The Fill Mead First Policy Proposal: An Opportunity to Reclaim America's Lost National Park?

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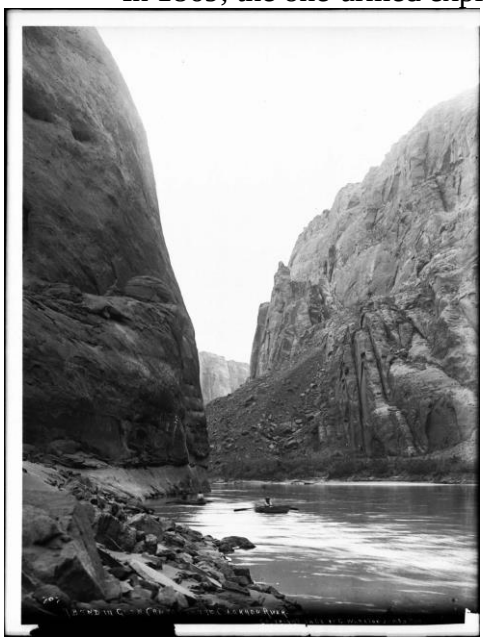
Abstract

With both Lake Mead and Lake Powell sitting at historic lows, environmentalists are calling for the draining of Lake Powell and the restoration of Glen Canyon. The Glen Canyon Institute ("GCI") has developed a proposal called the Fill Mead First ("FMF") policy that proposes to decommission the Glen Canyon dam and use Lake Mead as the primary reservoir for storage of Colorado River water. This paper tells the story of Glen Canyon and America's lost national park, describes the FMF policy proposal, and analyzes the legal, political, and scientific obstacles and unknowns regarding the FMF policy proposal.

Background

In 1869, the one-armed explorer John Wesley Powell and a group of men set out from Green River Station, Utah to explore the Colorado River.[1] During their travels, they floated along a magnificent canyon Powell described as "a land of beauty and glory." [2] Powell would name the magnificent canyon "Glen Canyon." Famed environmental author Edward Abbey traveled down Glen Canyon, which he described as "a portion of earth's original paradise." and as a perfect location for a national park.[3]



George Wharton James (1898)

However, despite its immense beauty, Glen Canyon was largely unknown to the outside world until the 1950s, when the United States Bureau of Reclamation ("BOR") selected Glen Canyon as one of the dam sites to quench the thirst of the rapidly growing western United States.[4] Environmentalists were fighting similar dam proposals across the west, led by David Brower—who would become the first executive director of the Sierra Club.[5] Brower was fighting a similar dam proposal to flood the beautiful Echo Park in Dinosaur National Monument. Without first visiting Glen Canyon, Brower and his fellow environmentalists made a compromise—if the BOR agreed not to flood Echo Park, the environmentalist would not protest or litigate the flooding of Glen Canyon.

In response, Glen Canyon Dam was completed in 1963 and Lake Powell, the reservoir formed by the Glen Canyon dam, slowly began to drown the sandstone spires and towering arches of Glen Canyon.

Before the dam was completed, Brower visited Glen Canyon for the first time, where he proclaimed his decision to trade Echo Park for Glen Canyon as "America's most regretted environmental mistake." Brower later proclaimed: "Glen Canyon died in 1963…. Neither you nor I, nor anyone else, knew it well enough to insist that at all costs it should endure. When we began to find out it was too late."[6] Ever since 1963, environmentalists have been calling for the removal of Glen Canyon dam and the restoration of Glen Canyon in hopes of resurrecting "America's lost national park."

