Glen Canyon Dam/Smallmouth Bass Flow Options
Draft Environmental Assessment (EA)

Public Comment Analysis Report

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Upper Colorado Basin Region
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TABLE OF CONTENTS

Chapter Page

SECTION 1. INTRODUCTION 1-1

1.1 Total Comments Received 1-1
1.2 Comment Analysis Process 1-1
1.3 Methodology 1-1

SECTION 2. PUBLIC COMMENT SUMMARY 2-1

2.1 Substantive Concerns 2-2

TABLE

Page

2-1 Number of Individual Substantive Comments by Issue Category Received during the Preliminary EA Public Comment Period 2-1
2-2 Concern Statements from the Substantive Comments 2-2

APPENDIXES

A Unique Submissions by Organization/Agency
B Substantive Comments
C Organization/Agency Letters

ACRONYMS AND ABBREVIATIONS

	Full Phrase
EA	environmental assessment
EIS	environmental impact statement
GCD	Glen Canyon Dam
HFE	High Flow Experiment
LTEMP	Glen Canyon Dam Long-Term Experimental and Management Plan
NEPA	National Environmental Policy Act of 1976
Reclamation	Bureau of Reclamation

Section 1. Introduction

This report documents the results of the public comment analysis process for the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment (EA). The Bureau of Reclamation (Reclamation) accepted public comments on the Draft EA from February 24 through March 10, 2023. A press release that announced the 14-day public comment period was issued on February 24, 2023. The comment period provided an opportunity for the public to review the Draft EA and identify additional issues and concerns related to the project.

Although public involvement and notification are requirements of the National Environmental Policy Act of 1976 (NEPA), public commenting on a draft EA is not specifically required. However, given the level of public interest in the project and in an effort to engage the interested public to the greatest extent possible, Reclamation provided for public comment on the Draft EA.

1.1 Total Comments Received

Reclamation received **6,953** total submissions during the public comment period, including **39** unique letters from various organizations and agencies. Reclamation received **6,914** emails, with **6,734** emanating from two form campaigns. In addition, there were **155** form plus letters[1] included. From the total submissions, **356** substantive comments were received. **Appendix A** provides a list of organizations and agencies that provided unique submissions/letters. **Appendix B** contains a table with all substantive comments. All unique letters from organizations and agencies are provided in **Appendix C**.

1.2 Comment Analysis Process

Comment analysis is a process used to compile public comments into a format that can be used to consider changes to the analysis and alternatives. Comment analysis assists in organizing, clarifying, and addressing technical information in accordance with NEPA regulations. The process includes the following three main components:

- Developing a coding structure
- Reading and coding public comments
- Interpreting and analyzing the comments to identify changes for the final EA

A coding structure was developed to sort comments into topic and issue groupings/categories. The coding structure was designed to capture all comment content. **Table 2-1** shows the coding categories.

1.3 Methodology

By analyzing the comments received, **356** substantive comments were derived. Substantive comments may raise, debate, or question a point of fact or policy. They may also question information in the EA,

[1] Form plus letters are form letters that deviate slightly from a standard form letter by containing similar text that is not identical to a master form letter submission.

the methodology used in the EA, and/or the assumptions in the EA. Comments that support or oppose a proposal or that simply agree or disagree with a Reclamation policy are not considered substantive.

The **356** substantive comments were further categorized into **95** representative concern statements (see **Table 2-2**). These concern statements assisted in efficiently analyzing overall contexts, meanings, and related focal points and issues for the diverse comments received.

Section 2. Public Comment Summary

Table 2-1 summarizes the distribution of the **356** unique substantial comments received by issue categories. **Appendix B** contains a listing of the substantive comments received. The majority of submissions focused on hydropower, socioeconomics, and fish.

Table 2-1
Number of Individual Substantive Comments by Issue Category Received during the Preliminary EA Public Comment Period

Issue Category	Number of Individual Comments	Percentage of Total
Issue/Action		
Beyond scope	15	4.2
NEPA	—	—
Purpose and need	4	1.1
Need for an environmental impact statement (EIS)	11	3.1
Consultation, coordination, and public outreach	6	1.7
Tribal consultation	3	0.8
Alternatives	3	0.8
No Action Alternative	8	2.2
General proposed action comments	33	9.3
Option A – cool mix	11	3.1
Option B – cool mix with flow spikes	17	4.8
Option C – cold shock	3	0.8
Option D – cold shock with flow spikes	6	1.7
Best available science and information	6	1.7
Authorities	12	3.4
Regulatory compliance (other laws)	5	1.4
Relationship with Reclamation or other federal agency plans and policy	1	0.3
Relationship with other state or local plans and policies	2	0.6
Cumulative effects analysis	7	2.0
Resource/Rationale		
Aquatic ecology	13	3.7
Recreation	7	2.0
Water resources	—	—
Water: Hydrology	1	0.3
Water: Water quality	1	0.3
Sediment resources	4	1.1
Hydroelectric power resources	—	—
Power: Generation	34	9.6
Power: Basin Fund	12	3.4
Power: Scheduling	1	0.3
Power: Load/generation following regulations	6	1.7
Power: Capacity reserves for emergencies and outages	6	1.7

Issue Category	Number of Individual Comments	Percentage of Total
Socioeconomics	—	—
Socio: Recreation socioeconomic impacts	1	0.3
Socio: Hydroelectric socioeconomic impacts	30	8.4
Socio: Environmental justice	4	1.1
Cultural resources	2	0.6
Tribal resources	3	0.8
Vegetation	—	—
Wildlife and fish	—	—
General fish and wildlife comments	3	0.8
Humpback chub (Gila cypha)	4	1.1
Smallmouth bass (Micropterus dolomieu)	25	7.0
Early Attention		
Proposed new alternatives	28	7.9
Comment period extension	3	0.8
Anticipated effects on Glen Canyon Dam Long-Term Experimental and Management Plan (LTEMP) resource goals	6	1.7
Climate change	9	2.5
Total	**356**	**100**

2.1 SUBSTANTIVE CONCERNS

After a complete review and consideration of public comments on the EA, Reclamation identified substantive comments and developed summary statements to capture overarching concerns.

Table 2-2
Concern Statements from the Substantive Comments

Concern ID	Concern Statement
1	Why was Flow Option E (Penstock Only Release) not analyzed further in detail?
2	Has Reclamation considered additional alternatives, such as increased reservoir elevations, fish barriers, modifications to the forebay, and modifications to the slough?
3	Does this EA allow for adjustments to monthly release volumes from Glen Canyon Dam?
4	The commenter is supportive of the flow options proposed in the EA.
5	The commenter would like Reclamation to consider only implementing one flow option per year to accurately test the effectiveness of the experiment.
6	The commenter would like Reclamation to consider an alternative that reduces the impacts on hydropower.
7	Reclamation should select a preferred flow option.
8	Reclamation should adjust a flow option to incorporate a large release akin to a High Flow Experiment (HFE) to benefit sediment resources.
9	The commenter would like a flow option that mimics natural pre-dam hydrology.
10	If no smallmouth bass have been detected below river mile 0, why target river mile 45 for the reduced temperatures?
11	The commenter wonders how sediment and turbidity impact aquatic ecology.
12	Does the current number of juvenile smallmouth bass found in the Glen Canyon reach represent an "established population" that could present a threat to humpback chub?
13	Has Reclamation considered other predators of humpback chub in the EA?

Concern ID	Concern Statement
14	How have the impacts of these options been analyzed with other experimental operations, such as bug flows and HFEs?
15	Has Reclamation considered the flow option impacts on other fish and aquatic species?
16	The commenter is concerned about the negative impacts of these flow options on macroinvertebrates.
17	The commenter would like Reclamation to better describe how these alternatives prevent smallmouth bass from spawning.
18	The commenter would like Reclamation to undertake a more comprehensive EA instead of the current targeted approach.
19	Government legislation, such as the Endangered Species Act and the Grand Canyon Protection Act, requires Reclamation to implement actions to protect and conserve downstream resources.
20	The commenter requested for Reclamation to provide additional details on the current and historical authorizations of the Colorado River.
21	This EA should use the best available science to evaluate impacts.
22	Will Reclamation use monitoring and adaptive management strategies to choose which flow option to use throughout the timeline of the project?
23	The commenter would like the EA to update certain references to more recent and pertinent resources.
24	The commenter requests Reclamation provide further detail on the decision-making process for choosing one flow option over another. Will this process include adaptive management and monitoring?
25	Why has there not been a more detailed analysis on the economic impacts on the Basin Fund and the power customers from the resulting loss in hydropower generation?
26	Can Reclamation secure funding from outside resources to mitigate the economic impacts resulting from the proposed action?
27	The commenter notes that the proposed action will not impact revenue.
28	The scope of the hydropower analysis is limited. The scope should be expanded to include impacts on operations and maintenance, government programs, and customers over the entire 3-year time frame of the project.
29	The EA fails to acknowledge how the impacts of this action will be inconsistent with the "beneficiary pays" construct.
30	The commenter requested that Reclamation update the capacity, reserves, and emergency operations language in the EA to reflect current administrative plans.
31	Why does the EA not include a detailed section on climate change and greenhouse gases?
32	The commenter would like further analysis on the replacement power and the potential impacts on greenhouse gases and climate change.
33	The commenter would like Reclamation to expand the stakeholder group.
34	The commenter requests that Reclamation and other federal agencies undertake more extensive planning to better manage the current drought in the Colorado River Basin.
35	The commenter would like Reclamation to expand consultation with tribes on the proposed action.
36	The commenter requests that Reclamation provide a more detailed analysis of the impacts on cultural and tribal resources.
37	The commenter requests an EIS be developed for the proposed action to better analyze any potential impacts.
38	Why does the EA not include a detailed analysis of underserved rural and tribal communities?
39	The EA does not address the lethal management of smallmouth bass associated with the proposed action.
40	The environmental justice section should be expanded to include all Colorado River Storage Project Firm Electric Service customers.

Concern ID	Concern Statement
41	The commenter believes the humpback chub should be reinstated on the endangered species list.
42	Reclamation should consult with the United States Fish and Wildlife Service to protect any federally listed species.
43	The commenter notes that costs to control smallmouth bass would only increase if the No Action Alternative is selected.
44	The commenter believes Reclamation should undertake actions that prevent smallmouth bass establishment instead of simply disrupting the establishment.
45	Has Reclamation considered how these flow options would impact other fish species, such as trout?
46	The commenter would like Reclamation to define the term "establishment" when referring to a population.
47	The commenter would like the EA language to better align with the United States Fish and Wildlife Service's letter included in Appendix C of the draft EA.
48	The commenter would like Reclamation to further discuss other fish species in the analysis area.
49	The commenter would like Reclamation to reconsider the term "fisheries" throughout the document.
50	The commenter wants to know why lower temperatures would prevent smallmouth bass from establishing when they exist in other cool-water rivers.
51	Has Reclamation considered using brown trout as a means to predate smallmouth bass without altering the flows of the river?
52	The commenter would like Reclamation to conduct an analysis of the negative economic impacts from the No Action Alternative.
53	Why does Reclamation want to undertake these actions now when smallmouth bass have been found below the dam since 2003?
54	The commenter requests Reclamation undertake mitigation strategies to aid in the creation of a finding of no significant impact.
55	Several commenters recommended minor updates to language, which would not result in substantive changes to the EA.
56	The commenter is concerned that sediment resources, particularly relating to beach building, have not been adequately analyzed. The commenter would like Reclamation to implement flow options to best support beach-building conditions.
57	The commenter would like Reclamation to clarify conditions that trigger HFEs.
58	The commenter suggests that further research is needed on the impacts of HFEs on nonnative fish dispersal.
59	Would the proposed flow options require the purchase of replacement power to offset lost power generation? If so, where would it come from and what happens if it is not available?
60	The commenter believes the impacts on hydropower generation are too great to implement the proposed action.
61	The commenter is concerned with the accuracy of the hydroelectric modeling. The commenter would like Reclamation to consider expanding the modeling effort and provide the modeling assumptions.
62	The commenter would like Reclamation to develop off-ramps for these experimental flows.
63	The commenter requests that Reclamation decide on the flow options well before implementation to allow for adequate hydropower operations planning.
64	The commenter would like Reclamation to further analyze the impacts of hydropower over the proposed action's full 3-year timeline.
65	The commenter is concerned that the source of replacement power is uncertain and could come from carbon-emitting sources. This could lead to further impacts on human health and climate change.

Concern ID	Concern Statement
66	The commenter is worried that the proposed action would have negative impacts on the transmission system.
67	The commenter is concerned that the proposed action would exacerbate the ongoing impacts of drought on hydropower generation, available replacement power, and customers.
68	The commenter is concerned that replacement power would not be available, if required.
69	The commenter suggests that Reclamation suspend the proposed action during electrical emergencies.
70	The commenter would like Reclamation to include flexibility around the flow options to account for peak energy days.
71	The commenter believes the socioeconomic impacts from the proposed action are too great for Reclamation to move forward with the proposed action.
72	The commenter requests that Reclamation conduct further analysis on the impacts on hydropower customers.
73	The commenter would like Reclamation to conduct a more thorough analysis on the costs of replacement power.
74	The commenter would like to note that recent drought conditions have led to costs across many resources, and the proposed action would be another example of incurred costs.
75	The commenter notes that financial impacts on hydropower resources should not stop the proposed action.
76	The commenter is concerned that the EA does not follow the regulations outlined in the LTEMP.
77	The commenter prefers Flow Option A.
78	The commenter prefers Flow Option A or B.
79	The commenter prefers Flow Option B.
80	The commenter prefers Flow Options B and D.
81	The commenter would like Reclamation to conduct a more detailed analysis on the impacts on recreational boating.
82	The commenter would like Reclamation to ensure this EA is implemented to meet standards as outlined by the Laws of the River and other executive orders.
83	The commenter recommends that the scope of this EA be expanded to include a purpose and need statement that protects other cultural, biological, and physical resources.
84	The commenter would like Reclamation to remove extraneous information from the EA, such as other experimental flows.
85	The commenter would like the scope to be expanded to extend to water conservation methods throughout the basin.
86	The commenter recommends that Reclamation analyze the many other actions that are planned for the basin, including the actions in the Interim Guidelines Supplemental EIS.
87	The commenter suggests expanding the scope of the EA to include actions outside the possibilities of the EA, such as removing Glen Canyon Dam and designating the Grand Canyon National Conservation Area as a national park.
88	The commenter would like Reclamation to extend the timeline for the project. Extending the timeline to mirror the life of the LTEMP, or at least until after the Post-2026 EIS is written.
89	The commenter would like Reclamation to add the reservoir elevation of Lake Powell to the analysis area to better analyze these operations under different lake elevation conditions.
90	The commenter believes the EA's proposed action would not significantly impact the backwaters, side channels, and sloughs where smallmouth bass spawning typically occurs.
91	The commenter does not believe any action would result in repairing the damage that smallmouth bass have done on the Colorado River fishery.
92	The commenter does not believe that a temperature threshold of 16 degrees Celsius is enough to completely prevent smallmouth bass spawning.

Concern ID	Concern Statement
93	The commenter would like Reclamation to provide more detail and analysis on the movement of smallmouth bass in response to flow spikes.
94	The commenter would like Reclamation to consider extending the commenter period beyond 14 days.
95	The commenter would like Reclamation to undertake a more detailed analysis on the impacts on water quality from the proposed action.

Appendix A. Unique Submissions by Organization/Agency

Unique Submissions by Organization/Agency
Organization/Agency
American River
Arizona Flycasters Club
Arizona G&T Energy Cooperatives
Arizona Game and Fish Department
Arizona Municipal Power Users' Association
Arizona National Parks Conservation Association
Arizona Trout Unlimited
Blue Ribbon Coalition
Center for Biological Diversity
City of St. George
Colorado River Basin States Representatives
Colorado River Commission of Nevada
Colorado River Energy Distributors Association
Delta Environmental Services
Electric Cooperatives
Farmington Electric Utility System
Glen Canyon Dam Adaptive Management Program, Recreational Fishing Adaptive Management Working Group, and Technical Work Group Representatives
Grand Canyon River Guides Inc.
Grand Canyon River Outfitters Association
Grand Canyon Trust
Heber Light & Power
Hopi Tribe
Irrigation and Electrical Districts of Arizona
Living Rivers
National Park Service
Navajo Nation Heritage and Historic Preservation Department
Platte River Authority
Pueblo of Zuni
Salt River Pima-Maricopa Indian Community
Salt River Project Agricultural Improvement and Power District
Tri-State Generation and Transmission Association
United States Fish and Wildlife Service
Upper Colorado River Commission
Utah Associated Municipal Power Systems
Utah Municipal Power Agency
Western Area Power Administration
Wild Arizona: Grand Canyon Wildlands Council
Wyoming Municipal Power Agency
Zuni Tribe

Appendix B. Substantive Comments

Substantive Comments
Page 1-3, "other cool-water and warmwater invasive fish" are mentioned but not specifically introduced in this EA. This document does not specify or discuss the "other" fish species. Consider modifying this sentence or EA as needed.
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
In addition to the direct effect from insufficient hydropower, Platte River asks Reclamation to consider WAPA's contractual obligations to deliver federal hydropower and the financial and societal costs to firm electric service (FES) customers. Reclamation must clearly communicate how changes in water operations will affect FES customers; if Reclamation chooses to pursue releases for water management, it must fully mitigate reduced hydropower production and contract deliveries. Any alternative analyses must consider direct and indirect cost impacts, a step not taken here.
Section 3.4.2, page 3-20: We question whether volume of water released during flow spikes "would be within the range analyzed in the LTEMP Final EIS", if the analysis included "up to three years" of flow options B and D and the frequency of flow spikes contained therein.
The Department of the Interior and Bureau of Reclamation Have Multiple Statutory Mandates to Manage Colorado River Flows to Protect Grand Canyon's Endangered Fish and Grand Canyon National Park's Natural and Cultural Values. Hydropower is "Incident" and Subservient to Conservation Mandates. The Department of Interior (DOI) and BOR have multiple statutory mandates to manage flows from Glen Canyon Dam to protect, improve, and mitigate adverse impacts to federally endangered species and the natural and cultural values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established. Because hydropower cannot be prioritized above other purposes, and because it is explicitly "incident" to flows for other purposes, BOR has both the authority and obligation to manage Glen Canyon Dam to effectively conserve water and natural resources without the additional burden of prioritizing the provision of hydropower from the dam. The Secretary, acting through the Director of the National Park Service, must "promote and regulate the use of the National Park System by means and measures that conform to the fundamental purpose of the System units, which purpose is to conserve the scenery, natural and historic objects, and wild life in the System units and to provide for the enjoyment of the scenery, natural and historic objects, and wild life in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." 54 U.S.C. § 10010
Hopi prefer other preventative methods that do not change flows that may impact the ecosystem. A gate or barrier on Dam site to prevent fish coming in, is a more solid preventative strategy.
Section 1.2, page 1-1 describes uses of Lake Powell. As this EA targets operations of GCD, please revise the Background section to refer specifically to GCD's authorizing legislation and stated purposes - the 1956 Colorado River Storage Project Act
Many questions and concerns have been raised by GCRG and other stakeholders. What if the bypass infrastructure does not perform as expected? What if it is determined that spike flows have minimal effect? Or worse what if multiple spike flows exacerbate the deteriorating condition of sediment resources? Given the three-year planning window and the high stakes at hand, the EA should clearly describe the criteria and process by which the BOR would consider modifying or choosing flow options to meet the purpose and need of this EA. It is paramount that the BOR disclose how it intends to regularly monitor evolving conditions for multiple resources, track progress towards desired outcomes, mitigate adverse effects, and articulate the benchmarks it will use to formulate its decisions. We must stress that monitoring should occur subsequent to each component of flow action. This data is critical to the success of this EA and its purpose and need. In turn, those critical decision points must be built into the implementation plan.

Substantive Comments
Tri-State notes that the impacts described in the EA are significant enough to prevent Reclamation from being able to issue a Finding of No Significant Impact (FONSI). The EA and its analysis are uncertain in many aspects and should be clear in its Purpose and Need Statement that the duration of the EA/Proposed Action is "up to three years", which is not stated until Chapter 2, section 2.2.1.
These alternatives impact salinity and recreation as well, despite how the Draft EA downplayed their true effects. For example, recreation impacts are described as "temporary" and affected "slightly" with no quantification of what that means. If you gave an accurate representation of the real impacts of hydropower in the Draft EA (and other categories), there is no way that you could determine a Finding of No Significant Impact (FONSI).
Page 3-9: The impacts of Flow Options C and D appear to be contrary to the objective of the last 3 years of the bug flow experiment. The flow spikes...."represent a disturbance that would scour benthic substrates and reduce the food-base abundance and biomass." How is this trade-off assessed and evaluated?
The EA Does Not Evaluate Potential Impacts to Underserved and Disadvantaged Rural and Tribal Communities Section 3.7 of the EA incorrectly states that no 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 dated January 27, 2021). Therefore, the EA has the potential to impact those disadvantaged communities that are CRSP firm electric service customers.
The uncertainties surrounding both the anticipated benefit of controlling small mouth bass and unanticipated detrimental collateral effects to the existing native and trout fisheries requires the least impactful action among four proposed options. For that reason, AFC member families support Option A and encourage its adoption in the effort to control small mouth bass.
The fact that four different flow options are being considered with no stated preferred option among the four demonstrates that preventing SMB establishment below GCD is full of conjecture. For example, the Proposed Action would allow BOR to 'utilize a flow option based on conditions at the time of implementation. Reclamation could switch to another flow option, as described below, to better match changing conditions.' This statement acknowledges BOR's limitations in understanding viable solutions and underscores the necessity for adaptability, flexibility, and, most importantly, data on which to base decisions that meet the mandates of the Grand Canyon Protection Act of 1992. It also exemplifies why more variation in the range of flow options should be considered beyond the Proposed 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.
The Upper Basin's history with warm water predators and the devastating impact that these fish have had on the native fish population upstream of Lake Powell is our guide to the need for immediate and decisive actions below Glen Canyon Dam. The window of opportunity is incredibly short to have any possibility of keeping these warm water predators at a level that can be effectively managed. While the flow strategies proposed in the draft EA are a critically important component in that effort, there must be a commitment by the Bureau and other agencies to implement multiple strategies simultaneously to have a chance against this threat. These strategies include, but are not limited to: effective devices or strategies to minimize fish passage through the dam, an ongoing monitoring plan for the entire river system including the confluences of warm water tributaries within the river corridor, trained staff, available equipment, and necessary permissions and funding to attend to pockets of warm water predators that monitoring uncovers.
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 operations and maintenance expense to be recovered through WAPA's cost-based power rates. Reclamation should consider the experiment proposed in this EA as a non-reimbursable expense under the Grand Canyon Protection Act.

Substantive Comments
By the same token, we caution that especially under low water and sediment depleted conditions, multiple flow spikes as outlined in Flow Options B and D may further erode the sediment resource that is key to the health of the Colorado River ecosystem as well as an absolute necessity for the river recreation industry in Grand Canyon. Therefore, in sediment depleted conditions we urge that flow spikes be as low, short, and few as possible, and we urge that regular monitoring of resource conditions, especially after each proposed flow action component concludes, must be conducted in order to provide the data necessary to ensure that the purpose and need of the EA is being met, as well as the resource goals of the Long Term Experimental and Management Plan, and the mandates of the Grand Canyon Protection Act. The decision-making matrix and implementation plan must be based on current science to ensure that proposed actions are actually benefiting resources while minimizing any adverse effects to the extent possible.
The EA fails to adequately address the impacts to hydropower customers. On page 3-29, there is a focus on the eight largest customers of WAPA with a statement that "to replace capacity lost at GCD would have only negligible impacts on electric bills paid by residential customers of the eight largest WAPA customer utilities." However, there is no further analysis offered in the EA in researching the impacts on the remaining customers of WAPA. How can the EA make a statement that impacts to residential customer bills would likely be small with providing an assessment to support that finding? The basin fund cannot support the cost for the replacement power impacted by the proposed flow options. The results will be passed on to the customers of WAPA. Many municipalities, rural co-operatives and tribes are not included in the big eight and the EA does the consumer a disservice by not fully examining the impacts. lt appears that there is an effort to present a desired outcome without examining the complete picture.
or these reasons, we urge that BOR select and implement actions that are likely to achieve the purpose and need of the EA by preventing smallmouth bass spawning: the "Cool Mix with Flow Spikes" and "Cool Mix" options (Flow Options B and A). Flow Spikes should be employed every time there is enough sediment to ensure that beaches and sandbars will be improved, and never when sediment models predict detrimental impacts to sediment resources. In order to implement flow spikes during 2023 and in other years when sediment is optimal, BOR must time dam maintenance activities to ensure that flow through the dam is not reduced when a flow spike is needed to protect Grand Canyon resources.
Frequent high flow experiments, or pulse flows, scour encroaching vegetation and keeping beaches and sandbars free of encroaching plants. Since no high flows have been conducted since 2018, many beaches and sandbars are severely overgrown with dense, strong, vegetation. Flow Options B or D would help address this problem.
UMPA represents six Utah cities^1 receiving power and energy from contracts to the Colorado River Storage Project (CRSP) federal hydropower system. UMPA is a non-profit joint action agency with the obligation to provide electricity to these six cities and manage the CRSP contract for federal hydropower. The contract for federal power is a major energy source for UMPA's member cities, supplying about 25% of its overall requirements in 2020. Impacts from the drought have resulted in reducing our federal allocation by 40%, raising contract energy costs by 14%, and causing us to purchase replacement power in the energy market at higher prices and from gas fired sources. In 2022, UMPA's wholesale rates were increased by $5.2 million, or about 11% increase caused from drought conditions. This impact along with other inflationary costs, supply chain challenges, and higher natural gas pricing are placing a strain on our ability to deliver reliable and affordable electricity to the customers. UMPA's federal power is relatively minor compared to the more than 5 million customers across the regional states receiving federal power from CRSP. However, Glen Canyon Dam (GCD) and the federal facilities are major contributors to providing customers with clean, renewable (carbon-free) power to maintain the reliability of the grid and offer an affordable price to the consumers. Simply stated, any reduction in federal power from GCD compromises the integrity of the grid system and raises rates for our consumers. 1 UMPA member cities are Provo, Spanish Fork, Salem, Nephi, Levan, and Manti. These cities provide electrical service to over 57,000 residential and business customers.
Section 2.2.2 states, "however, since smallmouth bass were detected in the Glen Canyon reach in 2022, no smallmouth bass have been detected below RM 0." The lack of detections downstream of RM 0 may be attributed more to the lack of sampling within this section of the river occurring from the first detection of juvenile SMB to present. Adult Smallmouth Bass have been detected downstream of Lees Ferry in the Department's long-term fish monitoring since at least 2005, although in extremely small numbers (n<10). This is acknowledged further in the document, but should be clarified here.

Substantive Comments
In addition, the EA costs and associated residual impacts on the communities that rely on hydropower and water deliveries far exceed what are perceived to be the benefits of the EA.
We recognize that SMB flow options presented in this document are experimental in nature and as such, the effectiveness of the treatments is unclear. Under this assumption we recommend that only one flow option should be selected and implemented during any one spawning season. Immediately after the flow option has concluded, a rigorous survey/monitoring effort should be undertaken to assess the relative impact of the implemented flow so that the BOR can scientifically determine the effectiveness of the treatment. If the selected flow option was unable to achieve success of limiting or eliminating spawning in the river, then another flow option could be selected for the upcoming spawning season. This approach is not only more scientifically rigorous but also in line with the principles of adaptive management.
Reclamation should use this EA to resolve the conflict between flow spike alternatives and HFEs by revising the sediment accounting window in the existing HFE protocol In January, in addition to the dire concern expressed regarding smallmouth bass, Glen Canyon Monitoring and Research Center ("GCMRC") scientists sounded the alarm regarding the downward spiral of sediment resources in the Colorado River in Marble and Grand Canyons. At least 28 million metric tons of sand has eroded since the dam was closed in 1963 and about half of that eroded in the late 1990s, including six metric tons from each Marble and Grand Canyons.^4 Further, sandbar monitoring indicates that 67 percent of sites in Marble Canyon had less high-elevation sand in 2022 than in June of 1990; that percentage was 11 percent for Grand Canyon sites.^5 These scientists urged the AMWG representatives to help reverse this negative trend by implementing a series of HFEs as required by LTEMP. The last HFE implemented in the Grand Canyon was in 2018. This is the only HFE that has been implemented since LTEMP was finalized in 2016. This is very concerning given the mandate in the Grand Canyon Protection Act to operate the dam in a manner "to protect, mitigate adverse impacts to and improve the values for which the Grand Canyon National Park" was established. 4 Topping, D. J., Grams, P.E., Griffiths, R.E., Dean, D.J., Wright, S.A., & Unema, J.A. (2021). Self-limitation of sand storage in a bedrock-canyon river arising from the interaction of flow and grain size. Journal of Geophysical Research: Earth Surface, 126, e2020JF005565. https://doi.org/10.1029/2020JF005565 5 See GCMRC, Project A Update and Evaluation of LTEMP Sand Management, January 25, 2023 AMWG Reporting Meeting Presentation. This EA seemingly sets up a conflict between conducting smallmouth bass flow spikes and HFEs. Flow Options B and D in the proposed action include up to three 36-hour flow spikes between late May and mid-July. The effects analysis concludes that these options will have both negative and positive effects on sediment including that the "flow spikes would export sediment from Marble Canyon, which could reduce the amount available for HFEs, but would contribute to beach building in Grand Canyon." Table 3-5, EA at 3-51. These smallmouth bass flow spikes may compete with the ability to implement fall HFEs under LTEMP due to the existing sediment accounting windows. For example, if a flow spike is conducted in July, it would likely mean that an HFE would not be possible in the fall because the sediment trigger may not be reached. Given these concerns and the strong need to balance both smallmouth bass and ensure sandbar building in the canyons, this EA may serve as an excellent vehicle for revising the sediment accounting window in the HFE protocol as GCMRC scientists^6 and members of the AMWG have been requesting for some time.
The table below shows an estimate of the number of tons of greenhouse gas emissions that would be produced by replacement power for each of the flow options. These estimates are based on the amount of bypass for each option provided by GCMRC. The figures also include equivalent carbon emissions from internal combustion engine vehicles that would produce the same amount of greenhouse gas emissions. Estimated Greenhouse Gas Emissions by Option & Auto Emissions/Year Equivalent with implementation of the Experiment when compared to the No Action (See PDF attached to letter for Table).
Our collective ask to the technical and working groups of GCDAMP is to please ask the Secretary to initiate a new Environmental Impact Statement with a preferred alternative that decommissions Glen Canyon Dam.

Substantive Comments
Further, the Draft EA goes to great lengths to distort or minimize the impacts to hydropower. For example, in Table 3-5: Summary of Anticipated Effects on LTEMP Resource Goals, the word "likely" is used when describing the need for replacement power purchases. This is a mischaracterization, as the CRSP contracts require firming from WAPA. On page 60 of the Draft EA, it states, "Replacement energy sources would need to cover the decrease in power generation." How does "need" convert to "likely" without an inherent bias? See PDF for figure/table
The impacts of the Proposed Action (Action) to the human environment will be significant and cannot be supported by an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the following reasons: - The impact of bypassing hydropower production will cause a significant increase in replacement power costs for CREDA members with firm electric service (FES) contracts for power from CRSP facilities. - The result of the Action will require WAPA and FES customers to purchase replacement power on the market, yet current projections indicate there may be little to no power availability on the market when the replacement power is needed. - The source of replacement power, should any be available, will not be carbon free; thus the Action will further exacerbate the impacts of a warming climate.
Monitoring, Criteria, Effectiveness, Offramps, Futility: Identify the metrics that will be monitored to determine effectiveness in all years, offramps for emergency exception criteria including replacement power being unavailable, and futility of the operational alternative. There is little discussion and no criteria provided in the EA for timely determination as to whether flow options may be futile given certain conditions, such as temperatures and elevations in Lake Powell. The EA should describe the circumstances under which Reclamation might switch to another flow option to match changing conditions or when and whether an offramp is implemented.
Flow Option C, p. 2-6: is there more recent data (besides 1945, 1957 and 1963) available? And to what degree of certainty can the statement be made that "achieving a cold shock down to RM 0 or RM 15 would still be effective at disrupting spawning (emphasis added). How is "effective" defined?
While we recognize the urgent need for this action to disadvantage specific non-native warm water invasive species, we remain concerned that primary focus on SMB in the forebay and Glen Canyon reach tailwaters may have unintended consequences related to other natural resources, as well as other nonnative invasive species that also pose severe threats to the downstream river (e.g., other non-native fish, several non-native invertebrate taxa, etc.). Unintended consequences often exacerbate threats to native species and natural processes, including increased cost to remediation and monitoring, and potentially limiting future management options. Therefore, we highlighted in our earlier AMP stakeholder input the need to carefully evaluate potential negative effects of the preferred action and develop robust contingency plans to cope with issues that arise unexpectedly. These include unexpected interaction effects among the various SMB flow and non flow treatment options, which require careful consideration in implementation planning. We continue to hold this concern and urge that contingency planning be explicitly addressed during decision-making and as guidance for monitoring. Such planning should be conducted in the context of the recently completed Non-native Fish Strategic Plan and in relation to Tribal stakeholder cultural concerns.
WAPA Recommends Reclamation Revise the Draft EA's Discussion of Emergency Operations The Draft EA states, at p. 3-36: "None of the four options would result in a decrease of reserve and emergency power available. Operations would follow LTEMP requirements for emergency situations." To better describe this situation, we suggest that Reclamation add the following considerations to the EA: · Glen Canyon Dam regulation requires that +/- 40 MW be available to the Balancing Authority. · During the experiment, Glen Canyon Dam will respond to Western Power Pool electrical emergencies. This requires sufficient "spinning" reserves be available for 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 these emergencies.

Substantive Comments
As stated in our scoping letter from December 2022, the Department of Interior (DOI) has collective responsibilities to address the issue of non-native fish passing through the dam and impacting the native and federally listed fish below the dam under the Endangered Species Act (ESA), 1992 Grand Canyon Protection Act (GCPA), the NPS Organic Act and under the conservation measures in the biological opinion from 2007 related to annual operations and the 2016 biological opinion related to monthly, daily and hourly operations. For instance, the Grand Canyon Protection Act (GCPA) is a federal law that mandates the Secretary of the Interior to "protect, mitigate the adverse effects to, and improve" the resources downstream of the dam that are impacted by dam operations. The humpback chub and other native fish are expected to be negatively impacted by the presence and potential establishment of invasive fish that have passed through the dam into a warmer river. The action alternative in this EA would mitigate the dam operations and protect the native and federally listed fish in compliance with the GCPA. NPS understands the analysis presented in this EA illustrates the action alternative as the most efficient available tool to comply with these acts, mandates and DOI policies for protecting endangered species.
Page 3-3: Since over 250 juvenile smallmouth bass were found throughout the Glen Canyon reach in 2022, and this number "suggests successful spawning", does that translate to "establishment", and if so, the Purpose and Need as drafted should be reconsidered. In addition, some less impacting actions/operations could be considered, assuming there is already establishment.
BOR Must Immediately Analyze and Implement Screens and Other Dam Modifications to Prevent Passage of Non-native Predator Fish through Glen Canyon Dam. BOR's Failure to Prevent Passage of Non-native Predator Fish through Glen Canyon Dam Violates the Endangered Species Act. BOR should immediately analyze and then implement screening upstream of Glen Canyon Dam or dam modifications to prevent future exotic species passage through the dam. Powell reservoir is likely to fluctuate around its current level into the future, continuing the risk of allowing more warm water non¬native fish in Grand Canyon, and the proposed action could also act to draw more nonnative fish through the dam. EA at 3-8. One possibility to prevent this is upstream screening. Because it will take some time to analyze the feasibility of this action, BOR should begin to study it now. By facilitating the passage of non-native predator fish from Lake Powell into the Colorado River through Grand Canyon, BOR's ongoing operations of Glen Canyon Dam in the absence of preventative screening or other dam modifications threatens humpback chub and other native fish.
As representative of the Secretary of the Interior, Reclamation has the responsibility to fulfill the Secretary's obligation to meet multiple and sometimes competing statutory requirements applicable to the operation of GCD and the exercise of other authorities as required by the provisions of the GCPA. The United States has described the relationship between the objectives of the GCPA and the CRSP as being "in addition to rather than in substitution of the Secretary's obligations concerning the operations of Glen Canyon Dam for hydropower and other project purposes."^6 "The U.S. District Court for the District of Arizona further clarified that the broadly worded provisions of the Colorado River Storage Project Act (CRSPA) and GCPA impose on the Secretary an obligation to balance many different interests in operating Glen Canyon Dam. The Secretary must continue to recognize that power production is still a primary purpose of the Dam that must be balanced against other purposes, statutory requirements, and water delivery obligations as (s)he considers actions to implement the GCPA."^7 In fact, the failure to incorporate within the EA an experiment that provides a less impacting and more balanced approach to smallmouth bass experimentation is arbitrary and capricious given statutory requirements.^8 As Judge David Campbell stated in the Grand Canyon Trust v. United States case: "The Bureau of Reclamation, as the operator of the Dam, has a complex set of interests it must balance in operating the Dam. Those interests include not only the endangered species below the Dam, but also tribes in the region, the seven Colorado River basin states, large municipalities that depend on water and power from Glen Canyon Dam, agricultural, Grand Canyon National Park and national energy needs at a time when clean energy production is becoming increasingly important." 6 See Grand Canyon Trust v. US Bureau of Reclamation, 623 F.Supp.2d 1015, 1036, Federal Defendants' Reply Memorandum In Support of Cross Motion for Summary Judgment on Claims 6-8 at p. 26, lines 25-27, (February 20, 2009) 7 See Colorado River Basin State Representatives to LTEMP EIS Scoping, January 31, 2012 8 CREDA raises here the issue of omission of a statutory requirement from the alternatives identified in a NEPA analysis and reserves the right to litigate the compliance with applicable statutory requirements.

Substantive Comments
The EA includes an extensive discussion on the Bug Flow experiment (see page 3-4). However, the proposed experiment is not about modifying daily releases from the dam, but about releasing cooler water and conducting periodic flow spikes. The EA should focus on evaluating the impacts of the proposed changes in operations rather than providing an extensive discussion on the merits of other unrelated experiments. Reclamation should omit the paragraphs speculating on how daily flow fluctuations are impacting the food base as they are irrelevant to the impacts analysis of the EA.
Wyoming Municipal Power Agency (WMPA) appreciates the opportunity to comment on the EA that was issued on February 24, 2023. In future NEPA processes, WMPA would ask that the Bureau of Reclamation (Reclamation) provide a longer public comment period. WMPA is a four-person office and short comment periods are burdensome for its staff.
Given the likelihood that the establishment of smallmouth bass populations would reduce the reproduction, numbers, and distribution of humpback chub in Grand Canyon, failure of BOR's dam operations to prevent the establishment of smallmouth bass populations or to select alternative(s) maximally preventative (rather than just disruptive) of the smallmouth bass reproduction will jeopardize humpback chub, in violation of the Endangered Species Act. BOR must avoid jeopardy to the Grand Canyon population of the humpback chub through consultation. Courts have recognized Fish and Wildlife Service's duty to consider project impacts on listed species on scales smaller than the entire population designated through ESA listing or recovery planning. See Wild Fish Conservancy v. Salazar, 628 F.3d 513, 529 (9th Cir. 2010); Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service, 378 F.3d 1059 (9th Cir. 2004), amended by 387 F.3d 968 (9th Cir. 2004). In Wild Fish Conservancy, the court invalidated a biological opinion that failed to consider the decline of an isolated bull trout sub-population in Icicle Creek on the species as a whole. 629 F.3d at 525¬29. The biological opinion there evaluated a project's impacts to the Icicle Creek sub-population, considered "the smallest local population in the Wenatchee River core area and the most vulnerable to extirpation." Id. at 526. Despite this sub-population experiencing long-term negative population trends, the Service concluded the project would not be expected to reduce the likelihood of survival and recovery of the larger Columbia River interim recovery unit. Id. The court invalidated the biological opinion, finding that because the Icicle Creek sub-population was important to the Wenatchee River core area, a relative stronghold for bull trout in the upper Columbia River area, a decline in this population could harm recovery. Id. at 528- 29. The court held that the Service failed to articulate a rational connection between the facts found and the no-jeopardy conclusion made. Id. at 529. Similarly, in Gifford Pinchot Task Force, plaintiffs challenged the validity of several biological opinions alleging that they failed to consider local impacts from logging projects on the Northern spotted owl. 378 F.3d at 1075. The court stressed the importance of considering local impacts, stating that "[f]ocusing solely on a vast scale can mask multiple site-specific impacts that, when aggregated, do pose a significant risk to a species." Id. (citation omitted). Here, BOR and FWS must consider the local impacts to the Grand Canyon population of humpback chub from the proposed dam operations in their ESA section 7 consultation.
Pursuant to the Endangered Species Act's Section 7(a)(1), Department of the Interior Agencies Must Plan Now for Endangered Species Survival and Recovery Amidst Climate Inevitabilities of Minimum Power Pool, Dead Pool, and A Warm Colorado River Through Grand Canyon. BOR and its sister agencies (NPS, USFWS) must undertake planning now to ensure the survival, and recovery of threatened and endangered fish in the context of minimum power pool, dead pool, and a warm Colorado River flowing through Grand Canyon. Worsening greenhouse gas pollution, regional warming, aridification, and Colorado River flow declines provide little assurance that, in the long term, sufficient water will be available to maintain Lake Powell levels and cold water flows from Glen Canyon Dam. BOR and its sister agencies' duty to "carry[] out programs for the conservation"-i.e., recovery of listed species, should compel planning now to ensure for the survival and recovery of threatened and endangered fish. This planning must consider ways to avoid, minimize, or off-set impacts from warm Colorado River water flowing through Grand Canyon due to increasing risks of long-term minimum power pool and dead pool behind Glen Canyon Dam. 16 U.S.C. § 1536(a)(l).
The EA should say that limiting warm-water releases during the experiment will likely continue to contribute to the low diversity and production of EPT, a negative effect, and that Reclamation intends to limit the proliferation of warm-water nonnative fish rather than allow the natural diversification and increased production of the aquatic food base by allowing increased temperature variation in releases from the dam (see our discussion of Natural Processes above).

