



**Department of Energy**  
Western Area Power Administration  
Colorado River Storage Project Management Center  
1800 South Rio Grande Avenue  
Montrose, CO 81401

November 1, 2023

SENT ELECTRONICALLY

Bureau of Reclamation  
Attn: LTEMP SEIS Project Manager  
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Salt Lake City, UT 84138  
[LTEMPSEIS@usbr.gov](mailto:LTEMPSEIS@usbr.gov)

Dear Project Manager:

The Western Area Power Administration (WAPA), Colorado River Storage Project (CRSP) Management Center, provides the following comments on the draft 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. WAPA appreciates the Bureau of Reclamation (Reclamation) preparing this National Environmental Policy Act (NEPA) assessment, analyzing the possible impacts, and involving various Glen Canyon Dam Adaptive Management Program stakeholders.

WAPA is a federal Power Marketing Administration within the U.S. Department of Energy responsible for marketing and delivering wholesale electricity from 57 hydropower plants across a 15-state region of the central and western United States. WAPA sells power to preference customers such as federal and state agencies, cities and towns, rural electric cooperatives, public utility districts, irrigation districts, and Native American Tribes. WAPA's preference customers, in turn, provide retail electric service to millions of consumers across the West.

The CRSP Management Center is a WAPA division responsible for marketing power from the Colorado River Storage Project hydroelectric plants and its participating projects, as well as from the Provo River Project and Olmstead Project in Utah and the Falcon-Amistad Project in Texas. CRSP operates and maintains over 2,300 circuit miles of high voltage transmission lines and related facilities in Arizona, Colorado, Nevada, New Mexico, Texas, Utah, and Wyoming. Glen Canyon Dam is the most significant generating asset within the CRSP system and produces approximately 80 percent of power CRSP markets as part of the Salt Lake City Integrated Projects.

Our comments below reflect WAPA's input on the Notice of Intent (NOI) and important issues that naturally will carry over from the EA process that was converted to the SEIS.

## **Purpose and Need**

- The purpose of responding to smallmouth bass and “other warmwater nonnatives” is not clear. Which fish are defined as warmwater nonnatives and what types of actions may be needed for these other species? Is Reclamation considering flow actions for other species such as green sunfish? The Glen Canyon Dam Adaptive Management Program’s (GCDAMP) [Invasive Fish Strategic Plan](#) focusses on “invasive fish” and “cool and warm-water nonnative fish.” Reclamation should review the strategic plan to align terminology and clarify the objective of this NEPA action.
- Is preventing establishment the right goal in considering continued entrainment through Glen Canyon Dam and availability of spawning and nursery habitat in areas like the -12-mile slough? Is preventing establishment in Glen, Marble, and Grand Canyons feasible by the mechanism proposed (i.e., lowering release temperatures at Glen Canyon Dam)? From the collective experience in the upper basin, it may be unlikely that Reclamation can prevent establishment of smallmouth bass in areas that are minimally affected by release temperature, and that a wider scope is needed to meet the purpose and manage smallmouth bass such that they will not be a threat to the recovery of the threatened humpback chub in Grand Canyon. Scope is discussed further below.
- GCDAMP’s [Invasive Fish Strategic Plan](#) highlights the need to have a “multi-faceted approach” in order to be effective. Although the plan on page 4 is a good one, a much more comprehensive approach is needed well beyond the items described there. The purpose described in this NOI is only one part of a larger plan and is thus not comprehensive and likely to fail on its own. The plan states that, “To be successful, all actions must be strategically orchestrated and cohesive.” WAPA agrees with this statement.
- Please avoid use of the term “core population” of humpback chub, as that is not a defined term. Other options are “aggregations” or the defined “LCR population,” per the recovery plan. The term “core” was used many years ago but has no basis in current terminology that we are aware of and may create confusion.

## **Scope of the Action**

- There are three key contributing factors to smallmouth bass establishment below Glen Canyon Dam that should be considered simultaneously within the same NEPA action, or at least as a cohesive invasive fish control strategy:
  - Lake Powell Elevations (entrainment): Low reservoir elevations allow smallmouth bass to be entrained through Glen Canyon Dam and continue to provide propagule pressure to the Lees Ferry reach. Options for mitigation include a thermal curtain in the forebay or maintaining a higher reservoir elevation during the summer and fall when bass are more susceptible to entrainment.
  - Lake Powell Elevations (temperature): Low reservoir elevations result in higher release temperatures that are suitable for smallmouth bass reproduction and recruitment below the dam. Options for mitigation instead of using bypass, include modifying the intake structures or maintaining a higher reservoir elevation during the summer and fall when reservoir temperatures are warmer (e.g., 3,550 ft. or higher).

