

November 3, 2023

Ms. Kathleen Callister
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U.S. Department of the Interior
Bureau of Reclamation
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To Ms. Callister,

This letter is in comment to Notice of Intent to prepare a Supplemental Environmental Impact Statement for the December 2016 Record of Decision Entitled Glen Canyon Dam Long-Term Experimental and Management Plan.

I am a Colorado Plateau resident, and I have hiked and boated thousands of miles of Colorado River country and tributaries. I am intimate with this landscape and see it as home. As an environmental journalist covering the current threats to the Colorado River, I have extensively researched all sides of this pending decision that will especially impact the threatened humpback chub. I have consulted with the Pueblo of Zuni Tribal Government, Navajo Nation Historic Preservation Department, Glen Canyon National Recreation Area, and United States Geological Survey. In the Fall of 2023, I joined US Fish and Wildlife Service biologists in the Little Colorado River to monitor humpback chub. Here is a link to my reporting from that trip: <https://www.sierraclub.org/sierra/can-ancient-humpback-chub-hang-today-s-grand-canyon>.

As with my previous comment in March, I continue to support Flow Option B which was proposed in the Draft Environmental Assessment (EA). It is the option in the best interest of the Colorado River, Grand Canyon, local Tribes, recreationists, and wildlife. The intention to consider only the “No Action Alternative” ignores scientific evidence for best practices to both manage river sediments and flows, as well as protecting humpback chub from smallmouth bass and other warm water invasive/non-native fish. It also runs counter to the Glen Canyon AMP’s agreement to, “prevent the establishment of smallmouth bass below the GCD, which could threaten core populations of humpback chub in and around the Little Colorado River and its confluence with the mainstem” which could forever alter the Colorado River and these federally listed fish.¹

The warming waters below Glen Canyon Dam create a problematic equation for the threatened humpback chub, which are more likely to venture out into the main channel below Glen Canyon Dam where smallmouth bass, a known predator which also prefers warm water to spawn, are becoming more established:

¹ Glen Canyon Dam AMP, “Invasive Fish Species Below Glen Canyon Dam: A Strategic Plan to Prevent, Detect and Respond” (“Draft Strategic Plan”), Att. B (“Science plan to support management of smallmouth bass in the Glen Canyon reach of the Colorado River, Lees Ferry to Glen Canyon Dam”), p. 4.

Like humpback chub, smallmouth bass can spawn when temperatures exceed 16°C/61°F; however, sufficient numbers of adult fish need to be present for successful reproduction and population establishment to occur.²

According to biologists, “If smallmouth bass and other predators become established, it could be a point of no return for humpback chub and other native fishes in Grand Canyon.”³

Past methods to remove smallmouth bass using rotenone and electro-fishing proved expensive and unsuccessful. They also directly counter and disrespect Indigenous cultural concerns regarding fish management in Glen and Grand Canyon.⁴

Flow Option B respects the Zuni and Hopi Tribes desire to not kill any fish, native or non-native, based on their belief that all life is sacred and that taking of life within the Colorado River system and Grand Canyon adversely affects both tribes. The Zuni and Hopi management preferences were presented to the Glen Canyon Dam Adaptive Management Group Technical Work Group on January 26, 2023, and accepted by the Adaptive Management Work Group on February 16, 2023:

The continued implementation of reactive management actions to undesirable fish below Glen Canyon Dam in the CRE that result in the destruction of these fish will continue to have negative psychological and emotional impacts on the Zuni community. Recent Western scientific studies have continuously demonstrated that emotional and psychological stress on the body can weaken immune systems and inflammatory response, cause the decline and dysfunction of the prefrontal cortex and the hippocampus, and even influence cancer incidence and cancer progression. The impacts of lethal management actions have farther reaching negative effects than those experienced within the defined CRE.