Substantive Comments
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. It could also increase the likelihood of scarcity events on the power grid and contribute to power emergencies. The EA does not address these potential impacts.
Since my involvement in the AMWG, there has been at least one other non-native predator that has made its way through the dam downstream, the green sunfish (2015). A decision was made to poison the slough that they were in with rotenone. This didn't solve the problem; they are still around, and yet we continue to perform high flow experiments. Maybe someone should study how far HFEs convey non-native fish downstream, since humpback chub populations tend to be centered around certain mile markers. I am not the only one who shares this opinion; it was stated in multiple pre-draft letters included in Appendix A.
Page 2-4, Paragraph 2: Consider revising the final two sentences to add clarity. For example, it could be rewritten as follows: "However, since smallmouth bass were detected in the Glen Canyon reach in 2022, no smallmouth bass [declined moving downstream from GCD and] have [not] been detected below RM 0 [where intensive monitoring ended]. This means that even if it is only possible to change the temperature down to RM 45, implementation of the flows would still be effective at preventing spawning of smallmouth bass [where they are currently known to occur]. This same revision would be needed elsewhere in the document.
In addition, sediment flow and the restoration of beaches should also be prioritized when considering flow spikes or high flow experiments. High sediment flows and the restoration of beaches are important not only for the ecology of the Grand Canyon but for the economy as well. Grand Canyon tourism, including river guides and outfitters and the 22,000 people who float down the river every year will all benefit from the restoration of beaches along the Colorado River.
Flow Options are Experimental and Require Monitoring: Flow Options A through D in the EA include bypass of the Glen Canyon Dam power plant. We do not oppose inclusion of these options as currently described in the EA, provided however, that such options are consistent with the Colorado River Storage Project Act (CRSPA) of 1956 and the Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs (LROC) of 1970. At a minimum, such approaches should be premised on the shared understanding that such flows continue to be experimental only, and that data from the experiments will be collected, analyzed, and compared to the impacts of other experiments implemented as part of the Glen Canyon Adaptive Management Program or associated management activities. Reclamation must include appropriate offramps should the monitoring indicate the implementation of the alternatives is failing to improve the sustainability of the native fish population below Glen Canyon Dam or if the costs outweigh the benefits. We expect Reclamation to address the terms of CRSPA and LROC before any flow activity that bypasses the Glen Canyon Dam power plant is considered a permanent management action. We reserve the right to oppose such a determination at the appropriate time.
As an environmental journalist covering the current threats to humpback chub, I have extensively researched all sides of this issue. I have consulted with the Pueblo of Zuni, Navajo Nation, National Park Service, and joined US Fish and Wildlife Service biologists in the Little Colorado River to monitor the humpback chub last fall. Here is a link to a story I wrote about this last fall: https://www.sierraclub.org/sierra/can-ancient-humpback-chub-hang-today-s-grand-canyon.
As has been highlighted during the extended drought the west is experiencing, significantly changed circumstances and new information regarding hydropower analysis has been brought to bear. Due to the resource availability, resource shifting and transition, Reclamation should consult with experts to assess the risk that electric load will go unserved in the region during summer months. This is not just an issue for WAPA, but for the FES customers and all other utilities in the West. This EA cannot rely on LTEMP analysis as the basis for cumulative impacts analysis/ conclusions given these changes.

Substantive Comments
Cumulative Effects: The claims made in this section are incorrect; the Glen and Grand Canyons and the Colorado river are "historic properties" eligible for listing on the National Register with TCP significance for Zuni relational life/ways, including the indelible and inextricable tangible capacities they present and embodied meanings and associative values they convey for the maintenance and perseverance of Zuni traditional cultural knowledge and science systems, beliefs, and practices, experiences of health and wellbeing, and capacities for collective continuance as a people always connected to the past through the present and the future. The cumulative impacts to Zuni traditional cultural property and the resultant adverse effects on the community of Zuni have been not addressed in this document.
The draft [A acknowledges that "the effects described above may be most likely for power consumers in the surrounding counties and states. However, effects could be felt across the Western Power Grid because GCD can supply power to this area." While the draft [A argues that these effects would diminish further from the dam, it fails to recognize that the Western Grid already has limited reserve margins. The North American Electric Reliability Corporation (NERC) in its 2022 summer reliability assessment rated the Western Electricity Coordinating Council at an elevated potential for insufficient operating reserves in above-normal conditions. This reliability assessment under a scenario with reduced hydropower generation from Glen Canyon Dam would likely be worsened.
Section 3.2.1, page 3-1: Has the population of humpback chub observed in the western Grand Canyon been factored into a risk assessment of smallmouth bass impacts to the chub? From the numbers of fish reported out at the recent TWG and AMWG meetings, it seems logical that although the dynamics are not fully understood, that sheer numbers should moderate the risk.
Each of these identified matters will require direct Government-to-Government consultation between Zuni leadership and that of Reclamation, if not also executive leadership in the Department of Interior.
Flow Option E should be analyzed in detail as this option appears to have the potential to have the greatest impact on spawning smallmouth bass in the Colorado River. Penstock only flow options may have a lesser potential to be effective as the multi-pronged approach that include temperature, velocity, higher elevation flows, but they have less consequences to hydropower and water storage. In this case, because Flow Options A, B, C, & D are experimental in nature and therefore lack the data to demonstrate their effectiveness, we would hesitate to lend full support to those options when Option E has a similar potential to be effective and has fewer negative consequences.
While hydropower can be a strong contributor to grid resilience and reliability, any loss or reduction of hydropower resources can adversely affect public health and safety in the communities we proudly serve. Hence, any plan that would curtail hydropower generation or water delivery must be heavily scrutinized and measured. While CREDA, and therefore Platte River, has been a longstanding participant in the Upper Colorado River Endangered Fish Recovery Program, we find the impact analysis of the draft EA to be insufficient to meet the goals it sets out to achieve.
Support for Actions to Prevent the Establishment of Smallmouth Bass: The Representatives acknowledge the urgency to address smallmouth bass through flow-related actions in order to protect the native fish in the Grand Canyon, particularly the humpback chub. However, as described in the Nonnative Fish Strategic Plan approved at the February 2023 AMWG meeting, flow options alone will not be sufficient to prevent establishment. Additional actions, including implementation of a fish exclusion device(s) and fishery actions, such as targeted removals, will be necessary to achieve this goal and should be developed and deployed as expeditiously as possible - ideally by 2024.
Additionally, it is very likely that most replacement power will not be carbon-free and exacerbate the impacts of a warming climate.
Provide data to support the implementation of spike flows. There is no data provided on smallmouth bass movement in response to flow spikes or cold-water releases in regulated rivers. Moreover, there may be negative impacts to other resources, such as sediment, with the implementation of successive spike flows, as discussed in Section 3.5.2 of the EA.

Substantive Comments
Bypass also has environmental impacts; any curtailment to the Western Area Power Administration's (WAPA's) hydropower requires WAPA and other entities to purchase replacement power with no guarantee that those sources of energy would be from noncarbon emitting sources. Replacing clean hydropower with purchased power from carbon-emitting sources undercuts our, and others', clean energy goals and potentially adds to the ongoing cycle of drought affecting the river basin. These impacts have not been modeled or considered in the EA, although the process under the National Environmental Policy Act requires fully considering all alternatives and impacts.
·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.
NPCA believes that Alternative B: Cool Mix with Flow Spikes is the best solution to protect the native fish species and ecology of the Grand Canyon. Alternative B has the highest certainty of preventing the establishment of new warmwater invasive fish by lowering the water temperature through the release of water from the bypass tunnels in combination with the release of water from the penstocks. We understand that the use of the bypasses will have a negative impact on the hydropower production unless modifications are made to compensate for the loss of power. However, the flow spikes and the use of the bypasses are essential for ecological restoration purposes.
Humpback chub was recently downlisted by the US Fish and Wildlife Service from endangered to threatened status. This change was partially influenced by the expansion of the breeding population into the Colorado River mainstem, especially in western Grand Canyon and overcoming the existential threat of losing the sole breeding population in the Little Colorado River. With the possibility of SMB establishment looming, once again humpback chub face the threat of a catastrophic crash of the core population in the Colorado River. The EA under-represents the importance of the Grand Canyon population to the species' recovery. Should SMB successfully establish under the no-action alternative or a less than optimal option in the Action alternative, the impacts of cost and limits on dam operational flexibility on hydropower interests would be far more significant. Such financial and other impacts are not clearly and accurately presented in the EA.
The Grand Canyon Protection Act of 1992 (GCPA) specifies that Glen Canyon Dam "shall" be operated in a manner that is protective of Grand Canyon National Park and Glen Canyon National Recreation Area: "The Secretary shall 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, including, but not limited to natural and cultural resources and visitor use." (Grand Canyon Protection Act (GCPA) (1992), Section 1802(a)) Here, pursuant to the GCPA, BOR must operate Glen Canyon Dam to protect, improve, and mitigate impacts to humpback chub and the riverine ecosystem upon which it depends, and for which Grand Canyon National Park was established in part to protect.
Because of this, we recommend that BOR add to the description of the Colorado River Storage Project (CRSP) Act (April 11, 1956) in the EA at I-5 the following: The purpose of the storage projects is for water storage, flow regulation, and flood control, with hydroelectric power "as an incident of" the other purposes. BOR and DOI must fulfill the Secretary of Interior's obligation to operate the dam "in such a manner as to protect, mitigate adverse impacts to, and improve" Grand Canyon, and to operate the dam in such a way that does not reduce the reproduction, numbers, or distribution of federally threatened humpback chub.
The EA is deficient in that more than a single focus (bypass flows) alternative should have been included.
14-day Public Comment Period Inadequate The Trust understand the urgent need to prevent the establishment of smallmouth bass in Marble and Grand Canyons and we appreciate the actions undertaken by Reclamation to provide flow options to address this challenging situation. However, the agency's emergency actions on an expedited timeline only ensures that the process is rushed, critical voices and concerns are excluded and/or not addressed, and that the solution does not consider or meet the larger challenges the region is facing. A 14-day public comment period on a 158-page EA is not adequate for meaningful engagement by stakeholders in this process. This is especially true for tribes and tribal communities that have stated strong objections to similar proposals in the past and that stated their continued objections as recently as the February 15-16, 2023 AMWG meeting. Reclamation has been aware of the need to prevent passage of nonnative species through Glen Canyon Dam at least since the Record of Decision for the LTEMP was finalized in 2016 (six

Substantive Comments
years ago) and likely long before. In fact, the Biological Opinion for the LTEMP ROD specifically contemplates temperatures to be warmer under lower reservoir elevations and that options to "minimize or eliminate passage through the turbines or bypass intakes" and to "hinder expansion of warmwater nonnative fishes" were warranted at that time. LTEMP ROD BO at E¬12. Further, the importance of "regulation and control of nonnative fish" has been a "management action identified in the humpback chub and razorback sucker recovery goals since 2002." LTEMP ROD BO at E-12. Reclamation, however, only acted after smallmouth bass were found reproducing in Marble Canyon in 2022. As mentioned above, Reclamation was aware for decades of the concerns of the tribes regarding the taking of life of nonnative species in the Grand Canyon. Thus, despite the sensitivity around this matter and the opportunity to take preventative measures over the past six years, Reclamation waited until the problem reached a critical point. We emphasize this here, not to place blame, but to encourage the agency to ensure that it has the resources and the foresight to advocate for measures before the issue reaches emergency status. We realize this is easier said than done, but it should be considered all the same.
We support Option B of the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment, recently proposed by the United States Bureau of Reclamation, Upper Colorado Basin-Interior Region 7. As you are aware, the Glen Canyon Dam is a crucial component of the Colorado River system and plays a significant role in water management, power generation, and environmental protection. However, the intrusion of non-native smallmouth bass into the Colorado River below the dam could have a devastating impact on the native fish population, and the rainbow trout fishery. Smallmouth bass are voracious predators that feed on juvenile native fish, disrupting the natural balance of the ecosystem. Option B proposes to increase flows from the Glen Canyon Dam during the summer months, which will create conditions that are less favorable for smallmouth bass reproduction and survival. While this approach may be effective in reducing the smallmouth bass population in the Colorado River, minimizing the impacts on other dam operations and downstream water users.
Page 3-39: In a post-WAPA-199 world, direct and immediate impacts are likely borne by all WAPA FES customers, not just the "largest of WAPA's customers". The impact assessment should be based not only on the size of an FES customer's CRSP allocation, but also the proportion of its CRSP allocation to its total resource mix. In addition, the ability of an FES customer to access market resources for replacement power is also a factor.
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 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 this experiment. 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.
HL&P is an FES customer with a long-term contract with the Western Area Power Administration (WAPA) for the purchase of CRSP resources. This resource makes up 30 percent of our energy portfolio, and because CRSP is our largest energy resource we have an interest and role in issues associated with Colorado River and CRSP operations. We have carefully reviewed the draft EA and its assessment of impacts. As HL&P has already been negatively impacted by the reduction in available federal hydropower due to the drought, it is concerning to find the draft EA fails to provide any meaningful analysis on the financial or economic impacts of this proposed action on CRSP customers.

Substantive Comments
It is the Navajo Nation's position that the taking of life through mechanical removal should be minimized as a management action and we appreciate that these flow options serve this purpose to some extent. However, the flow options presented in the EA are not considered a guaranteed way to limit or prohibit SMB spawning, so they are also not guaranteed to limit mechanical removals, yet they are still a disturbance to all species, native and invasive. It is therefore, not necessarily correct to indicate that these options would not negatively impact tribal concerns and values for the Colorado River and LCR systems (as stated in section 3.9.2). Undoubtably, other aquatic species will be disturbed so we would urge further analysis on the effects to other species and general ecology.
The Draft SMB EA No Action Alternative does not meet the Purpose and Need of the EA and is inaccurately represented because current operations/flows are not following the LTEMP.
The analysis in the EA is inadequate in its analysis of the proposed action. There is no analysis of replacement power costs or under the affordability of replacement power costs.
First of all I would like to ask why is this assessment even being considered? You have on the eastern seaboard humpback whales dying at a very unusual rate and the only change in the environment out there is the green energy Wind farms that are being produced in record setting amounts.
In particular, there is no discussion of potential no-flow alternatives and consistent with the National Environmental Policy Act (NEPA) the cumulative impact of the Action should be disclosed.
The Impacts Analysis Does Not Include the Entire Compliance Window The analysis of impacts on hydroelectric power generation is incomplete, as it only addresses the first year (i.e., 2023) of the proposed 3-year experiment (i.e., 2023-2025). The analysis should include the entire period of the experiment in order to adequately assess and disclose the multi¬year impacts to power operations, power generation, and the Basin Fund. For example, assuming the most probable annual cost to hydropower identified in the EA, a $50 million replacement power cost in 2023, the Basin Fund might be able to provide the necessary funding for the financial impacts in FY2023, though still potentially incurring significant impacts and risks to the CRSP system identified above. If the experiment is implemented again in 2024 and 2025, assuming another $50 million expense each year, the Basin Fund would simply not have sufficient funds to cover the additional expense and fund project costs.
By bypassing the electrical generators at Glen Canyon Dam, the experiment will reduce hydropower generation. Accordingly, WAPA will be required to purchase replacement power to fulfill its contractual obligations to customers. The draft EA incorrectly states 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 returned to the Treasury, leading to the impacts discussed below.
The EA describes severe financial impacts from each flow option yet fails to disclose its core assumptions. The EA should disclose its calculations to estimate the costs for replacement power. Furthermore, those values should be scrutinized by an independent and qualified subject matter expert that can either substantiate or clarify information provided by the Western Area Power Authority (WAPA) and its contractors especially given WAPA has an inherent conflict of interest in preserving hydropower for its customers and fulfilling its contracts. Also considered in this analysis, how WAPA's new contracts address the cost of experiments. This is especially important because the values presented in the EA are high enough that it raises a concern of being deemed a 'significant impact', which would derail the possibility of reaching a Finding of No Significant Impact (FONSI). We acknowledge that the GCD plays a unique role in the Western electrical grid, which only substantiates the criticality for WAPA and its customers to act proactively, prudently, and urgently integrate replacement power sources into their energy portfolios which would minimize any adverse impacts from reduced hydropower. Difficult decisions need to be made to prevent SMB establishment below the GCD and those decisions should not be hindered because of a lack of contingency plans for low water conditions.
According to the Grand Canyon Protection Act, Glen Canyon Dam must be operated "in such a manner as to protect, mitigate adverse impacts to, and improve the values for which" Grand Canyon National Park was established. To do that, the Bureau should implement the "Cool Mix" actions, which are most likely to completely inhibit smallmouth bass spawning behavior.

Substantive Comments
GCD is a major power source of power on the transmission grid system and offers spinning reserves and other emergency supporting services. With the rapid retirement of the coal fired base load and dispatchable facilities in the west and by adding intermittent renewable sources, the grid become more unstable and subject to disruptions and quality of service. Reducing any generation from GDC will add to this already compromised grid system. The EA should consider examining the impacts to the stability of the grid and the significant role of GCD.
While we support the DEA's finding that Flow Option B is most likely to achieve purpose and need, Flow Option D, which "would involve recurring cold shocks and recurring flow spikes," could also be effective in achieving the purpose and need. DEA, p. 3-9. These cold spikes under Options B and D would create more SMB dispersal (see DEA, p. 3-8) when SMB fry are young. Dispersal when fry are young makes survival less successful. However, the reliability of the bypass tube water at the volumes needed and the timing of the release proposed under Option B (DEA, p. 2-5) appears better than Option D, which would have uncertainty regarding the availability of bypass versus penstock flows and so could be less effective given maintenance schedules and volumes of water, etc. (id. at 2-8). Further, the DEA states that Flow Option D could have additional impacts on macroinvertebrates: "the cold shocks of Flow Option D could lead to high rates of macroinvertebrate drift and potentially disrupt macroinvertebrate development and life cycles." Id.
AEPCO utilizes the dwindling power resources made available at Glen Canyon Dam to serve the load of its Member Cooperatives. In addition, AEPCO schedules and balances resources for other non-Cooperative customers who have CRSP allocations. In recent years, the challenge of serving load and balancing resources has become acutely more difficult because the power resources available from the CRSP resources have diminished due to persistent drought conditions. When power that is not available pursuant to the contracts AEPCO has with the Federal Government, AEPCO must find replacement resources. The availability of replacement power, particularly in summer months, has become scarce. The slow-moving disaster of the pernicious drought affecting the CRSP resources has followed a trend of power plant retirements in the Desert Southwest. Although AEPCO does own and operate electric generation, it also relies on Federal Resources to keep rates as low as possible for its Cooperative Members and scheduling partners. In fact, AEPCO's Cooperative Members serve a higher proportion of Arizona electric ratepayers in the State of Arizona who fall below the Federal poverty line. Because AEPCO is a not for profit utility, the costs it incurs in serving its customers must be borne by all of its customers and their retail ratepayers. The failure of the Federal Government to deliver power affects some of the most vulnerable populations. This socio-economic impact has not been analyzed in the Smallmouth Bass EA.2
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.
NPS has concerns about the action alternative in terms of how the process would work for choosing which options would be employed each year. As we stated in the scoping letter, we expected Option B: Cold Mix with Spike Flow to have high certainty of prevention of SMB establishment under most conditions. The analysis presented in this document appears to demonstrate that this will indeed be the most effective at preventing the establishment of new warmwater invasive fish below the GCD. However, we do see the advantage of allowing for consultation with GCMRC and other agency experts in a given year to determine which option may be most appropriate in that year. However, it would be important to separate out the technical determinations of which tools would be more efficient under what conditions versus policy or legal issues that may arise.

Substantive Comments
Though the endangered fish populations above Lake Powell Reservoir are not yet thriving, they do exist and are not yet extirpated. They exist in the upper basin because the sediment load in the Green, Colorado and San Juan rivers disadvantages non-native, hunt-by-sight predators, such as smallmouth bass. The food web is much more nutritious (by four times) than the carbon deprived ecosystem below Glen Canyon Dam. ^8 ^9 Warm water, sediment, leaf litter, driftwood, and abundant insect hatches is what will save these fish from extinction, and not the dials and switches at GCD. 8 Driftwood-an alternative habitat for macroinvertebrates in a large desert river; 1999: http:// www.riversimulator.org/Resources/AquaticResearch/ DriftwoodAnAlternativeHabitatHaden1999.pdf 9 Benthic community structure of the Green and Colorado rivers through Canyonlands National Park, Utah, USA; 2003: http://www.riversimulator.org/Resources/AquaticResearch/ BenthicCommunityColoradoRiverCanyonlandsHaden2003.pdf It's time to decommission Glen Canyon Dam and let Nature and protected landscapes do what they do best-fill ecosystems with living things. Removing GCD will restore approximately 500 miles of historic habitat, and also reconnect all the tributary habitats that converge at Cataract, Glen, Marble and Grand canyons.
This EA is being developed in an ever-evolving landscape including changing hydrology and policy. As you are aware, Reclamation is currently undertaking the revision of the 2007 Interim Guidelines of the operations of Lakes Powell and Mead by preparing a Supplemental Environmental Impact Statement. 87 Fed. Reg. 69042 (2022). These revisions may authorize a reduction in the annual amount of water released from Glen Canyon Dam and establish a new target elevation for water storage in Lake Powell, among other actions. These policy changes have implications for the Grand Canyon ecosystem, interests of tribes and Native communities, as well as other economies, communities, and environments throughout the Colorado River Basin. Further, other plans and evaluations (both short and long-term) are underway to determine what other measures may be needed to combat the impacts of low reservoir elevations and low Colorado River flows including possible reengineering of Glen Canyon Dam, construction of physical barriers in Lake Powell to prevent the transfer of lake fish below the dam, and ultimately the renegotiation of the post-2026 guidelines for operating Lakes Powell and Mead into the future. These actions are all interrelated and need to be considered collectively to ensure their effectiveness at a basin-wide scale. Integration of these pivotal components and maximizing the benefits to multiple interests is also key to balancing the many competing mandates of the law.
2 The U.S. Supreme Court has held that "[u]nder NEPA, an EIS must also address the socioeconomic consequences of the environmental impact of the proposed action." Cachil Dehe Band of Wintun Indians of the Colusa Indian Cmty. v. United States DOI, No. 2:12-cv-03021-TLN-AC, 2017 U.S. Dist. LEXIS 9107, at *8 (E.D. Cal. Jan. 20 2017) citing Baltimore Gas & Elec. Co. v. Nat. Res. Def. Council, Inc., 462 U.S. 87, 106-07, 103 S. Ct. 2246, 76 L. Ed. 2d 437 (1983).
Clearly stated, the native fish of the Colorado River are under dire threat from the smallmouth bass (SMB) invasion due to lowering lake levels in Lake Powell, which allow this highly predatory warm water fish to pass through Glen Canyon Dam in ever greater numbers. If we fail to act immediately, the core population of the federally listed Humpback Chub could be lost, putting the species as a whole in peril of extinction. Scientific evidence has shown that if establishment of the smallmouth bass happens, at a certain point, it could simply be too late to save this emblematic fish that has evolved over the last 3.5 million years. We are also keenly aware of the significantly higher cost burden to try to manage rather than prevent small mouth bass establishment and an associated population explosion.
Currently, the Bureau of Reclamation is evaluating experimental releases from Glen Canyon Dam at the expense of hydropower generation in an attempt to prevent the potential establishment of small mouth bass in the Colorado River. The scientific basis for additional releases is unproven. The Bureau of Reclamation has only proposed flow-related measures that bypass hydrogenation in summer months as an experimental means to address the small mouth bass establishment in the Colorado River. There is no discussion of potential non-flow alternatives.

Substantive Comments
The impact to the "Basin Fund" managed by WAPA has not been adequately addressed in the EA. Failure to identify the funding for purchasing the replacement power required to offset the impact of the flow options is lacking in the EA. Protecting the endangered fishery below GCD is in the best interest of all the parties. However, placing the burden for funding these experimental fish flow options on the backs of the power customers is unfair. The power customer did not introduce the small mouth bass, a non-native fish, into Lake Powell. No one expected the low elevation and entrainment of fish caused by the drought. The federal agencies should seek federal funding or use their federal budgets to address this matter if the decision to proceed with by-pass flow happens. The EA should examine the beneficiary use and pay structure of GCD caused by the impacts of the drought. There are several beneficial uses with GCD not being recovered through an appropriate pay structure.
4. Expansion of the socio-economic impacts analysis beyond Coconino County residents to adequately include : 5. Impacts to all hydropower customers, customers of the Western Power Grid and, importantly, Tribal CRSP hydropower customers facing energy shortages. 6. Impacts to rural electric utility and Native American hydropower users from a reduction in hydropower generation and subsequent need to purchase more costly replacement power, and the possible consequences of "reduced power deliveries to customers" if sufficient affordable replacement power is not available.
The draft EA fails to adequately address and consider the impacts of flow options on the long-standing concern that the Pueblo of Zuni has expressed regarding the taking of aquatic life that exists within this very sacred land/waterscape: the Colorado River in Grand Canyon. In 2009, the Pueblo of Zuni conveyed grave concerns on the intentional taking of life associated with mechanical removal of rainbow trout in a letter from Zuni Governor Cooeyate to Mr. Larry Walkoviak, Regional Director of the Bureau of Reclamation. In 2010, the Zuni Tribal Council passed Tribal Council Resolution M70-2010-C086 formalizing the Zuni Government's opposition to lethal management actions on aquatic life in the Grand Canyon. The full language of this resolution was formally and directly provided to your agency. To remind you, in this resolution the Zuni Tribal Council formally declared: the government of the United States of America, especially the Department of the Interior, and all agencies thereof, has a trust responsibility to manage Zuni cultural and natural resources, including tangible and intangible cultural resources valued by the Zuni people wherever such resources may occur, in a manner responsive to the interests of the Zuni Tribe and its members; and the cultural values and beliefs of the Zuni people are intimately related to its ancestral lands, to natural places, and to the plants, animals, and spiritual qualities of such land and places. Since this time, Zuni has consistently and persistently made objections to any and all forms of lethal management of aquatic life to Reclamation, the National Park Service, the Grand Canyon Monitoring and Research Center, the U.S. Fish and Wildlife Service, and the Arizona Game and Fish Department. Given this well documented history and Reclamation's full awareness of these concerns, it is demonstrably negligent that this draft environmental assessment fails to both substantively engage the direct, indirect, and cumulative impacts of these practices on Zuni people and kin and thoughtfully consider the design and consideration of prophylactic measures to disrupt capacities and close opportunities for passage of non-native, sport fish through the dam. The failure of the federal government to take constructive steps to address this issue when the smallmouth bass were first detected in 2000 (page 3-3 of the EA) in the Colorado River below Glen Canyon Dam underscores the repeated failures of Interior agencies to effectively respond to a known emerging issue. Moreover, by not proactively working to prevent Lake Powell sport fish from entering the system through the dam, Reclamation has repeatedly made a conscious and willful decision to maintain standard reactive measures which knowingly and disproportionately impact the Zuni community, including direct, indirect, and cumulative effects on and impacts to opportunities and capacities for fulfillment of Zuni traditional practices and protocols, experiences of health and wellbeing, and possibilities for Zuni elected leadership to fulfill their oaths of office that require us to "cherish and protect all that contains life; from the lowliest crawling creature to the human" (Constitution of The Zuni Tribe, Article XVI - Oath of Office).

Substantive Comments
Drought Impacts to CRSP Federal Electric Service (FES) Customers Since December 2021, CRSP FES customers have been receiving approximately 65% of the CRSP contracted capacity and energy, but have been paying all of the costs associated with the contract which include: operations, maintenance, and replacements for the power plant, purchased power, transmission, participating project costs, interest, annual principal payments, and non-power expenses such as Salinity, Glen Canyon Dam Adaptive Management, Endangered Fish Recovery Implementation, aid to irrigation, and Water Quality and Consumptive Use Studies. Also, in December 2021, the CRSP FES customers experienced a rate increase of 11%. Finally, CRSP FES customers have to replace the 35% of the capacity and energy that is not supplied under the CRSP FES contract.
Platte River adds that if this EA moves forward, then this effort should not be a burden solely carried by the FES customers of the Colorado River Storage Project. Addressing an environmental issue is everyone's responsibility; any measure taken to protect an endangered species should be a responsibility of all and not just a few.
Section 1.4, page 1-5, 6. Supplementing comment 1) above, please broaden the description of the Colorado River Storage Project Act to refer to its authorized purposes and Section 5, and not just reference to the creation of the Basin Fund. In referring to the Grand Canyon Protection Act of 1992 (GCPA), please include the full mandate of the GCPA, which includes not only Section 1802(a) but Section 1802(b), which requires the protection, mitigation and improvement be done "in a manner fully consistent with and subject to the Colorado River Compact, the Upper Colorado River Basin Compact, the Water Treaty of 1944 with Mexico, the decree of the Supreme Court in Arizona v. California, and the provisions of the Colorado River Storage Project Act of 1956 and the Colorado River Basin Project Act of 1968 that govern allocation, appropriation, development, and exportation of the waters of the Colorado River Basin." Reference to the GCD AMWG should be corrected to refer to that body's responsibility to "Advise GCDAMP and the Secretary of Interior or their designee.... regarding GCDAMP priorities and policies, proposed changes to the criteria and operating plans for Glen Canyon Dam, and the implementation of resource management objectives, research studies, and environmental or cultural commitments" (ROD, page 14). The AMWG does not have any responsibility to "organize and coordinate dam operations." Finally, in describing the GCD LTEMP EIS, please revise the current text to reflect language from p.1 of the ROD: "The LTEMP will provide a framework for adaptively managing Glen Canyon Dam operations and other management and experimental actions over the next 20 years, consistent with the Grand Canyon Protection Act (GCPA) and other provisions of applicable Federal law." (emphasis added).
In 2022, smallmouth bass were found spawning and establishing in the -12 mile slough just below Glen Canyon Dam. Temperature monitoring showed about 2 degrees C of warming in the slough during normal weekday operations. However, there was about 12 degrees C of warming during the steady weekend flows associated with a Bug Flow experiment (NPS data presented at the October 2022 TWG). The warming during the Bug Flow experiment presents a robust data set that raises significant concerns about the slough and the potential impact of the Bug Flow experiment, and other steady flow components of experiments like options C and D, on the successful spawning and establishment of smallmouth bass in Glen Canyon. WAPA and the Basin States expressed this concern during the technical team process but were dismissed. When considering the proposed flow options, it appears unlikely that any of them will prevent warming above the 16 degrees C spawning threshold in the -12 mile slough and keep smallmouth bass from spawning and establishing there again in 2023. Additionally, there are several other sloughs, backwaters, and tributary mouths between Glen Canyon Dam and the Little Colorado River where smallmouth bass may establish like they did at the -12 mile slough last year. Establishment would be more likely for flow options that stabilize releases for an extended period like Options C and D and the Bug Flow experiment. Additionally, the flow options evaluated for this EA 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 the threat to humpback chub and razorback sucker populations, translocations, and reintroductions in western Grand Canyon.
Page 2-8, Please provide context from citation (Bestgen & Hill 2016) regarding SMB spawning when temperatures drop to 13.9°C. Additionally, in following paragraph cold shocks are described as 13°C though in all other options 16°C was stated as the target temperature. This discrepancy requires some additional explanation.

Substantive Comments
SMB, other warmwater non-native species, and increasing river temperature are potentially detrimental to the recreational rainbow trout fishery in Lees Ferry. SMB are direct predators of rainbow trout, and rainbow trout are not tolerant to river temperatures that exceed 20°C. The rainbow trout are also sensitive to low dissolved oxygen (DO) events that are more likely to occur in elevated temperature ranges. The action alternative in this EA would lower the river temperatures, decrease low DO events, and reduce the predation and competition pressure on the rainbow trout and maintain the economic benefits from the recreational trout fishery for the local economy. We would consider these benefits from the action alternative to be improvements to the resources of concern we've identified.
The action alternative in this EA, including the use of bypass and flow spikes was conceptually analyzed and recommended by the SMB task force led by the USFWS last year (link to AMWG notes) and is the tool most likely to be effective at preventing the establishment of SMB below the dam by reducing breeding behaviors. Consequently, the use of this SMB EA was discussed in the Technical Work Group (TWG) SMB strategy as an important part of the response to be considered because of its expected efficiency to address the problem. Ultimately, due to the collective efforts of the management agencies involved with the TWG, we have more than three decades of data on non-native fish below the dam that indicates that warmwater non-native fish have always been present in the system in small numbers, but there has been little to no evidence of breeding of SMB until this past year when river temperatures reached levels much higher into the breeding range for warmwater non-native fish such as SMB and green sunfish (GSF). The action alternative here has been identified as the most effective way to prevent future breeding of SMB.
The Temperature Threshold of 16 degrees C Will Not Completely Prevent Spawning The metric of preventing establishment is not well defined in the EA, but the EA appears 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 states 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)." The Habitat Suitability Index models for smallmouth bass developed by the USFWS supports this observation by stating "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 goal of not higher than 16 degrees C at the Little Colorado River would require a release temperature from Glen Canyon Dam below 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 is unlikely to completely prevent it.
Hydropower is one of many uses of water resources. Making full use of hydropower is key to ensuring that our electric grid remains reliable and resilient, and to also help meet emission reduction goals. Hydropower is a source of emissions-free, baseload power. Furthermore, hydropower can be started and stopped quickly - making it the sole dispatchable, clean energy source for many public power utilities. Therefore, Platte River must underscore how important hydropower is to the health and safety of all communities that depend on power generation as part of their daily lives.
The EA does not describe how implementation of the flow options would occur, nor how Reclamation may switch to another flow option to match changing conditions. The EA does not identify offramps or set forth criteria for whether an offramp is necessitated. Because the EA is narrow in scope and does not amend the LTEMP beyond that narrow scope, the decision making for implementing, switching between, or off-ramping of flow options should follow the same communication and consultation processes that have been developed according to Section 1.4 of the Long-Term Experimental and Management Plan Record of Decision. That process will allow for the Representatives to continue to be involved in the decisions to implement or not implement any of the options to continue to protect their significant interests in the subject waters and infrastructure. Reclamation should provide sufficient parameters on when to commence that process, as well as provide at least a 30-day notice to the Representatives prior to initiating implementation of any alternative(s) decided under that process.
The Upper Division States, through the UCRC, strongly encourage Reclamation to provide additional explanation in the text of the EA regarding the analyses conducted on the economic impacts and effectiveness of preventing establishment of smallmouth bass, and to provide supporting technical documents as appendices.

Substantive Comments
The range of alternatives in the EA is very narrow. In essence the BOR is presenting an Action/No Action EA while simultaneously dismissing the No Action alternative. This creates an all or none choice. With that in mind, GCRG believes the EA must consider modifying Flow Option B to include a larger magnitude (single) spike flow optimally timed in June to disrupt SMB spawning. A single flow above 40,000 CFS may be more beneficial than multiple flows at 30,000 CFS. Please refer to recent HFE optimization modeling conducted by Grand Canyon Monitoring and Research Center (specifically Paul Grams' September 1, 2022 presentation, Scenario C). Furthermore, because BOR is required to 'move water' through the dam this summer (i.e. DROA water that was held back in Lake Powell) adequate water should be available to increase the magnitude and duration of a spike flow. Based on Grand Canyon Monitoring & Research Center's recommendations, it may be possible to disrupt SMB spawning at a key juncture in order to inhibit their establishment, while also maximizing sediment deposition, and minimizing erosion throughout the Colorado River ecosystem. It is imperative that we capitalize on the current conditions that may not exist in the future - extra water and sediment enriched conditions.
The drought has already impacted CRSP customers causing them to enter the energy market to replace power not supplied by WAPA. Selecting any of the flow options would cause WAPA to enter into the energy market to replace the lost power. Customers will then be competing with WAPA as a buyer in the markets. Prices will increase for all utilities in the market from the constraint of energy supplies, transmission path congestion and fuel conditions. The EA has not considered the added operational constraints in the already competitive energy market.
Is this Draft EA another example of seeking outcomes (Spring HFE, colder water for rainbow trout) under the guise of protecting endangered species? The Draft EA stated that smallmouth bass have been detected downstream of the dam since 2003 yet no establishment has occurred to date. The National Park Service (NPS) acknowledged their existence below for the last 20 years in a news release dated July 11, 2022. If smallmouth bass have been present for the last two decades, why the sudden urgency? Isn't this the responsibility of the NPS anyway, as they performed a non-native fish EIS a few years ago?
In 2022, the reduction in available hydropower due to drought and experimental actions forced us to purchase replacement market power which increased our power costs by more than thirty percent. To recover these high costs, we implemented a five percent rate increase in 2022, and will raise rates again by five percent in 2023 and 2024. Additionally, we are implementing a power cost adjustment which will further increase our customer bills. The draft EA does not address the ability of ratepayers in communities such as ours to afford the increase in power costs or whether there is available power on the market that can be purchased to make up for this shortfall. Shortfalls in hydro have already put us in the position of competing for the same market resources that WAPA is purchasing to replace hydropower. As WAPA would be out on the market for substantially more power than in a case without the Proposed Action, the added competition for resources will most likely drive market prices higher, and further reduce availability for everyone. While the draft EA fails to provide analysis into the financial or economic impact the proposed action will have on our bottom line, we project the impacts will be severe. Natural gas and energy market futures indicate market volatility will continue through 2023, and the added market exposure from hydropower reductions puts our customers at risk for further rate hikes. Reclamation has failed to show the impacts to communities such as ours are not significant as required by the National Environmental Policy Act, we do not support the Proposed Action as articulated in the draft EA.
Flow Option A, p. 2-4: what percentage of time does "almost always" refer to in achieving the target temperature with all 4 bypass tubes in use?
Additionally, Bestgen and Hill (2016) found that smallmouth bass do not spawn in the mainstem but 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.
We also ask that Reclamation begin modifications in the forebay with a thermal curtain or some other short to mid-term fix to prevent smallmouth bass entrainment and provide cool-water releases without bypass before smallmouth bass begin spawning and establishing in the dam tailwater.

Substantive Comments
While the perspectives of the biologists and Indigenous tribes were very different, both agreed that it was possible to protect the humpback chub and more effectively reduce the threat of the smallmouth bass without the use of rotenone and electrofishing. While different than the proposal of the scientists in the story I wrote, both scientific and Tribal perspectives will honored with Flow Options B. This is determined to be effective by using a "flow spike" to send a cold water through the dam down river and also disturbing smallmouth bass still hanging out in the water. This respects both the Zuni and Hopi desire to not kill any fish, native or non-native, based on their belief that all life is sacred. As a secondary option, Flow option D would also be acceptable. To effectively protect the once endangered humpback chub, I urge you to prioritize the future of these 5-million-year-old fish that are endemic to the Colorado River by using Flow option B. (Or D). We must prioritize the future of these threatened fish over the interests of hydropower. We can find ways to adapt or transition to alternative electricity modalities, but we cannot bring the chub back from extirpation, as is the case with the Colorado Pikeminnow.
The EA fails to use the most current information regarding future hydrology and its impacts on hydropower production. Potential impacts of the Action cannot be analyzed in a vacuum. NEPA requires a disclosure of the cumulative impacts of the Action. In this case, Reclamation must analyze the impacts of the Action in light of the ongoing impacts to CRSP FES customers from the last 20 years of limited hydropower production and the resulting increased reliance on purchased power.
Now the most important issue of the entire study. You want to route water around the wicket gates of the dam where that water is used to turn generators that produce GREEN power for customers below the lake and Western Power grid as it is. Was it not just last summer that governor Newsome of California ws calling on people not to charge their electric cars during the day because there was insufficient power for the Western power grid.So we are going to reduce the generation in the western power grid by up to 50% of the Lake Mead Dam output. just so a fish that is thriving in today's times not decreasing in numbers. How can one truly make any sense of this at all? Summer is a time which power marketers are charging on an average of over 200 dollars per megawatt hour instead of the 45 or 55 normal price in the western market . This happens to be the wholesale prices of what electricity costs. This is the price the companies that send it to your home costs them. Then what each year the price goes up 15 cents per kilowatt for your home's energy
Section 1.3, page 1-5. The Purpose and Need Statement is broad enough to include "changes in flow velocity" along with temperature-only focused hypotheses and experiments. (See also comment 9) below regarding alternatives.) As the EA describes an experimental action, and the Action is based solely on modeling, please consider reinstating the word "help" prior to "prevent the establishment of...". As Upper Division States TWG representatives have stated, operational alternatives are not a panacea; fish exclusion should be an immediate priority; the EA is deficient in that more than a single focus (bypass flows) alternative should have been included. Reclamation should prioritize and expedite installation of its preferred prevention technology, and NPS should take action regarding the slough at RM 12, and continue addressing nonnative invasive species as required in its Expanded Non-Native Aquatic Species Management Plan.^1 1 See: ParkPlanning - Expanded Non-Native Aquatic Species Management Plan/EA (nps.gov)
In addition, the decision-making process should not reside with an exclusive set of stakeholders, but rather be more inclusive of the varied interests represented by the full membership of the Glen Canyon Dam Adaptive Management Program (AMP).
The proposed actions and duration (3 years) are too catastrophic to hydropower for an unproven theory.
The recent decision to down list the humpback chub from the endangered position to the threatened position, was premature, and we strongly recommend that the biological assessment that will be prepared for this EA will address this topic and consider reinstating the humpback chub to its endangered status.
The EA fails to acknowledge how the impacts of this Action will be inconsistent with the "beneficiary pays" construct that has been the cornerstone of Reclamation law and policy for 120 years. Smallmouth bass were not introduced into the Colorado River at either the request of, or to the benefit of, hydropower customers, yet the costs of actions to limit the range and impacts of these fish on native populations are being placed wholly at the feet of WAPA and its FES customers. This must be disclosed.