- Suitable Habitat in Glen Canyon: Smallmouth bass are spawning and growing above Lees Ferry, primarily in the -12 mile slough complex, but potentially in main channel habitats as well. Options for mitigation include slough modification as described in a recent Reclamation report and experimental spike flows that reduce smallmouth bass spawning success.
- By segmenting these possible mitigation efforts, it makes it nearly impossible to understand the effects on resources from the IG SEIS, post-2026 EIS, and LTEMP SEIS. These all have substantial overlap and should be considered together. The scope should be broadened in an EIS to allow Reclamation to consider all the potential management actions within their authority.
- Reclamation should also extend the scope of this EIS to consider non-flow actions (described below) to meet its purpose and need. Reclamation should consider adding the National Park Service (NPS) as a co-lead to provide compliance for non-flow management actions such as the physical modification of the -12 mile slough. This habitat is directly contributing to the establishment of smallmouth bass below Glen Canyon Dam. The mechanical and chemical treatments that NPS has now conducted on an annual basis are only removing a portion of the bass produced there each year. The 12 mile slough needs to be addressed immediately as part of a multi-faceted strategic plan, so it does not continue to provide nursery habitat for smallmouth bass and negate other efforts to address bass establishment below the dam.
- This quoted section is from the NOI (Background) and reinforces why it is crucial to have a cohesive strategy across these numerous actions, as each affects the other:

“As the water elevation at Lake Powell has declined, the epilimnion (upper layer of water) where most fish reside has become closer to the dam’s intakes, which move water from the reservoir, into the dam through the turbines for hydropower production, and downstream into the Colorado River. The decrease in water elevation means that nonnative fish in Lake Powell are now more likely than in prior years to become entrained, passing through the dam and downstream into the Colorado River”.

- WAPA is concerned that there is not a science plan that determines if the 4-year scope of this SEIS is sufficient to adequately test bypass, non-bypass and non-flow experiments to address the purpose and need. Experiments of Glen Canyon Dam operations will likely take more years to obtain the number of replicates needed to assess their efficacy.
- It is estimated there are approximately 60,000 humpback chubs below Glen Canyon Dam, with a smaller population residing in and around the Little Colorado River’s confluence with the Colorado River approximately 75 miles downstream of the dam, and a larger population in the western Grand Canyon beginning approximately 175 miles downstream of the dam. The existence and the boost to population viability of the western Grand Canyon population should be fully considered by Reclamation and the USFWS. If “preventing establishment” of smallmouth bass is not feasible, another set of solutions may be necessary to “manage” smallmouth bass canyon-wide and over a long-term period of time, as is the case in the upper basin.

## **Hydropower Impacts and Costs**

WAPA developed the hydropower impacts analysis for the EA that was developed earlier this year and plans to evaluate the hydropower impacts of the LTEMP SEIS. WAPA is working with the National Renewable Energy Laboratory (NREL) and the Argonne National Laboratory (Argonne) to develop WECC-wide models that focusses on the region of impact. We have tasked these national laboratories with:

- determining whether the implementation the SEIS alternatives will cause replacement power to be unavailable,
- evaluating the impacts to the local electrical transmission grid,
- determining the impacts to the stability and safety of the electrical system, and
- estimating the economic impacts on electrical production and distribution of the SEIS alternatives.

WAPA will also estimate the impact of the SEIS alternatives on the CRSP Basin Fund and on the SLCA/IP firm electric service rates.

WAPA's previous assessment in the EA described the cost of the proposed bypass experiments as having the potential to incur \$40-80 million annually in hydropower firming costs. Any attempt to quantify actual firming costs is challenging. As the experiment is proposed for 3 years, hydrology and energy prices could fluctuate significantly. WAPA has been informed that there are implementation strategies that could reduce this cost in the SEIS and are looking forward to working with Grand Canyon Monitoring and Research Center (GCMRC) and Reclamation to explore these strategies. However, these strategies will need to be identified in the SEIS to evaluate them and understand how they could be implemented. Some strategies may not be feasible due to limitations on implementation. During the rushed Environmental Assessment (EA) process, there were assumptions about these approaches that did not make it into the alternative descriptions. WAPA expects additional time will be needed to assess exactly how the strategies proposed in the SEIS might be implemented.