Given the above concerns, I believe the Pueblo of Zuni would be very supportive of the primary preventive measure recommended in your report which is to prevent fish from passing through Glen Canyon Dam. This is a position that the Zuni Governor, Tribal Council and religious leaders have repeatedly recommended to the National Park Service as a proactive measure, rather than continually being reactive by implementing lethal management actions.⁵

² Healy, Brian D., “Too Much of a Good Thing? Climate warming and water overallocation may lead to new warmwater fish invasions that threaten the viability of Grand Canyon’s native fishes,” *Canyon Views*. Volume 9, No.1, Spring/Summer 2022. p. 26

³ Healy, Brian D., “Too Much of a Good Thing? Climate warming and water overallocation may lead to new warmwater fish invasions that threaten the viability of Grand Canyon’s native fishes,” *Canyon Views*. Volume 9, No.1, Spring/Summer 2022. p. 26

⁴ <https://www.sierraclub.org/sierra/can-ancient-humpback-chub-hang-today-s-grand-canyon>

⁵ *Invasive Fish Species Below Glen Canyon Dam: A Strategic Plan to Prevent, Detect and Respond Developed by the Smallmouth Bass Ad Hoc Group, through the Technical Work Group of the Glen Canyon Dam Adaptive Management Program in partnership with the Grand Canyon Monitoring and Research Center and the Bureau of*

Additionally, the Hopi preference is documented:

The water levels and continued difficulties of climate change means new strategies need to be approached and that sacrifices of values on certain resources and discussion between institutions need to be made. This includes the Lake Powell side above the dam. The Colorado River is not a closed ecosystem between the dams. If it must come down to it, then Hopi hopes that procedures can be done without the taking life and if further then taking of life un-needlessly.⁶

Because no methods to impede smallmouth bass from passing through Glen Canyon Dam are included in the Flow Options, Flow Option B provides a non-lethal method, HFEs, to protect humpback chub from the smallmouth bass per the ongoing insistence of the Zuni and Hopi Tribal Governments and communities. HFE's proved this spring to be an effective way to protect the threatened humpback chub from non-native smallmouth bass as described here by the Glen Canyon Dam Smallmouth Bass Environmental Assessment (DEA) (p. 2-4):

Water would be released through the penstocks and bypass tubes to maintain a daily average water temperature below 16°C from below the dam to the Little Colorado River (RM 61), with the goal of disrupting smallmouth bass spawning. In addition, up to three 36-hour flow spikes would be added between late May and mid-July if sufficient water is available. The flow spike would likely disrupt spawning in margin habitats that may be warmer than the main stem river.

Option B, as explained in the DEA (p. 3-7) is most likely to achieve humpback chub protection because of its effect on spawning habitat:

Flow Option B would reduce the water temperature to below 16°C in the mainstem Colorado River, and the flow spikes would push cold water into the backwater habitats to prevent spawning or push male smallmouth bass off nests, if spawning has already occurred. *For these reasons, this option is most likely to meet the purpose and need.* (emphasis added).

There have been no other HFEs since 2018 despite clear evidence of their value to the Colorado River system including fish, invertebrates, vegetation, sediment deposits, and recreation. I have rafted the Grand Canyon, and the reach of Glen Canyon below the dam, and have witnessed the noticeable beach erosion. Without a replenishment of sediments, boaters and campers are limited to smaller areas that endure greater and greater impacts. It gives less breadth between recreationists and the wildlife that live on or near these beaches, and it threatens cultural sites as campers are forced to set-up in closer proximity. HFEs also mimic natural pre-dam flooding scouring that are a part of the reproduction process of riparian plants and prevent over-vegetation on beaches. This spring's HFE in the Grand Canyon successfully increased natural sedimentation

Reclamation, Attachment H (H-1 and H-2): <https://www.usbr.gov/uc/progact/amp/amwg/2023-02-16-amwg-meeting/20230216-InvasiveFishSpeciesBelowGlenCanyonDam-508-UCRO.pdf>

⁶ *Ibid.*, Attachment H (H-3) <https://www.usbr.gov/uc/progact/amp/amwg/2023-02-16-amwg-meeting/20230216-InvasiveFishSpeciesBelowGlenCanyonDam-508-UCRO.pdf>

on Grand Canyon beaches which is beneficial to wildlife and ecology in the National Park. Sand bars are essential for wildlife and river ecosystem functions, “Many campsites that had experienced significant gullyng have filled in, and beach fronts that had exposed boulders and bedrock prior to the HFE flood are now sandy again.”⁷

Flow Option B (along with D) will be the most beneficial to sediment management (p. 3.26). Improved hydrology models from this past water year that include this past water year demonstrate that there will be enough water in the system to proceed with Flow Option B in the coming spring.