Substantive Comments
Such a reduction in the Basin Fund would also carry longer 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.
There is no analysis on the availability of replacement power or on the impacts to the environment of purchasing replacement power (including impacts to the power grid and a warming climate).
Also, on page 3-30 the document states that "WAPA will continue to operate under the emergency exception criteria, as stipulated under the 1996 ROD, which allows GCD 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)." However, this citation is incorrect and needs to be updated. 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. This comment was provided on an earlier draft but not updated for the public draft. WAPA can provide this document to Reclamation if needed.
Tri-State's costs to replace our already reduced CRSP power will be greater because the Firm Electric Service (FES) customers will be competing for the same resources that WAPA will be attempting to purchase to replace the amount of generation lost due to the bypass flows.
Page 3-38: The affected environment should be revised to include the environmental justice populations represented by CRSP FES customers. See section D. of CREDA's December 13, 2022 letter, which is included in the Appendix to this EA.
The Experiment Will Increase Energy Prices at Exchange Nodes and Ultimately Costs to Consumers Based on the PLEXOS model runs for June to October 2023, the reduction of electrical power production caused by the experiment will 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 2024 and 2025. Forecasted Locational Marginal Price Impacts ($/MWh) in the Western Electric Coordinating Council (WECC) Footprint with implementation of the Experiment when compared to the No Action (see PDF attached to letter for Table). *Note that there are negative LMP differences in some months for Options A, C & D. These negative numbers indicate that, compared to the baseline case, the PLEXOS model was able to dispatch generators to meet WECC electrical demand in a way that resulted in a lower cost.
How do you have these numbers if the population is declining " The U.S. Geological Survey's (USGS) Grand Canyon Monitoring and Research Center oversees monitoring and research activities for the Grand Canyon population under the auspices of the Glen Canyon Dam Adaptive Management Program (GCDAMP). Analysis of data collected through 2006 suggests that the number of adult (age 4+ years) humpback chub in Grand Canyon increased to approximately 6,000 fish in 2006, following an approximate 40-50 percent decline between 1989 and 2001 (Coggins, 2007). Increasing numbers of adult fish appear to be the result of steadily increasing numbers of juvenile fish reaching adulthood beginning in the mid- to late-1990s and continuing through at least 2002 (Coggins, 2007)." Why was the fish placed on the February 16 2022 endangered species list at this particular time. Is the lower Colorado river basin considered a cold water river? If so then why is the smallmouth bass considered a warm water fish? Especially since one of the largest populations of small mouth bass that I have ever fished for are in the cold cold water lake of the San Juan Reservoir in Southwest Colorado and Northwest New Mexico. Since these fish are such massive predators of other fish then why is the San Juan river below the lake considered as one of the best trout fishing grounds in the United States. These are actual facts from real people that fish for the small mouth and the trout. No one fishes for humpback chub because it is a very foul tasting fish and it is what is known as a TRASH fish.

Substantive Comments
Page 3-31: The Power Marketing section of the EA and Section 3.6.2 Environmental Consequences Analysis should disclose the impacts based on WAPA's implementation of WAPA-199 on December 1, 2021. The EA must also address the Action's impact on replacement power availability during the summer months of the experiment. See NERC Summer Reliability Assessment 2022 at pp.5-6: "Drought conditions create heightened reliability risk for the summer. Drought exists or threatens wide areas of North America, resulting in unique challenges to area electricity supplies and potential impacts on demand: Energy output from hydro generators throughout most of the Western United States is being affected by widespread drought and below-normal snowpack. Dry hydrological conditions threaten the availability of hydroelectricity for transfers throughout the Western Interconnection. Some assessment areas, including WECC's California-Mexico (CA/MX) and Southwest Reserve Sharing Group (SRSG), depend on substantial electricity imports to meet demand on hot summer evenings and other times when variable energy resource (e.g., wind, solar) output is diminishing. In the event of wide-area extreme heat event, all U.S. assessment areas in the Western Interconnection are at risk of energy emergencies due to the limited supply of electricity available for transfer." This is not just an issue for WAPA, but for the FES customers and all other utilities in the West. A significant loss of generation from GCD will have significant financial impacts on WAPA and economic and financial impacts on WAPA's FES customers and their customers. The EA analysis does not quantify the impact of customers having to replace GCD generation with other resources. The analysis should include the impact on those customers that count their CRSP generation toward meeting their resource adequacy requirements, as well as include their CRSP generation in their greenhouse gas and Renewable Energy Certificates (RECs) reporting. Reduced and/or bypassed generation at GCD/CRSP has implications and impacts to both direct contracts of that/those resources as well as exchange agreements that rely on the output of that/those resources. Consideration of resource adequacy requirements, replacement resource availability, and contractual impacts impacting utilities' obligation to serve customers are essential elements that must be addressed in the EA's effects analysis. On September 28, 2022, CREDA submitted comments to Reclamation regarding potential fall experiments under LTEMP. These comments apply to every experiment or changed operation that may be considered for CRSP generating units.
Monitoring should be conducted subsequent to each component of actions through the life of this EA, so that we will know their relative effectiveness and impacts, as well as which are optimal for inhibiting SMB populations while mitigating adverse impacts to other resources.
If the small mouth bass experiment is approved to go forward, it will result in SGESD, a CRSP customer, having to find replacement power on the open market. Current projections indicate there may be little or no power available on the market when replacement power is needed and what power may be available will be at exceptionally high prices. As a public power, non-profit utility, our customers are the ones that will have to absorb the increased costs of power via their rates.
The positive impacts to sediment transport and the improvement to sandbars and beaches from B and D are significant. There has not been a HFE in the canyon since 2018, and as a result, there is extensive degradation and erosion of sandbars and beaches throughout the canyon, which inhibits both recreational benefits, but also ecological benefits for fish and invertebrate life. Additionally, without these high flows, vegetation has encroached on many beaches, crowding out available sand and again disrupting the balance that would have been maintained in the presence of these flows. Lastly, cultural resources/archeological sites have begun to be exposed and damaged by the erosion or other removal of the protective sand layers. The flow spikes would deposit new, protective sand on these culturally important sites, better preserving them overall.
The four different flow options in the Action alternative are presented with no stated preferred option indicating that the flow options aimed at preventing SMB establishment below GCD are accompanied by considerable uncertainty. For example, the Proposed Action would allow BOR to 'utilize a flow option based on conditions at the time of implementation. Reclamation could switch to another flow option, as described below, to better match changing conditions.' This statement underscores the necessity for adaptability, flexibility, and, most importantly, rigorous monitoring data on which to base decisions that meet the mandates of the GCPA (1992). It also exemplifies why more variation in the range of flows under the options should be considered.

Substantive Comments
On page 61, an analysis is discussed based on the average (median) predicted bypass over the 30 traces that might reduce the cost of firming expenses, but there was no discussion of the resource scarcity and possibility of escalated prices to balance this argument. WAPA's pre-draft letter expressed their concern of market availability for replacement power given the current constraints. With a footprint of over 15 states, WAPA is fully aware of the constraints of the current energy market. Yet this, as well as the overall diminishment of the resource, is excluded from the Draft EA. To put the hydropower impacts in perspective, the 322-600 GWH estimated would translate to 9.2%-17.1% reduction for the entire CRSP system in WY 2023 and an 11.5%-21.4% reduction in generation at Glen Canyon Dam. During August of 2020, power prices spiked to $2,000/MWH, which far exceeds the $250-$300/MWH summer pricing. The average pricing used for the replacement power for Flow Option B is $135.17/MWH. This is far below current summer power prices, but no mention of this is included in the Draft EA. IEDA's biggest concern is reducing the capacity of Glen Canyon Dam down to a minimum of 40 MW for regulation from its peak capacity of 1,500 MW if called upon in an emergency. This will lead to loss of human life if we experience another regional heat wave like the one that occurred in 2020
We believe more information is needed about whether the use of bypass in the action alternative may have potential effects to the water quality in Lake Mead. In the past year there was a low dissolved oxygen (DO) plume in Lake Mead that may have been caused by increased river temperatures and our understanding is that Southern Nevada Water Authority may be analyzing the effects of the action alternative in this EA and it would be beneficial to know if this action alternative would decrease the likelihood of those low DO spikes in the future. Our understanding is that the action alternative would likely provide a temporary benefit to Lake Mead's DO levels when this action was operational.
More broadly, BOR and its sister agencies (NPS, USFWS) must undertake planning now to ensure the survival, and recovery of threatened and endangered fish in the context of minimum power pool, dead pool, and a warm Colorado River flowing through Grand Canyon. Worsening greenhouse gas pollution, regional warming, aridification, and Colorado River flow declines provide little assurance that, in the long term, sufficient water will be available to maintain Lake Powell levels and cold water flows from Glen Canyon Dam. BOR and its sister agencies' duty to "carry[] out programs for the conservation"- i.e., recovery of listed species, should compel planning now to ensure for the survival and recovery of threatened and endangered fish. This planning must consider ways to avoid, minimize, or off¬set impacts from warm Colorado River water flowing through Grand Canyon due to increasing risks of long-term minimum power pool and dead pool behind Glen Canyon Dam . 16 U.S.C. § 1536(a)(l).
SRP acknowledges the importance of protected species and recognizes the risks associated with smallmouth bass ("SMB") proliferation in the river reaches below Lees Ferry. However, SRP has several significant concerns about all of the flow options proposed in the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment ("EA"). Most notably, SRP relies on GCD hydropower and other resources in its portfolio to provide reliable electric service to over 2 million customers in the Phoenix area, and the proposed flow options create a significant risk that SRP may not be able to continue to fulfill that obligation.
GCD hydropower is a unique and critical part of SRP's power portfolio. In addition to the Federal Preference Power Contracts, SRP holds an exchange agreement with WAPA that allows Colorado generation to be delivered to Arizona via GCD output. SRP depends on the execution of this exchange to meet summer peak capacity, which drives SRP resource needs. There is a significant risk that these resources could become stranded in Colorado, resulting in significant reliability and financial risks to SRP. While a power emergency may allow for full availability of GCD generation, it may not allow SRP to recover the capacity provided by these Colorado resources.
In addition, why is the Adaptive Management Program elevated to parity with legislation in section 1.4 of the Draft EA?
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.

Substantive Comments
The Bureau of Reclamation (Reclamation) released a draft Environmental Assessment (EA) proposing flow modifications at the Glen Canyon Dam (GCD) for the next three years.^1 The proposed experimental actions would, theoretically, attempt to disrupt the spawning of nonnative fish. However, each of the proposed actions in the EA would cause new and significant negative impacts on existing hydropower production capacity at GCD. Additionally, the National Environmental Policy Act (NEPA) would likely require a more rigorous Environmental Impact Statement (EIS) before proceeding with any actions. For these reasons, among others listed herein, the undersigned organizations oppose the proposed actions identified in the EA. 1 https://www.usbr.gov/newsroom/news-release/4434
The EA, at Section 3.2.1, identifies several important drivers to food-base production and diversity including flow, nutrients, and temperature. However, it omits discussion of how sediment and turbidity drive of food-base production and diversity, especially below the Paria River.
Complete evasion and failure to substantively consider these known concerns coupled with the wholesale inadequacies of the employed sciences in the EA to meaningfully account for let alone make valid and sound conclusions on the impacts and effects of the proposed actions of the Glen Canyon Dam/Smallmouth Bass Flow Options on Zuni renders this a highly controversial matter that Reclamation's own NEPA Handbook (2012) states necessitates a more in-depth and comprehensive Environmental Impact Analysis (EIS). The Zuni Tribe further reminds Reclamation that your agency's NEPA Handbook (2012:6-1) also states that "[t]he average EA should be about 30 pages or less. As the length of the EA increases, the chances increase that an EIS is the correct documentation under NEPA, simply because the number of issues is one indication of the possibility of significant impacts." The current EA is over four times this length, and that is without any meaningful engagement, analysis, or study of the direct, indirect, and cumulative adverse effects and significant impacts the proposed actions will have on the Zuni people and Zuni Tribe.
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 10s 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 purchase the amount of power needed (100's of megawatts per hour) to offset the impact of the experiment. WAPA's established trading partners have indicated they may be unable or unwilling to offer excess power during projected scarcity events in the coming summer.
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 project, WAPA's physical infrastructure, and the reliability of the power grid in the western United States.
In general, the Navajo Nation prefers a flow option that mimics natural (pre-dam) hydrology, as this will also restore natural processes and ecological function of the river system. See also our attached March 9, 2022 statement on Non-Native Fish management in the Colorado River.
Option B could potentially result in the taking of life: "Flow Options A and B are meant to stop spawning before it occurs, which means there would be no taking of life, but in backwater or margin habitats some mortality could occur under Option B if fish are moved off of nests." Id. at 3-45. The DEA notes that work is underway to develop a memorandum of agreement "regarding nonnative fish management and flow actions [that] will put forth procedures for consultation to resolve any adverse effects on the TCPS;" however, in the meantime, "because Flow Options B-D would result in additional taking of life within the Canyons in excess of the present conditions under the LTEMP dam operations, they could contribute to negative cumulative impacts on Zuni culture." Id. at 3-46. American Rivers takes seriously the strong tribal perspective around the taking of life, and feel that in balance, Option B has the benefit of minimizing the loss of life, mainly centered around the disruption of spawning beds while being the most effective at minimizing the expansion of the SMB population without taking of life. If we delay or restrict the opportunity to effectively address this problem now, it would be highly likely that mechanical or chemical treatments would be required to suppress the expansion of the population, leading to a much greater and more impactful loss of life overall.

Substantive Comments
Section 2.3, p. 2-9: Please describe the science basis for concluding without detailed analysis that a penstock only release "does not meet the project's purpose and need." A penstock only release could meet the purpose and need if the purpose had remained as it was provided to the AMWG Stakeholders, with the word "help" as a modifier to "prevent". Further, it appears this option was rejected for including one of the same objectives as the Action options: abandoning nests v. disrupting/disturbing spawning. Disrupting/disturbing spawning may have the potential of "high mortality of offspring", which is a secondary objective of disrupting/disturbing spawning. Page 3-7, describing the Action impacts on nonnative fish, is very clear: "All flow options are designed to inhibit smallmouth bass spawning, displace male smallmouth bass from guarding nests, or both". The EA should clearly explain why Option E was rejected for analysis based on the same criteria that is included in all flow options of the Proposed Action.
The EA should state there is a high likelihood that the experiment would have substantial negative impacts to food base production over the next three years especially if back-to-back spike flows are implemented.
The GCPA specifically mentions compliance with the Colorado River Storage Project Act of 1956 (Public Law 84-485) (CRSP), the law that authorized the construction of Glen Canyon Dam, in reference to water: "The Secretary shall implement this section in a manner fully consistent with and subject to the Colorado River Compact, the Upper Colorado River Basin Compact, the Water Treaty of 1944 with Mexico, the decree of the Supreme Court in Arizona v. California, and the provisions of the Colorado River Storage Project Act of 1956 and the Colorado River Basin Project Act of 1968 that govern allocation, appropriation, development, and exportation of the waters of the Colorado River basin." GCPA Sec. 1802(b). Regarding hydropower, GCPA only discusses the need to replace Glen Canyon Dam's power with other power supplies. Through the GCPA, "the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established" were prioritized above Glen Canyon Dam's hydropower production: "The Secretary of Energy in consultation with the Secretary of the Interior and with representatives of the Colorado River Storage Project power customers, environmental organizations and the States of Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming shall identify economically and technically feasible methods of replacing any power generation that is lost through adoption of long-term operational criteria for Glen Canyon Dam as required by Section 1804 of this title. The Secretary shall present a report of the findings, and implementing draft legislation, if necessary, not later than two years after adoption of long-term operating criteria. The Secretary shall include an investigation of the feasibility of adjusting operations at Hoover Dam to replace all or part of such lost generation. The Secretary shall include an investigation of the modifications or additions to the transmission system that may be required to acquire and deliver replacement power." GCPA, Sec. 1809. Hydropower generation is "incident" to other purposes set forth in the Colorado River Storage Project Act of 1956 (Public Law 84-485), the act which authorized Glen Canyon Dam. The Secretary of the Interior was authorized to "construct, operate, and maintain" Glen Canyon Dam: ". . . for the purposes, among others, of regulating the flow of the Colorado River, storing water for beneficial consumptive use, making it possible for the States of the Upper Basin to utilize, consistently with the provisions of the Colorado River Compact, the apportionments made to and among them in the Colorado River Compact and the Upper Colorado River Basin Compact, respectively, providing for the reclamation of arid and semiarid land, for the control of floods, and for the generation of hydroelectric power, as an incident of the foregoing purposes..." 43 U.S.C. §620 (emphasis added). The DOI and BOR have a clear responsibility to use Glen Canyon Dam to manage water according to the obligations in CRSP and GCPA. Because hydropower cannot be prioritized above other purposes under CRSP and GCPA, BOR has the authority and duty to manage Glen Canyon Dam to effectively conserve water and natural resources without the additional burden of providing hydropower from the dam.
The analysis of the EA is inadequate in its identification and analysis of potential impacts from the action. The Bureau of Reclamation has consistently failed to acknowledge there is not a readily available supply of replacement power available for purchase, even though Western Area Power Administration (WAPA) has identified this as an issue of concern in previous comments on this proposal.

Substantive Comments
In addition, we understand that a primary concern for Western Area Power Administration (WAPA) is the financial impact on the Basin Fund. Several sources of financial mitigation in the form of recent legislation appear to be available to Reclamation including the following: INFRASTRUCTURE BILL OF 2022 TITLE IX--WESTERN WATER INFRASTRUCTURE SEC. 40901. <> AUTHORIZATIONS OF APPROPRIATIONS. "There are authorized to be appropriated to the Secretary of the Interior, acting through the Commissioner of Reclamation (referred to in this title as the ?Secretary"), for the period of fiscal years 2022 through 2026-(12) $50,000,000 for endangered species recovery and conservation programs in the Colorado River Basin in accordance with- (A) Public Law 106-392 (114 Stat. 1602); (B) the Grand Canyon Protection Act of 1992 (Public Law 102-575; 106 Stat. 4669); and (C) subtitle E of title IX of the Omnibus Public Land Management Act of 2009 (Public Law 111-11; 123 Stat. 1327)." The EA should disclose its calculations to estimate the costs for replacement power. Information provided by WAPA and its contractors holds an inherent conflict of interest in the form of preserving hydropower for its customers and fulfilling its contracts at the expense of natural resource losses and contradicting the Grand Canyon Protection Act (GCPA, 1992).
Despite the supposed urgency of reducing downstream water temperatures, the scientific support for this was not self-evident in the Draft EA. The Draft EA admits as much stating, "There is no literature on smallmouth bass movement in response to flow spikes or cold-water releases." (page 36) Can someone definitely say that colder water is the best solution to prevent establishment?
Non-native fish management has been and will continue to be an on-going challenge in the CRE and at Glen Canyon Dam, a challenge that requires well-trained and committed staff. We recommend that, rather than a simple "informed consent" approach to cultural compliance, Reclamation and the participating agencies develop a fisheries monitoring education program for Native American students. Such a program will build a future workforce that is technically capable, consonant with federal trust obligations, and would be a program that would directly benefit the Tribes.
Provide additional cost information based on a hydrological range rather than relying on a single trace from the August 24-month projections. Clarify the relationship between potential 5-month impacts to power generation and firming expenses for each flow option and the proposal to use Flow Options C and D for a maximum of 12 weeks.
Evaluation of the conditions prior to and after the use of these flow options will assist in understanding the effectiveness of any action taken. Spawning and nesting for SMB generally occurs within the littoral zone of lakes and nearshore in flowing waters, making it relatively easy to conduct observations of nests from a distance with binoculars (Winemiller & Taylor 1982). Spawning (generally followed 4 to 5 days later by nesting) takes place from April to mid-July at southern latitudes when water temperatures exceed 15°C (Tringali et al. 2015). During this period in time, male SMB establish territories and excavate saucer-shaped depressions in coarse substrates (Pflieger 1966). Nests are often located near rocky or wood cover and males provide parental care during egg incubation, larval development, and the juvenile dispersal stage (Tringali et al. 2015). We believe that Reclamation, in partnership with the agencies responsible for the fishery in the Glen Canyon Reach of the Colorado River, should develop a detailed study plan to investigate the effects of these disturbances on SMB prior to, during, and after any flow is implemented. Methods are readily available (Bestgen 2018) to many of the agencies and planning for this field season needs to begin soon. Further, we offer the expertise of our fisheries staff to assist in the development, implementation, and evaluation stages of such an effort. The primary purpose of a flow spike is to sweep away egg and fry (newly hatched larvae) from the nest and to disrupt male guarding behavior; temperature reductions are a secondary benefit (in the upper Colorado Basin flow spikes are not implemented until after spawning has initiated). Knowing these conditions would be beneficial to planning which alternative may be most appropriate and or effective. For instance, if it is expected that SMB may spawn under option A, then a flow spike would be a useful tool to disrupt the spawning activity or, if adequate monitoring is taking place, and no SMB spawning is documented, then option B would not be needed.

Substantive Comments
An adaptively managed experiment of this significance and uncertainty must include a description of the proposed experiment, the time or frequency of implementation of the experiment, and the triggers or other conditions that must exist prior to implementation of the experiment. The experiment must also include a description of the hypotheses that will be tested by the experiment and benchmarks or other identifiable criteria that will allow the Secretary and interested parties to assess the success or lack thereof, when an experiment or action must be terminated because of unacceptable impacts (as specifically defined) to the listed humpback chub or other legally protected resources. Finally, any monitoring included in an implementation plan or experimental design must meet legal standards necessary to implement adaptive management, including monitoring of impacts to LTEMP resources2.
The impact of bypassing hydropower production will cause a significant increase in replacement power costs for CRSP FES customers for power from CRSP facilities.
The EIS incorrectly states that Colorado River Discovery has the concession for day trips between Glen Canyon Dam and Lees Ferry. CRD lost that contract to Wilderness River Adventures (Aramark) back in late 2017.
Now back to just the study. Numbers like 81 million dollars are going around as what it will cost just to do a study on a fish. Instead of using that 81 million dollars to invest in more base load or quick start power generators.
Ultimately, I am struck by a statement in the Smallmouth Bass EA in which the Bureau admits that "[s]mallmouth bass are managed as a sport fish in Lake Powell..."45 While I understand the dedication of many of the Federal family to provide stewardship of our Federal resources, hydropower customers like AEPCO cannot reconcile the concept of endangering the grid and nearing blackouts to manage a nonnative fish. Requiring indirect expenditures that will surely top $100 million to keep fish on one side of dam wall is not well understood by electric ratepayers living below the poverty line or on fixed incomes.
Additionally, since we are on the subject of reducing temperatures, flows that will reduce the temperature in the Lees Ferry reach should be considered for the benefit of the trout fishery should conditions that existed there in late summer 2022 are presented again.
Section 3.2.2, page 3-6: This section also states that under Options C and D, the cold temperatures would reach downstream to the confluence of the LCR. How does that risk to the humpback chub compare to the risk of smallmouth bass traveling down to the LCR? Finally, how can effects to razorback suckers be characterized as "minor" if flow changes "inundate or desiccate backwaters"?
We also suggest that Glen Canyon National Recreation Area be re-designated as a national park with critical habitat for the recovery of all eight threatened and endangered fish species, and that the mission statement for the Adaptive Management Program be repurposed, accordingly.
The result of the Action will require WAPA and CRSP FES customers to purchase replacement power on the market, yet current projections indicate there may be little to no power available on the market when replacement power is needed.
Proactive action via implementation of the action alternative described in this EA, even if the cost is in the range of $30-80M in the first year (we believe the lower end of that is more likely to be representative of the actual costs than the high end), could still be less expensive than the costs of trying to recover the species after the impacts are realized. Invasive species have cost the North American economy at least $1.26 trillion between 1960 and 2017 (Crystal-Ornelas et al. 2021). Many studies have found that investment early in an invasion is much less costly than expenditures later in the invasion (Blaalid et al 2021). A large amount of money on the scale of hundreds of millions spent by federal, state and non¬governmental agencies has already been invested in the humpback chub and other endangered fish through recovery programs in the upper and lower Colorado River basins. These efforts, over the past 20 years, could be negated if the population in Grand Canyon is severely impacted by SMB.
Section 3.7, page 3-34: CREDA disagrees that only the recreation resource should be analyzed for environmental justice impacts. Impacts to CRSP hydropower customers, particularly the smaller municipal, rural and tribal customers, should be analyzed in the context of environmental justice. The Proposed Action may disproportionately affect these customers as they will be paying more for an essential service that is necessary for human health; the GHG emissions impacts resulting from replacement power sources may also have a disproportionate impact on these communities. This analysis is required by the EA. The LTEMP Appendix K included a fair amount of impact analysis to tribal customers, in particular. As post-WAPA-199 impacts are direct and immediate to these (and all other) FES customers, the EA should analyze those impacts.

Substantive Comments
Let's ensure this EA and its implementation meet the mandates of the Grand Canyon Protection Act of 1992, "...to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established, including, but not limited to natural and cultural resources, and visitor use."
The Trust would also like to see this effort used to benefit broader resource goals set forth the in the Long-Term Environmental Management Plan ("LTEMP"), including protecting archaeological and cultural resources, enhancing natural processes, honoring tribal values and resources, increasing sediment transport and sandbar building, improving riparian vegetation, and enriching recreational experiences. While the priority of these flows should be to disrupt smallmouth bass spawning, secondary benefits should be actively pursued where multiple successes can be achieved. Based on the laser focus of this proposal, we fear Reclamation may miss a key opportunity to carry out its mandate under the Grand Canyon Protection Act of 1992 ("GCPA")^1 to ensure that Glen Canyon Dam is operated: 1 Grand Canyon Protection Act of 1992, Pub. L. No. 102-575, 106 Stat. 4600 (1992). 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, including, but not limited to natural and cultural resources and visitor use.
Provide information regarding possible entrainment through the bypass tubes. The purpose of the proposed flow options is to prevent smallmouth bass establishment below GCD. The EA does not discuss the potential and likelihood for entrainment of smallmouth bass through the bypass tubes, or the survival probability of smallmouth bass entrained through the bypass tubes.
Additional information regarding cumulative impacts for the possible implementation timeframe of up to 3 years.
The impact of the proposed action to the human environment will be significant and cannot be supported by the EA and FONSI. There will certainly be a cost to ratepayers in replacement power costs.
Many past government efforts on invasive species have shown there are large economic benefits of responding early in the invasion curve rather than trying suppression later in the invasion curve (Blaalid et al 2021). The largest subpopulation of humpback chub (over 90% of the adults in the total population) are in the Grand Canyon and may be negatively impacted by the SMB, as has happened to all the other subpopulations known in the Colorado River upstream of GCD. If this subpopulation experiences a rapid decline, it will likely affect the future trajectory and possibly the ESA status of the species as a whole. This could also lead to increased restrictions, regulations and costs for users along the Colorado River as a whole, as seen in other systems.
The CRCNV encourages Reclamation to more fully analyze Flow Option E (the non-bypass flow option). While a non-bypass flow option may not be as effective at preventing the establishment of smallmouth bass as the bypass flow options, there may be situations where this option may be desirable. Performing a full analysis in the EA could provide Reclamation with needed flexibility in the future.
Despite tens of millions of dollars spent each year studying the different aspects of system (HFE, Bug Flows, etc.), there hasn't been any definitive conclusions that I have heard why humpback chub are improving. One article I read suggested that it was due to the warmer water being released due to the lower lake levels (https://www.cpr.org/2022/09/19/colorado-river-trout-chub-populations-drop/). Could the chub benefit from additional warm water releases? It was also stated in the article that warm water could kill the trout. Are the cold-water releases planned to save the chub or the trout?
In the spirit of this broader focus, we support the proposed modifications to Flow Options B and D proposed by the National Park Service to address the potential conflict between smallmouth bass spike flows and High Flow Experiments ("HFEs") and to revise the HFE protocol for low water conditions.^2 2 See National Park Service's Letter to Regional Director, Wayne Pullen containing its comments in response to the "Glen Canyon Dam Smallmouth Bass Flow Options Environmental Assessment" to be prepared by the Bureau of Reclamation date December 14, 2022 p. 6-7. https://www.usbr.gov/uc/DocLibrary/EnvironmentalAssessments/GlenCanyonDamSmallmouthBassFlowOptions/St akeholderInput/20221215-NPSComments-508-UCRO.pdf

Substantive Comments
All flow options must be consistent with the Colorado River Storage Project Act (CRSPA) of 1956 and the Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs (LROC) of 1970. At a minimum, such approaches should be premised on the shared understanding that such flows continue to be experimental only, and that data from the experiments will be collected, analyzed, and compared to the impacts of other experiments implemented as part of the Glen Canyon Adaptive Management Program or associate management activities.
Considering Section 3.6 "Hydroelectric Power Generation," and the above stated concerns, CRCNV urges Reclamation to conduct a cost/benefit analysis when considering the implementation of any of the alternatives. The CRCNV is concerned that the cost for supporting any of the flow options may significantly outweigh the efficacy of their implementation, particularly given the lack of any field testing or analysis. For this reason, it is imperative that Reclamation move forward as expeditiously as possible with implementation of a permanent fish exclusion device.
A major problem with Glen Canyon Dam is its design. Intake tubes are 100' higher than the bypass tubes. This not only threatens the ability to generate hydropower at low lake levels, it creates a temperature problem between surface water and water below the thermocline. When the lake was higher, we didn't face that problem because the penstocks were pulling cold water. Now, we are facing an either-or situation, at the cost of hydropower generation. What happened to the temperature control devices that we have talked about for years, the upstream netting that we discussed after the green sunfish arrived or other non-flow options? Why does it seem like the only allowable option from the majority of the AMWG members are flow and release related? If certain parties insist that these as the only options, why aren't they paying for the costs of these experiments instead of hydropower?
Our understanding is that there are several ways to reduce costs from the use of bypass. If more SMB are not discovered in the Grand Canyon in 2023 or outyears, but only in the Lees Ferry reach in Glen Canyon, then it may be possible to use less bypass to cool only the Glen Canyon reach portion of the river. As other decisions are made on water allocations for the year, such as how much water is retained in both Lake Powell and upstream reservoirs, it's possible that temperature may not rise as much below the GCD as currently predicted, and this will decrease the need for bypass thereby decreasing costs. The action alternative has several options to choose from with differing costs, and while we feel strongly that option B is the most efficient, the action alternative appears to allow adjustment if needed in a given year between options and could be one way to control costs, as long as Reclamation still chooses options that are efficient enough for the goal of preventing SMB establishment. Finally, our understanding is that if these operations are anticipated in power purchase contracts well in advance, then replacement power is much less expensive than if those contracts do not anticipate this action. Accordingly, there are several ways to control the costs of this action, but not taking this action is likely to cause many negative impacts to the native species below the dam.
To be clear: Flow Options C and D risk decimating the Little Colorado River population and jeopardy to humpback chub overall by failing to prevent spawning of smallmouth bass. BOR, to ensure against jeopardy, must select alternatives and flow regimes that maximally prevent smallmouth bass spawning and reproduction, and that in turn maximally safeguard the humpback chub's Little Colorado River population.
But I digress. The spike component of two of the four options is highly dubious as a deterrent to SMB spawning. These fish are not nearly as dependent on specific spawning habitat as say RBT, which seek out very specific velocities and substrate sizes. As such, in the short Lees Ferry reach, RBT spawning can be greatly affected by highly fluctuating or spike flows because much of the preferred spawning habitat is relatively shallow. Redds can be dewatered, juveniles stranded or displaced because of the topography of the channel in Lees Ferry reach as well as the proximity to the dam. Not the case downstream and with SMB. SMB spawn in lacustrine or riverine environs, sand, cobble or large, unsorted rock substrates and the eggs hatch quickly. Unlike the Lees Ferry there is far too much potential SMB spawning habitat at variable depths in the 300 miles downstream to make this component a viable deterrent. Subjecting large numbers of SMB fry to displacement or stranding via spike flows is unlikely. Short incubation periods coupled with many more hatching episodes (due to variation in water temperatures that occurs over the 300 mile course of the river) as well as the minimization of magnitude of the "spike" due to attenuation will likely reduce the effectiveness of this component. However the spike component of these flows will be exceedingly effective in destroying the Lees Ferry fishery. May-July is exactly when Lees Ferry RBT are emerging from the gravel. Do this three years in a row and the trout fishery will collapse. Arizona Game and Fish apparently has no money nor any plans to mitigate such a population crash. This via Scott Rogers of the Arizona Game

Substantive Comments
and Fish Department. Additionally, the current political climate and conflicts between federal and state agencies concerning non-native sport fisheries on federal lands are not conducive to the rehabilitation of an impacted Lees Ferry trout fishery. For these reasons any SMB mitigation flows that incorporate spike releases should be abandoned
First, the cat is completely out of the bag concerning smallmouth bass below Glen Canyon Dam. This situation was inevitable, the only really effective tool that was ever potentially in the box was a TCD at the dam which should have been done at time of construction. Constant cold flows were the only fix. Now that they are there, in the 300 miles of river downstream of the dam, SMB will find an area of favorable water temperatures to spawn no matter the releases from GCD or the levels of Lake Powell. This is simply the way it is now. SMB successfully spawn at temperatures as low as 11.7C (Becker 1983). Additionally, SMB hatch in three days at 23.8C and in 10 days at 12.7C. Presumably, eggs will hatch in approximately 7 days at the target 16C at which time fry will seek out warmer backwater and near shore environs.
An "experimental" water release from Lake Powell is simply non-scientific and more importantly, releases badly needed water reserves that also serve to bolster the tourism economy affecting people's jobs they rely on to provide for their families.
Additionally, SRP plans its load and generation five years in advance-the current iteration of which includes GCD hydropower. To implement a change as impactful to hydropower generation as those proposed in the EA less than three months before summer season would result in a significant risk that SRP may not have sufficient resources to meet reliability needs.
Cited reference: Bestgen, K. R. 2018. Evaluate effects of flow spikes to disrupt reproduction of smallmouth bass in the Green River downstream of Flaming Gorge Dam. Final report to the Upper Colorado River Endangered Fish Recovery Program. Denver, Colorado. Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort Collins. Larval Fish Laboratory Contribution 214.
A robust analysis of the flow options is not possible without more detailed information on the short- and long-term costs to hydropower. From the analysis, it is not possible to assess the cost of replacement power to Navajo utilities or how these costs will be mitigated. There are other unanswered questions surrounding effects to hydropower: How will flow options affect direct costs to consumers? What are the effects on the overall power market? How does this affect grid reliability? There are likely many other related questions, but without expert analysis it is not possible to comfortably make a decision on the effects of the flow options. This uncertainty is, what for us, tips the balance toward a more in-depth analysis of Flow Option E.
For Option A, the PLEXOS model dispatches only natural gas as a replacement for Glen Canyon Dam production and reduces coal sources by a small amount. However, under Option B the model dispatches a combination of coal and natural gas as replacement. As explained (above, the PLEXOS model dispatches generators and finds solutions for every model run. The model run for Option A is independently derived from the model run for Option B. Apparently, the PLEXOS model found the least-cost solution for Option A required a small reduction in coal dispatch and replacing Glen Canyon generation with natural gas. For Option B, the least-cost solution included more generation from both coal and natural gas.
Page 3-8: Fish dispersal is a concern inherent to all flow options and "an important consideration for establishment". Flow spikes are identified with dispersal. We know from previous high-flow experiments (HFEs) that dispersal is a key concern. In fact, a decision was made in the fall of 2022 to not undertake an HFE due in large part to concern about nonnative fish dispersal. Is the statement that "green sunfish already occur throughout the Grand Canyon in low numbers accurate? Just because there may be "an overall lack of quantitative research on green sunfish movement or dispersal in response to flows", we know that green sunfish is a predator/competitor of humpback chub, and actions that will disperse more of this species should be reconsidered.

Substantive Comments
The analysis included in Table 1 (below) is based on the Strategic Plan to help guide flow option implementation planning and integrated action sequencing. We ranked these non-flow options based on simple numerical scoring of estimated cost, time, compliance, and implementation (low or short-term=1, medium = 2, high or long-term = 3) and simple summing of those scores (Table 1). Our analysis indicated that physical barrier screens, in-reservoir nets, floating barriers, turbine mortality, and electrofishing are all equally easy, cheap, short-term (emergency) options. If all are undertaken simultaneously, these may be the best collective strategy considered to reduce the likelihood of SMB establishment. The deeper water withdrawal and sorting facility options are intermediate management options, having higher cost or greater complexity, respectively. The lowest ranked long-term solutions are installation of an air bubble screen and/or an acoustic barrier, with greater management costs to the implementation of multi-stimulus, CO2, and energy dissipation, and with electrical barrier as the most costly and difficult to implement option. Table 1: Numerical scoring and summation of non-flow-related, non-native fish management options at Glen Canyon Dam (See PDF attached to letter).
Environmental Consequences section, please provide a citation for statements regarding fish entrainment. Summit Technologies Inc. is cited for information regarding consequences of fish entrainment though this is not a source of information on that subject.
In light of the nature of the issue and short time frame that some Glen Canyon Dam Adaptive Management Program members have previously identified as too short for them to route comments through their internal processes and submit, we would also appreciate Reclamation considering additional comments received outside of the 14-day comment window.
Utilizing prevention strategies that reduce lethal fish control methods will help address important tribal concerns about the taking of life.
No Action Alternative Should Not Assume HFEs are implemented when triggered The No Action Alternative suggests that without the proposed action HFEs will continue to occur if triggered by sediment conditions as set forth in the HFE protocol. However, it is not that simple, as HFEs are not always implemented even if sediment triggers are reached. A number of other factors are weighed in deciding whether or not to implement a HFE, including if humpback chub could be impacted by a HFE (e.g. HFE leading to passage of smallmouth bass through the dam or moving nonnative fish further downstream) or the impact on reservoir elevations of the water release, among other possible impacts to LTEMP resources. Since the LTEMP was finalized in 2016, only one HFE was implemented (fall 2018) after three fall and zero spring HFEs were triggered by sediment. The LTEMP HFE protocol actually authorizes (if triggering conditions exist) 38 HFEs over the 20-year period, but LTEMP modeling suggests that 15 fall HFEs and an additional 5 to 7 spring HFEs (a total of 22 HFEs) were anticipated during the 20-year period.^3 But in nearly 7 years, we have seen only 1. So, the assumption that HFEs will occur as triggered by sediment conditions is not entirely accurate. This matters because the proposed action's flow options with flow spikes are not only important in the context of smallmouth bass, but also important to protect and improve sediment resources in Marble and Grand Canyons. 3 U.S. Geological Survey's Evaluation of High-Flow Experiments during Aridification AMWG Reporting Meeting Presentation dated January 25, 2023.
Just read the article regarding smallmouth bass. I find it unfortunately laughable. There are smallmouth bass all along the Colorado River basin as far south as Parker, Arizona and father south because of the smallmouth accidently stocked in Lake Powell decades ago. I love catching them in Lake Mead, Lake Mojave, and Lake Havasu. Not sure any measures taken now could change the damage done by them Smallmouth bass without basically destroying the entire fishery.
The cursory review of the impacts from the proposed alternative on hydropower reduction fails to comply with the Administration's own policies. On April 16, 2021, you signed Order No. 3399 which set forth the "Department-Wide Approach to the Climate Crisis and Restoring Transparency and Integrity to the Decision-Making Process." While AEPCO has devoted countless hours and millions of dollars to comply with Federal mandates associated with climate change initiatives, it is chagrined and disappointed that the Department of Interior sidestepped its own obligations which your office instituted on a department wide basis two years ago.

Substantive Comments
Implementation of the Proposed Action would help to reduce the cumulative threats non¬native fish and habitat degradation pose to humpback chub and other listed species throughout the Colorado Basin. This would in turn serve to protect the accomplishments of the Upper Basin Fish Recovery Program and other restoration activities being implemented in the Basin. By contrast, the No Action Alternative would likely contribute to the establishment of SMB below GCD and could undermine the benefit of past accomplishments and increase the costs required to achieve future successes in native species recovery.
Also not considered/presented in this analysis is how WAPA's new contracts address the cost of experiments, contracting that appears to be used as a circular argument for a finding of significant impact to the Basin Fund and their financial stability. We acknowledge that Glen Canyon Dam plays a unique role in the Western electrical grid, which only substantiates the criticality for WAPA and its customers to act proactively, prudently, and urgently to integrate replacement power sources into their energy portfolios. Such actions would minimize adverse impacts from reduced hydropower production. Difficult decisions need to be made to prevent SMB establishment below the dam, but those decisions should not be delayed by a lack of contingency planning for low water impacts on energy pricing.
The Glen Canyon Dam (GCD) Adaptive Management Work Group (AMWG) recently recommended to the Secretary of the Interior a Smallmouth Bass Strategic Plan, which includes rapid response and mid-term and long-term actions that would be very costly and beyond the ability of WAPA to pay from the Basin Fund. The Proposed Action is limited to flows that bypass the hydropower generators, creating significant costs, potential resource reliability concerns during the summer months, and impacts to non-profit utility customers in the most underserved areas of the West.
The Department of the Interior and Bureau of Reclamation Have Multiple Statutory Mandates to Manage Colorado River Flows to Protect Grand Canyon's Endangered Fish and Grand Canyon National Park's Natural and Cultural Values. Hydropower is "Incident" and Subservient to Conservation Mandates. The Department of Interior (DOI) and BOR have multiple statutory mandates to manage flows from Glen Canyon Dam to protect, improve, and mitigate adverse impacts to federally endangered species and the natural and cultural values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established. Because hydropower cannot be prioritized above other purposes, and because it is explicitly "incident" to flows for other purposes, BOR has both the authority and obligation to manage Glen Canyon Dam to effectively conserve water and natural resources without the additional burden of prioritizing the provision of hydropower from the dam. The Secretary, acting through the Director of the National Park Service, must "promote and regulate the use of the National Park System by means and measures that conform to the fundamental purpose of the System units, which purpose is to conserve the scenery, natural and historic objects, and wild life in the System units and to provide for the enjoyment of the scenery, natural and historic objects, and wild life in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." 54 U.S.C. § 10010
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). It is important to note that there appears to be sufficient water to implement Option B this spring. More specifically, there is 523,000 AF of water from water year 2023 that was not moved downstream in the October - April time frame, but that must be moved downstream in the May - September time frame. The movement of this water could occur as part of the cold spikes found in Options B or D. This water is not water held in Lake Powell under Drought Response Operations Agreement; rather, it is re-timing the regular releases from that first time period to the later one. For those reasons, we recommend Reclamation identify the Proposed Action, Option B as the preferred alternative, at least for purposes of 2023 (year 1) implementation.^23 23 See Reclamation's NEPA Handbook (Feb. 2012), available at https://www.usbr.gov/nepa/, p. 4-9. ("The draft NEPA document released for public review should include a preferred alternative. If this is not possible, it must be included in the final NEPA document. A preferred alternative identified in the final NEPA document should be within the range of alternatives analyzed in the draft NEPA document."). See also 40 C.F.R. § 1508.1(h); Dine Citizens Against Ruining Our Env't v. Haaland, 59 F.4th 1016, 1030 (10th Cir. 2023) ("[a]n agency can have a preferred alternative in mind when it conducts a NEPA analysis.").