The magnitude of this proposed experiment, and its potential impacts, exceed any prior experiment executed or envisioned as part of the Glen Canyon Dam Adaptive Management Program. For example, both the 2000 Low Summer Steady Flow experiment and the potential Long-Term Experimental Management Plan (LTEMP) Low Summer Flow experiment have estimated impacts on the order of \$25 million. In addition, WAPA and Reclamation have never implemented flow actions of the type and magnitude proposed. As discussed further below, WAPA is concerned that these actions may impact the electrical system in ways we cannot quantify beforehand. WAPA is uncertain of its ability to implement the experiment without substantial risk to the CRSP project, WAPA's physical infrastructure, and the reliability of the power grid in the western United States.

Among WAPA's comments below, WAPA has identified two critical actions it believes Reclamation must address prior to implementing the action:

- Secure funding to mitigate the financial impacts of the experiment on the Upper Colorado River Basin Fund (Basin Fund). If not mitigated, this experiment could jeopardize the solvency of the CRSP project and force WAPA to suspend funding project requirements, including operations and management expenses, which could increase the likelihood of equipment failures and other impacts to the electrical system.
- Establish off-ramps addressing both operational and financial considerations impacting WAPA’s ability to operate and maintain the CRSP system as well as a process and appropriate agreements to provide WAPA adequate notice of experimental flows.

### **Other Comments**

- In the Alternatives section of the NOI, the term “revenues” is used to describe impacts to hydropower. This is not a term we prefer, as WAPA has a revenue requirement on which the rate is based. Instead, impacts generally involve the amount and timing of generation, costs such as for purchasing replacement power, and impacts to the Basin Fund.
- The LTEMP SEIS should follow the [Biden-Harris Administration guidance](#) to disclose climate impacts in environmental reviews by quantifying increases in greenhouse gas emissions as a result of the experiment. As described in WAPA’s comments on the EA, the experiment may require WAPA to use other generating resources to replace Glen Canyon Dam generation. Based on NREL’s analysis, replacement power would mostly come from fossil-fuel driven generators. Increased greenhouse gas emissions are among the impacts of generating electricity using fossil fuels sources and the SEIS should include an estimate of the additional greenhouse gasses that will be emitted due to the experiment.
- The LTEMP SEIS should evaluate potential impacts to underserved and disadvantaged rural and tribal communities. Environmental justice communities should be evaluated for an analysis of disproportionately high and adverse human health or environmental impacts of the experiment. WAPA estimates that 45 percent of CRSP power customers are electric service providers for areas that could be classified as disadvantaged communities (WAPA’s initial report to DOE based on 2019 data in response to the Justice40 Initiative, Executive Order 14008 (January 27, 2021). Therefore, the proposed action has the potential to impact those disadvantaged communities that are CRSP firm electric service customers.

### **Alternatives to be Considered**

- The “hydropower flow option” should be renamed as the “non-bypass flow option” or the “disturbance flow option.” Aspects of this flow option does not solely revolve around avoiding bypass just to protect the hydropower resource. Additionally, since this effort is no longer bound by attempting to reach a Finding of No Significant Impact (FONSI), this flow option should be expanded and reassessed to include minimum and maximum flow limits, ramp rates, and daily fluctuations beyond limits set by the LTEMP Record of Decision (ROD). For example, it may be necessary to have minimum flows below the current minimums to affect smallmouth bass spawning. WAPA is working with the science panel to consider these concepts further for later consideration by Reclamation.

WAPA appreciates Reclamation adding a non-bypass flow option, which was a request from the EA process.