While Flow option D is also more effective than the No Action Alternative to protect the integrity of the Grand Canyon and Colorado River’s natural ecosystem as is required, it “would involve recurring cold shocks and recurring flow spikes,” could also be effective in achieving the purpose and need. (DEA, p. 3-9).

However, Flow Option D could have negative effects on invertebrates “the cold shocks of Flow Option D could lead to high rates of macroinvertebrate drift and potentially disrupt macroinvertebrate development and life cycles.” *Id.* Aquatic invertebrates play an important role in the water purification process through consumption followed by decomposition of rich organic matter (bacteria, fungi, microbes, algae):

Aquatic insects constitute an abundant, diverse, and functionally important component of the biota of freshwater systems. Insects are by far the most speciose and abundant macroinvertebrates found in freshwater ecosystems. Nearly 100 000 species from 12 orders spend one or more life stages in freshwater (Dijkstra et al., 2014). They are, therefore, likely to be one of the most ecologically important groups.⁸

It is also important to note that,

Freshwater ecosystems cover less than 1% of the planet’s surface but support up to 10% of known species. Around 25% of freshwater invertebrate species are under threat of extinction.⁹

Aquatic invertebrates are an important step in removing and balancing ratios of pollutants in our water systems. Flow Option D would not only disrupt the macroinvertebrate life cycles in the Colorado River, but also their quiet behind the scenes work to maintain the integrity of water quality.

This further solidifies my stance to encourage you to consider Flow Option B.

⁷ <https://earthobservatory.nasa.gov/images/151320/high-flow-at-glen-canyon-dam>

⁸ CRAIG R. MACADAM and Jennia Stockan, “More than just fish food: ecosystem services provided by freshwater insects,” Buglife – The Invertebrate Conservation Trust, Stirling, U.K. and Environmental and Biochemical Sciences, The James Hutton Institute, Aberdeen, U.K. (2015).

⁹ Ibid.

This preferred alternative will have adverse effects on hydropower. But so will the “No Action Alternative.” Based on the results between 2018 and 2023 we know what will happen if no changes are made, and it will eventually result in a backlog of procedures. A consistent plan to include HFEs, as with Flow Option B, will mitigate actions that will be more costly to hydropower interests down the road. We are entering an era where we are aware that all of our actions have a cost. Flow Option B creates some financial and hydropower impacts now, but it also helps reduce a pile up of these costs for later.

And “no action” will cost us all something much greater. If the smallmouth bass populations are not addressed rapidly and effectively, these populations will establish to the permanent detriment of the humpback chub. The Grand Canyon’s ecosystem and wildlife, like the threatened humpback chub, are millions of years old and yet the management choices we make show how precariously close we may come to forever altering or losing them. The future of hydropower from Glen Canyon Dam is uncertain. Low water levels that persisted through Spring of 2023 demonstrated that “Power Pool” and “Dead Pool” are possibilities in the future driven by a combination of overallocation and climate change-induced drought. Hydropower is a very new concept, and one that we also have time to rethink our use and management of.

Both the environmental and energy management associated with Glen Canyon Dam affect my daily life. I will turn out the lights where I live forever before letting a fish that has existed here long before humans perish from our lifestyles. A wet winter does not alter the reality that we will all be asked to make significant changes and adaptations to the way we live so that our species does not suffer the same fate as the humpback chub, sequestered into a fraction of its traditional habitat because of harmful human-induced changes and manipulations. While we cannot start over or erase the damage done, the consideration of Flow Option B acknowledges these mistakes and takes the available efforts to restore what is possible within the Grand Canyon and Colorado River Habitats.

To effectively protect and preserve the Grand Canyon, Colorado River, and humpback chub, it is essential that you consider Flow Action B for the Supplemental Environmental Impact Statement for the December 2016 Record of Decision Entitled Glen Canyon Dam Long-Term Experimental and Management Plan. Thank you for taking these comments into consideration.

In solidarity with the river, the canyon, Tribes, and the humpback chub,

Morgan Sjogren