Substantive Comments
The document also cites the 2017 GCD LTEMP Programmatic Agreement and the required Memorandum of Agreement (MOA) for resolving adverse effect created by lethal management actions; however, the document fails to acknowledge that the MOA is nowhere near a final draft, or even close to identifying appropriate types or measures for avoidance, minimization, or mitigation, if any of the latter are required because avoidance is unfeasible. Under the regulations (36 CFR 800.6 and 800.7), an MOA is required prior to implementing the agency action/undertaking; however, Reclamation insists on implementing undertakings that result in adverse effects on and significant environmental impacts to the Zuni National Register-eligible traditional cultural landscape and traditional cultural property in spite of the fact that a MOA has not been finalized or executed in clear violation of their own 2017 PA.
Grand Canyons health should be the most important thing to consider when making this decision. According to the Grand Canyon Protection Act, Glen Canyon Dam shall be operated in such a manner as to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park was established. Because of that, the Bureau should implement the Cool Mix actions, which are most likely to completely inhibit spawning behavior. The Bureau should not rely on the Cold Shock which would attempt to decrease the survival of eggs and newly hatched fry or larvae. The Cold Shock attempts to find a compromise with hydropower delivery, and at a critical time like this, the Bureau should protect Grand Canyon and its fish in compliance with the Grand Canyon Protection Act and Endangered Species Act. Grand Canyons health must be top priority. The Cold Shock is also more likely to involve taking of life, which Grand Canyons traditionally associated Tribes have repeatedly expressed opposition to.
Page 3-30: Please remove the following sentence which is implied to be a citation from DOI 2016a, p. 3-204): "This type of operation creates large fluctuations in water releases, which has negative impact on environmental resources". The prior three sentences of that paragraph are accurate cites from page 3-204 of DOI 2016a. This last sentence is not.
Additional information regarding the possibility of a Cost Recovery Charge.
The EA is solely limited to alternatives regarding variations of flows bypassing power production. There is no discussion of potential non-flow alternatives.
Page 3-33: Please consider revising the last sentence to the following: The replacement power purchased by WAPA and its customers would likely be from carbon-emitting resources and would increase GHG emissions in the region. The EA should assess the impact of the Action on GHG emissions. Previous analysis showed that without GCD, an additional 2.4 million metric tons per 1,000 GWh would be emitted by the WECC."^4 Given the Departments of the Interior and Energy's commitments to maintain and expand renewable generation capacity, the importance of hydropower capacity to the overall power supply for the western United States, and the existing benefits of hydropower that avoids alternate fossil fuel greenhouse gas production^5, strong consideration should be given to the air emission impacts resulting from the Action. Please also include a sentence stating that WAPA and its customers may not be able to find replacement power, whether or not the Basin Fund has sufficient funds available, given resource scarcity during summer months. The paragraph referring to additional analysis for Flow Option A is based on outdated data, as confirmed at the AMWG meeting on February 16, 2023. A more likely scenario, based on recent market prices, is that the values included in the EA on hydropower/Basin Fund impacts are understated. Finally, the discussion of transmission congestion should be modified to remove statements about "reverse direction of historical operations" and "reversal of power;" these statements are confusing and inaccurate. New text should be provided by WAPA to reflect more current modeling by WAPA/NREL/Argonne and should state that societal effects will be felt across the Western Power Grid based on that analysis (emphasis added). 4 See Scientific Certification Systems, Life Cycle Impact Assessment (LCIA) of Glen Canyon Hydropower Generation System Compared to the WECC Baseline; Conducted in accordance with ISO 14044 LCIA Framework and the Draft SCS-002 Life Cycle Metrics Standard, Type III Life-Cycle Impact Profile Declarations for Materials, Products, Services and Systems, March 2009, p ii 5 See New Energy Frontier. Balancing Energy Development on Federal Lands. A Joint Report to Congress on Siting Energy Development Projects on Federal Lands. U.S. Department of Interior and U.S. Department of Agricultural. May 2011, pp. 28-31

Substantive Comments
The Experiment Appears Inconsistent with the LTEMP Goal of Restoring Natural Variability in Water Temperatures The draft EA describes the potential effect of the experiment on natural processes in Table 3-5 and indicates there would be no anticipated change under the no action alternative. The EA describes each of the proposed flow options as having a positive impact on natural processes because "colder water temperatures in the Colorado River during the flow operation could temporarily move ecological processes toward pre-drought conditions." These statements contradict the description of natural processes at section 3.4 of the LTEMP EIS. The goal identified in the LTEMP EIS is to "restore, to the extent practicable, ecological patterns and processes within their range of natural variability, including the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to those ecosystems." The EIS identifies the "major drivers of natural processes in river ecosystems, including regulated rivers below dams, are river flow, water temperature, sediment transport, and water quality (including nutrients and turbidity)" (LTEMP EIS at p. 3-58). Water temperature is a key driver, especially for plants, aquatic invertebrates, and fish. The LTEMP EIS identifies that "the construction and operation of Glen Canyon Dam has altered the ecosystem both above and below the dam" and "prior to construction of the dam, there was considerable seasonal and annual variability in flow and water temperature." The LTEMP EIS goes on to say that "water temperatures fluctuated seasonally between 0 degrees C (32 degrees F) and 30 degrees C (86 degrees F), with highest water temperatures occurring in summer" (LTEMP EIS at p. 3-58). Section 3.4 also states "the physical changes that have resulted from dam construction and operation include ... a decrease in mean main channel water temperatures." Thus, it seems contradictory to the LTEMP that cooler summer temperatures under the experiment, that would return the river to similar cold conditions as pre-drought, would be considered a positive effect on natural process. The LTEMP as described above, makes the argument that greater changes in temperature are needed to support natural processes, with warmer temperatures in the summer when the river used to get quite warm. We suggest a re-consideration of the impacts as they seem contrary to prior arguments made in the LTEMP EIS.
At the same time, GCROA would like to express our grave concerns about the continued viability of the recreational resource we depend upon -- the camping beaches and sandbars along the 277 miles of the Colorado River below Glen Canyon Dam. Frankly put, four years after the last High Flow Experiment (HFE), the sediment conditions continue to deteriorate significantly, exacerbated by violent monsoon storms as extreme weather events occur with greater frequency, and we are observing beaches experiencing severe erosion that can make camping extremely difficult, or in some locations impossible. Abundant scientific evidence supports the use of HFE's as the primary tool for sustaining shoreline habitats for native CRE fish and wildlife, and for rejuvenating recreational sandbars. Natural historical floods occurred during June, and CRE species and processes are adapted to a springtime flood cycle. In this time of prolonged drought, this is also potentially a more publicly acceptable timing.
As stated in the EA, entities that receive GCD generation allocations will be required to source replacement power under all four proposed scenarios. This resource loss will occur during peak demand periods for Arizona, during which replacement power is often difficult to source and cost-intensive to purchase. While this EA proposes much of this replacement power "may be wind [or] solar" (pg. 3-32), it subsequently acknowledges that it would most likely come from natural gas or similarly emitting resources via unspecified market purchase. Thus, the loss of GCD as a carbon-free power resource will most likely result in increases of regional greenhouse gas emissions across many GCD customers. The EA should give additional serious consideration to these elevated emission and economic impacts in each of the proposed scenarios.
The EA fails to meaningfully identify or analyze the affordability of replacement power for FES customers (many of which are at risk or tribal communities).
The Proposed Action as presented in the Draft EA constrains Reclamation to a limited set of tools to manage a dynamic river ecosystem that is changing more rapidly than expected. With that in mind, the EA should embrace flexibility, adaptation, rigorous monitoring, and include contingency off-ramps in decision-making and implementation to ensure the desired outcome of inhibiting SMB establishment below the GCD. The future of the humpback chub, sandbars, and the ecological integrity of the CRE in Grand Canyon depend upon such wisdom. Implementation of Option B with our recommended modification included, will require monitoring and feedback to improve management in perpetuity.

Substantive Comments
Section 3.3, page 3-11: CREDA submitted extensive comments during the LTEMP process regarding the cited 1987 Bishop study. CREDA's November 16, 2016 letter states in part: "The Fluctuation Index utilizes information derived from a 1987 study (Bishop et al),^3 which addressed recreational user preference for fluctuating flow levels. In that study, however, 10,000 cfs (not 8,000 cfs) was defined as "constant flows". We recommend reference to the 1987 study be removed, as it was mischaracterized in LTEMP, in favor of the work done in 2016 by Bari. 2 See: TechGuide.pdf (doi.gov), p. 9; Interior Environmental Statement Memorandum No. ESM 13-11, January 7, 2013, p. 5 3 See FEIS Appendix C, P. C-27, section 4.5
In particular, AEPCO notes in Section 5 which addresses transparency in the NEPA process, Order No. 3399 requires: b. Consideration of greenhouse gas (GHG) emissions and climate change impacts. Identifying important interactions between a changing climate and the environmental impacts of a proposed action in NEPA documents can help decision makers identify opportunities to reduce GHG emissions, improve environmental outcomes, and contribute to protecting communities from the climate crisis. When considering the impact of GHG emissions from a proposed action, Bureaus/Offices should use appropriate tools, methodologies, and resources available to quantify GHG emissions and compare GHG quantities across alternatives. When quantifying GHG emissions is not possible because tools, methodologies, or data inputs are not reasonably available, Bureaus/Offices will provide a qualitative analysis and the rationale for determining that a quantitative analysis is not warranted.33 33 Order No. 3399 at Section 5(b). The Smallmouth Bass EA provides the most cursory and perfunctory treatment of GHG impacts explaining that "[i]f less hydropower generation occurs at [Glen Canyon Dam], replacement power would most likely be provided from natural gas power plants, with a smaller portion supplied by coal-fired power plants. Non-renewable replacement power sources would be associated with increased greenhouse gas emissions as compared to hydropower generation."34 There is no analysis of the GHG emissions associated with the suggested alternatives. 34 Smallmouth Bass EA at 3-34. This failure to identify and consider the GHG impacts flatly contradicts the guidance from your office, violates NEPA, and flies in the face of Ninth Circuit precedent.35 The means to obtain the data inputs are easily obtained. The Bureau simply needs to contact the CRSP customers and ask how replacement resources may be sourced and what generation resources may be required to compensate for lost generation due to extensive bypass operations. If someone from the Bureau had contacted AEPCO, it could have provided some modeling of impacts associated with running either its coal or gas fired units to generate the power the Federal government has decided not to provide under its existing contracts. It was unreasonable not to ask, particularly if it is essentially Department of Interior policy to do so. This too, represents another example of how the Bureau has rushed to judgement with the Smallmouth Bass EA without full comprehension of the impacts and analysis of alternatives. 35 See 350 Mont. v. Haaland, 50 F.4th 1254 (9th Cir. 2022). The Ninth Circuit held that the Department of the Interior violated NEPA "by failing to provide a convincing statement of reasons why the project's impacts were insignificant. The 2018 EA failed to articulate any science-based criteria of significance in support of its finding of no significant impact (FONSI), but instead relied on the arbitrary and conclusory determination that the Mine Expansion project's [greenhouse gas] emissions would be relatively minor." Id. at 1258.
The EA describes severe financial impacts from each flow option, yet it fails to disclose its core assumptions. We are concerned that the analysis of these impacts to hydropower may be relying on cost metrics and comparisons that are no longer consistent with the LTEMP EIS by measuring from a reference baseline of power revenue that existed before drought impacts affected reservoir levels.
Re leasing water through bypass tubes has important dual purpose to control smallmouth bass All of the proposed action's Flow Options (A-D) expressly rely on releases from the bypass tubes in Glen Canyon Dam to lower temperatures in the Colorado River to create inhospitable conditions for smallmouth bass spawning. However, the other important purpose that is not emphasized in the EA, is that bypass releases are also critical to avoiding additional smallmouth bass passing through the dam. Therefore, until Reclamation can construct a barrier to downstream passage of nonnative fish through the dam, measures should be taken, not just to disrupt spawning of smallmouth bass already in Marble and Grand Canyons, but also to prevent as few nonnative fish as possible pass through the dam.

Substantive Comments
The West is experiencing extreme drought conditions and water levels have been dropping at Lake Powell. This has caused a decrease in power generation at GCD. As a result, residents and customers are already experiencing increases in power rates. Now is not the time to be conducting costly experiments at GCD. The uncertainty of disadvantaging nonnative species is outweighed by the known negative impacts which will be felt by millions of individuals if the proposed actions in the EA are executed. One of the main reasons the GCD exists is to provide power to the region. The proposed experiment would directly conflict with this mission of the GCD.
The Upper Division States, through the UCRC, strongly encourage Reclamation to provide additional information and clarifying text regarding the choice of 16 °C at the confluence with the Lower Colorado River as the target temperature, given that the following information in the EA appears inconsistent with that decision: 1. Recognition that the desired temperature will not be achievable at the Lower Colorado River confluence under some conditions. 2. Recognition that "[e]ven if it is not possible to achieve a temperature of 13°C, the flow would likely disrupt spawning even though data from the Yampa and Green Rivers suggests that smallmouth bass can continue to spawn when temperatures drop to 13.9°C (Bestgen and Hill 2016)." 3. Recognition that "since smallmouth bass were detected in the Glen Canyon reach in 2022, no smallmouth bass have been detected below RM 0. This means that even if it is only possible to change the temperature down to RM 45, implementation of the flows would still be effective at preventing spawning of smallmouth bass."
(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 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.
We feel that the EA does not provide sufficient analysis into the financial impact of bypassing hydropower production for those UAMPS members with firm electric services (FES) contracts and find that the EA cannot be the basis for a finding of no significant impact (FONSI).
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. WAPA provided a summary of this to Reclamation, but it was not included in the EA. Reclamation should fully evaluate economic impacts of the change of energy prices.
WAPA Requires Six 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 water releases. Under each of the proposed flow options, WAPA will be required to purchase substantial amounts of power and possibly transmission before the experiment is implemented to meet its obligations. 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 six weeks to arrange the purchases necessary for any flow option. This will require determining bypass volumes at least six 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.

Substantive Comments
Process for deciding between flow options in the proposed action is unclear The proposed action with flow options analyzed in the EA will provide Reclamation and its partners with the authority to operate Glen Canyon Dam flows in ways that disrupt spawning in smallmouth bass. This is in addition to the Framework to prevent nonnative fish species establishment below Glen Canyon Dam that was recently finalized and approved by the Glen Canyon Dam Adaptive Management Work Group ("AMWG"). What is not clear from either of these documents is how Reclamation or its partners will make decisions related to which flow option(s) may be pursued in a given year or what other management actions will be taken. While we understand the agency needs flexibility in this decision making, it would be helpful for the process to be transparent. Further, given the interaction of the flow options with spike flows and the existing HFE protocol (see the discussion below), it would be helpful for Reclamation to clarify when and if the HFE decision trees will be used in that context or if similar tables will be established for determining smallmouth bass flow options. Finally, it is not clear what role, if any, AMWG will have in providing recommendations to Reclamation regarding these flows and Reclamation's process and commitment to tribal consultation.
We believe that of the options proposed, that Options B and A offer the greatest likelihood of success to protect native fish. The additional advantage of cold water releases to maintain water temperatures below 16 degrees Celsius during the potential spawning window for smallmouth bass means that these releases will also provide a benefit to the rainbow trout fishery. Summer and fall water temperatures have of late approached 20 degrees Celsius or more, and add quite a bit of stress to the trout in the Lees Ferry Reach.
The EA notes that the 2007 Interim Guidelines ("2007 Guidelines") govern GCD annual releases, and the LTEMP operates within those guidelines and underlying authorities. However, the ongoing Supplemental Environmental Impact Statement (SEIS) process could significantly alter operations under the 2007 Guidelines, including annual release volumes and other GCD operational adjustments during the flow implementation period. While this EA acknowledges that sub-annual releases must be consistent with the outcome of the SEIS and will not result in a cumulative impact to water resources, it does not reflect the potential for cumulative impacts to hydropower resources. This EA cannot fully assess potential impacts of the proposed flow options to the hydropower LTEMP Resource Goal until more information is available in the SEIS process. In addition to the timing challenges noted above for managing reliability of power supplies with the shortened timeframe proposed in this EA, the full impacts of the Proposed Action cannot yet be fully quantified, which further exacerbates any reliability concerns.
The EA fails to meaningfully identify or analyze the impacts on the Upper Colorado River Basin Fund (Basin Fund) and the implications those impacts have on the ongoing operation of the CRSP facilities and programs it funds.
Broader purpose and need could help meet additional LTEMP resource goals Reclamation engages in this targeted EA to address the immediate threat to the humpback chub in Marble and Grand Canyons from establishment of smallmouth bass below Glen Canyon Dam. Reclamation articulated this very specific purpose and need in the EA at 1-5. The Trust appreciates the urgency of this situation and the need to address it in a focused manner; however, we also believe that with a slightly broader purpose, Reclamation could consider, evaluate, and prioritize the benefits of these actions-not only to remove the threat of smallmouth bass for the humpback chub-but also to contribute to furthering other important resource goals enumerated in the LTEMP that ensure compliance with the mandates of the Grand Canyon Protection Act. A primary example of this would be designing flow spikes in Flow Options B and D of the proposed action that disrupt smallmouth bass spawning but also operate like or with HFEs to build sandbars and mobilize sediment to enhance archeological and cultural resources, natural processes, riparian vegetation, and recreational camping. If the purpose and need is too narrow, however, Reclamation may be passing up an important opportunity to create much needed environmental benefits to Marble and Grand Canyons.

Substantive Comments
Duration of the flows In your draft EA, chapter 2.2.1 you state that these flow options would occur for up to three years starting in 2023. The Service has previously stated that we see these plans are in accordance with the LTEMP Biological Opinion which has an expiration in the year 2036. We believe that Reclamation may desire to pursue similar actions in the remaining years of the LTEMP and we recommend that Reclamation not put a three-year window on these flow options, rather leave the options available during the life of LTEMP. Additionally, in chapter 2.2.1 you state that action would be triggered when the temperature at the Little Colorado River (LCR) is predicted to be 15.5°C using a recent model of thermal suitability for fishes in this reach (Dibble et al. 2021). Though it is not explicitly stated in your description of the proposed action and alternatives, we assume that it is Reclamation's intention to maintain less than 16°C temperature at the LCR during the specific period (five months) in which SMB spawning and nesting are likely to be successful. We come to this conclusion by considering the data presented in Table 3-2 titled "potential 5-month flow impacts to power generation and firming expenses, as estimated by WAPA". Based on early modeling exercises, when temperatures are maintained below 16°C through the course of a season there is a greater likelihood of preventing SMB population growth (Young et al. 2022). As such, we believe that the action alternative, if used through the course of SMB spawning and nesting season, would be more effective than if only applied periodically during the spawning and nesting season.
The Proposed Action boxes BOR into a limited set of options to manage a dynamic system that has demonstrated an unwillingness to perform according to human expectations. With that in mind, the EA should build flexibility, adaptation, monitoring, and off-ramps into its decision-making process and implementation plan to ensure the desired outcome of inhibiting SMB establishment below the GCD. The very future of the humpback chub, camping beaches, and sandbars of Grand Canyon depend upon it.
We understand the desire for a range of flow options for flexibility and adaptability in preventing the establishment of smallmouth bass in Grand Canyon over the three-year period covered by this EA. Two of the proposed flow options include flow spikes. Naturally timed, cooler water high flow releases can disrupt the spawning of smallmouth bass - a strategy that has proven effective on the Green River below Flaming Gorge Dam. Accordingly, GCROA supports the unique opportunity to conduct a LARGER MAGNITUDE FLOW SPIKE under sediment-enriched conditions this June by taking advantage of water that was held back in Lake Powell but must be released this summer. In particular, we suggest modifying Flow Option B: Cool Mix with Flow Spikes to utilize this "extra DROA water," which could also potentially help extend cooler water and spawning disturbance downriver below the Glen Canyon reach, as the best, most effective tool for benefitting multiple resources and inhibiting smallmouth bass establishment. We absolutely must capitalize on these conditions which are not likely to exist in the near future, given the climate responses we are experiencing.
Grand Canyon National Park should not become an ecological sacrifice zone by allowing current operations to continue under the "No Action" alternative. Instead, BOR must take actions to lower temperatures in the Colorado River below the Glen Canyon dam - this will help reduce the reproductive potential of invasive fish like smallmouth bass that have managed to enter the lower Colorado river basin. It is crucial to saving the ecosystem and protecting the native fish species like the humpback chub, which were recently down listed from an endangered species to threatened species because of their successful restoration within the Grand Canyon.
Smallmouth bass establishment would be a big problem requiring a big response The Secretary of the Interior's designee directed Reclamation and the Grand Canyon Monitoring and Research Center to work with the GCD Adaptive Management Working Group (AMWG) to develop flow options to disrupt or prevent spawning of SMB and other invasive fish species that pass through the dam. The Service endorses this action because the science indicates that the risk of SMB establishment is reduced through cold water discharges intended to disrupt their spawning (Bestgen & Hill 2016; Bestgen 2022; Yackulic & Eppehimer 2022; Young et al. 2022). Prevention of the establishment of SMB is the overarching goal for this partnership. Thus, we see this action as one of a number efforts that could be used to prevent establishment, including specific targeted removals (Rogers 2015; Bestgen & Hill 2016) and/or infrastructure management (Svoboda 2022; Lewis et al. 2023). We encourage Reclamation to continue a coordinated effort to prevent escapement and entrainment of fishes out of Lake Powell and into the Colorado River downstream. Should these efforts not be available in time and the action be ineffective, targeted removals like those undertaken in the fall of 2022 (Reclamation 2023) would be implemented to reduce propagule pressure in Lees Ferry with hopes of limiting downstream movement. By current estimations, the populations of federally threatened Humpback Chub (HBC; Gila cypha) in the Grand

Substantive Comments
Canyon represent more than 90% of all the known HBC (Appendix 1). Should additional non¬native species become established in the Grand Canyon due to entrainment from GCD and the appropriate habitat conditions exist for their growth, the threats to HBC would increase (USFWS 2018). Given the importance of the Grand Canyon population to the recovery of this species any additional threats would be seen as counter productive to the efforts that have been made by the HBC recovery partnership in Grand Canyon.
It is undeniable that that the Proposed Action would likely have negative impacts on hydropower generation in spring 2023. See DEA, p. 3-50. We also share some of the concerns that have been raised regarding further reduction in hydropower generation this spring and summer, which is already limited by the ongoing drought and low levels in Lake Powell. However, the potential impacts to hydropower as a result of the Proposed Actions contemplated under the DEA would be limited in duration and measures could be implemented to effectively mitigate the impacts. We disagree with the DEA's finding that the No Action alternative would result in "no change" to hydropower and energy resources. As stated above, if no or insufficient action is taken to prevent establishment of SMB now, the costs to manage the population would likely increase exponentially in a short period of time. The additional management actions required to suppress or eradicate rather than prevent establishment of SMB could have more significant, long-term impacts on hydropower generation. The science shows it may be impossible to eradicate SMB from below the dam, resulting in irreparable impacts to humpback chub and other native aquatic species in the Colorado River Basin. As explained by the U.S. Fish and Wildlife Service (FWS): under conditions where SMB or other warm-water nonnative predatory species become established in the Grand Canyon the predation threats to federally listed species, like the HBC become greater. For Reclamation, to take no action due the cost alone would be counter to policy and strategy (U. S. Department of Interior 2020, 2021), with respect to the commonly documented invasion curve which describes the theoretical relationship between the area occupied, time since introduction, and the cost of prevention, eradication, containment, and long-term management (U. S. Department of Interior 2021). The cost to control SMB if no action is taken, are likely to grow exponentially beyond the estimates presented in Table 3-2 of the EA.^26 26 Letter from Heather Whitlaw to Reclamation Regional Director (Mar. 10, 2023), p. 3. Western Area Power Administration (WAPA) and other stakeholders have expressed concern regarding the potential cost of replacement power.^27 However, as WAPA has noted, the financial impacts related to the increased cost of replacement power this summer could be mitigated with appropriations or other Reclamation funding sources.^28 The National Park Service (NPS) has further described opportunities to mitigate the costs of bypassing the generation units: 27 See letter from Brian Sadler to Sarah Bucklin (Dec. 15, 2022), p. 2. 28 Id. Our understanding is that there are several ways to reduce costs from the use of bypass. If more SMB are not discovered in the Grand Canyon in 2023 or outyears, but only in the Lees Ferry reach in Glen Canyon, then it may be possible to use less bypass to cool only the Glen Canyon reach portion of the river. As other decisions are made on water allocations for the year, such as how much water is retained in both Lake Powell and upstream reservoirs, it's possible that temperature may not rise as much below the GCD as currently predicted, and this will decrease the need for bypass thereby decreasing costs. The action alternative has several options to choose from with differing costs, and while we feel strongly that option B is the most efficient, the action alternative appears to allow adjustment if needed in a given year between options and could be one way to control costs, as long as Reclamation still chooses options that are efficient enough for the goal of preventing SMB establishment. Finally, our understanding is that if these operations are anticipated in power purchase contracts well in advance, then replacement power is much less expensive than if those contracts do not anticipate this action. Accordingly, there are several ways to control the costs of this action, but not taking this action is likely to cause many negative impacts to the native species below the dam.^29 29 See letter from Brian Drapeaux to Wayne Pullan (Mar. 10, 2023), p. 5. Reclamation's implementation process for the Proposed Action should include development and implementation of measures to effectively mitigate impacts of GCD releases that forego power generation. There are multiple factors that have contributed to conditions favorable to SMB below GCD and the costs of management actions to address the problem should be allocated equitably, especially given the benefits of preventing SMB establishment will run to all Basin stakeholders.
While the analysis in the EA overall may show that some impacts are negligible or temporary, other impacts resulting from reduced hydropower generation may be significant. Reduced hydropower generation has the potential to impact the reliability of the electric grid in the Colorado River Basin, affect market prices, and have a significant financial impact on WAPA's customers.

Substantive Comments
We recognize that balancing the priorities outlined in the draft EA is a complex and challenging task. As you move forward, we respectfully request that the significant risks that reduced hydropower generation will have on the region be taken seriously. If an alternative flow option or non-flow option that avoids significant impacts to hydropower cannot be identified, we urge you to adopt the "No Action" option to avoid these significant risks.
The EA also omits discussion of the results from Stevens et al. (2020), which experimentally and statistically showed that macroinvertebrate production and diversity, especially with respect to Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies), collectively referred to as "EPT" species, were affected more by sedimentation of mainstem habitats than by other variables including cooler water temperatures, water chemistry, or flow fluctuations. These findings should be included along with and a more balanced discussion of other factors that may be affecting food-base quantity and diversity below Glen Canyon Dam.
Reclamation needs to take advantage of the opportunity in 2023 to create environmental benefits in the Grand Canyon as mandated by the GCPA Based on several factors that appear to be aligning in 2023, Reclamation may have a unique opportunity to move water through Marble and Grand Canyons-even under lower annual releases and reservoir elevations-in a way that could protect and improve resource conditions in the canyon as mandated by the GCPA. First, "sediment-enriched conditions are anticipated to exist in Marble Canyon through summer 2023, resulting from high sediment inputs from the Paria River during the fall HFE accounting period in 2022." EA at 3-23. GCMRC scientists indicated that "current sediment conditions support a high flow of up to 40,000 to 45,000 cubic feet per second and up to 72 hours anytime between fall 2022 and summer 2023."^9 Second, based on water that was released from Upper Basin Reservoirs and held in Lake Powell under the Drought Response Operations Agreement ("DROA"), 523,000 acre-feet of water will need to be released from Glen Canyon Dam this summer. And, finally, this EA, if modified as suggested by the National Park Service and GCMRC to revise the sediment accounting window, could allow for various opportunities for cool water releases, smallmouth bass flow spikes, and/or a rare spring HFE to both address smallmouth bass and build sandbars^10 for the first time in nearly 5 years. The last time a spring HFE was created in the Grand Canyon was in 2008. 9 Id. 10 "Sandbars form a fundamental element of the river landscape and are important for vegetation, riparian habitat for fish and wildlife, cultural resources, and recreation." EA at 3-25 "Low-elevation sandbars are also a source of sand for wind transport that may help protect archaeological resources." Id.
BOR should select "Cool Mix with Flow Spikes" and "Cool Mix" options (Flow Options B and A) to maximally prevent (rather than just disrupt) small mouth bass reproduction and establishment and to avoid jeopardy under the Endangered Species Act. The emergency facing humpback chub demands BOR heed the flow recommendations of scientists who, informed by years of research and adaptive management, have carefully developed plans to experimentally manage federally listed and native fish with Glen Canyon Dam flow various regimes. Those actions must not be delayed. The proposed action should explicitly prioritize the actions that are likely to achieve the purpose and need of the EA: the "Cool Mix with Flow Spikes" and "Cool Mix" options (Flow Options B and A). BOR must prevent smallmouth bass reproduction and safeguard Grand Canyon's fish species, several of which rely on Grand Canyon and its tributaries to sustain their populations. Environmental flow actions like this are the safest way to ensure a healthy Colorado River in Grand Canyon without potentially harmful and less effective chemical treatments or electrofishing. Importantly, drought should not be used as an excuse to postpone or cancel any flow management action that would benefit native fish or redistribute sediment in Grand Canyon. In 2021 and again in 2022, a High Flow Experiment (HFE) was skipped despite U.S. Geological Survey scientists reporting the proper conditions for a 192 hour (8 day) HFE for the first time ever under LTEMP, and while sandbar size was the lowest in ten years. BOR decided not to implement the HFE because of "concerns about pool elevation and the Basin Fund, although there would have been a positive effect on sediments especially given the unprecedented drought conditions." This is despite the acknowledgement that HFEs do not affect annual water release volumes. Again, we point to the Grand Canyon Protection Act, which is clear about the mandate to "operate Glen Canyon Dam... in such a manner as to protect, mitigate adverse impacts to, and improve" Grand Canyon. Flow spikes, which are likely to improve the effectiveness of the proposed action, should be employed every time there is enough sediment to ensure that beaches and sandbars will be improved, and never when sediment models predict detrimental impacts to sediment resources. Since sediment resources are favorable in 2023, a flow spike should absolutely be implemented with the Cool Mix (Flow Option B - Cool Mix with Flow Spikes) during the spring or summer of 2023.

Substantive Comments
BOR should implement Flow Options A and B because they are likely to "disrupt or prevent spawning of smallmouth bass and other nonnative, invasive warmwater fish species." EA at 3-7 (emphasis added). BOR should not rely on Flow Options C and D because, instead of preventing spawning, these flows are only designed to disrupt spawning, and are only likely to "result in population decreases" for fish that "are spawning at the time of these releases." EA at 3-7.
The EA has a sparse and inadequate analysis of impacts to recreational boating. It limits the analysis area to the reach between the dam and the Little Colorado River (LCR). In doing so it ignores over 160+ river miles below the LCR that includes critical camping beaches as well as the most severe impediments to navigability (rapids), yet concludes that 'all four flow options would affect a relatively small portion of the Colorado River used by boaters in the Grand Canyon' and further concludes (albeit limited to the analysis area) that 'Flow Options B and D would produce flows that would likely improve boater navigability in the Grand Canyon.' The analysis area should be expanded to include the entire stretch of river impacted by the flow options proposed, while expanding the analysis of impacts, both positive or negative, to the camping beaches depended upon by over 24,000 river users annually.
Most notably, the proposed actions in the EA would likely constitute major federal action, thus requiring a more exhaustive EIS, as required by NEPA.^5 Additionally, Reclamation's own requirements for implementing NEPA would also likely require an EIS because of the foreseeable impacts on existing GCD operations as well as multiple entities relying on regularly programmed operations at GCD.^6 The EA fails to analyze alternative approaches to managing the invasive fish populations below the GCD. Each of the proposed options in the EA involves the use of the bypass tubes and, therefore, only considers a single solution. An EIS would include a more comprehensive analysis of a reasonable range of alternative choices to manage the nonnative fish populations while considering economic, technical, and other factors. 5 43 C.F.R. § 46.400. 6 516 D.M. 14.4 (Major Actions Normally Requiring an EIS). For these reasons, we encourage Reclamation to forego any plans to implement any of the proposed actions in the EA.
The EA fails to meaningfully identify or analyze the affordability of replacement power for CRSP FES customers.
Based on the Grand Canyon Monitoring & Research Center's recommendations, I support disrupting SMB spawning in order to inhibit their establishment, while maximizing sediment and minimizing erosion--under Options B and D, with Option B cool mix and flow spikes as the most effective means.
Please consider adding a definition for "establishment" recommend considerations from general invasion literature (Beck et al. 2008; U. S. Department of Interior 2020, 2021).
While we think that Option B will likely be the most effective strategy, our recommendation would be to start with Option A, and move to Option B if warranted. We advocate for an effective monitoring process to accompany any flow option considered. In the case of Option A, if that option is employed, it would be very important to determine if the water level spikes associated with Option B are needed before they are implemented. Our concern is that these flow spikes could have a detrimental impact on young of year rainbow trout in the shallows. If smallmouth bass and other warm water predators are found in the backwaters in concerning numbers during Option A flows, we support the use of the flow spikes described in Option B.
Finally, the Pueblo of Zuni, the Hopi Tribe, and other tribes have expressed significant ongoing concerns regarding taking of life in the Marble and Grand Canyons. Specifically, the tribes oppose many, if not all, of the measures proposed by Reclamation to prevent the establishment of smallmouth bass in the Colorado River downstream of Glen Canyon Dam detailed in this EA and otherwise. Given these concerns, we strongly encourage Reclamation and other partners to prioritize and elevate consultation with the Grand Canyon affiliated tribes to understand their interests, consider alternate solutions that do not conflict with their culture and values, and do so in a way that allows adequate time and engagement to ensure meaningful consultation and to influence outcomes. This consultation should be ongoing, not just during the EA process, including during planning, design and implementation of actions related to preventing establishment of nonnative fish in the Grand Canyon, and should include travel to respective reservations to reduce barrier to conversation and consultation. Further, preventative methods- such as creating a barrier in Lake Powell to ensure non-native species do not pass through the dam-have long been advised as an action Reclamation could take that may not conflict with values of and cause harm to tribes and Native communities. We strongly

Substantive Comments
recommend that these proactive solutions be expedited and prioritized to carry out the agency's trust responsibility to the tribes and Native communities with ties to the Colorado River and its canyons.
The decision-making process for implementing, switching or cessation of options should follow the same communication and consultation processes that have been developed according to Section 1.4 of the Long-Term Experimental and Management Plan Record of Decision. Reclamation should provide sufficient parameters on when to commence that process, as well as provide at least a 30-day notice to the representatives prior to initiating implementation of any alternative(s) decided under that process.
Another unconsidered option would be propagation and release of a large number of mature, predatory endangered Colorado River pikeminnow. This option would require low cost in a medium-to-long-term timeframe, with medium levels of compliance, and low implementation cost. It would lead to a maximum possible ranked score of "7", tying it with implementation of a sorting facility. All non-flow options will also require continued monitoring, likely in perpetuity.
The scope of the environmental justice analysis in this environmental assessment is purposefully narrowly defined to only Coconino County, Arizona, and only considers the impacts on recreation from changes in dam operations (p. 3-34). This EA fails to consider the disproportionate environmental adverse effects of the various operational alternatives, including the cumulative effects of implementing over a decade of lethal management actions, on the community of Zuni located in the Zuni Reservation, McKinley County, New Mexico. This environmental justice analysis demands inclusion of the adverse effects to the community of Zuni from lethal management actions; including flows that are intended to retard, restrict or disadvantage smallmouth bass reproduction. To impose pre¬determined standards, metrics, checkboxes, are artificial spatial containers on environmental justice matters, as Reclamation has attempted to do so far with this EA, is itself to perform a social and environmental injustice on and serves as a barrier to building equity for the Zuni people and Zuni Tribe. This fact was documented in a letter to U.S. President Joe Biden on July 1, 2021, by the Pueblo of Zuni, a letter which was provided to Reclamation that same month and year.
Coupling treatments to control undesirable resource elements while benefiting desired natural resources, such as sandbar and beach habitats, is core to adaptive ecosystem management, and should play a strong role in prioritization in the selection of a preferred option in the alternatives for this EA. It has repeatedly been shown that single-species management is ineffective as an ecosystem management approach due to the complexity of habitat X species X assemblage interactions. Therefore, we emphasize the importance of evaluating whole-system impacts and recognizing the complexity and uncertainty of these dynamic systems, especially under accelerating climate impacts. We additionally emphasize that the preferred Option(s) needs to provide the greatest benefit to ecosystem and program integrity, by coupling prevention of SMB establishment with other resource benefits, particularly those related to improvement or enhancement of habitat, such as sandbar rejuvenation.
In the event of an electrical emergency, as could result from insufficient generation on the electrical system to meet demand causing citizens to lose power through blackouts and brownouts, WAPA will request that Reclamation modify the experiment for the duration of the emergency. If it becomes evident that this experiment is contributing to increased instances of electrical emergencies, WAPA will ask that Reclamation suspend the experiment.
Furthermore, the depth of the impacts on the project purpose of hydropower and the direct effects of not generating hydropower to manage a nonnative species has not been analyzed in the Smallmouth Bass EA. This is the fundamental problem with the process pursued by the Bureau. By opting for the short cut of an EA, the Bureau has failed to consider multiple impacts which indicate the proposed action rises to the level of a major federal action which will significantly affect the quality of the human environment. Pursuant to NEPA, the Bureau must therefore perform a Supplemental Environmental Impact Statement (SEIS) to adequately evaluate the impacts that could result from the proposed action.
While SRP's time of use pricing programs and customer demand response programs have proven more effective on weekdays, its service area has demonstrated a possibility of high electric system demands on weekend afternoons. Over the past decade, three of SRP's last ten system peaks have occurred on summer weekend afternoons. Flexibility around scheduled days of hydrogeneration unavailability could benefit regional reliability as well as the economic value of limited GCD hydrogeneration.