- Non-flow actions that should be common to all alternatives:
  - Increasing downstream turbidity (i.e., the turbidity curtain concept previously developed by the GCDAMP)
  - TCD or generation on the bypass tubes
  - Thermal curtain in the forebay
  - Slough modification to eliminate spawning and nursery habitat for smallmouth bass
  - Monitoring to describe effects and impacts of experimental releases

## **HFE Protocol**

- WAPA generally supports the proposals to modify the High-Flow Experiment (HFE) windows and implementation strategy based on the changes in sand supply and sediment transport. However, there is a scenario that could be extremely costly to hydropower and should be avoided. If a spring or early summer (e.g., June) HFE is contemplated, the water needed for that HFE should be taken from winter or early spring months. A preliminary analysis of impacts to the Basin Fund show that costs approximately triple if water for a spring or early summer HFE is taken out of the summer. For example, instead of having a potential impact of \$2-3 million, a spring HFE could cost \$8-9 million. The key takeaway is that early planning and decision making for a spring HFE will be important in minimizing the costs to hydropower.

## **GENERAL COMMENTS ON DEVELOPING THE SEIS**

### **The Proposed Action Would Impact WAPA's Ability to Fund Water and Power System Operations and Maintenance**

The CRSP Act of 1956 established the Basin Fund, 43 U.S.C. § 620d, which remains available until expended to carry out the project's purposes and operations. Maintaining a sufficient Basin Fund balance is critical to operating and maintaining the reliability of CRSP facilities in delivering water to water users and generating and transmitting power to power customers. WAPA and Reclamation use this fund to pay operations and maintenance expenses of CRSP facilities, provide power for WAPA customers, the Basin States' Memorandum of Agreement (MOA) funds, environmental and salinity programs, and to return the cost of constructing the CRSP system to the U.S. Treasury. Other than the Basin Fund, WAPA does not have a non-reimbursable funding source that can be utilized for experimental releases at Glen Canyon Dam. Additionally, a Cost Recovery Charge (CRC) cannot be implemented to cover non-reimbursable purchase power expenses.

WAPA provides wholesale power to small utilities, municipalities, and tribal reservations who fold this power into the rest of their portfolio to fulfill their load requirements. Under WAPA's current rate structure, WAPA provides its long-term firm power customers with a set amount of power on a quarterly basis. The amount of power is based on the amount of water Reclamation forecasts to release from the CRSP units during that quarter. If CRSP units do not generate

enough power to fulfill these contractual obligations, WAPA must purchase power and transmission on the energy market to make up the difference. WAPA uses cash from the Basin Fund to make those purchases.

Under the Grand Canyon Protection Act of 1992, Pub. L. 102-575 (GCPA), WAPA records the financial costs of environmental experiments as non-reimbursable by accounting for such costs as a constructive return to the U.S. Treasury rather than an operational or maintenance expense to be recovered through WAPA's cost-based power rates. Reclamation should consider the experiment proposed in this SEIS as a non-reimbursable expense under the Grand Canyon Protection Act.

By bypassing the electrical generators at Glen Canyon Dam, the bypass options will reduce hydropower generation. Accordingly, WAPA will be required to purchase replacement power to fulfill its contractual obligations to customers. The draft EA released earlier this year inaccurately stated that the experiment would reduce revenue generated and therefore reduce revenue transferred to the Treasury. More accurately, the experiment would markedly increase the amount of non-reimbursable costs drawn from the Basin Fund and constructively returned to the Treasury, leading to the impacts discussed below.

As the Basin Fund is used to fund ongoing operating expenses, its balance significantly fluctuates due to the ongoing purchase and sale of energy and transmission. WAPA must maintain a sufficient balance in the Basin Fund to pay for operations and maintenance notwithstanding these fluctuations. WAPA projects that if the Basin Fund balance falls below \$70 million, it would result in increased impacts to its ability to adequately fund project needs and environmental programs, including the Glen Canyon Dam Adaptive Management Program (and related experiments), the Upper Colorado River Recovery Implementation Program (and related experiments), water quality programs, consumptive use studies, and other functions it supports.

This could lead also to immediate impacts, such as WAPA becoming unable to purchase sufficient energy or transmission to fulfill its contractual obligations. Such a reduction in the Basin Fund would carry long-term impacts resulting from WAPA cancelling or deferring maintenance and replacement of critical electrical infrastructure due to insufficient funds to fulfill those project needs. This could ultimately compromise reliability of the CRSP system. Accordingly, WAPA requires Reclamation establish an off-ramp that would modify or terminate the experiment if the Basin Fund balance is projected to fall below \$70 million in the following 6 months or reaches a level otherwise insufficient to fund project needs.