In 1996, a group of these environmentalists created the Glen Canyon Institute ("GCI"), a non-profit organization with the goal of restoring and protecting Glen Canyon.[7] Since then, GCI has been advocating for a policy termed "Fill Mead First," ("FMF"), which proposes

decommissioning the Glen Canyon dam, transferring the storage capacity of Lake Powell downstream to Lake Mead, and restoring Glen Canyon to its pre-dam state.[8]

Analysis

Overview of Fill Mead First

Both Lake Powell, which is formed by the Glen Canyon dam, and Lake Mead, which is several hundred miles downstream of the Glen Canyon dam and is created by the Hoover dam, have been shrinking at a rapid pace since 2000. As of February 2023, Lake Powell sits at 5.393-million-acre feet ("MAF") or 23% full while Lake Mead sits at 7.503 MAF or 29% full.[9] Due to increasing droughts caused by climate change, predictions are that neither reservoir will ever fill again. [10] When full, Lake Mead can hold about 27 MAF.[11] If all the water in Lake Powell was drained and transferred into Lake Mead, as the GCI wants to do under the FMF policy, Lake Mead would contain 12.896 MAF—and would still be more than half empty. Due to the worsening drought in the western United States, the FMF policy may be a realistic policy option.

The Glen Canyon Institute wants to "Fill Mead First" for several reasons. First, draining Lake Powell would begin the process of restoring Glen Canyon and allowing America to regain its lost national park. Next, GCI argues that maintaining one reservoir, instead of two reservoirs, would lead to increased water conservation due to less evaporation and groundwater seepage. GCI argues that only filling Lake Mead would result in a smaller surface area to allow for evaporation, and that the volcanic bedrock that makes up Lake Mead would allow less seepage than the more porous Navajo sandstone that makes up Lake Powell.[12] GCI also believes that FMF would restore much of the downstream habitat the Grand Canyon by allowing Colorado River water temperatures to warm to pre-dam temperatures and increase in turbidity.[13]

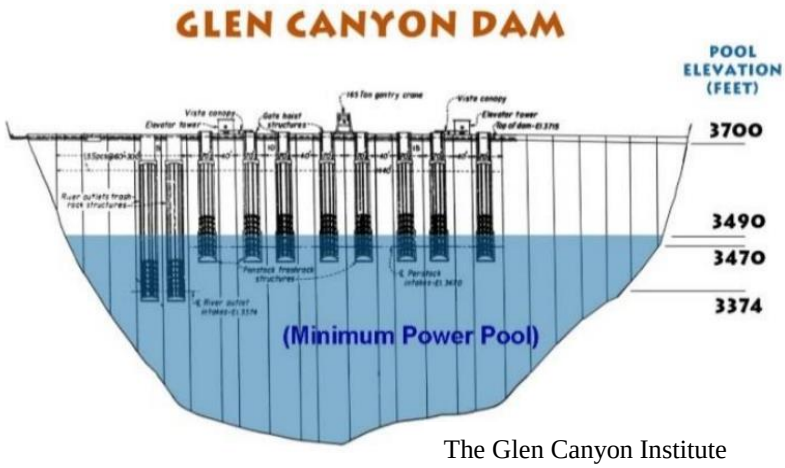
Additionally, the decommissioning of the dam would allow a normal flow regime to return to the downstream canyon, with large floods occurring in the spring and early summer. A normal flow regime would help native fish species like the humpback chub that prefer warmer, turbid water with seasonal flooding compared to invasive species like rainbow trout.[14] Lastly, GCI believes that the decommissioning of the Glen Canyon dam would allow sediment to return downriver, restoring sandbars that are habitat for native plant and fish species, native fish, and great campsites for boaters.[15]

Drawbacks acknowledged by GCI of the FMF policy include the loss of hydropower generation, unknown impacts on downstream ecosystems, a high cost to decommission the dam, and the loss of the reservoir recreation economy around Lake Powell.[16]

The Three Phases of Fill Mead First

The Glen Canyon Institute envisions the Fill Mead First policy being accomplished in three distinct phases.

