsewhere reference was only made to the values for which the national park and the national recreation area were created without any geographic specificity. The GCPA also stated that “nothing [in the act] ... is intended to affect ... the allocation of water ... or any Federal environmental law, including the Endangered Species Act ...” (Section 1806). The EIS description of the Adaptive Management Program reiterated this point.

In January 1997, Secretary Babbitt signed the Charter of the AMWG that stated that the “AMWG will facilitate the AMP, recommend suitable monitoring and research programs, and make recommendations to the Secretary as required to meet the requirements of the [Grand Canyon Protection] Act.” The Charter reiterated the language of the GCPA, stating that the Secretary is to operate Glen Canyon Dam “in such a manner as to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and the Glen Canyon National Recreation Area were established.” Thus, there is ambiguity about the geographic scope of the GCDAMP and the AMWG.

An earlier draft of the AMWG charter written in fall 1996, whose format is the same as that of the final signed document, made frequent reference to “downstream resources” (sections 2, 6e, 6f, 6h). Notably, every reference to “downstream resources” was removed from the final version of the Charter signed by Secretary Babbitt. Thus, the purpose of the AMWG, as stated in its Charter, reiterate the objective to ensure protection, mitigation, and improvement of the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established without geographic restriction to “downstream resources.”

It is not clear why the restriction to downstream resources was removed from the final version of the AMWG Charter, but it is well known that there was substantial debate within the Department of the Interior during the tenure of Secretary Babbitt about the need to evaluate the effects of other CRSP reservoirs and dams on other parts of the river system. We contacted many Interior

officials of the 1990s era, and no one remembers the motivation that led to the removal of “downstream resources” from the final signed AMWG Charter and from every subsequent renewal of the Charter.

What are the values for which Glen Canyon National Recreation Area was established? Insight about these values can be found in the Foundation Document for this park unit¹. The Foundation Document explains that Glen Canyon NRA, “provides for public enjoyment through diverse land- and water-based recreational opportunities, and protects scenic, scientific, natural, and cultural resources on Lake Powell, the Colorado River, its tributaries, and surrounding lands.” The Foundation Document does not solely focus on Lake Powell and reservoir recreation, and the document includes one “Significance Statement” concerning the rivers of the NRA, including those flowing into Lake Powell, “The Colorado River and its many tributaries, including the Dirty Devil, Paria, Escalante, and San Juan rivers, carve through the Colorado Plateau to form a landscape of dynamic and complex desert and water environments.” These Significance Statements “express why a park’s resources and values are important enough to merit designation as a unit of the national park system ... [and] are linked to the purpose of Glen Canyon National Recreation Area.”

Presently, the National Park Service is developing a Colorado River Management Plan for Canyonlands National Park and Glen Canyon NRA. The scope of this Management Plan includes the Colorado River in Cataract Canyon within the NRA that was once inundated by Lake Powell at full capacity and has now returned to river ecosystems during the reservoir’s low stand.

Thus, there is some measure of ambiguity in the geographic scope of the AMWG. The values for which Glen Canyon NRA was established seem to indicate recognition of the values of the rivers flowing into the reservoir, and these values are affected by decisions about target elevations for Lake Powell and annual releases from the dam.

1 National Park Service, 2014, Foundation document, Glen Canyon National Recreation Area and Rainbow Bridge National Monument. NPS/GLCA/RABR/608/125220.



What to do?

Operations of Glen Canyon Dam affect environmental and societal values upstream from the dam as well as downstream. When Lake Powell was relatively full, upstream resources were only those associated with the limnology of the reservoir and its aquatic life. Today, upstream resources also include the emergent rivers flowing into the reservoir during its new, persistent low stand. New management issues exist:

- How to manage the deltas where the inflowing rivers deposit their sediment loads;
- How to manage waterfalls and the potential of un-navigable rapids at the upstream end of the reservoir;
- How to manage marinas and take-out points for river runners entering from upstream Cataract Canyon;
- How to manage the reservoir's non-native, warm water sport fishery; and,
- How to control undesired entrainment of these non-native fish through the dam and into Grand Canyon.

These issues, and the tradeoffs associated with prioritizing some issues over others, should be evaluated by the GCDAMP, and recommendations should be made by the AMWG concerning how the dam and reservoir

could be operated to protect the values for which Glen Canyon NRA was established.

Obviously, lawyers and policy experts will need to take a deep dive into the complex legal and administrative history of the Colorado River Storage Project Act, Grand Canyon Protection Act, various Records of Decisions, and the history of the AMWG Charter. Nevertheless, at a time when many fundamental aspects of reservoir operating rules and of the Law of the River itself are being reconsidered, the geographic focus of the GCDAMP, and the scope of the AMWG's recommendations to the Secretary, should also be reconsidered. Although there does not appear to be any legal basis to expand the geographic focus to include Lake Mead National Recreation Area, there may be a strong argument for considering the effect of reservoir and dam operations on all of Glen Canyon NRA.

The river resources now affected by dam and reservoir operations are more complex and wide-ranging than they were when the reservoirs were relatively full. It is time to comprehensively evaluate the entire range of resources affected by dam and reservoir operations. The post-2026 guideline development process is a perfect time to consider the complicated and ever-changing goals of managing the dramatic river and reservoir scenery and ecosystem.

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