### **Replacement Power May Not Be Available During the Experiment**

The experiment may impact WAPA's ability to meet its customers' energy needs and the loss of generation on the electrical system could result in energy emergencies when supply is insufficient to meet demand. The proposed bypass flow options increase the risk that WAPA will be unable to meet its contractual obligations to provide customers with power unless it is able to procure sufficient replacement energy and associated transmission. This replacement energy and transmission may not be available without significant added expense, and WAPA's

trading partners may not have sufficient replacement power and transmission available for purchase during periods of peak power demand at any cost. Accordingly, this experiment could increase the likelihood of scarcity events on the power grid and contribute to power emergencies.

WAPA purchases replacement power through bilateral contracts with trading partners, where the sellers of electrical power must recognize market uncertainties and may not be fully aware of the positions of their trading partners. Additionally, many sellers of electrical power may be less willing to sell available power in times of scarcity and uncertainty to ensure they can fulfill their own power needs. WAPA has typically purchased power from a relatively small set of utilities, in relatively small amounts, and for short durations. Typical purchases are on the order of tens of megawatts per hour and only for a few hours at a time. It may not be possible for WAPA to find enough willing utilities to trade or sell the amount of power needed (100's of megawatts per hour) to offset the impact of the experiment. Accordingly, the experiment could impact the government's ability to fulfill its contractual obligations to the customers that fund its power system if WAPA cannot secure power to firm its contractual obligations.

### **WAPA Requires 6 Weeks Advanced Notice of Experimental Flows**

WAPA is required to purchase energy to “firm” to the levels established in its Federal Electric Service contracts during experimental operations at Glen Canyon Dam. Under each of the proposed flow options that include bypass, WAPA will be required to purchase substantial amounts of power and possibly transmission before the experiment is implemented to meet its obligations for its Deliverable Sales Amount (DSA). Given the substantial amount of power the experiment would require WAPA to purchase, WAPA must have sufficient planning time to make these arrangements. Based on our experience with purchasing in the wholesale energy market, WAPA will need at minimum 6 weeks to arrange the purchases necessary. This will require determining bypass volumes at least 6 weeks in advance. Power is typically purchased in weekly blocks, so changes in bypass volume will need to follow the same weekly time step. Once the 6-week purchase window has closed, WAPA may not be able to accommodate unanticipated decreases in generation, due to the difficulty of finding replacement power on the day-ahead energy market. It will be easier for WAPA to accommodate changes that reduce bypass volume (resulting in an increase generation) than to increase bypass unexpectedly and try to purchase replacement power on the day-ahead market.

### **WAPA Recommends Reclamation Include Discussion for Emergency Operations**

Revised operations under the SEIS would follow LTEMP requirements for emergency situations. To help describe this, we suggest that Reclamation include the following information in the SEIS:

- Glen Canyon Dam regulation historically requires that +/- 40 MW be available to the WAPA's Balancing Authority (BA). This number has changed recently due to low releases at Glen Canyon Dam, but the provision of regulation for the BA remains an obligation.



- During the experiment, Glen Canyon Dam will continue to respond to Northwest Power Pool electrical emergencies. This requires sufficient reserves be available to respond to these emergencies.
- To assist in the elimination or reduce the severity of black-outs or brown outs, Glen Canyon Dam will be available, under existing criteria, to respond to power emergencies.

In the previous EA on page 3-30, the document stated that “WAPA will continue to operate under the emergency exception criteria, as stipulated under the 1996 ROD, which allows Glen Canyon Dam to be operated outside of minimum and maximum flow limits, daily change constraints, and both maximum hourly up-and-down ramp rates in the event of a power system emergency (Reclamation 1996).” This citation is incorrect and should be updated in the SEIS. On June 6, 2018, then Regional Director, Brent Rhees signed a revised “Operating Criteria for Glen Canyon Dam” which implements the LTEMP ROD and provides for Emergency Exception Criteria. WAPA can provide this document to Reclamation if needed.

In addition to WAPA’s response to the type of electrical emergencies described above, an electrical emergency can result from insufficient generation on the electrical system to meet demand causing citizens to lose power through blackouts and brownouts, WAPA believes that these emergencies are also part of WAPA and Reclamation’s existing obligation to respond to electrical emergencies and may impact the implementation of an experiment for the duration of the emergency.

Note that the implementation of an experiment at Glen Canyon Dam may cause a shortage of electrical capacity in the region and potentially increased instances of electrical emergencies. If this occurs, WAPA will ask that Reclamation modify or suspend the experiment.