Substantive Comments
NPS has concerns about the action alternative in terms of how many years this may be used and how the process would be implemented for choosing which options in the action alternative to employ in a given year. The EA states it may be used for up to three years, but it appears that it might be four years before another Reclamation EIS (the Post 2026 process) may be in place leaving one year without this control measure before any other compliance might be in place to address these issues. NPS has described throughout this response that to protect the largest subpopulation of the federally listed humpback chub (more than 90% of the adults in the entire population), a combination of three major tools (this action alternative to cool the river, escapement prevention devices, and rapid response efforts in `hotspots') may be needed for several years to stop the establishment of SMB if GCD operations stay in the operating range near powerpool. If the tools in the action alternative in this EA are used for a period of years and the level of Lake Powell is able to increase above the 3550' or 3560' 1 within a few years and is maintained above that elevation, this tool may not be necessary again, but it is uncertain at this point, and it seems prudent to allow this tool to be available for the years preceding future EIS processes related to GCD operations.
Consequences of the no action alternative In the EA table that summarizes anticipated effects on LTEMP resource goals (Table 3-5), Reclamation describes the consequences of no action and the flow options. There is one LTEMP resource goal that would be impacted under all possible flow actions, hydropower and energy. This presents a serious challenge to the GCD AMWG and the Service does not take lightly the importance of power generation. However, under conditions where SMB or other warm-water nonnative predatory species become established in the Grand Canyon the predation threats to federally listed species, like the HBC become greater. For Reclamation, to take no action due the cost alone would be counter to policy and strategy (U. S. Department of Interior 2020, 2021), with respect to the commonly documented invasion curve which describes the theoretical relationship between the area occupied, time since introduction, and the cost of prevention, eradication, containment, and long-term management (U. S. Department of Interior 2021). The cost to control SMB if no action is taken, are likely to grow exponentially beyond the estimates presented in Table 3-2 of the EA. Further, in your EA you allude to costs being "likely be more expensive" (Section 1.8) but do not specifically state why these costs are higher.
The Cool Mix with Flow Spikes (Flow Option B) should be implemented this year in an attempt to disrupt spawning in margin habitats as well as the rivers core. The goal should be to completely disrupt spawning of smallmouth bass, beginning as soon as possible.
We write to you today with that goal in mind, as the proposed bypass flows will further reduce generation from Glen Canyon Dam, crash the Basin Fund, trigger a cost-recovery-charge, and put additional strain on the already limited summer energy resources in the West.
We believe that Option B represents the most viable and cost-effective solution for mitigating the impacts of smallmouth bass on native fish populations in the Colorado River. It is consistent with the goals of the Glen Canyon Dam Adaptive Management Program and the Endangered Species Act, which require the protection and recovery of endangered and threatened species in the Colorado River ecosystem.
As an electric utility that frequently partners with the Federal Government, AEPCO is well aware of the procedural requirements of NEPA. While AEPCO searches for opportunities to move expeditiously forward on projects with its Federal partners, AEPCO is reminded on every occasion that it must abide by the strictures of NEPA. AEPCO has been told repeatedly that NEPA is the "basic national charter for protection of the environment."3 Further, AEPCO must honor NEPA's twin aims. First, "it places upon an agency the obligation to consider every significant aspect of the environmental impact of a proposed action. Second, it ensures that the agency will inform the public that it has indeed considered environmental concerns in its decision-making process."4 3 Ctr. for Biological Diversity v. United States Forest Serv., 349 F.3d 1157, 1166 (9th Cir. 2003) (internal citations omitted). 4 Id. As a consequence, NEPA requires Federal agencies, such as the Bureau, to take a "hard look" at environmental consequences of the agency's proposed action and "emphasizes the importance of coherent and comprehensive up-front environmental analysis to ensure informed decision making to the end that the agency will not act on incomplete information, only to regret its decision after it is too late to correct."5 NEPA's hard look requirement "includes determining whether the agency adequately evaluated all potential environmental impacts of the proposed action, analyzed all reasonable alternatives to the proposed action, and identified and disclosed to the public all foreseeable impacts of the proposed action."6 5 Id. 6 Ctr. for Biological Diversity v. United States Blm, No. 3:17-CV-553-LRH-WGC, 2019 U.S. Dist. LEXIS 7525, at *11 (D. Nev. Jan. 15, 2019) citing 42 U.S.C § 4332(2)(C) (emphasis added). An EIS is required for "major Federal actions significantly affecting the quality of the human environment . . . ."7 Procedurally, "[t]he agency first prepares an EA to determine whether an action

Substantive Comments
will have a significant impact, thus requiring preparation of an EIS."8 An EA is a "concise, public document' providing 'sufficient evidence and analysis' for the agency to determine 'whether to prepare an environmental impact statement." Thus, an EA is intended to help an agency decide if an EIS is warranted; an EA is not meant to replace or substitute for an EIS.9 In accordance with Ninth Circuit precedent, a violation of NEPA occurs when a federal agency fails to provide a "convincing statement of reasons to explain why [the] project's impacts are insignificant."10 7 Envtl. Prot. Info. Ctr. v. United States Forest Serv., 451 F.3d 1005, 1009 (9th Cir. 2006) citing 42 U.S.C. § 4332(2)(C). 8 Id. citing 40 C.F.R. § 1508.9. 9 Envtl. Def. Ctr. v. Bureau of Ocean Energy Mgmt., 36 F.4th 850, 872 (9th Cir. 2022) (internal citations omitted 10 350 Mont. v. Haaland, 29 F.4th 1158, 1163 (9th Cir. 2022) citing Bark v. United States Forest Serv., 958 F.3d 865, 869 (9th Cir. 2020). Under NEPA, a federal agency is statutorily mandated to prepare a SIES if "[t]he agency makes substantial changes in the proposed action that are relevant to environmental concerns; or...[t]here are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts."11 Here, the U.S. Supreme Court has stated that "in the context of reviewing a decision not to supplement an EIS, courts should not automatically defer to the agency's express reliance on an interest in finality without carefully reviewing the record and satisfying themselves that the agency has made a reasoned decision based on its evaluation of the significance, or lack of significance, of the new information. A contrary approach would not simply render judicial review generally meaningless but would be contrary to the demand that courts ensure that agency decisions are founded on a reasoned evaluation 'of the relevant factors."12 As discussed in detail below, significant new circumstances and information relevant to hydropower concerns and bearing on the proposed action exists. Therefore a SIES is required. 11 40 C.F.R. § 1502.9(c). 12 Marsh v. Or. Nat. Res. Council, 490 U.S. 360, 378, 109 S. Ct. 1851, 1861 (1989)
All the proposed modified flow options in the EA would result in significant lost power generation at GCD ranging from 380 GWh to over 560 GWh over 5-month periods for each year. Additionally, the timing of the lost power generation would occur during peak summer months when electricity demands are at their highest. The impacts of the lost power generation would affect market prices, transmission congestion, and even potential cost-recovery charges for Upper Colorado River Basin Fund obligations. Power customers would be forced to find more expensive replacement power which may not be available at any price. The financial burdens created by the proposal will significantly impact the communities relying on power output from the GCD which will likely take years to recover from. Furthermore, those who would bear the increased costs of the proposed experiment are those from a region including underserved and disadvantaged populations-those who are least likely to afford these negative impacts.
However, the record reveals that WAPA has doubts as to both the cost and availability of replacement power. As set forth in a letter from WAPA to the Bureau on December 15, 2022, WAPA representatives state: WAPA is currently experiencing difficulty in purchasing even modest amounts of energy on the market. WAPA does not know if replacement electrical power is available for the Flow Options that require water bypass and thus reduce energy production as part of the experiment. An analysis must be completed to determine if replacement energy is available and if so identify if sources are from renewable sources or from fossil-fuel generation.43 43 Smallmouth Bass EA at 134. Further, WAPA informs the Bureau that "[t]here is considerable uncertainty in power costs for the summer of 2023. If GCD generation is reduced and replacement power is available, it will be costly."44 If anything, WAPA's correspondence reveals a substantial environmental controversy which underscores the need for the Bureau to convene at minimum a public hearing or public meeting. From AEPCO's perspective, the Bureau has not taken the hard look at hydropower impacts as required by NEPA. Moreover, the interaction and portrayal of WAPA's comments illuminates the need for a SEIS and a more thoughtful process overall.
The CRCNV is concerned that the estimated impact to hydropower may be significantly understated. Based on the models developed by the federal agencies, in conjunction with National Renewable Energy Laboratory and Argonne National Laboratory, the estimated impacts to hydropower generation range from $41 to $81.2 million, depending upon which of the 4 bypass flow options is selected. Depending on the assumptions made about system operating conditions and market prices in those models, the cost may be much greater. For example, it is unclear from the draft EA whether normal operating conditions were simulated or whether stressed grid conditions were modeled such as those that occurred during the summer of 2022, when imports out of California were constrained and Western Area Power Administration ("WAPA") was called upon to provide emergency power to the grid. It is worth noting that hourly market prices during those constrained hours reached over $1000/MWh. It is also unclear whether the models take into

Substantive Comments
consideration the possibility that market prices could rise in the region because of the loss of Glen Canyon Dam generation, impacting others in the region besides WAPA and its customers. The CRCNV recommends that the Bureau provide the modeling assumptions behind the impact calculations in the draft EA and, for each flow option, provide a range of impact calculations that reflect both normal operating conditions and stressed operating conditions.
SRP's power generation resource needs are increasing in the coming years, driven by projected continued significant growth in its service territory and commitments to retiring coal generation facilities. In addition, the western power grid lacks surplus capacity due to resource retirements and delays in replacement resources created by supply chain and other challenges. As a result, SRP will not be able to count on the market to provide the capacity that is needed in the coming year. The scarcity of capacity has been validated by third party studies, including a recent study of the Desert Southwest by E3, an independent environmental and economic consulting firm. 1 E3 found that "load growth and resource retirements are creating a significant and urgent need for new resources in the Southwest region; maintaining regional reliability will hinge on whether utilities can add new resources quickly enough to meet this growing demand and will require a pace of development largely unprecedented for the region." E3 also found that "[e]xisting and committed resources alone will be insufficient to meet the region's reliability needs. Filling this gap will require close to 4,000 MW of new effective capacity by 2025...." For these reasons, SRP has made deliberate efforts to not rely on short-term purchases to cover resource needs and counts on GCD hydropower resources in its near-term planning. The E3 study included an exploration of drought impacts on reliability related to Colorado River Generation. As the report concludes, "Utilities in the region who rely on these resources for a share of their capacity needs should plan proactively for the full range of future outcomes, lest they be caught unprepared and without recourse to cure a deficiency caused by drought conditions. Utilities that do not rely on these resources to meet their needs may not be impacted as directly; however, hydro resource availability will have impacts on wholesale markets, and critical conditions could reduce these utilities' opportunities for short-term transactions that may be needed in real-time operations to maintain reliability." While SRP has taken steps to plan for unavailability in future years based on hydrologic conditions, SRP does not have near-term solutions to replace GCD's capacity for near-term proposed policies. If GCD is not generating power during peak summer months at critical hours in a region that is already without surplus capacity, SRP does not anticipate replacement power to be available for purchase during those times. The PLEXOS model referenced in the EA assumes free exchange and allows dispatch of any amount on any transmission path; the model does not include assumptions for unexpected outages, operation and capacity margins, or summer peak conditions.
Lastly, the main cause of the issue at hand, lower water levels in Lake Powell, which allow small mouth bass to pass through the Glen Canyon Dam, must also be addressed. With projections of increased drought conditions, Lake Powell water levels need to be addressed more broadly and long-term solutions need to be considered to not only prevent the small mouth bass from entering the Grand Canyon, but to protect the entire Grand Canyon ecosystem.
We believe consideration of the action alternative in this EA is important and urgent to address the impacts of dam operations on the native fish communities and the federally listed fish below the Glen Canyon Dam (GCD). There is a danger to the federally threatened humpback chub and other native fish in Glen and Grand Canyon downstream of the dam from the escapement of warmwater non-native fish through the dam and the warmer river temperatures that occur in the lower operating range of Lake Powell (falling below the 3525'-3540' level). If smallmouth bass (SMB) or other highly predatory non- native fish breed and establish in the Colorado River downstream of the dam, there is a strong possibility of their establishment in both the mainstem and tributaries in Grand Canyon. This could result in negative impacts to many of these native fish populations, including the federally listed fish populations, over the coming years. There is evidence from the upper basin that the presence of invasive fish like smallmouth bass (SMB) has been the largest determining factor in declines in native and federally listed fish in the last 20 years (Johnson et al. 2008, Martinez et al. 2014). The 2018 USFWS species status assessment for Humpback Chub concluded that, "Predation is a major threat to the Humpback Chub in the Grand Canyon-as in the upper basin," and that "Smallmouth Bass present the highest potential impacts to Humpback Chub because the species can co-occur with Humpback Chub in certain canyon habitats and is a potential predator across its entire life history" (USFWS 2018). Recent statistics suggest that the Grand Canyon is home to over 90% of the known population of adult humpback chub (based on updated information from USFWS - see graph and citations in figure legend). All of the other remaining subpopulations of humpback chub have been impacted by the presence of SMB and other predatory non-natives (USFWS 2018). SMB are a

Substantive Comments
threat to the Grand Canyon humback chub population and to the species as a whole. Figure 1. Current adult population abundance estimates (N) with upper and lower confidence intervals for Humpback Chub (Gila cypha) at six locations throughout its range. Estimates taken from most current and available reports (Badame 2008; Francis et al. 2016; USFWS 2018; Hines et al. 2020; Caldwell 2021; Van Haverbeke et al. 2022, 2023) (SEe Figure 1 in PDF attached ot letter).
We have serious concerns regarding the draft EA's failure to sufficiently analyze the impact that the flow options will have on hydropower production and the risk that reduced hydropower production may have on the ability for utilities to provide power to the southwest region during the summer. On pages 3-32 and 3-33, the draft EA discusses the lost generation across the various flow options, as well as WAPA's estimated firming expense based on Flow Options A-D. While the EA acknowledges that power generated through Glen Canyon Dam would need to be replaced, it does not take into consideration the regional scarcity in energy generation faced by the Southwest nor the prices that accompany replacement power during the summer. A regional summer heatwave, like what was seen in 2020, with reduced hydropower generation could result in significant impacts to the grid and the potential loss of human life if enough energy is not available on the grid this summer. Significant reductions in the hydropower generation at Glen Canyon Dam should be avoided.
Section 2.2, p. 2-1: The description of the Proposed Action with Flow Options (Action) was challenging to understand. Assuming that the last three bullets on page 2-2 are the key drivers, we have the following questions: a. Implementation of the experiment appears to be determined by temperatures at the Little Colorado River (LCR). Is it a model that makes that critical determination? Is that the referenced "adapted" model, and has that model been peer reviewed? b. Is it feasible, since such a significant experiment is being considered, to use actual temperature data as the trigger? As opposed to projections based on mean daily air temperature from Page, Arizona (77 miles from the LCR), and mean solar radiation from Williams, Arizona (90 miles from the LCR).
However, options being considered in this EA are limited to only the options that can impact water temperature and flow. While these are important tools, these strategies need to be combined with mechanisms to reduce fish pass-through from Lake Powell to the river below the dam, and must include ways to address pockets of targeted warm water predatory fish that are detected in areas below Glen Canyon Dam if mechanical removal of those fish is practical and found to be effective. These other strategies are being pursued and moving forward, but are outside the scope of this EA.
Arizona Flycasters Club (AFC) prefers Option A: Cool Mix of the Glen Canyon Dam Smallmouth Bass Flow Options Draft Environmental Assessment (EA). AFC appreciates the opportunity to comment on this EA.
As described in the Nonnative Fish Strategic Plan adopted by the Adaptive Management Work Group (AMWG) in February 2023, prevention of establishment of smallmouth bass below the GCD cannot be achieved solely through flow manipulation. Other actions including installation of fish exclusion device(s), detection efforts, and rapid response are critical to preventing smallmouth bass establishment and must be implemented as expeditiously as possible.
The EA should be clear in its Purpose and Need Statement that the duration of the EA/Action is "up to three years", which is not stated until Chapter 2, section 2.2.1. CREDA's understanding is that since the Table 3-2 impacts are only for 5 months in 2023, the EA only analyzed impacts over the 5 summer months of 2023, and not over the period of the EA, three years. For all resources analyzed, that level of analysis is insufficient.
While NPS recognizes the economic impact of bypassing the hydropower turbines, we would also point out that there are major costs being incurred up and down the Colorado River from lower water levels brought about by climate change and overallocation. NPS has spent or is contemplating a major investment of hundreds of millions of dollars at Glen Canyon National Recreation Area and Lake Mead National Recreation Area to address recreation in the face of greatly reduced reservoir levels. We may lose amounts of that scale due to lost revenue, and our surrounding gateway communities and states may lose amounts greater than that in regional economic expenditures from lost visitation to these national park units if Lake Powell and Lake Mead elevations are allowed to continue to decline. So, while the cost of this river management action to protect resources in the Grand Canyon could be costly to WAPA, it would be happening within a context where many costs are being incurred by government agencies, other users, and land mangers along the Colorado River as a result of dropping water levels.

Substantive Comments
The passage of warm water and smallmouth bass from near the surface of Lake Powell through still-unscreened penstocks of Glen Canyon Dam, into the Colorado River, threatens the survival and recovery of humpback chub. Once established, a reproducing population of smallmouth bass in the Grand Canyon would be impossible to suppress. Predation by bass would reduce the number and reproductive success of the largest remaining population of humpback chub at the Little Colorado River. This outcome would jeopardize humpback chub, sharply increase extinction risk, and would be catastrophic for humpback chub recovery efforts overall. BOR must avoid that outcome. To do so, BOR must analyze, select, and implement alternative(s) and flow regime(s) that (1) maximally prevent, rather than only disrupt, smallmouth bass reproduction in Grand Canyon, and that (2) maximally safeguard against resultant predation of humpback chub and other endangered, threatened, and native fish. This requires selecting flow alternatives A and B. Legal mandates are many and clear for BOR to select flow regimes to maximally protect the humpback chub. BOR lacks a legal mandate to prioritize flow regimes for hydropower. BOR's analysis, selection, and implementation of flow regimes must advance actions maximally beneficial to the survival and recovery of federally listed fish to avoid jeopardy to humpback chub. Failure to do so will jeopardize humpback chub.
Additional description of the purpose, uses, and importance of the Basin Fund and a description of impacts to the Basin Fund from the Proposed Action in light of the already reduced hydropower revenues due to the ongoing drought.
This section is deficient in addressing Zuni resources that will be impacted by the various flow options because it only cites one twelve year old reference. This is woefully insufficient and elides the numerous correspondence from the Pueblo of Zuni to Reclamation from 2008 to present (see above). In fact, there are other more recent publications that are available and speak directly to this issue that Reclamation appears to have conveniently ignored: Dongoske, K and M. Yeatts. 2018. Tribal perspectives on nonnative fish removal, in Runge, M.C., Yackulic, C.B., Bair, L.S., Kennedy, T.A., Valdez, R.A., Ellsworth, C., Kershner J.L., Rogers, R.S., Trammell, M.A., and Young, K.L., Brown trout in the Lees Ferry reach of the Colorado River-Evaluation of causal hypotheses and potential interventions: U.S. Geological Survey Open-File Report 2018-1069, p. 63-66. Dongoske, K. and Kelley Hays-Gilpin, 2016. Parks, Petroglyphs, Fish, and Zuni: An Emotional Geography of Contemporary Human-Animal-Water Relationships in Relating to Rock Art in the Contemporary World: Navigating Symbolism, Meaning, and Significance edited by Liam M. Brady and Paul S. C. Tacon. University Press of Colorado, Boulder; and Dongoske, K., T. Pasqual and T. King. 2015. National Environmental Policy Act (NEPA) and the Silencing of Native American Worldviews, Environmental Practice 17:36-45.
If "no smallmouth bass have been detected below RM 0, then why not target RM 45. And how is "effective" quantified?
Section 2.2.1 states that operational flow actions would occur for up to three years. The EA acknowledges sustained long-term threats to LTEMP resources from the establishment of Smallmouth Bass, but does not fully address how the alternatives could be utilized for long-term prevention should it be needed, nor does it establish a process for deliberation and reinitiation of flow alternatives for long-term Smallmouth Bass establishment prevention.
Of the four proposed thermal treatments, cold shock-related flow options (Flow Options C and D) appear to be most likely to accomplish the stated Purpose and Need. Combined with the flow spikes utilized in Option D, that alternative would be more likely to disrupt warmer off-channel waters by creating more opportunities for mixing. Options C and D have less impact on total hydropower production than Options A and B, consistent with the hydropower LTEMP Resource Goal, but SRP has concerns that all of the proposed flow options could have an impact on the power production at times when the power is needed the most; i.e., at times of peak electricity demand.
The replacement power will not be clean, green, carbon-free, and renewable as a substitute for hydropower generation. If power utilities already have solar and wind, these renewable sources are already economically dispatched in conjunction with CRSP power before any carbon fueled generation is operated. The EA has not addressed impacts to climate change caused by the additional coal and natural gas resources that will be called upon to replace the reduced hydro power. How can we ignore the concerns of air quality and greenhouse gases over the fishery?
Three years is a long time for this experimental flow along with the costly replacement power. Reclamation should immediately begin the work on a barrier device in the forebay as discussed for the long-term solution to this challenge. The EA is deficient by only focusing on using mixing of flows using the bypass tubes to address the small mouth bass matter and did not seriously examine other options.

Substantive Comments
SGESD has received power from the Colorado River Storage Project (CRSP) since it began generating in the 1960's. This valuable resource has been an important non-carbon emitting resource for SGESD. It has provided reliable power to meet our demand all year, however, it has been of particular value in meeting our high summer demand, providing a reliable and cost-effective resource for our customers.
Page 3-32: Please consider updating Table 3-2 data for Flow Option C and Flow Option D, and its associated text, to match the duration of those options as described in Chapter 2.
Reclamation Should Consider Options to Raise Reservoir Levels Reclamation could potentially avoid or reduce the impacts of the experiment by taking measures to increase elevations at Lake Powell from 2023 to 2025. Higher reservoir elevations would also reduce the entrainment risk of smallmouth bass. The February 2024, 24-Month Study suggests that keeping Water Year (WY) 2023 releases at 7.0 million acre feet (maf) would keep elevations at Powell above 3565 feet from June to October 2023. Additional releases from upstream reservoirs in WY23 would also aid in increasing elevations at Lake Powell. WAPA asks that Reclamation consider these actions to reduce impacts of the experiment.
A larger magnitude flow spike should be implemented this June, taking advantage of water that was held back in Lake Powell under DROA, but must be released this summer, to mitigate severe beach erosion, under the current sediment-rich conditions. In years with sediment-rich conditions the spike flow should be designed to be as large and of as long a duration as possible. Conversely, in sediment depleted conditions SMB flow spikes should be as low, short, and few as possible.
Acknowledgement that if replacement power includes non-renewable energy sources, greenhouse gas emissions will increase.
Further, and as discussed in more detail later as it relates humpback chub, Section 7 of the Endangered Species Act requires that"[e]ach Federal agency shall, in consultation with and with the assistance of [the Services], insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification" of designated critical habitat. 16 U.S.C. § 1536(a)(2). The regulations implementing the ESA define to "jeopardize the continued existence of" as "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." 50 C.F.R. § 402.02.2 Here, pursuant to the ESA, the BOR must ensure that flow regimes from Glen Canyon Dam are not likely to jeopardize the continued existence of humpback chub, result in the destruction or adverse modification of its critical habitat in Grand Canyon National Park, or directly or indirectly reduce its reproduction, numbers, or distribution.
WMPA requests that Reclamation considers options other than bypassing the generators at GCD to address the smallmouth bass issue due to the negative impacts on the people that receive electricity from this facility.
I do not support any experimental water releases from lake Powell that have low bases in science. I do however support the plan to fill lake Powell. It is a win-win in this scenario as far as I can see.
I have been a member of the Adaptive Management Work Group in the past (as the Federal Purchase Power Contractor's alternate) and witnessed a dismissive if not targeted approach towards hydropower. Despite the expressed goal of maintaining or improving hydropower in the LTEMP, the majority of the alternatives in the LTEMP reduced generation at Glen Canyon Dam, and every alternative in the Draft EA (except the "No Action") does the same. The inherent bias against hydropower is evident in the Draft EA, beginning with the refusal to evaluate Flow Option E - Penstock Only Release. Western Area Power Administration's (WAPA) letter outlines sound scientific reasons regarding how the flow releases, without bypass, would disrupt smallmouth bass nesting and aid in preventing establishment below the dam without impacting hydropower. The ramping proposed in this option could benefit hydropower as well.
Sections 1 and 2, statements are made about this project preventing SMB from successfully spawning. A more ecologically appropriate description would be that these alternatives will prevent SMB spawning, egg incubation, and recruitment. While temperature modifications will attempt to reduce the likelihood adults entering spawning condition, the flow spike options will also sweep from nests any eggs and fry that are provided. All options should have the goal of delaying or preventing spawning, but also to decrease survival of any eggs and fry that are produced.

Substantive Comments
The socioeconomic impact fails to acknowledge the potential impacts to disadvantaged communities that rely on hydropower. As noted by the GCD AMP stakeholder Leslie James representing the Colorado River Energy Distributors Association, more than 50 tribes are customers of the Colorado River Storage Project who benefit from federal hydropower in ways as determined by the tribes. Ms. James further points out that reductions in hydropower could impact tribal customers 'not only from a financial standpoint, but from a quality-of-life standpoint as well .' The EA does not make any mention of this potential impact.
It is difficult for WAPA to adequately comment on this action due to the unprecedented scope of the potential impacts and the short time to evaluate them. Although our initial assessment of the annual cost of the experiment ranges from about $40-80 million in hydropower firming costs, the impacts could be much larger as prices are incredibly volatile during the summer months. Any attempt to quantify actual firming costs is at best challenging. As the experiment is proposed for 3 years, hydrology and energy prices could fluctuate significantly.
According to Reclamations' NEPA Handbook, the purpose of NEPA, as defined by Congress and the President, is: · To declare a national policy that will encourage productive and enjoyable harmony between man and his environment; · To promote efforts that will prevent or eliminate damage to the environment and biosphere and stimulate health and welfare of man; · To enrich the understanding of the ecological systems and natural resources important to the nation. In addition, Reclamation's handbook provides guidance on compliance with EO 13007 by directing the agency to "avoid adversely affecting the physical integrity of such sacred sites." This EA and this section abjectly fail in this regard. For example, Table 4-1 presents a list of preparers and contributors to this document. In reviewing this list, there is not one individual listed that possesses the knowledge or expertise to evaluate the impacts of the proposed alternative options from a credible Zuni perspective. These people are not qualified to perform or think they can perform an assessment of the effects to the community of Zuni; therefore, the only conclusion one can reasonably reach is that this document is insufficient with respect to necessary considerations and attention to Zuni impacts and cumulative effects. Reclamation has failed in its responsibility to the Pueblo of Zuni and the Zuni community.
The various dam operational alternatives defined in the EA are understood through the Zuni concept "Deshamik'ya," which is imagining or acting out an undesirable behavior that results in negative effects to a family or community of people. In this instance, purposefully altering dam operations as a method to prevent or disrupt the continuing of life and which could result in mortality can be understood through the translation of the word karma, with the harmful effects and impacts being directed on and toward the Zuni community. These adverse effects and impacts will exponentially contribute to greater vulnerability and precariousness, which Indigenous people experience at greater frequency and intensity than do the industrial nations. Consideration and analysis of these effects and impacts are lacking from an equitable and meaningful environmental justice analysis and must be included lest this EA and NEPA process itself serve as part of systemic social and environmental injustice and continually imposed barriers and obstacles for equity. An additional consideration that is need of attention is that any increase in power rates due to the need for purchasing contracted power as a result of changes to operations in Glen Canyon dam that the low-income Zuni community members will have to pay will compound and intensify the emotional and psychological trauma experienced.
BOR's Operation of Glen Canyon Dam Must Prevent Jeopardy of Federally Threatened Humpback Chub and Reductions of its Reproduction, Numbers, or Distribution. Failure by BOR to Prevent a Reproducing Smallmouth Bass Population in the Colorado River of Glen, Marble, or Grand Canyons, or to Select an Alternative(s) or Flow Regime(s) Maximally Preventative of Small Mouth Bass Reproduction and Reductions in Humpback Chub Reproduction, Numbers, or Distribution, Will Jeopardize Humpback Chub in Violation of the Endangered Species Act
The EA should reflect these points in Table 3-5: Summary of Anticipated Effects on LTEMP Resource Goals, which does not include an impacts analysis of the food base and is an omission.

Substantive Comments
As noted in the hydropower impact summary in the EA, the modelers at the National Renewable Energy Laboratory (NREL), using the PLEXOS model, projected that replacement power would generally be available for this experiment. However, the PLEXOS model assumes free exchange of power within the Western Electricity Coordinating Council (WECC) footprint. Thus, if additional generation exists in the model, and a transmission path is available, the model will dispatch the energy to meet demand without regard to generator ownership or contractual obligations. The PLEXOS model also assumes all utilities in the market have situational awareness and perfect foreknowledge. This model is an approximation, and in many ways does not reflect the reality of WAPA's transactions to secure replacement power.
Flow Option D, p. 2-8: What is the science basis (or data supporting) the statement "even if it is not possible to achieve a temperature of 13 C, the flow would likely disrupt spawning, even though data from the Yampa and Green Rivers suggests that smallmouth bass can continue to spawn when temperatures drop to 13.9 C".
Finally, given the climate-inevitability of Lake Powell levels falling further, and of a warm Colorado River once again flowing through the Grand Canyon, I urge the Bureau of Reclamation and other federal agencies to undertake planning now to ensure for the survival and recovery of all of Grand Canyon's endangered fish in the context of those conditions.
Another aspect of this EA that has been noted by GCMRC researchers is that it could benefit sediment and mitigate the lack of High Flow Experiments (HFEs) in recent years and higher summer flows that may happen as a result of the Drought Response Operations Agreement (DROA) redistributions of water or the balancing decisions for the remainder of water year 2023. The DROA distributions have had positive benefits by helping to minimize the impacts of fish passthrough at the dam, but they have also had negative sediment impacts by moving more releases to the summer. The flow spikes in options B and D of the action alternative may be a way to have positive benefits for both native fish and sediment. The flow spikes can either negatively impact or positively impact sediment depending on the sediment in the channel present when they are deployed. It would be important to design the spikes in a given year to minimize negative impacts and maximize positive benefits for sediment per the GCPA. The rebuilding of beaches and sandbars affects recreation and cultural resource protection, both of which are resources that the GCPA mandates dam operations to protect, mitigate adverse effect to, or improve. Taking advice from GCMRC on the design of flow spikes to ensure they are consistent with the principles of the HFE protocol - that they have the right timing magnitude and duration to affect the non-native fish as the first priority and then secondarily that they are at the best timing magnitude and duration to maximize sediment rebuilding in sediment rich conditions or minimize sediment erosion in sediment poor conditions. The draft EA states in section 3.5.2 that flow spikes implemented after July 1 have the potential to erode sediment and limit the ability to implement an HFE following the LTEMP HFE protocol. To mitigate this impact in compliance with the GPCA, this EA should contemplate designing the first flow spike to be as large in magnitude and long in duration as possible to redistribute sediment and rebuild eroded sandbars as much as possible. This recommendation is based on the statement in Section 3.5.2 that a flow spike with the same magnitude as included in options B and D (40,000 cfs) but with longer duration (potentially up to 72 hours) has better sandbar building potential. We further recommend that subsequent flow spikes be as few and as small as are needed to achieve non-native fish reduction goals. GCMRC may be able to provide advice tailored to the specific sediment, fish and hydrology conditions of each specific year. Vegetation effects should also be monitored and taken into account as July spikes are more likely to have negative impacts by increasing shoreline vegetation density than June spikes. NPS staff believe fish concerns should take priority given the current situation and staff believe we can try to maximize sediment benefits and minimize sediment erosion within that prioritization.

Substantive Comments
This draft has a restriction built into the action alternative that "monthly volumes will not be adjusted specifically to implement the flow options." However, under DROA operations the last two years, monthly volumes have been adjusted resulting in more water being delivered out of the dam in some months than the 2016 Long Term Experimental and Management Plan (LTEMP) monthly pattern. This has resulted in higher levels of sediment erosion, while also having no HFEs to rebuild beaches. The LTEMP Record of Decision (ROD) has operational flexibility (in section 1.2) that allows for: "specific adjustments to daily and monthly release volumes [...] for resource-related issues that may occur uniquely in a given year, release adjustments may be made to accommodate nonnative species removal, to assist with aerial photography, or to accommodate other resource considerations separate from experimental treatments under the LTEMP." If we are adjusting monthly flows for other purposes that increase resource impacts, NPS does not believe we should be limiting the flexibility currently in the LTEMP when putting in place flows that could mitigate those impacts. The flow spikes under the SMB EA present both an opportunity for a way to use water being redistributed already and a mitigation for the additional erosion that is created by the DROA adjustments that were not anticipated under the LTEMP. The GCPA directs the Secretary to manage the dam in a manner to mitigate the adverse effects to downstream resources, and as adjustments are being made to monthly volumes for other purposes, it is important that this law be applied to ensure the adverse effects created by these adjustments are mitigated. We would question if the LTEMP ROD allows the flexibility to adjust monthly volumes for DROA, then why would it not be allowable to adjust monthly volumes to mitigate the fish and sediment issues caused by those other adjustments in order to mitigate as required under the GCPA? This restriction should not preclude a comprehensive adjustment that allows for larger flow spikes if it makes sense for the conditions of the year to maximize sandbar building or minimize erosion.
All of Today's Releases are "Steady, Unfluctuating Flows" according to the Bishop Study Bishop et. al. 1987 is cited in the first paragraph of page 3-12 to suggest that anglers prefer "steady, unfluctuating flows." It is inappropriate to cite the Bishop study here for that conclusion. The Bishop study sought to identify flow preferences from boaters and anglers in the pre-1996 ROD era and defined "steady flows" as those with daily fluctuations of less than 10,000 cfs. Daily fluctuations have been limited to 8,000 cfs since the 1996 ROD making all contemporary releases (aside from HFEs) "steady flows" as defined by Bishop et. al. 1987.
We note that threats of non-native fish invasion in the CRE in Glen and Grand canyons are multi-directional. The warmer river water temperatures also allow striped bass and other non-native fish to uprun the river from Lake Mead, and perhaps may allow other non-native species to invade through the Little Colorado River drainage. Therefore, we recommend that monitoring be conducted in the lower Colorado River and Little Colorado reaches as well.
For success in preventing the establishment of SMB we need to use multiple tools together (Integrated Pest Management). This is consistent with the SMB task force findings and the TWG SMB strategy document. Reclamation has the authority over dam operations and the role of NPS is limited to conducting fish control actions within our park units. The multiple tools have been referred to in TWG discussions as the "three-legged stool" of this EA for 1) modifying dam operations to include bypass cooling and spike flows, 2) escapement prevention devices, and 3) rapid response actions for removing non-native fish in breeding and aggregation areas. Rapid response actions such as mechanical or chemical means are very unlikely to be successful at preventing the establishment of SMB and other non-natives if used alone and if the river-water temperatures are highly suitable for their breeding. Trying to stop the SMB invasion with mechanical or chemical means alone would require a high level of expense and effort for most of each of multiple years. These methods would also require a great deal more taking of life of fish over many years, which is a concern for some Tribes. The action alternative would reduce the need for such large-scale fish control operations by using larger, cooler flows at the times of year they would have naturally occurred to proactively address the problem. Under the action alternative, less manual fish control operations would be necessary, and taking of life would be reduced. These actions would fulfill an important role, in conjunction with the action alternative in this EA, by removing small aggregations of non-native fish breeding in warmer backwater areas. The powerful combination of a cooler river, targeted manual fish control operations, and increased escapement prevention in the form of a barrier or nets at or near the dam would be much more likely to succeed than one tool alone.

Substantive Comments
Cumulative Impacts: This entire section which addresses the "cumulative impacts to the community of Zuni is specious, because it implies that mitigation will be accomplished through consultation. Consultation is not mitigation, and the first options are avoidance and minimization-mitigation, if it is even possible, is the last option, not the first. Further, what counts as mitigation for the cultural damage and loss that Reclamation continues to impose on the Zuni people through mismanagement and disregard for proper treatment of the traditional cultural property and the integrity and the capacities it provides for relational life and relational lifeways can only be defined by the Zuni Tribe
The climate crisis has brought Lake Powell, upstream of the canyon, to record-low levels. Low water levels in the hot, dry desert have led to warmer-than-normal water temperatures, which in turn have let nonnative smallmouth bass - who eat humpback chubs - pass through Glen Canyon Dam into Grand Canyon. If the predatory bass become established there, they could wipe out the largest remaining population of humpback chubs. To prevent that, the U.S. Bureau of Reclamation must implement the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment, and should implement the "Cool Mix with Flow Spikes" and "Cool Mix" options (Flow Options B and A) which maximally protect chub by preventing, rather than merely disrupting, bass reproduction. Urgent action is needed to stop smallmouth bass reproduction and safeguard the Grand Canyon's humpback chubs and other native fish species, several of whom rely on the canyon and its tributaries to sustain their populations. Environmental flow actions - like the one in this draft environmental assessment - are the safest way to ensure a healthy Colorado River without potentially harmful chemical treatments or electrofishing. If the Bureau doesn't act now, the Grand Canyon could lose its humpback chubs and other species protected under the Endangered Species Act.
Additionally, as explained by the Ninth Circuit, "[w]hen determining whether to issue a supplemental EIS, an agency must "apply a rule of reason," and continue to "maintain a 'hard look' at the impact of agency action when the 'new information is sufficient to show that the remaining action will affect the quality of the human environment in a significant manner or to a significant extent not already considered."13 Notably, the Ninth Circuit has previously required federal agencies to "prepare a supplemental EIS after it changed a policy upon which the original EIS had relied."14 According to the Ninth Circuit, "the bar for whether 'significant effects' may occur is "a low standard"15 and a policy change that "raise[d] 'substantial questions; regarding [the project's] impact' was enough to require further analysis before allowing the project to proceed."16 As set forth by the Supreme Court, "[t]he decision not to prepare a supplemental environmental impact statement is controlled by the 'arbitrary and capricious' standard."17 "In making the factual inquiry concerning whether an agency decision was 'arbitrary or capricious,' the reviewing court must consider whether the decision was based on a consideration of the relevant factors and whether there has been a clear error of judgment. This inquiry must "be searching and careful."18 12 Marsh v. Or. Nat. Res. Council, 490 U.S. 360, 378, 109 S. Ct. 1851, 1861 (1989) 13 League of Wilderness Defs./Blue Mts. Biodiversity Project v. Connaughton, 752 F.3d 755, 760 (9th Cir. 2014) (internal citations omitted). 14 Id. 15 Id. 16 Id. 17 Ctr. for Biological Diversity v. Mayorkas, No. CV-17-00163-TUC-CKJ, 2021 U.S. Dist. LEXIS 159034, at *23 (D. Ariz. Aug. 20, 2021) citing Marsh v. Or. Nat. Res. Council, 490 U.S. 360, 377, 109 S. Ct. 1851, 1861 (1989) (Accordingly, as long as the Corps' decision not to supplement the FEISS was not 'arbitrary or capricious,' it should not be set aside."). 18 Marsh v. Or. Nat. Res. Council, 490 U.S. 360, 363, 109 S. Ct. 1851, 1853 (1989). Against this legal baseline, AEPCO finds multiple issues with the Smallmouth Bass EA. Notably, the Bureau improperly tiered the Smallmouth Bass EA to the Long-Term Experimental and Management Plan (LTEMP) Final EIS and therefore, a SEIS is necessary in order to comply with NEPA. "Tiering refers to the coverage of general matters in broader [EIS] or [EA] (such as national program or policy statements) with subsequent narrower statements or environmental analyses (such as regional or basin-wide program statements or ultimately site-specific statements) incorporating by reference the general discussions and concentrating solely on the issues specific to the statement subsequently prepared."19 Put another way, '[t]iering' is defined as 'avoiding detailed discussion by referring to another document containing the required discussion."20 19 40 C.F.R. § 1508.1(ff). 20 Earth Island Inst. v. Muldoon, No. 1:22-CV-00710-AWI-EPG, 2022 U.S. Dist. LEXIS 172147, at *52-53 (E.D. Cal. Sep. 21, 2022) (internal citations omitted). Here, the Bureau issued the Smallmouth Bass EA to evaluate the impacts of the Agency's proposed action "to change the temperature of the water released through Glen Canyon Dam (GCD) by changing where water is released through the dam's existing structure."21 According to the Bureau, relevant laws and executive orders "that provide context for the management of the Colorado River and GCD" are provided in the GCD LTEMP Final EIS.22 The LTEMP Final EIS was drafted in October 2016. As such, the Smallmouth Bass EA tiers to the LTEMP Final EIS analysis.23 21 Smallmouth Bass EA, at I-I. 22 Id. at I-5.

Substantive Comments
23 Id. at I-7; I-8. To provide context, the Ninth Circuit has stated that "NEPA regulations allow agencies to 'tier' later NEPA documents to earlier NEPA documents so that the agency can 'avoid some of the burdens of the NEPA process.'...The later NEPA documents 'concentrate on issues specific to the current proposal' while the earlier NEPA documents are broader and 'cover matters more general in nature.' An agency may tier to a NEPA document if the subsequent statement is either of 'lesser scope' or a 'statement or analysis at a later stage.'"24 Most notably, "the previous document must actually discuss the impacts of the project at issue"25 "and have been subject to NEPA review."26 Furthermore, although "NEPA regulations 'encourage[]' tiering", the Ninth Circuit has also specified that "[t]o encourage tiering, however, hardly means that tiering alone proves sufficient to satisfy NEPA's various requirements. NEPA regulations encourage tiering "to eliminate repetitive discussions of the same issues' in different levels of environmental review."27 As noted above, the hard look requirement is a cornerstone of NEPA. Accordingly, the Ninth Circuit has found "the government's EA to be inadequate under NEPA because of, inter alia, improper tiering and vague analysis." Therefore, the Ninth Circuit held that a federal agency "failed to take a 'hard look' at the environmental effects" of its proposed action.28 24 Earth Island Inst. v. Muldoon, 2022 U.S. Dist. LEXIS 172147, *52-53 (internal citations omitted). 25 Native Vill. of Nuiqsut v. BLM, 9 F.4th 1201, 1213 (9th Cir. 2021). 26 Earth Island Inst. v. Muldoon, 2022 U.S. Dist. LEXIS 172147, *52-53 (internal citations omitted). 27 Wildearth Guardians v. United States BLM, 457 F. Supp. 3d 880, 893-94 (D. Mont. 2020) (internal citations omitted). 28 Ctr. for Biological Diversity v. United States Blm, No. 3:17-CV-553-LRH-WGC, 2019 U.S. Dist. LEXIS 7525, at *19-20 (D. Nev. Jan. 15, 2019) (internal citations omitted). Against this legal framework, the Bureau's tiering of the Smallmouth Bass EA to the LTEMP Final EIS analysis is arbitrary and capricious, and therefore fails to satisfy NEPA's requirements. This is perhaps best illustrated in examining lake levels and generation output between 2016 and 2022.29 In 2016, the year the LTEMP was published in draft form, Glen Canyon Lake levels fluctuated between 3,590 and 3,620 feet. On April 30, 2016, Glen Canyon Lake rested at 3,592 with 457 MW of head, and max generation of 517 MW. In comparison, on April 20, 2022, Glen Canyon Lake hovered at 3,522 feet with 389 MW of head and max generation of 250 MW. This comparison roughly demonstrates that over half the generation is available.30 Nonetheless, "[t]he flows analyzed in [the Smallmouth Bass] EA are tiered from the LTEMP analysis[.]"31 According to the Bureau, the flows analyzed in the Smallmouth Bass EA "fall within the scope of release parameters addressed in the LTEMP."32 29 See https://www.wapa.gov/regions/CRSP/OpsMaint/Pages/operations-maintenance.aspx. 30 Because the experiment is due to commence on May, 1, 2023, April 1 was selected for purposes of comparison. 31 Smallmouth Bass EA at I-7. 32 Id An EA which tiers off the 2016 LTEMP conclusions does not account for the drastic drop in lake elevations at Glen Canyon Lake and cannot reasonably account for impacts to hydropower. Between January 1, 2021, and December 31, 2021, Lake Powell lost forty-five feet of elevation. Indeed, since the publication of the 2016 LTEMP, Lake Powell has been in a veritable free fall as droughts continue and persistent arid conditions have sapped moisture from annual snowpack diminishing the expected run off to replenish lake levels. Using the 2016 LTEMP as a baseline measurement for acceptable flows is arbitrary and capricious and cannot support a Finding of No Significant Impact (FONSI). Facially and substantively, the Corps fails its obligations under NEPA to take the required hard look. Accordingly, the Bureau must reject the Smallmouth Bass EA and proceed to complete a SEIS before taking any further action.
The Trust is supportive of the proposed action with flow options outlined in this EA and agrees that the time is now to prevent smallmouth bass from establishing in Marble and Grand Canyons. Based on the EA's analysis, Flow Option B stands out as providing the highest effectiveness to reach the target temperature of 16°C for the greatest distance downstream from Glen Canyon Dam and including flow spikes to ensure these cool waters reach backwater habitats where smallmouth bass are known to spawn. We endorse this option, but also understand the need for different tools given changing conditions on the river. While it appears difficult to achieve outside of Marble Canyon, Flow Option D also may be effective to address smallmouth bass in the upper reaches of Marble Canyon where spawning occurred in 2022.
We also understand that the flow regimes outlined here are intended to be short-term and will be difficult to test and retest before longer term solutions become available. For this reason, it seems prudent to limit flow options in order to better understand their overall effectiveness. Measures like exclusion curtains and bypass generators, while planned for implementation in the next 3-5 years, are likely to encounter roadblocks and delays common in large scale projects, so it may be wise to expect these flow options to be utilized for longer than expected.