Phase I of FMF would require lowering Lake Powell to the minimum power pool level, which is about 3490 feet above sea level. Because a minimal amount of water would be flowing through the dam's turbines, Phase 1 would include reduced hydropower generation output.[17] However, Phase I would allow 100 new river miles and 175 square miles of land to reemerge in Glen Canyon, beginning the restoration process of Glen Canyon and allowing increased hiking and rafting opportunities upstream of the dam.[18] Boating opportunities on



The Glen Canyon Institute

the reservoir would diminish, and there would be fewer fluctuations in downstream temperatures, which might harm native fish.[19]

Phase II of Fill Mead First would require lowering Lake Powell below minimum power pool, but above dead pool (the point at which no water would flow out of the dam), which is between 3490 feet and 3374 feet in elevation. Phase II would allow 150 river miles and 222 square miles of land to reemerge behind the dam.[20] However, GCI acknowledges that Phase II has many drawbacks that make Phase II a policy that should remain in place for as little time as possible. In Phase II, the reservoir would be too low to flow through any penstock structures to generate electricity, leading to a complete loss of power generation by Glen Canyon Dam. Water would instead only flow through the dam's river outlet intakes, which would release a constant 15,000 cubic feet per second ("CFS"). The 15,000 CFS would likely harm downstream native species like the humpback chub that prefer flow and temperature fluctuation.

Phase III of Fill Mead First is the end goal of the FMF policy proposal by the GCI. In Phase III, two large bypass tunnels would be drilled in the bedrock around Glen Canyon dam, allowing for the complete draining of Lake Powell. and for the Colorado River to successfully bypass Glen Canyon dam altogether. [21]

The dam would remain in place for flood control but would be decommissioned, allowing for the restoration of the 300 miles of river and 254 square miles of Glen Canyon. Pre-dam sediment flows would return to the river, allowing sandbars to be rebuilt downstream. Pre-dam flow, temperature, and turbidity fluctuations would return and aid in the recovery of native species.

Obstacles to FMF

1. **Legal Obstacles**

If FMF were to be implemented, the first obstacle to overcome would be the legal rules that govern how water is allocated along the Colorado River—known as the "Law of the River." The Law of the River is the various agreements, laws, and court cases that control who has rights to the water that comes from the Colorado River.

The most important of these agreements, the Colorado River Compact ("the Compact"), was negotiated in 1922 between the various states that use the Colorado River.[22] The Compact breaks the states into two separate basins—the lower basin states of California, Arizona, and Nevada, and the upper basin states of Wyoming, Colorado, Utah, and New Mexico.[23] The Compact divided up water rights to the river between the lower and upper basin states, and again between each state. The most important section of the Compact for FMF is article 3(d), which obligates the upper basin states to allow 7.5 MAF of water, on average over a ten-year period, to pass through Lee's Ferry (the portion of the river directly below the Glen Canyon dam). [24] Under the current treaty with Mexico, another .73 MAF is required to pass through Lee's Ferry and make it to the US-Mexico Border. [25] In total, 8.23 MAF is legally required to pass through Lee's Ferry every year.

After the Compact was negotiated, Lake Powell was created as a sort of "cash register" for the lower basin states. When there was a high flow year, Lake Powell would fill up, like putting cash in a cash register, and when it was a low flow year, more water would be released from Lake Powell to fulfill the 8.23 MAF obligation owed to the lower basin states and Mexico, like taking cash out of a cash register. Unfortunately, the lower basin states have been taking

water (cash) out of Lake Powell (cash register) since 2000 with almost no years of excess flows to store water—now the cash register is almost out of cash.

In 2013, Professor MacDonnell at the University of Wyoming Law School conducted a legal analysis of the FMF policy proposal that concluded that no state or federal statutes explicitly precluded the FMF policy proposal.[26] The biggest barrier to the proposal is the 8.23 MaF (on average over a 10-year period) that is required to pass through Lee's Ferry each year under article 3(d) of the Compact and under treaty obligations to Mexico. However, a legal way around this barrier is the creation of an Intentionally Created Surplus ("ICS") of water that would be stored in Lake Mead instead of Lake Powell.[27] Using the legal fiction of an ICS, the upper basin state's water could be legally counted as having passed through Lee's Ferry even though the water is actually being stored in Lake Mead. This sort of legal loophole would allow the upper basin states to still meet their obligations under the Compact without having to actually store the water in Lake Powell and send it through Lee's Ferry every year.

Additionally, MacDonnell concluded that both the legally binding Interim Guidelines and the Long-Range Operating Criteria adopted by the BOR for administering the dam on the Colorado River would have to be revised to allow for the FMF policy.[28] Finally, FMF would require an Environmental Impact Statement ("EIS"), which would likely be bogged down by litigation.