**Reclamation Must Develop Off-Ramps to Modify or Suspend Experimental Flows to Ensure the CRSP System Can Stably Operate**

In WAPA’s view, Reclamation must develop off-ramps for the experiment to avoid significant impact to the CRSP system and the broader power grid. The off-ramps are in addition to financial mitigation discussed above. WAPA proposes two off-ramps below. The first is intended to ensure the Basin Fund remains above the level WAPA needs to ensure stable operations. The second will ensure WAPA is able to fulfill its contractual obligations and that the experiment does not adversely impact the stability of the broader power grid.

- (1) WAPA will monitor the Basin Fund status and project future balances. If during the experiment, WAPA projects the Basin Fund will drop below \$70 million in the following six months, Reclamation will immediately suspend the experiment. The experiment may be restarted if WAPA secures financial mitigation sufficient to maintain a Basin Fund balance over \$70 million.
- (2) If during the experiment, WAPA is unable to purchase necessary replacement energy on the day-ahead market, in real time, or cannot find needed transmission, the experiment will be modified to provide the needed energy or be suspended. This off-ramp may have short notice due to the real-time nature of power operations. However, WAPA will attempt to

project energy needs and provide advance notice to Reclamation if at all feasible. It is anticipated these would be short events, perhaps hours to weeks at most, and full implementation of the experiment could resume once replacement power is available.

### **The Experiment May Increase Energy Prices at Exchange Nodes and Ultimately Costs to Consumers**

Based on the PLEXOS model runs for June to October 2023, for the EA, the reduction of electrical power production caused by the bypass alternatives would result in an increase in locational marginal prices in the WECC system. This means the reduction of power generated at Glen Canyon Dam is expected to make electrical power more expensive in some areas of the WECC. An increase in power prices indicates that the experiment is likely to have economic impacts to the electrical energy market. Because of the reductions in electrical generation at Glen Canyon Dam due to the experiment, utilities will be required to pay a higher price for the electrical power they purchase. The PLEXOS model was only run for 2023, and thus further analysis is needed to assess impacts to hydropower for this new time period under the SEIS.

The experiment will likely also result in WAPA competing with its own customers to purchase replacement power. This competition for limited resources will likely result in increased power prices (as described above with the PLEXOS modeling) and is likely the driving factor of the price increases projected at exchange nodes. The increased power prices at exchange nodes indicate an economic impact and suggest the experiment will likely have significant impacts to power users. Reclamation should fully evaluate economic impacts of the change of energy prices in the SEIS with the assistance of WAPA.

### **The Temperature Threshold of 16 degrees C Will Not Completely Prevent Spawning**

The metric of preventing establishment was not well defined in the EA that was released earlier this year, but the EA appeared to associate the metric with “disrupting or preventing spawning” and suggests smallmouth bass will not become established if mainstem water temperatures remain cooler than 16 degrees C. However, the EA stated on Page 2-8 that, “...data from the Yampa and Green Rivers suggests that smallmouth bass can continue to spawn when temperatures drop to 13.9 degrees C (Bestgen and Hill 2016).” Additionally, the [Habitat Suitability Index models for smallmouth bass](#) developed by the USFWS states “nest building and spawning occur when the water temperature is 12.8-21.0 degrees C, but most activity occurs at or above 15 degrees C.” These sources suggest that smallmouth bass can and will spawn at temperatures lower than 16 degrees C, possibly down to about 13 degrees C.

Assuming typical summer warming, a temperature target of no more than 16 degrees C at the Little Colorado River would require a maximum release temperature from Glen Canyon Dam of 14.5 degrees C. This may be cool enough to reduce spawning in the mainstem between Glen Canyon Dam and the Little Colorado River, but it is unlikely to completely prevent it. This is because [Bestgen and Hill \(2016\)](#) found that smallmouth bass spawn in backwaters, side channels, and sloughs; locations where cold-water releases from Glen Canyon Dam are less likely to reduce water temperatures below the desired temperature threshold.