Substantive Comments
The account of "consultation" with Tribes in this document is understood by the Pueblo of Zuni as not fulfilling actual Government-to-Government consultation requirements. Rather, what is reflected in this document is Reclamation's minimalist efforts to superficially inform the Pueblo of Zuni about the agency's intentions toward managing smallmouth bass in the Colorado River below Glen Canyon Dam. Public meetings held on October 25, November 18, November 21, and December 01, 2022, and January 18, 2023, do not suffice nor fulfill Government-to-Government consultation with the Pueblo of Zuni as required by numerous laws, Executive Orders, and court findings. These are documented facts that Reclamation is fully aware of and should not be represented in this document as such. This is especially true given that Reclamation has had specific knowledge for the past 14 years about the Zuni objections to any lethal management of aquatic life. Moreover, and importantly, Zuni Adaptive Management Work Group and Technical Work Group representatives have repeatedly expressed the Zuni opposition and why to lethal management at meetings of the Glen Canyon Dam Adaptive Management Program. It is insulting to the Pueblo of Zuni, as a federally recognized Indian Tribe and sovereign government, and the community of Zuni people as citizens of both the Pueblo of Zuni and the United States of America that a federal agency would knowingly and intentionally describe these routine activities as meaningful or in good faith "consultation and coordination" efforts.
Section 1.2, page 1-3 refers to the Secretary's Designee's charge directing Reclamation and GCMRC to work with the Adaptive Management Work group "to develop flow options to disrupt or prevent spawning of smallmouth bass ". Please include the additional charge in that directive, which was "to minimize impacts to other resources." (May 2022 Directive). None of flow options within the Action include an attempt to minimize impacts to the hydropower resource, notwithstanding viable option(s) were proposed by biologists and hydropower experts from WAPA during the summer and fall of 2022 (WAPA November 18, 2022 and December 15, 2022 letters).
Tri-State will receive fewer associated RECs from CRSP because WAPA will deliver power from the market, almost certainly from carbon-based resources, since hydro-electric generation will be reduced due to the SMB experiment. The RECs Tri-State receives from CRSP are a significant component of the RECs Tri-State utilizes to meet its Colorado and New Mexico RPS requirements.
The Department continues to stress the importance of preventative measures in the management of high-risk warmwater non-native fish through temperature control. As such, we are supportive of Flow Options A-D as outlined within the EA as actions to achieve the stated purpose and believe that they serve as viable options to contribute to efforts designed to reduce the risk of establishment of Smallmouth Bass. We encourage Reclamation, as feasible, to plan for flexibility within the implementation of action alternatives to fit within the adaptive management framework that the program is built on. The Department also recommends Reclamation consider long-term solutions to maintaining cold water releases, including infrastructural changes, and identifying effective fish deterrents, or installing exclusion structures in the forebay of Glen Canyon Dam, in order to reduce entrainment of high-risk warmwater non-native fish through the dam.
In fact, the National Park Service has proposed a modification to the flow spike alternatives (Options B and D) to address the impacts to sediment as a part of this EA.^7 The Trust endorses this proposal and encourages Reclamation to use this EA as an opportunity to prioritize HFEs over the next three years, including revising the sediment accounting window in the current HFE protocol to run annually starting and ending on July 1 each year. Adapting the HFE protocol and the alternatives in this EA to address the issues arising due to "low water conditions" helps to address both the smallmouth bass issue, the sediment issue, as well as ensure better compliance with the Grand Canyon Protection Act. 6 See USGS 2023, above. 7 See National Park Service's Letter at 6-7, above. This proposed change to the sediment accounting window would reduce the total number of HFEs possible for the remainder of the LTEMP 20-year period, but it could also ensure that HFEs are conducted more regularly to produce positive outcomes for sediment resources. The LTEMP HFE protocol appears to authorize (if sediment trigger is reached during the accounting window) 38 HFEs over the 20 year period, but based on the modeling analysis, LTEMP anticipated 15 fall HFEs and an additional 5 to 7 spring HFEs (a total of 22 HFEs) during the 20-year period.^8 To date, only one HFE in 2018 was implemented during the LTEMP period, which leaves 15 fall HFEs and 5 to 7 additional spring HFEs through 2036. With the proposed modification to the sediment accounting window, the maximum number of sediment triggered HFEs for the remainder of the LTEMP period would be one per year or 13. 8 See USGS 2023, above.

Substantive Comments
The scope of this experiment, and its potential impacts, far exceed any prior experiment executed or envisioned as part of the 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.
Page 3-6, Paragraph 3: Consider making the following revision. "Also, the cold temperatures would reach downstream to the confluence of the Little Colorado River where [most] humpback chub habitat begins."
Section 1.8, page 1-8: The EA refers to Reclamation's close coordination with USFWS through the EA process, which is important. However, in reviewing the USFWS letter (Appendix C), we question whether the statement in the EA that refers to "a potential future decline in humpback chub that would occur if smallmouth bass are allowed to establish" (emphasis added) accurately reflects the Service's description of risk and threats (i.e., uncertainty).
The EA contains several references to the hydropower conclusions that were drawn during the Long-Term Experimental Management Plan ("LTEMP") process a number of years ago. It is worth noting that the power markets have changed dramatically since that time. Any reliance on data from that time period to draw conclusions about future market conditions is unreliable. The emergence of increased solar on the grid, the shutdown of traditional fossil fueled resources, the requirement to meet renewable portfolio standards, heightened concerns about resource adequacy and natural disasters have changed the energy landscape. In addition, purchased power prices during both the on-peak and off-peak periods, have increased significantly. To illustrate this point, in 2016, the average day-head price for on-peak power at Mead Substation in Southern Nevada was $27.83/MWh compared to $99.74/MWh in 2022. The average day-ahead price for off-peak power in 2016 was $20.88/MWh compared to $81.11/MWh in 2022. The CRCNV recommends that impacts to hydropower be evaluated over a range of market prices and assumptions to capture the complete range of possible impacts resulting from the different flow options.
The Draft EA Should Include Option E - Penstock Only Release The EA states on page 2-9 that Option E is likely to "disturb smallmouth bass spawning and rearing..." and "...cause males to abandon nests, resulting in high mortality of offspring." Based on this statement, it appears this option would help prevent smallmouth bass becoming established in the section of river between Glen Canyon Dam and the Little Colorado River. Additionally, because flow fluctuations are transmitted all the way through the Grand Canyon to Lake Mead, it seems this alternative could be more effective at preventing establishment in the Grand Canyon as a whole, and particularly below the Little Colorado River, than the experiment of relying on temperature control. Using flows to control smallmouth bass is supported by Bestgen and Hill (2016). Their research on the Green River showed smallmouth bass reproduction was delayed for up to 2 weeks past reaching 16 degrees C, apparently because of the flow effects from releases at Flaming Gorge Dam. The EA states that Reclamation excluded Option E because "it does not meet the project's purpose and need of preventing establishment of smallmouth bass below Glen Canyon Dam." The Purpose and Need for this EA is very specific, stating that flow options are those that will "prevent the establishment of smallmouth bass." The Purpose and Need does not align with the Secretary's Designee's guidance from May 2022 which directed Reclamation and Grand Canyon Monitoring and Research Center (GCMRC) to work with the TWG to "...develop two to four operational alternatives that could help prevent cool- and warmwater invasive fish establishment, while minimizing potential adverse effects to other resources." WAPA presumes Option E was excluded because it would not provide cooler release temperatures and therefore would not completely prevent spawning below Glen Canyon Dam. However, the temperature target of 16 degrees C at the Little Colorado River appears unlikely to completely prevent smallmouth bass spawning in the project area or protect humpback chub and razorback sucker from smallmouth bass establishment in western Grand Canyon (see following section on temperature). Initial modeling of Option E indicated it may be neutral to slightly beneficial to hydropower power production depending on how it was implemented. Additionally, it would be much easier to operationally implement when compared to the flow options evaluated in the EA. Accordingly, WAPA would encourage Reclamation to further evaluate Option E as an alternative for controlling smallmouth bass below Glen Canyon Dam.

Substantive Comments
Sediment is the foundational element for the entire ecosystem in Grand Canyon, and the lynchpin for the health of multiple resources - ecological, recreational, and cultural. With current climate conditions, aridification, and a significant, as yet unresolved supply/demand imbalance for the Colorado River, we can no longer consider sediment to be a renewable resource. Along with other GCD AMP stakeholders, GCRG submitted a letter prior to release of the EA that described our suggestions and concerns. After release of the EA we continue to be deeply concerned that Flow Options B and D (with potential for multiple spike flows) could be detrimental to sediment, resulting in substantial erosion of the sand that has accumulated in the channel from the Paria River over the last two seasons, and precluding the opportunity to conduct an HFE in 2023. The EA acknowledges this potential outcome. This EA further describes an assumption of a maximum discharge of up to 32,000 cubic feet per second (cfs) (18,000 cfs through the penstocks and a maximum 14,000 cfs through the bypass tubes) yet releases of 34,000 to 37,000 cfs or greater are required to cause significant deposition at most long¬term sandbar monitoring sites (Hazel et al. 2022). As a result, the spike flows could further exacerbate the deteriorating condition of sediment resources in the Grand Canyon ecosystem. However, the EA concludes that 'Flow Options B and D...would have the greatest potential for sandbar growth...' This contradiction draws the EA analysis into question while failing to accurately disclose the potential impacts of these alternatives. What measures will BOR put in place to ensure that the spike flows not only meet the desired outcomes of preventing SMB establishment below the GCD but also do not denude the Grand Canyon ecosystem of its limited sediment resource? The bottom line is - under this current operating range, if sediment enriched conditions exist, flow spikes under this EA should be as long in duration and as large in magnitude as possible. In sediment depleted conditions, any spikes should be as short and low as they can be. Again, we reiterate our valid concern for the already devastated beaches of Grand Canyon and our concern that multiple spikes may deteriorate conditions further. Decisions must be made on science, and in keeping with not only the EA purpose and need but sediment goals of the Long Term Experimental and Management Plan (LTEMP) EIS and the mandates of the Grand Canyon Protection Act of 1992. We find ourselves at a critical juncture and inflection point regarding both the sediment resource and the future of native fish in Grand Canyon. This underscores the importance of capitalizing on the extra DROA water and the sediment enriched conditions this spring to implement the most robust flow option possible, in order to avoid adverse impacts to beaches while inhibiting smallmouth bass spawning to the best of our ability. These are our tools. Let's use them as wisely and as effectively as possible to maximize benefits across multiple resources while minimizing adverse impacts.
Section 1.7, p. 1-7: CREDA recommends including in Operational Guidelines, the text from the LTEMP ROD, page B-7, section 1.2: "Reclamation also will make specific adjustments to daily and monthly release volumes, in consultation with other entities as appropriate, for a number of reasons, including operational, resource-related, and hydropower-related issues. Examples of these adjustments may include, but are not limited to, the following: ... For hydropower-related issues, adjustments may occur to address issues such as electrical grid reliability, actual or forecasted prices for purchased power, transmission outages, and experimental releases from other Colorado River Storage Project dams."
One of the most significant impacts of the EA's proposed options is reduced hydropower generation. SRP is particularly concerned about short-term reliability impacts associated with unavailability of capacity, whether due to GCD generators being unavailable or due to increased demand on regional markets for summer peaking power. While GCD generation may be available for regional emergency utilization, its expected absence on a forward-looking basis changes the dynamics of the regional power markets and may challenge the ability of SRP or others in the region to procure adequate capacity for emergency system needs. GCD's unavailability would further compound regional challenges in maintaining reliability, with an increased potential for rolling blackouts if remaining regional capacity is insufficient.
Prior to Glen Canyon Dam, the Colorado River water temperatures fluctuated from 0* to 30* C. With its construction, it has been attributed to be an effective fish barrier when the water is high, preventing establishment of non-native fish establishment, but isn't responsible for the introduction of these non-native fish. The Wildlands Council's letter highlights physical barrier options that were not included. So why are the only alternatives in the Draft EA flow related?

Substantive Comments
On page 3-50 , in Table 3-5: Summary of Anticipated Effects on LTEMP Resource Goals, there is an error in the summary of anticipated effects on resource goals. Under the resource titled "Hydropower and Energy", all four proposed action flow options fail to address the obvious obligation for replacement power purchases by grossly understating it. The statement "would reduce hydropower generation and load following capacity, and would likely increase the need for replacement power" needs to be revised. In Table 3-2, page 3-32, the flow option impacts are provided resulting in millions of dollars for replacement power. This is inconsistent.
Another aspect of this process that must be utilized is effective adaptive management. None of these options have been tried in this setting, and we advocate for the flexibility within the process to shift to the best likely strategy, or set of strategies, given expeditious analysis based on results from the last set of actions.
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 to immediate impacts, such as WAPA becoming unable to purchase sufficient energy or transmission to fulfill its contractual obligations.
In the Colorado River upper basin from 1989 through 2021, recovery programs spent $209 million in capital, and were federally funded starting at $8 million per year for annual base funding, adjusted for inflation. The upper basin programs spend nearly $2 million per year on invasive species control in the rivers as well as having spent tens of millions on reservoir escapement prevention. In the Colorado River lower basin, the Multispecies Conservation Program (MSCP) spent more than $381 million during the first fourteen years of program implementation. This includes $28.3 million for fish augmentation; $118.5 million for research, monitoring, and adaptive management; $22.8 million for securing land and water; and $172 million for habitat development. Historically WAPA, through the Upper Colorado River Basin Fund, provided $20 million per year to endangered fish recovery programs and to the adaptive management program below GCD; in three of the last five years, they have not provided that funding and federal appropriations have been used instead. This is $60 million over the past five years that they have not had to spend on endangered fish protection that could be used now. Our understanding is that part of the reason the Upper Colorado River Basin Fund was established is -- to fund costs such as these to mitigate dam and power operations in the Colorado River system. If the action alternative is not chosen and we allow SMB breeding and establishment to occur, this would likely lead to negative impacts to the humpback chub population and would increase costs to NPS and Colorado River users as a whole.
The sense of urgency to ram the Smallmouth Bass EA through the NEPA process highlights another grievous deficiency in this misguided effort. While AEPCO is critical above of the Bureau's failure to collect requisite information in the analysis of alternatives, the timeline to provide comments violates due process rights afforded the public. In the current instance, the Bureau has provided a mere fourteen-day public comment period regarding the Smallmouth Bass EA.36 This brief comment period is insufficient and fails to meet the standard set forth in 40 C.F.R. § 1500.1(b). Per 40 C.F.R. § 1500.1(b), the purpose of NEPA is to ensure that "environmental information is available to public officials and citizens before decisions are made and before actions are taken.. .Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA."37 36 See Bureau of Reclamation, Reclamation seeks public comment on Glen Canyon Dam/Smallmouth Bass Flow Options Environmental Assessment (Feb. 24, 2023) available at: https://www.usbr.gov/newsroom/news-release/4434 37 40 C.F.R. § 1500.1(b). A single fourteen-day comment period is insufficient to foster "informed public participation" as necessary under NEPA.38 As such, the Bureau must provide additional opportunities for public participation, such as public meetings and comment periods, so that interested persons may have the opportunity to adequately review the Smallmouth Bass EA and related materials and provide informed comments. 38 Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin., 538 F.3d 1172, 1194 (9th Cir. 2008) (internal citations omitted) ("We must determine whether the EA 'foster[s] both informed decision-making and informed public participation.'"). This is not a casual responsibility. Federal agencies are statutorily mandated to engage the public in a specific level of involvement during the NEPA process.39 Federal agencies, such as the

Substantive Comments
Bureau, shall "[h]old or sponsor public hearings or public meetings whenever appropriate or in accordance with statutory requirements applicable to the agency."40 In determining whether a public hearing or public meeting is necessary, the agency must consider whether there is "[s]ubstantial environmental controversy concerning the proposed action or substantial interest in holding the hearing."41 As stated by the Ninth Circuit, not only must the public "be given an opportunity to comment on draft EAs and EISs.. .[but] public hearings are encouraged to facilitate input on the evaluation of proposed actions."42 39 See 40 C.F.R. § 1506.6. 40 40 C.F.R. § 1506.6(c). 41 40 C.F.R. § 1506.6(c)(1). 42 Anderson v. Evans, 371 F.3d 475, 487 (9th Cir. 2002) (internal citations omitted). Ultimately, AEPCO is convinced that the Bureau neither seeks public input nor desires feedback on the proposed alternatives. This is a failure that is actionable under the law. AEPCO's views are informed by reviewing table 3-2 on page 3-37 in which the Bureau estimates the costs of firming power associated with the various flow regimes. These estimates are attributed to the Western Area Power Administration (WAPA).
The EA fails to use the most current information regarding the future hydrology and its impacts on hydropower production. NEPA requires a disclosure of all the cumulative impacts of the action and an analysis of all reasonable alternatives to the proposed action. In this case, the Bureau of Reclamation must analyze, identify and disclose to the public all foreseeable impacts of the Action. This includes the ongoing impacts to FES customers from the last 20 years of limited hydropower production and the resulting increased reliance on purchased power.
The larger problem is the unsustainable demand on the water supplied by the Colorado River system. The flow strategies undertaken in this EA will not address that. There must be a strong effort by the Bureau of Reclamation and the Basin States to impose stricter conservation measures to assure future water for homes, agriculture, and industry, and the ability to generate the needed hydropower from Glen Canyon Dam that the region has relied upon.
In my opinion, science experiments have been proposed under the guise of helping the environment for purposes of building beaches for river rafters and flatten flows for fishermen. When some people discovered that high-flow experiments only improved beaches for 3-6 months, they shifted their focus to advocate for a Spring HFE for summer river rafters. If you look at the series of photos from Brewster Stanton (1889) and the series 100-years later from Franklin Nims (post-dam), you will see no discernible difference in the beaches except for non¬native vegetation. That is because the river hydraulics haven't changed, and the gradation of sand that is thrown up on the beaches easily erodes and washes back into the river. See PDF for figure "Sandbar Monitoring Cont (2).
Specifically, the table should state that cold shock options C and D could lead to high rates of macroinvertebrate drift and potentially disrupt macroinvertebrate development and life cycles and that this could lead to a decrease macroinvertebrate production and diversity.
The same table should also state that the flow spike options B and D would scour benthic substrates and reduce the food base abundance and biomass. The food-base section correctly states that recovery of the food base after a spike flow could be rapid, but it fails to point out that the experiment includes options for up to three, HFE-like spike flows occurring back-to-back during the summer growing season for the next three years. Back-to-back HFE-like spike flows could prevent the aquatic food base from recovering by periodically scouring it with sequential spike flows.
I understand that balancing these priorities are incredibly complex. However, given the current shortage of energy available during the summer months, the scarcity pricing that accompanies that, and the only option available in the EA that doesn't do exorbitant harm to hydropower is the "No Action" option. If you fail to consider any non-flow options (mixing of the water strata, siphons to below the thermocline, etc.), then must we implore you to select the "No Action" alternative.
The EA states that visitor use from the Colorado River Management Plan (CRMP) is regulated by a lottery system. That is incorrect. Non-commercial and commercial use levels are specified in the CRMP, but only the non-commercial trips are awarded through a weighted lottery.

Substantive Comments
The EA Does Not Evaluate the Impacts on Greenhouse Gas Emissions The EA does not 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 the Draft EA, the experiment requires WAPA to use other generating resources to replace Glen Canyon Dam generation. Based on NREL's analysis, this replacement power will mostly come from fossil-fuel driven generators. Increased greenhouse gas emissions are among the impacts of generating electricity using fossil fuels sources and the EA should include an estimate of the additional greenhouse gasses that will be emitted due to the experiment. The table below includes estimates of the amount of replacement power expected to be generated from fossil fuels and the reduction of hydropower production under the experiment.
Additionally, we ask that National Park Service (NPS) begin work on physically modifying the -12 mile slough before smallmouth bass begin spawning and establishing there again in 2023.
Cost estimates for replacement power in the EA are simply estimates and may not reflect all of the contributing factors in energy supply. We are concerned that these WAPA estimates may be low and undervalue the real impact in the market. WAPA's estimates should be further scrutinized by others knowledgeable in the market structures to ensure proper assessment of the impacts.
As discussed below, AEPCO finds that the proposed Smallmouth Bass EA fails to meet legal and regulatory standards required by the National Environmental Policy Act (NEPA) and associated executive orders. The deficiencies are glaring, profound and do not support the current process that the Bureau has embarked upon to address a non-native fish species at a time of unprecedented drought in modern times. The process to date has been rushed and deficient in the consideration of the widespread impacts that the diversion of precious hydrological resources will have on populations in the West. The failure of the Bureau to consider no alternative other than releases of water through bypass tubes in summer months, which also meets the project's purpose and need, underscores the base infirmity associated with proposed action.1 Indeed, NEPA requires more of the Bureau than the rushed Smallmouth Bass EA that has been published for public comment. 1 The Bureau is mandated under NEPA to consider a no action alternative. Envtl. Def. Ctr. v. Bureau of Ocean Energy Mgmt., 36 F.4th 850, 866 (9th Cir. 2022) citing 42 U.S.C. § 4332; 40 C.F.R. § 1502.14 ("Under NEPA, agencies must evaluate the environmental impacts of alternatives to the proposed action, and it specifically mandates consideration of a 'no action' alternative."). Here, "Reclamation analyzed the no action alternative... This alternative does not meet the project's purpose or need. Bureau of Reclamation, Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment, at 2-1 (Feb. 2023) ("Smallmouth Bass EA").
NPS has concerns about whether no action and action are being compared for the full range of possible Lake Powell elevations in which the dam could be operated. For instance, if the dam were operated between 3500'-3515' for an extended period of time, it is our understanding that the differences between action and no action would be greatly increased. The no action alternative would pass a large amount of non-natives into a warmer river and very likely greatly increase SMB passthrough and reproduction below the dam, greatly increasing the chances of SMB establishment. If the action alternative were chosen and Option B (the Cool Mix with Flow Spikes) was used, the river would remain below 16°C for the most part and SMB would be much less likely to establish and much less likely to impact native fish and humpback chub. If Reclamation were to choose to operate in that range of 3500'-3515' for an extended period, then NPS views the action alternative as the appropriate mitigation for that operational choice, under the GCPA. It would also be good to clarify if flow spikes can be used when operating close to 3500' or whether there is a minimum elevation above that like 3505' or 3510' at which flow spikes would no longer be able to be considered because of the temporary drop in elevation they might cause.
Grid Reliability Concerns Dispatchable generation, such as coal, hydro, nuclear, and gas, keep the power grid reliable. Dispatchable generation must equal non-dispatchable generation, such as solar and wind, minus customer usage. When there is not enough dispatchable generation on the grid, customers' power is turned off to maintain the frequency, which is necessary to keep the grid interconnected.

Substantive Comments
In riverine environments, SMB typically spawn in off-channel waters (e.g., backwaters and sloughs) where little, if any, flow exists. As observed in the Lees Ferry reach below GCD, these waters are notably higher in temperature than the main channel. The alternatives outlined in this EA that utilize steady "bypass flows" to decrease riverine temperatures below 16 degrees Celsius may not sufficiently affect temperatures in these off-channel waters to preclude SMB spawning, as warmer aquatic refugia will almost always be available.
The draft EA documents the anticipated negative effects resulting from the establishment of Smallmouth Bass on native fish communities in the Grand Canyon. The Department agrees with this assessment and supports actions to minimize this risk of establishment. Negative impacts to the economically important Rainbow Trout Fishery at Lees Ferry would also be expected with the establishment of high-risk warmwater non-native species, such as Smallmouth Bass. These impacts are addressed within the sections covering the no action alternative; however, we suggest they should also be included within the introduction of the document, which outlines the underlying need for addressing warming release temperatures at Glen Canyon Dam.
Accordingly, WAPA requires Reclamation establish an off-ramp, discussed further below, that would modify or terminate the experiment if the Basin Fund balance falls below $70 million or reaches a level otherwise insufficient to fund project needs. Based on the financial impacts identified in the EA, this could happen as early as summer 2023, and a balance reduction of this magnitude would be likely in 2024 and 2025 if the experiment continues through to 2025.
Concerning SMB the Lees Ferry trout fishery, the situation will eventually rectify itself. Eventually, we will have lower water temperatures in this reach that will limit SMB reproduction and will make existing fish more open to predation by brown trout, provided there are any left. Might want to rethink that brown trout incentivized harvest program. A predator that can't live in the majority of Humpback chub habitat, but potentially preys on one that can, may not be all that bad. The enemy of my enemy is my friend.
The EA does not appear to consider that spawning activity of SMB occurs along a gradient and does not simply turn off or on once certain environmental conditions are met (i.e., 16°C). Rather, individual bass may initiate spawning activities and behaviors at a temperature that is below and above the referenced 16°C. The proposed actions and flow options do not consider that spawning may occur at a temperature below 16°C. The triggering event for any action should reflect this variability in spawning and should encompass the full time period in which SMB could be spawning.
We strongly encourage Reclamation to consider mitigation that could be undertaken to avoid significant impacts so that a mitigated Finding of No Significant Impact (FONSI)^1 might be issued within the necessary timeframe to complete this NEPA process. Timely completion of the NEPA process is necessary to implement flow options to help prevent establishment of smallmouth bass below GCD. 1 Final Guidance for Federal Department and Agencies on the Appropriate Use of Mitigation and Monitoring to Clarify the Appropriate Use of Mitigated Findings of No Significant Impact, 76 Fed. Reg. 3843, 3846 (Jan. 21, 2011).
Flow Option B, p. 2-6: this section refers to two flow spikes; yet, page 2-4 refers to "up to three 36-hour flow spikes". Please clarify.
Under Flow Option B a single flow above 40,000 cfs may be more beneficial than multiple flows at 30,000 cfs. Please refer to recent HFE optimization modeling conducted by Grand Canyon Monitoring and Research Center (i.e., Dr. Paul Grams' 1 September 2022 presentation, Scenario C). Furthermore, because BOR is required to 'move water' through the dam in the summer of 2023 (i.e., DROA water that was held back in Lake Powell), sufficient water should be available to increase the magnitude and duration of the flow spike. Based on Grand Canyon Monitoring & Research Center's recommendations, it may be possible to disrupt SMB spawning at a key juncture to inhibit establishment, while also maximizing sediment deposition, and minimizing erosion throughout the Colorado River ecosystem. It is imperative that we capitalize on the current conditions of flow and sediment that may not exist in the future. In particular, we suggest modifying Flow Option B: Cool Mix with Flow Spikes to use this "extra DROA water," which could also potentially help extend cooler water and spawning disturbance downriver below the Glen Canyon reach. This appears to us to be the best, most effective tool for benefiting multiple resources and inhibiting SMB establishment. We must capitalize on these conditions, which are unlikely to exist in the near future, given the climate aridification the West is experiencing.

Substantive Comments
Section 3.3.1 contains the statement, "fish in all waters within the GCNRA and GCNP are managed by the National Park Service (NPS), in coordination with the Arizona Game and Fish Department and the USFWS." We respectfully request an amendment to "fish in all waters within the GCNRA and GCNP are managed jointly by the National Park Service (NPS) and Arizona Game and Fish Department in coordination with the USFWS."
The potential impact of removing dispatchable generation from the electric grid is substantial. Reliable electricity is vital to the American public.
Establishment of a smallmouth bass population in the Colorado River of Grand Canyon because of Glen Canyon Dam operations would jeopardize humpback chub by reducing the reproduction, numbers, and distribution of the Chub's Little Colorado River population. Section 7 of the ESA requires that "[e]ach Federal agency shall, in consultation with and with the assistance of [the Services], insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification" of designated critical habitat. 16 U.S.C. § 1536(a)(2). To "jeopardize the continued existence of" means "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." 50 C.F.R. § 402.02.2 Here, BOR's operation of Glen Canyon Dam, by passing warm water and smallmouth bass from Lake Powell into the Colorado River downstream, threatens jeopardy of humpback chub by facilitating the establishment of smallmouth bass populations that will reduce the reproduction, numbers, and distribution of humpback chub. There is little evidence to suggest that the failure to prevent the establishment and reproduction of a smallmouth bass between the Little Colorado River and Glen Canyon Dam would not decimate the Little Colorado River population's recruitment and overall size. To the contrary, abundant information indicates that humpback chub are vulnerable to predation by smallmouth bass generally, ^14 that survival and recovery requires habitat with few nonnative predators so that young survive and recruit into self-sustaining populations,^15 that smallmouth bass predation has likely decimated breeding populations of humpback chub in the Yampa river,^16 and that the Little Colorado River population of humpback chub may be particularly prone to predation by non-native fish should a population become established in Grand Canyon.^17 14 U.S. Fish and Wildlife Service. 2017. Species status assessment for the Humpback Chub (Gila cypha). U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, CO. At 24. 15 Id at iiv. 16 Id at 116. 17 Marsh, P.C., and M.E. Douglas. 1997. Predation by introduced fishes on endangered Humpback Chub and other native species in the Little Colorado River, Arizona. Transactions of the American Fisheries Society 126: 343-346.
Just read the article regarding smallmouth bass. I find it unfortunately laughable. There are smallmouth bass all along the Colorado River basin as far south as Parker, Arizona and father south because of the smallmouth accidently stocked in Lake Powell decades ago. I love catching them in Lake Mead, Lake Mojave, and Lake Havasu. Not sure any measures taken now could change the damage done by them Smallmouth bass without basically destroying the entire fishery.
The proposed 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.
The Draft EA states "[t]he proposed action's Purpose and Need are to prevent the establishment of smallmouth bass below the GCD." The Draft EA further states the goal of all flow options is to "disrupt smallmouth bass spawning." The Draft EA concludes that Flow Option E does not meet the Purpose and Need and therefore does not provide any analysis for Option E. While Flow Options A through D primarily focus on reducing or preventing spawning through lowering stream temperatures below Glen Canyon Dam (GCD), all Flow Options, A through E, focus on disrupting smallmouth bass spawning. The EA provides that Flow Option E would disturb spawning and rearing, drive male smallmouth bass off nests, and result in high mortality of offspring. The language reflects that Flow Option E meets the Purpose and Need of the EA and the stated goal of the flow options and therefore should be retained as an option in the Proposed Action Considering the potential three-year life span of the actions proposed in the EA, there is an extensive amount of time to learn from these actions. Flexibility should be retained in the EA in the event that future data or analyses prove one alternative is less or more effective than previously understood. Flow Option E is the only flow option that does not require use of the bypass tubes. If, in the future, some or all of the bypass tubes are unavailable for use, the ability to implement Flow Option E may be critical to help prevent the establishment of smallmouth bass below GCD. Additionally, Flow Option E will minimize impacts to hydropower generation, grid stability, the Upper Colorado River Basin Fund (Basin Fund) and,

Substantive Comments
importantly, disadvantaged and Tribal communities that are recipients of hydropower. Flow Option E warrants further consideration and may provide beneficial information regarding important tradeoffs and impacts for all flow options.
The EA outlines an assessment of anticipated effects to recreational experience downstream of Glen Canyon Dam, but does not include an assessment of recreational impact in Lake Powell (e.g. boat ramp access) associated with changes in pool elevations for the proposed actions.
The term "fisheries" has traditionally been used in describing fish populations with economic use through commercial or recreational harvest. Although the term has expanded in use to include general description of fish populations, there are some instances throughout the document that the term could be considered misapplied to native fish communities.
The ESA mandates that all the impacts of the agency's discretionary activities on listed species, such as BOR's operation of Glen Canyon Dam, be assessed as an effect, not as part of the environmental baseline, in determining jeopardy. This principle was reaffirmed during the rulemaking process for the 2019 revisions to the 402 consultation regulations. 84 Fed. Reg. 44,976, 44,978 ("discretionary activities . . . that are part of the proposed action but for which no change is proposed" are to be analyzed "as part of the effects of the action, even those operations that the Federal agency proposes to keep the same."). Establishing an environmental baseline that fails to consider factors harming the species or degrading the species' habitat violates the ESA. See, e.g., Am. Rivers & Ala. Rivers All. v. FERC, 895 F.3d 32, 46-47 (D.C. Cir. 2018) (holding Fish and Wildlife Service acted arbitrarily in establishing a baseline that failed to consider degradation caused by power plant); Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv., 524 F.3d 917, 929 (9th Cir. 2008) (finding that a biological opinion violated ESA where it did not "incorporate degraded baseline conditions into its jeopardy analysis."). As a result, in order for the Bureau of Reclamation to meet the requirements of the ESA, it must engage in consultation with the Service to "insure" that the proposed actions, including existing operations, are "not likely to jeopardize" the continued existence of listed species. 16 U.S.C. § 1536(a)(2).
There is not a guarantee that the replacement of the needed capacity and energy lost to the experiment is available, regardless of price, in the summer months because of the very tight resource sufficiency conditions that currently exist in the Western interconnect.
I recommend that you consider maximizing water storage in Lake Powell to the maximum extent practical during the testing periods defined in each of the options rather than balancing water storage between Lakes Mead and Powell.
Section 3.6, page 3-27: Please include reference to the September 2022 emergency power supply from GCD to California. Please remove the incorrect reference to the Grand Canyon Protection Act in the last sentence.
However, if stuck with these options then Options A or B are superior to Options C or D which impact far more. If other options cannot be considered then Hopi prefers option A. Flows must match the most natural occurring flow as possible.
If there is any flexibility in your water storage management plan, increased pool depth in lake Powell will provide more cold water for downstream releases from Glenn Canyon Dam during the testing periods each year which will be beneficial to all options in the EA.
SRP would look forward to the opportunity to work with Reclamation and other stakeholders to develop alternate approaches to mitigate impacts on hydropower from GCD, given its critical role in maintaining the reliability of the western grid.

Appendix C. Organization/Agency Letters

Archived: Wednesday, March 15, 2023 2:44:31 PM
From: Bucklin, Sarah A
Sent: Monday, February 27, 2023 12:43:35 PM
To: GCD_SMB_EA, BOR-SHA-UCR-
Subject: Fw: Small Mouth Bass Enviroment
Importance: Normal
Sensitivity: None

From: Parsons, Curtis <cparsons@fmtn.org>
Sent: Monday, February 27, 2023 11:58 AM
To: Bucklin, Sarah A <sbucklin@usbr.gov>
Subject: [EXTERNAL] Small Mouth Bass Enviroment

First of all I would like to ask why is this assessment even being considered? You have on the eastern seaboard humpback whales dying at a very unusual rate and the only change in the environment out there is the green energy Wind farms that are being produced in record setting amounts.

How do you have these numbers if the population is declining " The U.S. Geological Survey's (USGS) Grand Canyon Monitoring and Research Center oversees monitoring and research activities for the Grand Canyon population under the auspices of the Glen Canyon Dam Adaptive Management Program (GCDAMP). Analysis of data collected through 2006 suggests that the number of adult (age 4+ years) humpback chub in Grand Canyon increased to approximately 6,000 fish in 2006, following an approximate 40–50 percent decline between 1989 and 2001 (Coggins, 2007). Increasing numbers of adult fish appear to be the result of steadily increasing numbers of juvenile fish reaching adulthood beginning in the mid- to late-1990s and continuing through at least 2002 (Coggins, 2007)."

Why was the fish placed on the February 16 2022 endangered species list at this particular time. Is the lower Colorado river basin considered a cold water river? If so then why is the smallmouth bass considered a warm water fish? Especially since one of the largest populations of small mouth bass that I have ever fished for are in the cold cold water lake of the San Juan Reservoir in Southwest Colorado and Northwest New Mexico. Since these fish are such massive predators of other fish then why is the San Juan river below the lake considered as one of the best trout fishing grounds in the United States. These are actual facts from real people that fish for the small mouth and the trout. No one fishes for humpback chub because it is a very foul tasting fish and it is what is known as a TRASH fish.

Now the most important issue of the entire study. You want to route water around the wicket gates of the dam where that water is used to turn generators that produce GREEN power for customers below the lake and Western Power grid as it is. Was it not just last summer that governor Newsome of California ws calling on people not to charge their electric cars during the day because there was insufficient power for the Western power grid.So we are going to reduce the generation in the western power grid by up to 50% of the Lake Mead Dam output. just so a fish that is thriving in today's times not decreasing in numbers. How can one truly make any sense of this at all? Summer is a time which power marketers are charging on an average of over 200 dollars per megawatt hour instead of the 45 or 55 normal price in the western market . This happens to be the wholesale prices of what electricity costs. This is the price the companies that send it to your home costs them. Then what each year the price

goes up 15 cents per kilowatt for your home's energy...

Now back to just the study. Numbers like 81 million dollars are going around as what it will cost just to do a study on a fish. Instead of using that 81 million dollars to invest in more base load or quick start power generators.

I have been in this industry since I was 19 years old. performed everything from building electrical substations all the way up to supervisor of power system operations. I believe my credentials can speak for themselves when it comes to saying I just might know a little about this industry.

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Curtis Parsons
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Notice: New Mexico law requires government agencies to disclose to the public, upon request, most written communications, including those in electronic form. Persons communicating with City officials or employees should expect that any communications could be released to the public and that this disclosure could include the email addresses of those communicating with City officials or employees.

March 8, 2023

VIA EMAIL

Secretary Haaland
Department of the Interior
1849 C Street NW
Washington DC 20240

Ms. Sarah Bucklin
Regional NEPA Coordinator
US Bureau of Reclamation, Upper Colorado Basin Region
125 South State Street, Room 8100
Salt Lake City, UT 84138

RE: GRAND CANYON DAM / SMALLMOUTH BASS FLOW OPTIONS DRAFT ENVIRONMENTAL ASSESSMENT

Dear Secretary Haaland:

On behalf of Arizona Electric Power Cooperative, Inc. (AEPCO) and the Distribution Member Cooperatives that it serves with the resources provided by the Colorado River Storage Projects (CRSP) including the Glen Canyon Project, I am providing comments in response to the request for public comment on the Glen Canyon Dam/ Smallmouth Bass Flow Options Draft Environmental Assessment (EA) (Smallmouth Bass EA) published by the Bureau of Reclamation (Bureau) on February 24, 2023. As a member of the Colorado River Energy Distributors Association (CREDA), we support the comments presented in its letter of March 10 in response to request for comments. We also agree with the concerns raised by the Irrigation and Electrical District of Arizona (IEDA) presented in its letter of March 3, 2023.

AEPCO is a nonprofit generation and transmission (G&T) cooperative providing power, transmission, and market services to distribution cooperatives and public power members in Arizona, California, and Nevada. AEPCO owns and operates the Apache Station power facility in southeastern Arizona, and has a diverse portfolio of power resources including natural gas, utility scale solar and battery, coal powered generation, and federal hydro contracts. AEPCO partners with Alliances for Cooperative Energy Services Power Marketing (ACES) to operate the Western Regional Trading Center (WRTC) at its headquarters in Benson, Arizona, supporting electric cooperatives and public power utilities throughout the Western Electricity Coordinating Council (WECC) and and the California Independent System Operator (CAISO). And, through its

Arizona Electric Power Cooperative, Inc. • Sierra Southwest Cooperative Services, Inc.
P.O. Box 670 • 1000 S. Highway 80 • Benson, Arizona 85602 • (520) 586-3631 Phone • www.azgt.coop

parnership with WAPA Desert Southwest, AEPCO operates a 24-hour dispatch center for its metered subsystem, supporting electric cooperatives and public power utilities throughout Arizona.

As discussed below, AEPCO finds that the proposed Smallmouth Bass EA fails to meet legal and regulatory standards required by the National Environmental Policy Act (NEPA) and associated executive orders. The deficiencies are glaring, profound and do not support the current process that the Bureau has embarked upon to address a non-native fish species at a time of unprecedented drought in modern times. The process to date has been rushed and deficient in the consideration of the widespread impacts that the diversion of precious hydrological resources will have on populations in the West. The failure of the Bureau to consider no alternative other than releases of water through bypass tubes in summer months, which also meets the project's purpose and need, underscores the base infirmity associated with proposed action.[1] Indeed, NEPA requires more of the Bureau than the rushed Smallmouth Bass EA that has been published for public comment.

AEPCO utilizes the dwindling power resources made available at Glen Canyon Dam to serve the load of its Member Cooperatives. In addition, AEPCO schedules and balances resources for other non-Cooperative customers who have CRSP allocations. In recent years, the challenge of serving load and balancing resources has become acutely more difficult because the power resources available from the CRSP resources have diminished due to persistent drought conditions. When power that is not available pursuant to the contracts AEPCO has with the Federal Government, AEPCO must find replacement resources.

The availability of replacement power, particularly in summer months, has become scarce. The slow-moving disaster of the pernicious drought affecting the CRSP resources has followed a trend of power plant retirements in the Desert Southwest. Although AEPCO does own and operate electric generation, it also relies on Federal Resources to keep rates as low as possible for its Cooperative Members and scheduling partners. In fact, AEPCO's Cooperative Members serve a higher proportion of Arizona electric ratepayers in the State of Arizona who fall below the Federal poverty line. Because AEPCO is a not for profit utility, the costs it incurs in serving its customers must be borne by all of its customers and their retail ratepayers. The failure of the Federal Government to deliver power affects some of the most vulnerable populations.

This socio-economic impact has not been analyzed in the Smallmouth Bass EA.[2] Furthermore, the depth of the impacts on the project purpose of hydropower and the direct effects of not

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[1] The Bureau is mandated under NEPA to consider a no action alternative. *Envtl. Def. Ctr. v. Bureau of Ocean Energy Mgmt.*, 36 F.4th 850, 866 (9th Cir. 2022) citing 42 U.S.C. § 4332; 40 C.F.R. § 1502.14 ("Under NEPA, agencies must evaluate the environmental impacts of alternatives to the proposed action, and it specifically mandates consideration of a 'no action' alternative."). Here, "Reclamation analyzed the no action alternative… This alternative does not meet the project's purpose or need. Bureau of Reclamation, Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment, at 2-1 (Feb. 2023) ("Smallmouth Bass EA").

[2] The U.S. Supreme Court has held that "[u]nder NEPA, an EIS must also address the socioeconomic consequences of the environmental impact of the proposed action." *Cachil Dehe Band of Wintun Indians of the Colusa Indian Cmty. v. United States DOI*, No. 2:12-cv-03021-TLN-AC, 2017 U.S. Dist. LEXIS 9107, at *8 (E.D. Cal. Jan. 20,

generating hydropower to manage a nonnative species has not been analyzed in the Smallmouth Bass EA. This is the fundamental problem with the process pursued by the Bureau. By opting for the short cut of an EA, the Bureau has failed to consider multiple impacts which indicate the proposed action rises to the level of a major federal action which will significantly affect the quality of the human environment. Pursuant to NEPA, the Bureau must therefore perform a Supplemental Environmental Impact Statement (SEIS) to adequately evaluate the impacts that could result from the proposed action.

As an electric utility that frequently partners with the Federal Government, AEPCO is well aware of the procedural requirements of NEPA. While AEPCO searches for opportunities to move expeditiously forward on projects with its Federal partners, AEPCO is reminded on every occasion that it must abide by the strictures of NEPA. AEPCO has been told repeatedly that NEPA is the "basic national charter for protection of the environment."[3] Further, AEPCO must honor NEPA's twin aims. First, "it places upon an agency the obligation to consider every significant aspect of the environmental impact of a proposed action. Second, it ensures that the agency will inform the public that it has indeed considered environmental concerns in its decision-making process."[4]

As a consequence, NEPA requires Federal agencies, such as the Bureau, to take a "hard look" at environmental consequences of the agency's proposed action and "emphasizes the importance of coherent and comprehensive up-front environmental analysis to ensure informed decision making to the end that the agency will not act on incomplete information, only to regret its decision after it is too late to correct."[5] NEPA's hard look requirement "includes determining whether the agency adequately evaluated ***all*** potential environmental impacts of the proposed action, analyzed all reasonable alternatives to the proposed action, and identified and disclosed to the public all foreseeable impacts of the proposed action."[6]

An EIS is required for "major Federal actions significantly affecting the quality of the human environment . . . ."[7] Procedurally, "[t]he agency first prepares an EA to determine whether an action will have a significant impact, thus requiring preparation of an EIS."[8] An EA is a "concise, public document' providing 'sufficient evidence and analysis' for the agency to determine 'whether to prepare an environmental impact statement." Thus, an EA is intended to help an agency decide if an EIS is warranted; an EA is not meant to replace or substitute for an EIS.[9] In accordance with Ninth Circuit precedent, a violation of NEPA occurs when a federal agency fails

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2017) *citing* Baltimore Gas & Elec. Co. v. Nat. Res. Def. Council, Inc., 462 U.S. 87, 106-07, 103 S. Ct. 2246, 76 L. Ed. 2d 437 (1983).