2. Political Obstacles

Perhaps no obstacle is more difficult to overcome for the Glen Canyon Institute than the political nightmare that would be FMF. FMF and the decommissioning of the Glen Canyon Dam would require Congressional approval, a new agreement between the basin states and the federal government, and revision of the 1944 Treaty with Mexico.[29]

The biggest opponents of FMF would likely be the upper basin states that use Lake Powell as insurance that they can fulfill their 8.23 MAF requirement to the lower basin states and Mexico. Without Lake Powell, upper basin states would have less control over how they fulfill their obligations and may have to decrease their water use to fulfill their obligations.

Current negotiations between Arizona and California regarding cutting water rights due to the extreme drought have stalled and the federal government has been required to step in to allocate water under the Compact.[30] If these current negotiations are any indication, a new agreement between the basin states that decreases their ability to fulfill their obligations under the Compact is not very likely to be negotiated successfully anytime soon.

3. Scientific Unknowns

Few scientific studies have been conducted regarding the impacts of the FMF policy. Proponents of the FMF policy argue the policy will result in water savings, hypothesizing that having one reservoir instead of two can help reduce evaporation by reducing the overall surface area of the reservoirs, and reduce seepage by combining the water storage into one large reservoir in the less porous volcanic Lake Mead. However, a 2016 study from Utah State University estimated that FMF would reduce evaporation losses slightly or not at all and would save only 50,000 AF a year in seepage.[31] The study concluded that the surface area difference of having one reservoir instead of two would not impact evaporation rates significantly, and that much of the water that seeps into the Navajo sandstone around Lake Powell ends up flowing around the Glen Canyon dam through the porous sandstone and reentering the river later downstream.[32]

The 2016 study further found that the sediment delivery downstream of Glen Canyon dam in Phase III of FMF would likely cause a sudden change from cold, clear water to turbid,

warm water that could cause a shock across the ecosystem and require significant ecosystem adjustments.[33] Endangered fish like the humpback chub would have to be closely monitored to guarantee that the shock didn't further imperil the species. However, this sediment delivery would likely restore sandbars, providing habitat for species downstream and campsites for boaters.

Decommissioning Glen Canyon dam would result in the loss of about five billion kilowatt-hours of power generation a year. [34] However, a 2015 study found that the grid could easily absorb the losses of hydropower generation from decommissioning Glen Canyon Dam.[35] The study found there are readily available alternatives, such as wind and solar, that could make up the loss of energy from the Glen Canyon dam and ratepayers may see an increase of a few cents a month for residential users to around six dollars a month for industrial users.[36]

Lastly, the potential for restoration of the Glen Canyon ecosystem is vast. An entire ecosystem was drowned when Glen Canyon Dam was built and is only starting to reemerge as the reservoir recedes. Already species are returning to the side canyons of Glen Canyon as the reservoir recedes, which scientists are beginning to study.[37]

Conclusion

For decades, the FMF policy was seen as a radical environmentalist movement. However, with Lake Powell sitting just 32 ft above the minimum power pool level, the FMF has gained traction with the media and public who desire the return of their "lost national park."

On February 7, 2023, BOR took the latest step in reworking Glen Canyon dam when it hosted a meeting to discuss six proposals to overhaul Glen Canyon dam.[38] These proposals included drilling lower level intakes, installing a new underground power plant, drilling tunnels around the dam to a new power plant, and investing in solar and wind power to make up for the

loss of energy from Glen Canyon dam.[39] The BOR and state officials largely focused on how to make up for power generation lost if Lake Powell dipped below the minimum power pool.

The FMF policy was not included as one of the six policy proposals. Regardless, BOR's acknowledgment that the Glen Canyon Dam is not functioning in an increasingly arid west is the first step towards the FMF policy becoming a reality. As the situation becomes more dire on the shrinking Colorado River, resources should be spent on scientific studies to further analyze where the Fill Mead First policy proposal is a viable option. If so, America may finally be able to get its lost national park back.

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