In 2022 and 2023, smallmouth bass were found spawning in the -12 mile slough just below Glen Canyon Dam and chemical treatments were conducting in both years to try and remove this establishing population. Temperature monitoring showed about 4 degrees C of warming in the slough during normal weekday operations and about 10 degrees C of warming during the steady weekend flows associated with a Bug Flow experiment ([Reclamation's 2023 Slough Modification Report](#)). The warming during the Bug Flow experiment presents a robust data set that raises significant concerns about the slough and the potential impact of steady flow experiments like Bug Flows, and the steady flow components of operations like balancing and equalization, on the successful spawning and establishment of smallmouth bass in Glen Canyon. WAPA and the Basin States expressed these concerns during the technical team process for the Bug Flow experiment and during TWG meetings in 2022 but these concerns were dismissed by all Department of the Interior (DOI) agencies and AZGFD representatives at those meetings.

When evaluating the flow options with bypass that were proposed in the EA earlier this year, it appeared unlikely that any of them will prevent the -12 mile slough from warming above 16 degrees C and keep smallmouth bass from continuing to spawn and establish in Glen Canyon. Additionally, there are several other sloughs, backwaters, and tributary mouths between Glen Canyon Dam and the Little Colorado River that would similarly be unaffected by changes in release temperatures. Smallmouth bass are likely to eventually establish in these sloughs, backwaters, and tributary mouths like they have at the -12 mile slough over the last 2 years if their entrainment through the dam and continued spawning in the Lees Ferry reach is not promptly addressed. Additionally, flow options with bypass will do little to address the risk of smallmouth bass establishment in the 200 miles of the Colorado River between the Little Colorado River and the Lake Mead inflow and reduce the threats to the humpback chub and razorback sucker populations, translocations, and reintroductions in western Grand Canyon.

Additionally, without efforts by NPS to physically modify the -12 mile slough as outlined in [Reclamation's 2023 Slough Modification Report](#), WAPA does not see how Reclamation can prevent establishment of smallmouth bass below Glen Canyon Dam with a flow-only option. The -12 mile slough allows for successful spawning, recruitment, and dispersal. As long as smallmouth bass continue to be entrained through the dam, maintain a presence in the Lees Ferry reach, and have habitat where they can maintain their life cycle, they will continue to establish below Glen Canyon Dam.

## **Conclusions**

WAPA appreciates Reclamation's efforts in developing the SEIS and shares the goal of addressing smallmouth bass establishment in the Grand Canyon. WAPA continues to be concerned about the status of the Basin Fund and our ability to absorb impacts from experimental releases at Glen Canyon Dam, as well as the availability of replacement power to offset lost hydropower generation and the ancillary impacts to our customers. The additional impacts of the experiment to generation and transmission, the Basin Fund, and our customers concern us very much. Based on our review of the previous proposed actions, WAPA anticipates the bypass alternatives will significantly impact hydropower operations, the CRSP Basin Fund and WAPA's ability to serve its customers.


WAPA remains committed to work with Reclamation to find a way to mitigate the financial and operational impacts of the proposed action. Financial mitigation is critical even with the implementation of off-ramps. WAPA appreciates Reclamation’s decision to consider additional alternatives, including a non-bypass alternative, which may help prevent smallmouth bass establishment by “causing a disturbance to smallmouth bass spawning and rearing, causing males to abandon nests, and resulting in high mortality of offspring” and it does this without putting CRSP water and power operations at risk. Combined with added measures such as mechanical removal, modifications of the slough, installation of a thermal curtain in the forebay, and keeping reservoir elevations high, the program could conceivably reverse the likelihood of smallmouth bass establishment, or at least reach containment in the Lees Ferry reach.

To address all the considerations mentioned above, WAPA, in coordination with Reclamation, has convened an independent science panel to help consider and inform Reclamation, WAPA, DOI and the GCDAMP participants on possible solutions to smallmouth bass populations below Glen Canyon Dam. We have asked this science panel to take a holistic approach and consider all the possible actions, even those that may lay outside of Reclamation’s authority to implement. WAPA is interested in generating ideas to help find solutions. We expect information from the science panel will inform modifications to Reclamation’s proposed action and to a long-term science plan, as it becomes available.

We look forward to continued work with Reclamation to address these comments and concerns.

Sincerely,

**RODNEY  
BAILEY**

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Date: 2023.11.01 23:44:44  
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Rodney G. Bailey  
Senior Vice President  
and CRSP Manager

Enclosure  
Appendix

cc:  
William Stewart, [WStewart@usbr.gov](mailto:WStewart@usbr.gov)  
(Sent electronically with enclosure)