3 *Ctr. for Biological Diversity v. United States Forest Serv.*, 349 F.3d 1157, 1166 (9th Cir. 2003) (internal citations omitted).

4 *Id.*

5 *Id.*

6 *Ctr. for Biological Diversity v. United States Blm*, No. 3:17-CV-553-LRH-WGC, 2019 U.S. Dist. LEXIS 7525, at *11 (D. Nev. Jan. 15, 2019) *citing* 42 U.S.C § 4332(2)(C) (emphasis added).

7 *Envtl. Prot. Info. Ctr. v. United States Forest Serv.*, 451 F.3d 1005, 1009 (9th Cir. 2006) *citing* 42 U.S.C. § 4332(2)(C).

8 *Id. citing* 40 C.F.R. § 1508.9.

9 *Envtl. Def. Ctr. v. Bureau of Ocean Energy Mgmt.*, 36 F.4th 850, 872 (9th Cir. 2022) (internal citations omitted).

to provide a "convincing statement of reasons to explain why [the] project's impacts are insignificant."[10]

Under NEPA, a federal agency is statutorily mandated to prepare a SIES if "[t]he agency makes substantial changes in the proposed action that are relevant to environmental concerns; or…[t]here are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts."[11] Here, the U.S. Supreme Court has stated that "in the context of reviewing a decision not to supplement an EIS, courts should not automatically defer to the agency's express reliance on an interest in finality without carefully reviewing the record and satisfying themselves that the agency has made a reasoned decision based on its evaluation of the significance, or lack of significance, of the new information. A contrary approach would not simply render judicial review generally meaningless but would be contrary to the demand that courts ensure that agency decisions are founded on a reasoned evaluation 'of the relevant factors."[12] As discussed in detail below, significant new circumstances and information relevant to hydropower concerns and bearing on the proposed action exists. Therefore a SIES is required.

Additionally, as explained by the Ninth Circuit, "[w]hen determining whether to issue a supplemental EIS, an agency must "apply a rule of reason," and continue to "maintain a 'hard look' at the impact of agency action when the 'new information is sufficient to show that the remaining action will affect the quality of the human environment in a significant manner or to a significant extent not already considered."[13] Notably, the Ninth Circuit has previously required federal agencies to "prepare a supplemental EIS after it changed a policy upon which the original EIS had relied."[14] According to the Ninth Circuit, "the bar for whether 'significant effects' may occur is "a low standard"[15] and a policy change that "raise[d] 'substantial questions; regarding [the project's] impact' was enough to require further analysis before allowing the project to proceed."[16] As set forth by the Supreme Court, "[t]he decision not to prepare a supplemental environmental impact statement is controlled by the 'arbitrary and capricious' standard."[17] "In making the factual inquiry concerning whether an agency decision was 'arbitrary or capricious,' the reviewing court must consider whether the decision was based on a consideration of the relevant factors and whether there has been a clear error of judgment. This inquiry must "be searching and careful."[18]

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10 *350 Mont. v. Haaland*, 29 F.4th 1158, 1163 (9th Cir. 2022) *citing Bark v. United States Forest Serv.*, 958 F.3d 865, 869 (9th Cir. 2020).

11 40 C.F.R. § 1502.9(c).

12 *Marsh v. Or. Nat. Res. Council*, 490 U.S. 360, 378, 109 S. Ct. 1851, 1861 (1989)

13 *League of Wilderness Defs./Blue Mts. Biodiversity Project v. Connaughton*, 752 F.3d 755, 760 (9th Cir. 2014) (internal citations omitted).

14 *Id.*

15 *Id.*

16 *Id.*

17 *Ctr. for Biological Diversity v. Mayorkas*, No. CV-17-00163-TUC-CKJ, 2021 U.S. Dist. LEXIS 159034, at *23 (D. Ariz. Aug. 20, 2021) *citing Marsh v. Or. Nat. Res. Council*, 490 U.S. 360, 377, 109 S. Ct. 1851, 1861 (1989) (Accordingly, as long as the Corps' decision not to supplement the FEISS was not 'arbitrary or capricious,' it should not be set aside.").

18 *Marsh v. Or. Nat. Res. Council*, 490 U.S. 360, 363, 109 S. Ct. 1851, 1853 (1989).

Against this legal baseline, AEPCO finds multiple issues with the Smallmouth Bass EA. Notably, the Bureau improperly tiered the Smallmouth Bass EA to the Long-Term Experimental and Management Plan (LTEMP) Final EIS and therefore, a SEIS is necessary in order to comply with NEPA. "Tiering refers to the coverage of general matters in broader [EIS] or [EA] (such as national program or policy statements) with subsequent narrower statements or environmental analyses (such as regional or basin-wide program statements or ultimately site-specific statements) incorporating by reference the general discussions and concentrating solely on the issues specific to the statement subsequently prepared."[19] Put another way, '[t]iering' is defined as 'avoiding detailed discussion by referring to another document containing the required discussion."[20]

Here, the Bureau issued the Smallmouth Bass EA to evaluate the impacts of the Agency's proposed action "to change the temperature of the water released through Glen Canyon Dam (GCD) by changing where water is released through the dam's existing structure."[21] According to the Bureau, relevant laws and executive orders "that provide context for the management of the Colorado River and GCD" are provided in the GCD LTEMP Final EIS.[22] The LTEMP Final EIS was drafted in October 2016. As such, the Smallmouth Bass EA tiers to the LTEMP Final EIS analysis.[23]

To provide context, the Ninth Circuit has stated that "NEPA regulations allow agencies to 'tier' later NEPA documents to earlier NEPA documents so that the agency can 'avoid some of the burdens of the NEPA process.'…The later NEPA documents 'concentrate on issues specific to the current proposal' while the earlier NEPA documents are broader and 'cover matters more general in nature.' An agency may tier to a NEPA document if the subsequent statement is either of 'lesser scope' or a 'statement or analysis at a later stage.'"[24] Most notably, "the previous document must actually discuss the impacts of the project at issue"[25] "and have been subject to NEPA review."[26] Furthermore, although "NEPA regulations 'encourage[]' tiering", the Ninth Circuit has also specified that "[t]o encourage tiering, however, hardly means that tiering alone proves sufficient to satisfy NEPA's various requirements. NEPA regulations encourage tiering "to eliminate repetitive discussions of the same issues' in different levels of environmental review."[27] As noted above, the hard look requirement is a cornerstone of NEPA. Accordingly, the Ninth Circuit has found "the government's EA to be inadequate under NEPA because of, *inter alia*, improper tiering and vague analysis." Therefore, the Ninth Circuit held that a federal agency "failed to take a 'hard look' at the environmental effects" of its proposed action.[28]

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19 40 C.F.R. § 1508.1(ff).

20 *Earth Island Inst. v. Muldoon*, No. 1:22-CV-00710-AWI-EPG, 2022 U.S. Dist. LEXIS 172147, at *52-53 (E.D. Cal. Sep. 21, 2022) (internal citations omitted).

21 Smallmouth Bass EA, at I-I.

22 *Id.* at I-5.

23 *Id.* at I-7; I-8.

24 *Earth Island Inst. v. Muldoon*, 2022 U.S. Dist. LEXIS 172147, *52-53 (internal citations omitted).

25 *Native Vill. of Nuiqsut v. BLM*, 9 F.4th 1201, 1213 (9th Cir. 2021).

26 *Earth Island Inst. v. Muldoon*, 2022 U.S. Dist. LEXIS 172147, *52-53 (internal citations omitted).

27 *Wildearth Guardians v. United States BLM*, 457 F. Supp. 3d 880, 893-94 (D. Mont. 2020) (internal citations omitted).

28 *Ctr. for Biological Diversity v. United States Blm*, No. 3:17-CV-553-LRH-WGC, 2019 U.S. Dist. LEXIS 7525, at *19-20 (D. Nev. Jan. 15, 2019) (internal citations omitted).

Against this legal framework, the Bureau's tiering of the Smallmouth Bass EA to the LTEMP Final EIS analysis is arbitrary and capricious, and therefore fails to satisfy NEPA's requirements. This is perhaps best illustrated in examining lake levels and generation output between 2016 and 2022.[29] In 2016, the year the LTEMP was published in draft form, Glen Canyon Lake levels fluctuated between 3,590 and 3,620 feet. On April 30, 2016, Glen Canyon Lake rested at 3,592 with 457 MW of head, and max generation of 517 MW. In comparison, on April 20, 2022, Glen Canyon Lake hovered at 3,522 feet with 389 MW of head and max generation of 250 MW. This comparison roughly demonstrates that over half the generation is available.[30] Nonetheless, "[t]he flows analyzed in [the Smallmouth Bass] EA are tiered from the LTEMP analysis[.]"[31] According to the Bureau, the flows analyzed in the Smallmouth Bass EA "fall within the scope of release parameters addressed in the LTEMP."[32]

An EA which tiers off the 2016 LTEMP conclusions does not account for the drastic drop in lake elevations at Glen Canyon Lake and cannot reasonably account for impacts to hydropower. Between January 1, 2021, and December 31, 2021, Lake Powell lost forty-five feet of elevation. Indeed, since the publication of the 2016 LTEMP, Lake Powell has been in a veritable free fall as droughts continue and persistent arid conditions have sapped moisture from annual snowpack diminishing the expected run off to replenish lake levels. Using the 2016 LTEMP as a baseline measurement for acceptable flows is arbitrary and capricious and cannot support a Finding of No Significant Impact (FONSI). Facially and substantively, the Corps fails its obligations under NEPA to take the required hard look. Accordingly, the Bureau must reject the Smallmouth Bass EA and proceed to complete a SEIS before taking any further action.

The cursory review of the impacts from the proposed alternative on hydropower reduction fails to comply with the Administration's own policies. On April 16, 2021, you signed Order No. 3399 which set forth the "Department-Wide Approach to the Climate Crisis and Restoring Transparency and Integrity to the Decision-Making Process." While AEPCO has devoted countless hours and millions of dollars to comply with Federal mandates associated with climate change initiatives, it is chagrined and disappointed that the Department of Interior sidestepped its own obligations which your office instituted on a department wide basis two years ago. In particular, AEPCO notes in Section 5 which addresses transparency in the NEPA process, Order No. 3399 requires:

> b. Consideration of greenhouse gas (GHG) emissions and climate change impacts. Identifying important interactions between a changing climate and the environmental impacts of a proposed action in NEPA documents can help decision makers identify opportunities to reduce GHG emissions, improve environmental outcomes, and contribute to protecting communities from the climate crisis.
> When considering the impact of GHG emissions from a proposed action, Bureaus/Offices should use appropriate tools, methodologies, and resources

[29] *See* https://www.wapa.gov/regions/CRSP/OpsMaint/Pages/operations-maintenance.aspx.
[30] Because the experiment is due to commence on May, 1, 2023, April 1 was selected for purposes of comparison.
[31] Smallmouth Bass EA at I-7.
[32] *Id.*

> available to quantify GHG emissions and compare GHG quantities across alternatives. When quantifying GHG emissions is not possible because tools, methodologies, or data inputs are not reasonably available, Bureaus/Offices will provide a qualitative analysis and the rationale for determining that a quantitative analysis is not warranted.[33]

The Smallmouth Bass EA provides the most cursory and perfunctory treatment of GHG impacts explaining that "[i]f less hydropower generation occurs at [Glen Canyon Dam], replacement power would most likely be provided from natural gas power plants, with a smaller portion supplied by coal-fired power plants. Non-renewable replacement power sources would be associated with increased greenhouse gas emissions as compared to hydropower generation."[34] There is no analysis of the GHG emissions associated with the suggested alternatives.

This failure to identify and consider the GHG impacts flatly contradicts the guidance from your office, violates NEPA, and flies in the face of Ninth Circuit precedent.[35] The means to obtain the data inputs are easily obtained. The Bureau simply needs to contact the CRSP customers and ask how replacement resources may be sourced and what generation resources may be required to compensate for lost generation due to extensive bypass operations. If someone from the Bureau had contacted AEPCO, it could have provided some modeling of impacts associated with running either its coal or gas fired units to generate the power the Federal government has decided not to provide under its existing contracts. It was unreasonable not to ask, particularly if it is essentially Department of Interior policy to do so. This too, represents another example of how the Bureau has rushed to judgement with the Smallmouth Bass EA without full comprehension of the impacts and analysis of alternatives.

The sense of urgency to ram the Smallmouth Bass EA through the NEPA process highlights another grievous deficiency in this misguided effort. While AEPCO is critical above of the Bureau's failure to collect requisite information in the analysis of alternatives, the timeline to provide comments violates due process rights afforded the public. In the current instance, the Bureau has provided a mere fourteen-day public comment period regarding the Smallmouth Bass EA.[36] This brief comment period is insufficient and fails to meet the standard set forth in 40 C.F.R. § 1500.1(b). Per 40 C.F.R. § 1500.1(b), the purpose of NEPA is to ensure that "environmental information is available to public officials and citizens before decisions are made

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33 Order No. 3399 at Section 5(b).

34 Smallmouth Bass EA at 3-34.

35 *See 350 Mont. v. Haaland*, 50 F.4th 1254 (9th Cir. 2022). The Ninth Circuit held that the Department of the Interior violated NEPA "by failing to provide a convincing statement of reasons why the project's impacts were insignificant. The 2018 EA failed to articulate any science-based criteria of significance in support of its finding of no significant impact (FONSI), but instead relied on the arbitrary and conclusory determination that the Mine Expansion project's [greenhouse gas] emissions would be relatively minor." *Id.* at 1258.

36 *See* Bureau of Reclamation, *Reclamation seeks public comment on Glen Canyon Dam/Smallmouth Bass Flow Options Environmental Assessmen*t (Feb. 24, 2023) *available at:* https://www.usbr.gov/newsroom/news-release/4434.

and before actions are taken…Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA."[37]

A single fourteen-day comment period is insufficient to foster "informed public participation" as necessary under NEPA.[38] As such, the Bureau must provide additional opportunities for public participation, such as public meetings and comment periods, so that interested persons may have the opportunity to adequately review the Smallmouth Bass EA and related materials and provide informed comments.

This is not a casual responsibility. Federal agencies are statutorily mandated to engage the public in a specific level of involvement during the NEPA process.[39] Federal agencies, such as the Bureau, shall "[h]old or sponsor public hearings or public meetings whenever appropriate or in accordance with statutory requirements applicable to the agency."[40] In determining whether a public hearing or public meeting is necessary, the agency must consider whether there is "[s]ubstantial environmental controversy concerning the proposed action or substantial interest in holding the hearing."[41] As stated by the Ninth Circuit, not only must the public "be given an opportunity to comment on draft EAs and EISs…[but] public hearings are encouraged to facilitate input on the evaluation of proposed actions."[42]

Ultimately, AEPCO is convinced that the Bureau neither seeks public input nor desires feedback on the proposed alternatives. This is a failure that is actionable under the law. AEPCO's views are informed by reviewing table 3-2 on page 3-37 in which the Bureau estimates the costs of firming power associated with the various flow regimes. These estimates are attributed to the Western Area Power Administration (WAPA).

However, the record reveals that WAPA has doubts as to both the cost and availability of replacement power. As set forth in a letter from WAPA to the Bureau on December 15, 2022, WAPA representatives state:

> WAPA is currently experiencing difficulty in purchasing even modest amounts of energy on the market. WAPA does not know if replacement electrical power is available for the Flow Options that require water bypass and thus reduce energy production as part of the experiment. An analysis must be completed to determine if replacement energy is available and if so identify if sources are from renewable sources or from fossil-fuel generation.[43]

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37 40 C.F.R. § 1500.1(b).

38 *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1194 (9th Cir. 2008) (internal citations omitted) ("We must determine whether the EA 'foster[s] both informed decision-making and informed public participation.'").

39 *See* 40 C.F.R. § 1506.6.

40 40 C.F.R. § 1506.6(c).

41 40 C.F.R. § 1506.6(c)(1).

42 *Anderson v. Evans*, 371 F.3d 475, 487 (9th Cir. 2002) (internal citations omitted).

43 Smallmouth Bass EA at 134.

Further, WAPA informs the Bureau that "[t]here is considerable uncertainty in power costs for the summer of 2023. If GCD generation is reduced and replacement power is available, it will be costly."[44] If anything, WAPA's correspondence reveals a substantial environmental controversy which underscores the need for the Bureau to convene at minimum a public hearing or public meeting. From AEPCO's perspective, the Bureau has not taken the hard look at hydropower impacts as required by NEPA. Moreover, the interaction and portrayal of WAPA's comments illuminates the need for a SEIS and a more thoughtful process overall.

Ultimately, I am struck by a statement in the Smallmouth Bass EA in which the Bureau admits that "[s]mallmouth bass are managed as a sport fish in Lake Powell…"[45] While I understand the dedication of many of the Federal family to provide stewardship of our Federal resources, hydropower customers like AEPCO cannot reconcile the concept of endangering the grid and nearing blackouts to manage a nonnative fish. Requiring indirect expenditures that will surely top $100 million to keep fish on one side of dam wall is not well understood by electric ratepayers living below the poverty line or on fixed incomes. We ask for your guidance and assistance in slowing down this initiative, requiring a SEIS and selecting a solution that accounts for the far reaching impacts the proposed alternatives will otherwise impose.

I thank you for your consideration of these comments.

Sincerely,

Patrick F. Ledger
Executive VP and CEO

[44] *Id.*
[45] *Id.* at 3-7.

March 8, 2023

gcd_smb_ea@usbr.gov

Re: Public comments on the Glen Canyon Dam/Smallmouth Bass Flow Options Environmental Assessment. (https://www.usbr.gov/uc/DocLibrary/EnvironmentalAssessments/20230200-GCDSmallmouthBassFlowOps_Draft EA_508.pdf.)

Gentlemen:

I am writing to you in support of your proposed action to modify flows at Glen Canyon Dam for up to three years beginning in 2023 to disrupt smallmouth bass spawning. However, I suggest you consider the following recommendations regarding flow options A, B, C, and D. I also recommend you consider one operational condition modification regarding water storage in Lake Powell. I recommend that you consider maximizing water storage in Lake Powell to the maximum extent practical during the testing periods defined in each of the options rather than balancing water storage between Lakes Mead and Powell. If there is any flexibility in your water storage management plan, increased pool depth in lake Powell will provide more cold water for downstream releases from Glenn Canyon Dam during the testing periods each year which will be beneficial to all options in the EA.

Recommendations regarding Options B and D

Flow options B and D both involve evaluation of flow spikes on spawning behavior and success of smallmouth bass and should be deleted from the proposed action. The effectiveness of flow spikes is poorly understood and in need of more rigorous studies before being considered for testing as proposed in this EA. Bestgen (2018) states the following regarding flow spikes:

"*Thus, a different control method is proposed that involves disruption of smallmouth bass reproductive success with flow spikes and water temperature alterations.* ***Potential effectiveness of this approach is not well understood because few other studies have been implemented to effect reduced spawning success of smallmouth bass. Even though effectiveness has not been tested with a rigorous study, empirical data and observations indicate potential effectiveness of this approach*** *and testing this hypothesis is merited because of potential links between smallmouth bass and the declining status of Colorado pikeminnow Ptychocheilus lucius and other rare native fishes in the Green River."* (Emphasis added).

In addition, the EA states on page 3-8 "*In regulated rivers, operational flow fluctuations showed no impact on black bass (includes largemouth and smallmouth bass) dispersal*

(Earley and Sammons 2015, Sammons and Earley 2015). There is no literature on smallmouth bass movement in response to flow spikes or cold-water releases. Furthermore, there have been no reports of population level movement from the flow spike experiments below Flaming Gorge Dam."

Further, **Table 3.2** of the EA indicates that implementing options B and D would incur an additional loss of power production of 278.4 to 57.9 GHw, respectively, compared to option C. In terms of firming expenses options B and D would incur additional losses of $278.4 and $4.3 million, respectively, compared to option C. These are substantial economic impacts to incur in order to evaluate a control method that still lacks rigorous scientific study and demonstrated success in deterring movement and spawning behavior of smallmouth bass. I recommend both options be dropped from the EA.

There is a more cost-effective way to evaluate changes in behavior of smallmouth bass and spawning success within the remaining options A and C which simulates anticipated effects of flow spikes on spawning success of smallmouth bass. The entire GCD reach can be surveyed with underwater video camera (UWV) equipment (such as the Aqua-Vu Quad HD Underwater Viewing System) twice a week during the spawning season. When smallmouth bass are observed exhibiting spawning behavior or territoriality, they can be live captured and the bottom habitat hydro-pressure washed to dislodge and wash out eggs and larvae from that location similar to what is expected to occur from flow spikes. Live-captured fish can be stored in live pens, and periodically relocated into Lake Powell. The UWV system provides geolocation data as well so favorable smallmouth bass habitat and occurrences in the GCD reach can be easily mapped. A 2-team effort, of 4 persons each, operating for 6-8 months, could easily be conducted for less than $1 million annually and result in much more data on the behavior, occurrence, and population status of the smallmouth bass invasion occurring in the Grand Canyon from the Glenn Canyon Dam reach to the Little Colorado River.

Recommendations regarding Options A and C

Flow options A and C are both on target in assessing the effects of temperature in disrupting spawning of smallmouth bass in the GCD reach and are better choices than options B and D. However, there is a large economic difference in power production between the two, with option A having a 57% greater negative economic impact on power generation. According to **Table 3,5** in the EA environmental effects are nearly identical between these two options. On balance with overall impacts, option C should be the highest ranked option in the EA, followed by option A. Since environmental outcomes are not significantly different between these two options, we should not incur such great negative economic impacts in option A with no net environmental gains.

General comments on the EA

A major deficiency in the EA is the lack of any information, or references to other documents, on how success or failure of any of the options will be determined with

respect to smallmouth bass behavior and spawning. Earlier comments in this letter for options B and D indicate that measuring impacts (positive or negative) currently lack scientific corroboration, which makes this oversight all the more important. We need to be able to answer the question “what is success or failure?” in each option tested. We have no control option in this study on flows either, so what are our conclusions going to be based upon? "Best Professional Judgement” is not an acceptable answer. We need empirical data and detailed observations that can be repeated and verified over the duration of each test run across the 3-year program.

The flow options, and water temperature controls, are based on maintaining temperatures below 16ºC for the duration of the spawning season. However, Wisconsin Department of Natural Resources states that while smallmouth bass prefer waters between 20-26ºC, the spawning season actually starts at 12.7ºC; but spawning can occur at temperatures as low as 4,5ºC. Given this reproductive spawning data, it would appear that a threshold of 16ºC is too high as a meaningful temperature control target. A target ambient control temperature of 12-13ºC would be biologically more meaningful for these tests over the next 3 years. Flow modelling at this lower temperature threshold would be helpful in evaluating the duration and effectiveness of temperatures experienced in each option. According to statements in the EA, adult smallmouth bass have been found in the GCD reach since 2000 and first captured in 2003/2004. The first confirmed spawning occurred in 2022 with over 250 young of the year smallmouth bass captured in this reach. This data is indicative of establishment of a breeding population of invasive smallmouth bass in this reach. In this situation, we need to be ready with an ongoing control plan for this invasive species if we are unsuccessful in using temperature to control spawning behavior. That plan, in case of failure of all options, or reference to one in another document, is missing from this EA.

Finally, I think a live-capture/relocation/nest disturbance program will be essential in the long term to controlling and limiting impacts from the presence of smallmouth bass in the Colorado River from Glenn Canyon dam to the Little Colorado River. It is essential to work closely with the Pueblo of Zuni people in developing a plan for removing/relocating fish from this area to Lake Powell. In particular we should strive to avoid disturbance and removal of fish from sacred places in this section of the Colorado River. If possible, we should include a Tribal member as part of every field survey team involved in this live- capture effort. The UWV survey described as a surrogate for flow spikes could serve as a model for such an ongoing invasive fish control program if it included methodologies for turbid water conditions that preclude UWV technology. Such methodologies could include electrofishing in combination with beach seines, baited fish traps, and sonar fish detection systems.

Thank you for the opportunity to provide comments on the Glen Canyon Dam/Smallmouth Bass Flow Options Environmental Assessment.

Sincerely,

Paul C. Rusanowski, Ph.D.
Delta Environmental Sciences
2304 W Campus Dr
Tempe, AZ 85282

Cc: Jim Strogen <jimstrog@gmail.com>
Rod Buchanan rodbuchanan23@gmail.com

Cited reference:

Bestgen, K. R. 2018. Evaluate effects of flow spikes to disrupt reproduction of smallmouth bass in the Green River downstream of Flaming Gorge Dam. Final report to the Upper Colorado River Endangered Fish Recovery Program. Denver, Colorado. Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort Collins. Larval Fish Laboratory Contribution 214.

Archived: Thursday, March 9, 2023 2:07:09 PM
From: Bucklin, Sarah A
Sent: Thu, 9 Mar 2023 14:18:41
To: Clayton McGee
Cc: David Scott
Subject: Save Grand Canyon's Endangered Humpback Chub
Importance: Normal
Sensitivity: None

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emailed comment below

From: cknowles@everyactioncustom.com <cknowles@everyactioncustom.com> on behalf of Cybele Knowles <cknowles@everyactioncustom.com>
Sent: Wednesday, March 8, 2023 3:42 PM
To: GCD_SMB_EA, BOR-SHA-UCR- <bor-sha-ucr-gcd_smb_ea@usbr.gov>
Subject: [EXTERNAL] Save Grand Canyon's Endangered Humpback Chub

Dear Upper Colorado Basin Region Bureau of Reclamation,

I support your efforts to protect threatened humpback chubs and other native fish species of the Grand Canyon from nonnative smallmouth bass.

The climate crisis has brought Lake Powell, upstream of the canyon, to record-low levels. Low water levels in the hot, dry desert have led to warmer-than-normal water temperatures, which in turn have let nonnative smallmouth bass — who eat humpback chubs — pass through Glen Canyon Dam into Grand Canyon. If the predatory bass become established there, they could wipe out the largest remaining population of humpback chubs.

To prevent that, the U.S. Bureau of Reclamation must implement the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment, and should implement the “Cool Mix with Flow Spikes” and “Cool Mix” options (Flow Options B and A) which maximally protect chub by preventing, rather than merely disrupting, bass reproduction

Urgent action is needed to stop smallmouth bass reproduction and safeguard the Grand Canyon’s humpback chubs and other native fish species, several of whom rely on the canyon and its tributaries to sustain their populations. Environmental flow actions — like the one in this draft environmental assessment — are the safest way to ensure a healthy Colorado River without potentially harmful chemical treatments or electrofishing.

If the Bureau doesn’t act now, the Grand Canyon could lose its humpback chubs and other species protected under the Endangered Species Act.

According to the Grand Canyon Protection Act, Glen Canyon Dam must be operated “in such a manner as to protect, mitigate adverse impacts to, and improve the values for which” Grand Canyon National Park was established. To do that, the Bureau should implement the “Cool Mix” actions, which are most likely to completely inhibit smallmouth bass spawning behavior.

Finally, given the climate-inevitability of Lake Powell levels falling further, and of a warm Colorado River once again flowing through the Grand Canyon, I urge the Bureau of Reclamation and other federal agencies to undertake planning now to ensure for the survival and recovery of all of Grand Canyon’s endangered fish in the context of those conditions.

Together we must work to protect the Grand Canyon’s vulnerable aquatic communities.

Sincerely,
Cybele Knowles
Tucson, AZ 85733
cknowles@biologicaldiversity.org

March 9, 2023

Sarah Bucklin
Regional NEPA Coordinator
United States Bureau of Reclamation
Upper Colorado Basin-Interior Region 7

RE: Glen Canyon Dam Smallmouth Bass Flow Options Draft Environmental Assessment

Arizona Flycasters Club (AFC) prefers Option A: Cool Mix of the Glen Canyon Dam Smallmouth Bass Flow Options Draft Environmental Assessment (EA). AFC appreciates the opportunity to comment on this EA.

AFC is a non-profit, tax-exempt organization that has been dedicated since 1962 to encouraging, supporting, and educating its members and the community in the sport of fly fishing with the techniques of fly fishing, and the ethics of "catch and release" which advance the conservation of fish and their habitats. The organization's activities promote friendship, enjoyment, sportsmanship, and safety and include regular meetings, outings, and fishing trips for our more than three hundred angling family members. We are a Fly Fishers International affiliate club.

The uncertainties surrounding both the anticipated benefit for controlling small mouth bass and unanticipated detrimental collateral effects to the existing native and trout fisheries requires the least impactful action among the four proposed options. For that reason, AFC member families support Option A and encourage its adoption in the effort to control small mouth bass.

Sincerely,

Craig Mernitz
President Arizona Flycasters Club

March 9, 2023

Re: Comments on the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment (EA)

To: Project Coordinator, Bureau of Reclamation

On behalf of the National Parks Conservation Association (NPCA) and our 1.6 million members and supporters nationwide, thank you for the opportunity to submit comments concerning the Glen Canyon Dam/Smallmouth Bass Flow Options Draft EA. Founded in 1919, NPCA is the leading citizen voice for the national parks. Our mission is to protect and enhance America's National Park System for present and future generations. We are a national nonprofit with headquarters in Washington, D.C. and a local field office in Tucson, AZ.

Grand Canyon National Park is already dealing with invasive smallmouth bass entering the lower Colorado river basin through Glen Canyon Dam because of the low water levels in Lake Powell. The National Park Service (NPS) has done the best they can to respond to this crisis, but ultimately the Bureau of Reclamation (BOR) must take action to remedy this situation as required by the Grand Canyon Protection Act of 1992 and not only prevent smallmouth bass from entering the Grand Canyon, but also from reproducing there.

Grand Canyon National Park should not become an ecological sacrifice zone by allowing current operations to continue under the "No Action" alternative. Instead, BOR must take actions to lower temperatures in the Colorado River below the Glen Canyon dam - this will help reduce the reproductive potential of invasive fish like smallmouth bass that have managed to enter the lower Colorado river basin. It is crucial to saving the ecosystem and protecting the native fish species like the humpback chub, which were recently down listed from an endangered species to threatened species because of their successful restoration within the Grand Canyon.

NPCA believes that Alternative B: Cool Mix with Flow Spikes is the best solution to protect the native fish species and ecology of the Grand Canyon. Alternative B has the highest certainty of preventing the establishment of new warmwater invasive fish by lowering the water temperature through the release of water from the bypass tunnels in combination with the release of water from the penstocks. We understand that the use of the bypasses will have a negative impact on the hydropower production unless modifications are made to compensate for the loss of power. However, the flow spikes and the use of the bypasses are essential for ecological restoration purposes.

Southwest Regional Office
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P 505.423.3550 | southwest@npca.org **NPCA.org**

In addition, sediment flow and the restoration of beaches should also be prioritized when considering flow spikes or high flow experiments. High sediment flows and the restoration of beaches are important not only for the ecology of the Grand Canyon but for the economy as well. Grand Canyon tourism, including river guides and outfitters and the 22,000 people who float down the river every year will all benefit from the restoration of beaches along the Colorado River.

Lastly, the main cause of the issue at hand, lower water levels in Lake Powell, which allow small mouth bass to pass through the Glen Canyon Dam, must also be addressed. With projections of increased drought conditions, Lake Powell water levels need to be addressed more broadly and long-term solutions need to be considered to not only prevent the small mouth bass from entering the Grand Canyon, but to protect the entire Grand Canyon ecosystem. We look forward to ongoing participation in the BOR's Supplemental EIS to the Interim Guidelines for Lower Basin Shortages and Coordinated Operation of Lakes Powell and Mead in addition to the Smallmouth Bass Flow Options EA process.

Thank you for your work and for the opportunity to comment. We look forward to continued engagement.

With gratitude,

Miché Lozano
Arizona Program Manager, National Parks Conservation Association

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ARIZONA COUNCIL TROUT UNLIMITED

March 9, 2023

Sarah Bucklin
Regional NEPA Coordinator
United States Bureau of Reclamation
Upper Colorado Basin-Interior Region 7

Subject: AZTU Support of Option B

Dear Ms. Bucklin:

We are writing this letter on behalf of the over 3000-members and supporters of the Arizona Council of Trout Unlimited, a non-profit organization dedicated to the conservation and protection of native and wild trout and their habitat. Many of our members are frequent river users below Glen Canyon Dam as anglers, rafters, and Arizonans who want to protect the Colorado River Corridor.

We support Option B of the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment, recently proposed by the United States Bureau of Reclamation, Upper Colorado Basin-Interior Region 7.

As you are aware, the Glen Canyon Dam is a crucial component of the Colorado River system and plays a significant role in water management, power generation, and environmental protection. However, the intrusion of non-native smallmouth bass into the Colorado River below the dam could have a devastating impact on the native fish population, and the rainbow trout fishery. Smallmouth bass are voracious predators that feed on juvenile native fish, disrupting the natural balance of the ecosystem.

Option B proposes to increase flows from the Glen Canyon Dam during the summer months, which will create conditions that are less favorable for smallmouth bass reproduction and survival. While this approach may be effective in reducing the smallmouth bass population in the Colorado River, minimizing the impacts on other dam operations and downstream water users.

However, options being considered in this EA are limited to only the options that can impact water temperature and flow. While these are important tools, **these strategies need to be combined with mechanisms to reduce fish pass-through from Lake Powell to the river below** the dam, and must include ways to address pockets of targeted warm water predatory fish that are detected in areas below Glen Canyon Dam if mechanical removal of those fish is practical and found to be effective. These other strategies are being pursued and moving forward, but are outside the scope of this EA.

We believe that Option B represents the most viable and cost-effective solution for mitigating the impacts of smallmouth bass on native fish populations in the Colorado River. It is

consistent with the goals of the Glen Canyon Dam Adaptive Management Program and the Endangered Species Act, which require the protection and recovery of endangered and threatened species in the Colorado River ecosystem.

In conclusion, we strongly urge the United States Bureau of Reclamation, Upper Colorado Basin-Interior Region 7, to adopt Option B of the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment, combined with mechanisms to reduce fish pass-through from Lake Powell to the river below the dam. These methods offers the best of the temperature modulations to restore and preserve the ecological health of the Colorado River and protect the native fish populations that depend on it, while helping solve the larger dam related problems.

Thank you for your consideration of our position on this important issue.

Sincerely,

Yours in conservation,

Alan C. Davis

Chairman

Platte River Power Authority
Estes Park • Fort Collins • Longmont • Loveland

March 10, 2023

BY EMAIL: SBucklin@usbr.gov

US Department of the Interior
Bureau of Reclamation
Upper Colorado Basin Region
125 South State Street, Room 8100
Salt Lake City, UT 84138

RE: Glen Canyon Dam / Smallmouth Bass Flow Options Draft Environmental Assessment (EA)

Platte River Power Authority (Platte River) understands The Bureau of Reclamation (Reclamation) has drafted an environmental assessment (EA) for an experimental process at the Glen Canyon Dam to manage smallmouth bass by diverting water flows from hydropower production (Bypass).

As a generation and transmission provider for the growing northern Colorado front range powering over 170,000 homes and businesses, we appreciate the importance of the Colorado River to all of us in the west. Platte River supports the comments from the Colorado River Energy Distributors Association (CREDA) regarding the Reclamation's EA and the impacts Bypass would have on hydropower's ability to meet customer energy demands and water delivery obligations in 2023 and 2024.

Hydropower is one of many uses of water resources. Making full use of hydropower is key to ensuring that our electric grid remains reliable and resilient, and to also help meet emission reduction goals. Hydropower is a source of emissions-free, baseload power. Furthermore, hydropower can be started and stopped quickly – making it the sole dispatchable, clean energy source for many public power utilities. Therefore, Platte River must underscore how important hydropower is to the health and safety of all communities that depend on power generation as part of their daily lives.

Platte River is a not-for-profit, community-owned public power utility that generates and delivers safe, reliable, environmentally responsible, and financially sustainable energy and services to Estes Park, Fort Collins, Longmont and Loveland, Colorado, for distribution to their utility customers. Since Platte River's inception 50 years ago, hydropower has been integral to our generation history and commitment to a clean energy future. To this day, our clean energy goals rely on federal hydropower as an existing dispatchable carbon-free resource.

Platte River promised state and federal regulators that it would achieve a 90% noncarbon energy supply by 2030 – the most aggressive clean energy goal in a state, Colorado, committed to clean energy production. The diversity and resilience of our generation portfolio will be essential to achieving

this goal. In recent decades, and in the last several years, the dwindling supply of water has reduced our hydropower generation levels.

While hydropower can be a strong contributor to grid resilience and reliability, any loss or reduction of hydropower resources can adversely affect public health and safety in the communities we proudly serve. Hence, any plan that would curtail hydropower generation or water delivery must be heavily scrutinized and measured. While CREDA, and therefore Platte River, has been a longstanding participant in the Upper Colorado River Endangered Fish Recovery Program, we find the impact analysis of the draft EA to be insufficient to meet the goals it sets out to achieve. In addition, the EA costs and associated residual impacts on the communities that rely on hydropower and water deliveries far exceed what are perceived to be the benefits of the EA.

Bypass also has environmental impacts; any curtailment to the Western Area Power Administration's (WAPA's) hydropower requires WAPA and other entities to purchase replacement power with no guarantee that those sources of energy would be from noncarbon emitting sources. Replacing clean hydropower with purchased power from carbon-emitting sources undercuts our, and others', clean energy goals and potentially adds to the ongoing cycle of drought affecting the river basin. These impacts have not been modeled or considered in the EA, although the process under the National Environmental Policy Act requires fully considering all alternatives and impacts.

In addition to the direct effect from insufficient hydropower, Platte River asks Reclamation to consider WAPA's contractual obligations to deliver federal hydropower and the financial and societal costs to firm electric service (FES) customers. Reclamation must clearly communicate how changes in water operations will affect FES customers; if Reclamation chooses to pursue releases for water management, it must fully mitigate reduced hydropower production and contract deliveries. Any alternative analyses must consider direct and indirect cost impacts, a step not taken here.

Platte River adds that if this EA moves forward, then this effort should not be a burden solely carried by the FES customers of the Colorado River Storage Project. Addressing an environmental issue is everyone's responsibility; any measure taken to protect an endangered species should be a responsibility of all and not just a few.

Our vision at Platte River is to be a respected leader and responsible power provider improving the region's quality of life through a more efficient and sustainable energy future. We hope you receive this letter with our value proposition in mind and give weight to hydropower resources to help ensure a clean, resilient energy future for all.

Thank you,

Melie Vincent
Chief Operating Officer
Platte River Power Authority

TRI-STATE

March 9, 2023

Sarah Bucklin
Regional NEPA Coordinator
U.S. Bureau of Reclamation, Upper Colorado Basin Region
Via Email only – sbucklin@usbr.gov

Dear Ms. Bucklin,

Tri-State Generation and Transmission Association, Inc. (Tri-State) appreciates the opportunity to provide comments on the Environmental Assessment (EA) issued on February 24, 2023. Tri-State is a cooperative power supplier with 45 members, including 42 distribution cooperatives that service more than one million consumer-members in Colorado, Nebraska, New Mexico, and Wyoming. Together with our members, we serve 18 Native nations, including 29 chapters of the Navajo Nation.

Tri-State supports all the general and specific comments made by the Colorado River Energy Distributor's Association (CREDA).

The Glen Canyon Dam (GCD) Adaptive Management Work Group (AMWG) recently recommended to the Secretary of the Interior a Smallmouth Bass Strategic Plan, which includes rapid response and mid-term and long-term actions that would be very costly and beyond the ability of WAPA to pay from the Basin Fund. The Proposed Action is limited to flows that bypass the hydropower generators, creating significant costs, potential resource reliability concerns during the summer months, and impacts to non-profit utility customers in the most underserved areas of the West.

Tri-State is focused on prudent resource planning to ensure it can deliver reliable, affordable, and responsible wholesale power. The Colorado River Storage Project (CRSP) resource is an important source of capacity in our planning to meet our resource adequacy criteria, and Tri-State relies on the CRSP deliveries of both capacity and energy to meet its members' electric needs. Due to the extended drought and concerns of the water levels at Glen Canyon Dam our deliveries of CRSP were 33% less in 2022 and so far in 2023 they are 38% less than in 2021. This reduction in both capacity and energy causes Tri-State to purchase additional electricity from the market. In addition, Tri-State uses the Renewable Energy Credits (RECs) it receives from CRSP deliveries generated from its hydro facilities to help meet both our Colorado and New Mexico Renewable Portfolio Standards (RPS) mandated by its state legislatures. The proposed reductions in hydropower to be replaced by WAPA with purchase power raises several concerns:

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DENVER, CO 80233-0695
303-452-6111
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1. Tri-State's costs to replace our already reduced CRSP power will be greater because the Firm Electric Service (FES) customers will be competing for the same resources that WAPA will be attempting to purchase to replace the amount of generation lost due to the bypass flows.
2. There is not a guarantee that the replacement of the needed capacity and energy lost to the experiment is available, regardless of price, in the summer months because of the very tight resource sufficiency conditions that currently exist in the Western interconnect.
3. Tri-State will receive fewer associated RECs from CRSP because WAPA will deliver power from the market, almost certainly from carbon-based resources, since hydro-electric generation will be reduced due to the SMB experiment. The RECs Tri-State receives from CRSP are a significant component of the RECs Tri-State utilizes to meet its Colorado and New Mexico RPS requirements.

Tri-State notes that the impacts described in the EA are significant enough to prevent Reclamation from being able to issue a Finding of No Significant Impact (FONSI). The EA and its analysis are uncertain in many aspects and should be clear in its Purpose and Need Statement that the duration of the EA/Proposed Action is "up to three years", which is not stated until Chapter 2, section 2.2.1. The EA is deficient in that more than a single focus (bypass flows) alternative should have been included.

As has been highlighted during the extended drought the west is experiencing, significantly changed circumstances and new information regarding hydropower analysis has been brought to bear. Due to the resource availability, resource shifting and transition, Reclamation should consult with experts to assess the risk that electric load will go unserved in the region during summer months. This is not just an issue for WAPA, but for the FES customers and all other utilities in the West. This EA cannot rely on LTEMP analysis as the basis for cumulative impacts analysis/ conclusions given these changes.

While Tri-State appreciates the opportunity to comment on the SMB EA, we have significant concerns with the assessment's findings and its inadequacy in addressing the true impacts to WAPA CRSP customers. It is our hope that the BOR will seriously consider the comments from power customers so we can continue to look for solutions in the Colorado River basin for all user groups.

Sincerely,

Dan Walter
Dan Walter (Mar 9, 2023 15:49 MST)
Dan Walter
Vice President Energy Markets

TRI-STATE

March 9, 2023

Sarah Bucklin
Regional NEPA Coordinator
U.S. Bureau of Reclamation, Upper Colorado Basin Region
Via Email only – sbucklin@usbr.gov

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Sincerely,

Dan Walter
Dan Walter (Mar 9, 2023 15:49 MST)
Dan Walter
Vice President Energy Markets

United States Department of the Interior

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9828 North 31st Avenue, Suite C3
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In Reply Refer to:
AESO/SE/
02EAAZ00-2012-F-0059
02EAAZ00-2014-CPA-0029
02EAAZ00-2022-0063848

Memorandum

To: Regional Director, Bureau of Reclamation, Salt Lake City, Utah

From: Field Supervisor, Phoenix, AZ

Subject: Response to News Release Seeking Comments on Reclamation's Draft Environmental Assessment on Glen Canyon Dam/Smallmouth Bass Flow Options

This letter responds to the Bureau of Reclamation's (Reclamation) February 24, 2023, news release seeking comments on Reclamation's draft Environmental Assessment (EA) on Glen Canyon Dam/Smallmouth Bass Flow Options (Reclamation 2023). In addition to your draft EA our offices have been involved in periodic conversations about this EA and these were summarized in our last correspondence issued to your office on February 2, 2023.

In the February 24, 2023, news release it was stated that Reclamation is responding to the threat of establishment of smallmouth bass (SMB; *Micropterus dolomieu*) below Glen Canyon Dam (GCD). Establishment, understood as the survival, recruitment, and growth of the population, of SMB in the Colorado River below GCD is likely to have deleterious effects on the native fish in this ecosystem. As such, we see this action as one step in a much larger process that will be required by the many agencies responsible for managing the fisheries of the Colorado River in the Grand Canyon. The following letter intends to highlight a few critical aspects of the proposed effort (hereafter the action) we deem necessary for Reclamation and its partners to consider as we finalize and plan for this action.

Success monitoring

Evaluation of the conditions prior to and after the use of these flow options will assist in understanding the effectiveness of any action taken. Spawning and nesting for SMB generally occurs within the littoral zone of lakes and nearshore in flowing waters, making it relatively easy to conduct observations of nests from a distance with binoculars (Winemiller & Taylor 1982). Spawning (generally followed 4 to 5 days later by nesting) takes place from April to mid-July at southern latitudes when water temperatures exceed 15°C (Tringali et al. 2015). During this period in time, male SMB establish territories and excavate saucer-shaped depressions in coarse substrates (Pflieger 1966). Nests are often located near rocky or wood cover and males provide parental care during egg incubation, larval development, and the juvenile

dispersal stage (Tringali et al. 2015). We believe that Reclamation, in partnership with the agencies responsible for the fishery in the Glen Canyon Reach of the Colorado River, should develop a detailed study plan to investigate the effects of these disturbances on SMB prior to, during, and after any flow is implemented. Methods are readily available (Bestgen 2018) to many of the agencies and planning for this field season needs to begin soon. Further, we offer the expertise of our fisheries staff to assist in the development, implementation, and evaluation stages of such an effort. The primary purpose of a flow spike is to sweep away egg and fry (newly hatched larvae) from the nest and to disrupt male guarding behavior; temperature reductions are a secondary benefit (in the upper Colorado Basin flow spikes are not implemented until after spawning has initiated). Knowing these conditions would be beneficial to planning which alternative may be most appropriate and or effective. For instance, if it is expected that SMB may spawn under option A, then a flow spike would be a useful tool to disrupt the spawning activity or, if adequate monitoring is taking place, and no SMB spawning is documented, then option B would not be needed.

Smallmouth bass establishment would be a big problem requiring a big response

The Secretary of the Interior's designee directed Reclamation and the Grand Canyon Monitoring and Research Center to work with the GCD Adaptive Management Working Group (AMWG) to develop flow options to disrupt or prevent spawning of SMB and other invasive fish species that pass through the dam. The Service endorses this action because the science indicates that the risk of SMB establishment is reduced through cold water discharges intended to disrupt their spawning (Bestgen & Hill 2016; Bestgen 2022; Yackulic & Eppehimer 2022; Young et al. 2022). Prevention of the establishment of SMB is the overarching goal for this partnership. Thus, we see this action as one of a number efforts that could be used to prevent establishment, including specific targeted removals (Rogers 2015; Bestgen & Hill 2016) and/or infrastructure management (Svoboda 2022; Lewis et al. 2023). We encourage Reclamation to continue a coordinated effort to prevent escapement and entrainment of fishes out of Lake Powell and into the Colorado River downstream. Should these efforts not be available in time and the action be ineffective, targeted removals like those undertaken in the fall of 2022 (Reclamation 2023) would be implemented to reduce propagule pressure in Lees Ferry with hopes of limiting downstream movement. By current estimations, the populations of federally threatened Humpback Chub (HBC; *Gila cypha*) in the Grand Canyon represent more than 90% of all the known HBC (Appendix 1). Should additional non-native species become established in the Grand Canyon due to entrainment from GCD and the appropriate habitat conditions exist for their growth, the threats to HBC would increase (USFWS 2018). Given the importance of the Grand Canyon population to the recovery of this species any additional threats would be seen as counter productive to the efforts that have been made by the HBC recovery partnership in Grand Canyon.

Duration of the flows

In your draft EA, chapter 2.2.1 you state that these flow options would occur for up to three years starting in 2023. The Service has previously stated that we see these plans are in accordance with the LTEMP Biological Opinion which has an expiration in the year 2036. We believe that Reclamation may desire to pursue similar actions in the remaining years of the LTEMP and we recommend that Reclamation not put a three-year window on these flow options, rather leave the options available during the life of LTEMP. Additionally, in chapter 2.2.1 you state that action would be triggered when the temperature at the Little Colorado River (LCR) is predicted to be 15.5°C using a recent model of thermal suitability for fishes in this reach (Dibble et al. 2021). Though it is not explicitly stated in your description of the proposed action and alternatives, we assume that it is Reclamation's intention to maintain less than 16°C temperature at the LCR during the specific period (five months) in which SMB spawning and nesting are likely to be successful. We come to this conclusion by considering the data presented in Table 3-2 titled "potential 5-month flow impacts to power generation and firming expenses, as estimated by WAPA". Based on early

modeling exercises, when temperatures are maintained below 16°C through the course of a season there is a greater likelihood of preventing SMB population growth (Young et al. 2022). As such, we believe that the action alternative, if used through the course of SMB spawning and nesting season, would be more effective than if only applied periodically during the spawning and nesting season.

Consequences of the no action alternative

In the EA table that summarizes anticipated effects on LTEMP resource goals (Table 3-5), Reclamation describes the consequences of no action and the flow options. There is one LTEMP resource goal that would be impacted under all possible flow actions, hydropower and energy. This presents a serious challenge to the GCD AMWG and the Service does not take lightly the importance of power generation. However, under conditions where SMB or other warm-water nonnative predatory species become established in the Grand Canyon the predation threats to federally listed species, like the HBC become greater. For Reclamation, to take no action due the cost alone would be counter to policy and strategy (U. S. Department of Interior 2020, 2021), with respect to the commonly documented invasion curve which describes the theoretical relationship between the area occupied, time since introduction, and the cost of prevention, eradication, containment, and long-term management (U. S. Department of Interior 2021). The cost to control SMB if no action is taken, are likely to grow exponentially beyond the estimates presented in Table 3-2 of the EA. Further, in your EA you allude to costs being "likely be more expensive" (Section 1.8) but do not specifically state why these costs are higher.

General and specific comments

Please consider adding a definition for "establishment" recommend considerations from general invasion literature (Beck et al. 2008; U. S. Department of Interior 2020, 2021).

Page 2-8, Please provide context from citation (Bestgen & Hill 2016) regarding SMB spawning when temperatures drop to 13.9°C. Additionally, in following paragraph cold shocks are described as 13°C though in all other options 16°C was stated as the target temperature. This discrepancy requires some additional explanation.

Environmental Consequences section, please provide a citation for statements regarding fish entrainment. Summit Technologies Inc. is cited for information regarding consequences of fish entrainment though this is not a source of information on that subject.

Page 1-3, "other cool-water and warmwater invasive fish" are mentioned but not specifically introduced in this EA. This document does not specify or discuss the "other" fish species. Consider modifying this sentence or EA as needed.

Sections 1 and 2, statements are made about this project preventing SMB from successfully spawning. A more ecologically appropriate description would be that these alternatives will prevent SMB spawning, egg incubation, and recruitment. While temperature modifications will attempt to reduce the likelihood adults entering spawning condition, the flow spike options will also sweep from nests any eggs and fry that are provided. All options should have the goal of delaying or preventing spawning, but also to decrease survival of any eggs and fry that are produced.

Page 2-4, Paragraph 2: Consider revising the final two sentences to add clarity. For example, it could be rewritten as follows: "However, since smallmouth bass were detected in the Glen Canyon reach in 2022, no smallmouth bass [declined moving downstream from GCD and] have [not] been detected below RM 0 [where intensive monitoring ended]. This means that even if it is only possible to change the temperature down to RM 45, implementation of the flows would still be effective at preventing spawning of

smallmouth bass [where they are currently known to occur]. This same revision would be needed elsewhere in the document.

Page 3-6, Paragraph 3: Consider making the following revision. “Also, the cold temperatures would reach downstream to the confluence of the Little Colorado River where [most] humpback chub habitat begins.”

Page 3-32: Please consider updating Table 3-2 data for Flow Option C and Flow Option D, and its associated text, to match the duration of those options as described in Chapter 2.

Closing

Thank you for your continued coordination and commitment to conservation of threatened and endangered species. Should you require further assistance or if you have any questions, please contact Dan Leavitt, daniel_leavitt@fws.gov, of my office staff.

Cc: Project Leader, Arizona Fish and Wildlife Conservation Office (jess_newton@fws.gov)

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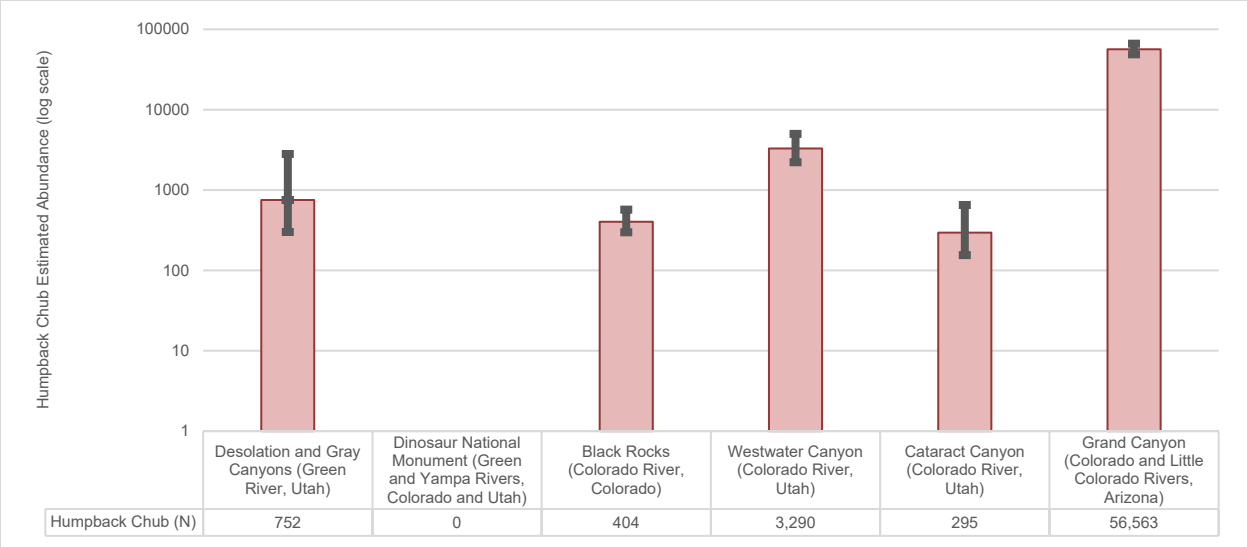

Appendix 1. Current adult population abundance estimates (N) with upper and lower confidence intervals for Humpback Chub (*Gila cypha*) at six locations throughout its range. Estimates taken from most current and available reports (Badame 2008; Francis et al. 2016; USFWS 2018; Hines et al. 2020; Caldwell 2021; Van Haverbeke et al. 2022, 2023) data can be made available upon request.

March 10, 2023

Via electronic mail

Sarah Bucklin
Regional NEPA Coordinator
U.S. Department of the Interior
Bureau of Reclamation
Upper Colorado Basin Region
125 South State Street, Room 8100
Salt Lake City, UT 84138
gcd_smb_ea@usbr.gov

Dear Ms. Bucklin:

American Rivers' Southwest Regional Program (American Rivers) provides these comments in response to the U.S. Department of Interior's Bureau of Reclamation's (Reclamation) Glen Canyon/Smallmouth Bass Flow Options Draft Environmental Assessment (DEA). As discussed below, we support the DEA's finding that Flow Option B is the preferred alternative.

I. Description of American Rivers

American Rivers is a national, non-profit, 501(c)(3) river conservation organization with offices in Washington, D.C., Flagstaff, Arizona, and Denver, Glenwood Springs, and Durango, Colorado. Serving more than 300,000 members and supporters nationwide and more than 50,000 supporters in the Colorado River Basin, we are dedicated to protecting wild rivers, restoring damaged rivers, and conserving clean water for people and nature.

Additionally, American Rivers promotes public awareness about the importance of healthy rivers and the threats that face them. American Rivers' programs address flood control and hydropower policy reform, endangered aquatic and riparian species protection, instream flow, clean water, and urban rivers. One of its principal programs is the protection of rivers from uneconomic or otherwise unwise hydroelectric development that negatively impacts fish and other aquatic organisms, water quality, recreation, and cultural values of North American rivers.

American Rivers also participates in the Glen Canyon Dam Adaptive Management Program (GCDAMP) Adaptive Management Work Group.

II. Comments on the DEA

A. The Proposed Action is needed to prevent the establishment of smallmouth bass below the GCD.

The DEA (p. 1-5) states, "[t]he proposed action's purpose and need are 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." American Rivers agrees that protection of endemic and endangered humpback chub from high-risk, non-native smallmouth bass (SMB) is an important purpose to avoid or forestall dramatic altercation of the Colorado River ecosystem and the viability of threatened and endangered fish. The "[p]resence and establishment of invasive fish could dramatically alter the [Colorado River ecosystem (CRe)] and the status of federally listed fish."[1]

Moreover, the science shows the Proposed Action to prevent the establishment of SMB below Glen Canyon Dam (GCD) is needed to achieve that purpose.

The Colorado River has been reshaped physically and biologically by extensive water development projects and climate change. As a result of the changed riverine landscape, native fish species are in decline and opportunistic non-native fish species are ascendant:

> The Colorado River basin was historically home to more than thirty mostly endemic native fish species, including the four "big river" fishes that are federally endangered [or threatened]: Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), humpback chub (*Gila cypha*), and bonytail (*Gila elegans*) (Minckley and Deacon 1991, Mueller and Marsh 2002). Dams, diversions, and reservoirs have fundamentally changed the physical and biological template of the river and opened niche space for nonnative species through stabilization of flow regimes and thermal regime impairment (Olden et al. 2006, Bestgen and Hill 2016). In recent decades, rapidly spreading opportunistic nonnative fish have contributed to observed declines in native species (Martinez et al. 2014, Bestgen et al. 2018).[2]

Temperature is an essential component of fish habitat.[3] SMB have a higher tolerance for warmwater releases than native species, giving SMB a competitive advantage over humpback

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[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.

[2] Dibble, K. L., C. B. Yackulic, T. A. Kennedy, K. R. Bestgen, and J. C. Schmidt. 2021. Water storage decisions will determine the distribution and persistence of imperiled river fishes. Ecological Applications 00(00):e02279. 10.1002/eap.2279 ("Dibble et al. 2021"). *See also* draft Strategic Plan, Att. B ("SMB invasion into rivers throughout the globe have been associated with substantial population declines, and in many instances, extirpations of native fish species [citations omitted]").

[3] Dibble et al. 2021 (emphasis added).

chub where and when their ranges overlap, increasing the need for intervention to protect the native species:

> Fish are ectotherms, and as such, the thermal regime of their environment is critically important in determining species distribution, abundance, and growth [citations omitted]. There is substantial overlap in the thermal suitability of river segments for growth of warmwater native and nonnative fishes across the basin, and current evidence suggests nonnative species have a competitive or predatory advantage over native species in places where their ranges overlap …. [N]onnative species in the basin have responded more strongly to recent river warming than native species. *Thus, in the absence of effective management interventions, future warming is likely to disproportionately benefit nonnative species to the detriment of native species*.[4]

Addressing the threat posed by SMB became more urgent when evidence of SMB reproduction was identified below GCD in 2022:

> In the upper Colorado River basin, SMB are considered the greatest threat to the persistence of threatened and endangered fish species (Johnson *et al.* 2008). SMB are fecund, adaptable to a substantial range of environmental conditions, and extremely capable predators able to consume many size classes of the federally listed humpback chub (*Gila Cypha*) [citations omitted]. These traits have allowed SMB to quickly increase in abundance and exert negative population level impacts to species that did not co-evolve with them. *SMB have rarely been observed in the Colorado River ecosystem below Glen Canyon Dam … during the last two decades* [citation omitted]*, however, reproduction was identified for the first time in 2022* [citation omitted].[5]

On May 18, 2022, the Secretary of the Interior directed the Glen Canyon Dam AMP to "[d]evelop a strategic plan to prevent, detect, and respond to cool- and warmwater invasive fish establishment below Glen Canyon Dam.[6] The Secretary also directed the development of "2-4 operational alternatives that could help prevent cool- and warmwater invasive fish establishment, while minimizing potential adverse effects to other resources," and indicated alternatives within the scope of the Record of Decision (ROD) for the Glen Canyon Long-Term Experimental Management Plan (LTEMP) would be prioritized.[7]

In response, the Glen Canyon Dam AMP, through its Smallmouth Bass Ad Hoc Group, developed the "Invasive Fish Species Below Glen Canyon Dam: A Strategic Plan to Prevent,

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4 *Id.* at 6 (emphasis added).

5 Draft Strategic Plan, Att. B, p. 1.

6 GCDAMP Action Tracker Report (May 26, 2022), available at https://www.usbr.gov/uc/progact/amp/amwg/2022-05-18-amwg-meeting/20220518-AMWGMeeting-ActionItemTrackingReport-508-UCRO.pdf (last accessed Mar. 10, 2023), p. 2.

7 *See id.*

Detect and Respond," a draft of which was presented to the Glen Canyon Technical Work Group on January 26, 2023 ("draft Strategic Plan"). The draft Strategic Plan explains the existing conditions of low Lake Powell levels resulting in warmwater releases through the GCD penstocks, which have created downstream conditions more favorable to establishment of smallmouth bass.[8] Its recommendation actions are premised on the finding that "[p]resence and establishment of invasive fish could dramatically alter the [Colorado River ecosystem (CRe)] and the status of federally listed fish."[9]

The draft Strategic Plan states the "preference for invasive species management is prevention," and that "[t]o prevent the establishment of invasive fish species in the CRe, a combination of long-term, mid-term, and short-term actions are required."[10] It recommends that, "[w]hile long-term, more permanent action(s) are being prepared and implemented, a combination of mid-term, and short-term actions *are required*."

The draft Strategic Plan also describes the significantly increased costs, and potential impossibility, of eradicating smallmouth bass if prevention actions failed:

> If an invasive species becomes established, eradication will likely not be possible and attempts could come at the cost of other programs or resources in the CRe. On the other hand, "functional eradication" or suppression of a species population is difficult to achieve in a large system such as the CRe [citations omitted]. If invasive fishes become established in the CRe, the costs of extended suppression attempts could come at the expense of other CRe programs and resources.[11]

Figure 1 of the draft Strategic Plan illustrated the increased cost of managing invasive species if prevention actions are not successful:

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[8] "Based on low elevations projected at Lake Powell by the August (2022) 24-Month Study produced by Reclamation, prevention of invasive fish establishment should include long-term preparation for continued low lake elevations and warmer release temperatures. The penstocks are at a fixed elevation of 3470 ft (centerline), and as lake levels drop, the depth to penstocks decreases. … This results in increased thermal suitability for warmwater fishes downstream of GCD, and likely increased rates of fish entrainment and passage." Draft Strategic Plan, pp. 3-4.

[9] *Id.* at 4.

[10] *Id.* at 7.

[11] *Id.*

Figures

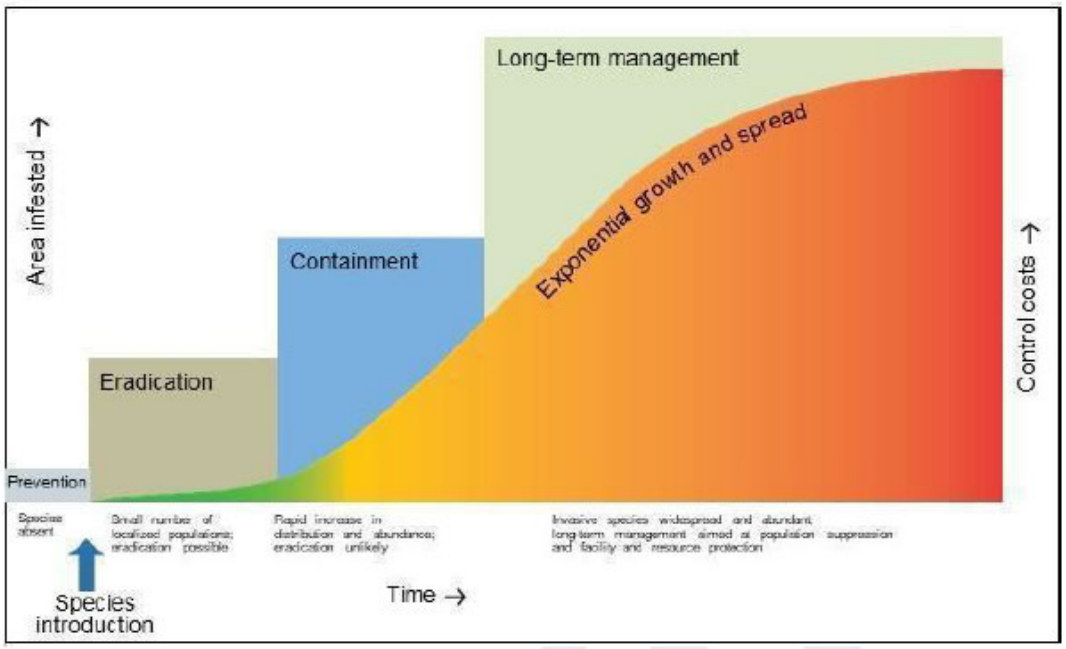

Figure 1. Phases of the Invasion Curve. United States Department of the Interior, *Invasive Species Strategic Plan 2021-2025*. (Adapted from Rodgers. 2010. *Invasive Plants and Animals Policy Framework*. State of Victoria, Department of Primary Industries)

The Proposed Action to implement operational alternatives in the near-term is needed to prevent establishment of SMB consistent with the Secretary's directive and the draft Strategy Plan prepared by the Glen Canyon Dam Adaptive Management Program in response to that directive.[12] As described in the DEA (p. 2-1), the Proposed Action could be implemented as early as spring 2023 and have immediate effect in creating environmental conditions that are unsuitable for SMB spawning.[13] The opportunity for immediate implementation is important because conditions this spring are expected to be favorable for SMB if no action is taken.

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[12] Operational alternatives can help achieve the goal of "prevent[ing] establishment during a transition period to more long-term solutions (e.g., infrastructure to minimize fish passage and/or changes to much deeper withdrawal depts)." Charles B. Yackulic and Drew Eppehimer, U.S. Geological Survey, Southwest Biological Science Center, Grand Canyon Monitoring Research Center, "Operational alternatives to address warmwater invasives," *available at* https://www.usbr.gov/uc/progact/amp/amwg/2022-08-18-amwg-meeting/20220818-Yackulic_Op_Alts_AMWG_508.pdf (last accessed Mar. 10, 2023).

[13] U.S. Geological Survey staff has previously described the importance of operational and non-operational measures, but also stated, to their knowledge, there is no example where "establishment of warmwater nonnatives in a large river system like the Colorado River in the Grand Canyon segment has been prevented or reversed while environmental conditions remained suitable." *Id.* Resource managers in the Southwest have increasingly explored intervention in the form of "flow management strategies to suppress smallmouth bass reproduction while also benefitting native endemic species through the timing of flood disturbance events [citations omitted]." Dibble et al., p. 6.

However, as explained in the DEA (p. 2-1), Reclamation would determine whether future flow releases were warranted based on conditions at the time of implementation.[14] Future implementation of the Proposed Action would also depend on the monitoring data of the effectiveness of the flow releases and other management actions, which could also include non-flow measures.

B. The Proposed Action would be implemented consistent with selected authorities that inform GCD operations and would help accomplish the purposes for which several of those authorities were enacted.

The DEA (pp. 1-5 – 1-9) summarizes relevant legal and regulatory authorities that inform GCD operations. These authorities formalize the Colorado River stakeholders' collective commitment to working together to preserve and enhance the ecological, cultural, and other values of the river. We briefly discuss how the Proposed Action would be consistent with highlighted authorities below. The Proposed Action would also help to protect the work and investment undertaken through other fish recovery programs in the Colorado River Basin.

1. Grand Canyon Protection Act of 1992

As stated in the DEA (p. 1-5), the Grand Canyon Protection Act of 1992 (GCPA) "was enacted to 'protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park (GCNP) and Glen Canyon National Recreation Area (GCNRA) were established.'" Those values include, but are not limited to, natural and cultural resources, and visitor use. The DEA demonstrates the Proposed Action is consistent with the GCPA.

2. Glen Canyon Dam Adaptive Management Program

Building on the principles of the GCPA, Congress established the GCDAMP in 1997 to facilitate operation of GCD "in such a manner as to protect, mitigate adverse impacts to, and improve the values for which [GCNP] and [GCNRA] were established."[15] This program focuses on the operational changes, particularly the adjustment and study of flow releases to improve outcomes for natural resources south of the dam:

> Reclamation is in charge of modifying flows for experiments, and the U.S. Geological Survey [USGS] conducts monitoring and other studies to evaluate the effects of the flows. The results are expected to better inform managers how to provide water deliveries and conserve species.[16]

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[14] "The proposed action with flow options provides Reclamation with flexibility to adaptively manage water releases from GCD to target smallmouth bass." DEA, p. 2-1.

[15] Report No. R45546, p. 13.

[16] *Id.*

As stated in the DEA, implementation of the Proposed Action, like other GCDAMP activities, would be required to comply with all relevant legal authorities. Thus, while the "implementation of the GCDAMP provides for flexibility in adaptive the dam's operations in order to facilitate continued scientific research and monitoring," the GCDAMP's activities cannot prevent "the dam from achieving its primary purposes." Even "[a]s environmental experimentation and study continues … the Secretary must continue to operate Glen Canyon Dam to meet the purposes established by Congress." Further, section 1802(b) of the GCPA expressly requires the Secretary operate GCD

> in a manner fully consistent with and subject to the Colorado River Compact, the Upper Colorado River Basin Compact, the Water Treaty of 1944 with Mexico, the decree of the Supreme Court in Arizona v. California, and the provisions of the Colorado River Storage Project Act of 1956 and the Colorado River Basin Project Act of 1968 that govern allocation, appropriation, development, and exportation of the waters of the Colorado River basin.

The DEA shows that implementation of the Proposed Action would have negative impacts on certain resources, particularly hydropower. However, the DEA's analysis does not show that implementation of the Proposed Action to prevent establishment of SMB would also *prevent* the achievement of the GCD's purposes.

It is also important to note that the GCDAMP has largely been successful in using science to improve GCD operations to better protect environmental, cultural, and recreational values while seeking to minimize adverse impacts to consumptive water users and hydropower. This has required significant investment in the implementation of the GCDAMP.[17] The program is funded at approximately $10 million annually, which will add up to approximately $250 million in funding over the life of the program.[18] The anticipated benefit of this investment would likely be significantly diminished if the program was required to respond SMB becoming established below GCD.

3. GCD Long-Term Experimental and Management Plan EIS

As described the DEA (p. 1-7), the Long-Term Experimental and Management Plan (LTEMP) Environmental Impact Statement (EIS)

was developed to better operate GCD in a manner to improve and protect important resources identified by the GCDAMP while maintaining compliance with relevant laws. The LTEMP Final EIS created adaptive management practices using best current scientific information to guide dam operations and experimentation for 20 years following the ROD. Several key issues and

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[17] One of the sources of funding is hydropower revenues. *Id.*

[18] Prior to the GCDAMP, there was the U.S. Geological Survey fish program initiated in 1997 that was funded on average at approximately $1.6 million per year for 25 years, or roughly $40 million total. Additional effort and investment in humpback chub recover also occurred in the 1980s.

goals were identified in the LTEMP Final EIS, including protecting humpback chub and other native fishes.[19]

As stated above, the Secretary directed development of 2-4 operational alternatives that would fall within the scope of the LTEMP EIS and ROD. As described in the draft Strategy Plan (p. 10), implementation of short-term operational measures is necessary to prevent establishment of SMB while mid- and long-term actions are being developed and can be implemented in conjunction with other operational considerations that are currently being evaluated.

As explained in the DEA (p. 1-7), the implementation of the Proposed Action would occur only after and be consistent with the determination of annual flow volume based on the 2007 Interim Guidelines. In fact, it will be important for Reclamation and stakeholders to monitor and adapt activities related to SMB management to remain in alignment with updates and changes to operational decisions concerning annual releases from GCD to Lake Mead under the 2007 Interim Guidelines and applicable laws. That is, implementation of the Proposed Action over the next three years must be coordinated with existing and forthcoming decisionmaking in furtherance of operational guidance under the LTEMP as well as under current and future provisions of the Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operation of Lake Powell and Lake Mead. It will be necessary to ensure those decisions governing long-term operations are informed by additional environmental study and analysis, including information gained through implementation of the Proposed Action.

4. Upper Colorado River Endangered Fish Recovery Program

In addition to being consistent with the authorities that specifically govern GCD operations, the Proposed Action would complement the work being done to protect native fish elsewhere in the Basin, including the work of the Upper Colorado Endangered Fish Recovery

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[19] The DEA also incorporates by reference the complete list of "goals" in the LTEMP ROD, which are extensive, in many cases competing, and plainly more challenging to balance during periods of prolonged drought:

> The LTEMP objectives addressed were (I) compliance with water allocation laws, regulations, and guidelines; (2) water delivery; (3) scope of flow and non-flow actions; (4) hydropower generation and capacity; (5) tribal interests; (6) use of the latest scientific findings; (7) adaptive management; and (8) compliance with Federal laws. The resource goals addressed were (1) archaeological and cultural resources; (2) natural processes; (3) humpback chub; (4) hydropower and energy; (5) other native fish; (6) recreational experience; (7) sediment; (8) tribal resources; (9) rainbow trout fishery; (10) nonnative invasive species; and (11) riparian vegetation. The full text of the objectives and resource goals is provided in Attachment A of this ROD. For the purposes of the EIS analysis, specific metrics were developed to objectively determine the relative performance of alternatives with regard to effects on resources; these are listed in Appendix B of the L TEMP FEIS.

Reclamation, Record of Decision for the Glen Canyon Dam Long-Term Experimental and Management Plan Final Environmental Impact Statement (Dec. 2016), p. 6.

Program.[20] That program serves the important function of "providing [ESA] compliance for water-related activities in the states of Colorado, New Mexico, Wyoming, and Utah."[21]

The Upper Basin Fish Recovery Program has provided population-level benefits to humpback chub and other listed native fish species. As Commissioner Touton previously testified to the Senate's Committee on Energy and Natural Resources, the programs have been important to the sustainable development of Upper Colorado River water supplies:

> Actions taken by the Programs to recover the Colorado pikeminnow, humpback chub, razorback sucker, and bonytail meet ESA requirements for operation of federal multi-purpose projects, water projects benefiting the Tribes, and non-federal water projects. *Activities and accomplishments of these Programs provide ESA compliance for more than 2,500 federal and non-federal water projects depleting approximately 3.7 million acre-feet per year in the Upper Colorado River and San Juan River Basins*.
>
> These two important recovery programs are intended to recover four species of endangered fish while allowing the states and Tribes to develop their full water entitlement and maintain compliance with interstate compacts and associated laws. Work focuses on four major areas:
>
> 1. Habitat management including providing and protecting instream flows;
>
> 2. Habitat development and maintenance, including fish ladders, fish screens, levee removal, and flooded bottomland restoration;
>
> 3. Augmentation and conservation of genetic integrity, development and operation of propagation facilities, and fish stocking; and
>
> 4. Management of non-native fish;
>
> As evidence of the success of these Programs, the Fish and Wildlife Service recently reclassified the humpback chub from endangered to threatened on October 15, 2021 and proposed a similar reclassification for razorback sucker in July of 2021.[22]

Implementation of the Proposed Action would help to reduce the cumulative threats non-native fish and habitat degradation pose to humpback chub and other listed species throughout

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[20] Charles V. Stern and Pervaze A. Sheikh, "Congressional Research Service Report No. R45546: Management of the Colorado River: Water Allocations, Drought, and the Federal Role," (Feb. 6, 2023), p. 12, available at https://crsreports.congress.gov ("Report No. R45546").

[21] Upper Colorado and San Juan River Basins Recovery Act, S. Rep. 117-174 (2022).

[22] S. REP. 117-174 (Statement of Camille Camlimlim Touton, Commissioner, Bureau of Reclamation, Department of the Interior; emphasis added).

the Colorado Basin. This would in turn serve to protect the accomplishments of the Upper Basin Fish Recovery Program and other restoration activities being implemented in the Basin. By contrast, the No Action Alternative would likely contribute to the establishment of SMB below GCD and could undermine the benefit of past accomplishments and increase the costs required to achieve future successes in native species recovery.

C. Reclamation should identify the Proposed Action, Options B or D as the Preferred Alternative.

The Proposed Action incorporates four different flow options labeled A, B, C, and D. "The flow options incorporate releasing water from either the penstocks or the bypass tubes during certain months based on when temperatures at the Little Colorado River confluence reach or exceed 16 degrees Celsius (°C) and smallmouth bass would be expected to initiate spawning [citations omitted]." DEA, p. 1-4. In addition to generally supporting the Proposed Action, American Rivers specifically supports Flow Options B (Cool Mix with Flow Spikes) and D (Cold Shock with Flow Spikes), both of which include cold water releases *and* flow spikes.

1. Flow Option B would best achieve the project purpose and need.

The DEA (p. 2-4) describes Flow Option B as follows:

> 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.

We support the DEA's proposal (p. 2-1) that Reclamation would retain some discretion, in consultation with the GCDAMP and other stakeholders, as to which of the four Flow Options to implement based on environmental conditions existing at the time of implementation for a given release and adaptive management decisions. However, as described below, the information presented in the DEA and other available data shows Flow Option B is the superior operational alternative for spring 2023.

The DEA (p. 3-7) explains that Option B is "most likely" to achieve the purpose and need because it could prevent spawning in margin 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).

It is important to note that there appears to be sufficient water to implement Option B this spring. More specifically, there is 523,000 AF of water from water year 2023 that was not moved downstream in the October - April time frame, but that must be moved downstream in the May - September time frame. The movement of this water could occur as part of the cold spikes found in Options B or D. This water is not water held in Lake Powell under Drought Response Operations Agreement; rather, it is re-timing the regular releases from that first time period to the later one.

For those reasons, we recommend Reclamation identify the Proposed Action, Option B as the preferred alternative, at least for purposes of 2023 (year 1) implementation.[23]

While we support the DEA's finding that Flow Option B is most likely to achieve purpose and need, Flow Option D, which "would involve recurring cold shocks and recurring flow spikes," could also be effective in achieving the purpose and need. DEA, p. 3-9. These cold spikes under Options B and D would create more SMB dispersal (*see* DEA, p. 3-8) when SMB fry are young. Dispersal when fry are young makes survival less successful.

However, the reliability of the bypass tube water at the volumes needed and the timing of the release proposed under Option B (DEA, p. 2-5) appears better than Option D, which would have uncertainty regarding the availability of bypass versus penstock flows and so could be less effective given maintenance schedules and volumes of water, etc. (id. *at* 2-8). Further, the DEA states that Flow Option D could have additional impacts on macroinvertebrates: "the cold shocks of Flow Option D could lead to high rates of macroinvertebrate drift and potentially disrupt macroinvertebrate development and life cycles." *Id.*

2. <u>Flow Options B and D would also promote tangential benefits to other important resources in the River</u>.

The DEA expressly recognizes (p. 3.26) that, in addition to being most likely to achieve the project purpose and need, Flow Option B, as well as Flow Option D, would have beneficial impacts on sediment management, specifically beach building in Glen Canyon, under certain assumptions:

> If the maximum magnitude is higher (approximately 40,000 cfs) and the duration is longer (72 hours), there is higher confidence of sediment benefits from a flow spike. If a flow spike occurs in May or June, it would not affect the potential for a fall [high flow experiment (HFE)] due to the sand budget accounting window constraints. The sandbar model predicts a greater than 50 percent increase in sandbar volume for a 40,000 cfs and

[23] *See* Reclamation's NEPA Handbook (Feb. 2012), available at https://www.usbr.gov/nepa/, p. 4-9. ("The draft NEPA document released for public review should include a preferred alternative. If this is not possible, it must be included in the final NEPA document. A preferred alternative identified in the final NEPA document should be within the range of alternatives analyzed in the draft NEPA document."). *See also* 40 C.F.R. § 1508.1(h); *Dine Citizens Against Ruining Our Env't v. Haaland*, 59 F.4th 1016, 1030 (10th Cir. 2023) ("[a]n agency can have a preferred alternative in mind when it conducts a NEPA analysis.").

72-hour flow spike, compared with approximately 14 percent for a single 32,000 cfs flow spike.[24]

The positive impacts to sediment transport and the improvement to sandbars and beaches from B and D are significant. There has not been a HFE in the canyon since 2018, and as a result, there is extensive degradation and erosion of sandbars and beaches throughout the canyon, which inhibits both recreational benefits, but also ecological benefits for fish and invertebrate life. Additionally, without these high flows, vegetation has encroached on many beaches, crowding out available sand and again disrupting the balance that would have been maintained in the presence of these flows.

Lastly, cultural resources/archeological sites have begun to be exposed and damaged by the erosion or other removal of the protective sand layers. The flow spikes would deposit new, protective sand on these culturally important sites, better preserving them overall.

3. Flow Option B would most likely achieve the project purpose while also seeking to minimize the killing of fish.

As described in the DEA (p. 3-45), "[f]rom time immemorial, the Canyons, including Glen and Marble Canyons, and the Colorado and Little Colorado Rivers have ben sacred places for Native communities." The potential taking of life under the Proposed Action was identified as a significant concern during tribal consultation. *Id.* at 3-44 -3-45.

Option B could potentially result in the taking of life: "Flow Options A and B are meant to stop spawning before it occurs, which means there would be no taking of life, but in backwater or margin habitats some mortality could occur under Option B if fish are moved off of nests." *Id.* at 3-45. The DEA notes that work is underway to develop a memorandum of agreement "regarding nonnative fish management and flow actions [that] will put forth procedures for consultation to resolve any adverse effects on the TCPS;" however, in the meantime, "because Flow Options B-D would result in additional taking of life within the Canyons in excess of the present conditions under the LTEMP dam operations, they could contribute to negative cumulative impacts on Zuni culture." *Id.* at 3-46.

American Rivers takes seriously the strong tribal perspective around the taking of life, and feel that in balance, Option B has the benefit of minimizing the loss of life, mainly centered around the disruption of spawning beds while being the most effective at minimizing the expansion of the SMB population without taking of life. If we delay or restrict the opportunity to effectively address this problem now, it would be highly likely that mechanical or chemical treatments would be required to suppress the expansion of the population, leading to a much greater and more impactful loss of life overall.

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[24] *See also id.* at 3-51. Flow Option B would have "Negative and Positive" impacts on the LTEMP Resource Goal of sediment management: "Flow spikes would export sediment from Marble Canyon which could reduce the amount available for HFEs, but would contribute to beach building in Glen Canyon." *Id.*

4. <u>Flow Options B and D would have beneficial impacts on riparian vegetation</u>.

The DEA (pp. 3-48 – 3-49) finds that, in addition to being most likely to achieve the project purpose and need, Flow Option B, as well as Flow Option D, would have beneficial impacts on riparian vegetation.[25] For example, the flow spikes under Flow Options B and D would "correspond with the timing of pre-dam seasonal flooding conditions and could provide benefits to riparian species that germinate in the late spring and early summer by aiding in seed dispersal and germination [citations omitted]." *Id.* at 3-49.

Frequent high flow experiments, or pulse flows, scour encroaching vegetation and keeping beaches and sandbars free of encroaching plants. Since no high flows have been conducted since 2018, many beaches and sandbars are severely overgrown with dense, strong, vegetation. Flow Options B or D would help address this problem.

5. <u>There would be negative impacts to hydropower generation under the Proposed Action and No Action Alternatives</u>.

It is undeniable that that the Proposed Action would likely have negative impacts on hydropower generation in spring 2023. *See* DEA, p. 3-50. We also share some of the concerns that have been raised regarding further reduction in hydropower generation this spring and summer, which is already limited by the ongoing drought and low levels in Lake Powell. However, the potential impacts to hydropower as a result of the Proposed Actions contemplated under the DEA would be limited in duration and measures could be implemented to effectively mitigate the impacts.

We disagree with the DEA's finding that the No Action alternative would result in "no change" to hydropower and energy resources. As stated above, if no or insufficient action is taken to prevent establishment of SMB now, the costs to manage the population would likely increase exponentially in a short period of time. The additional management actions required to suppress or eradicate rather than prevent establishment of SMB could have more significant, long-term impacts on hydropower generation. The science shows it may be impossible to eradicate SMB from below the dam, resulting in irreparable impacts to humpback chub and other native aquatic species in the Colorado River Basin.

As explained by the U.S. Fish and Wildlife Service (FWS):

> under conditions where SMB or other warm-water nonnative predatory species become established in the Grand Canyon the predation threats to federally listed species, like the HBC become greater. For Reclamation, to take no action due the cost alone would be counter to policy and strategy (U. S. Department of Interior 2020, 2021), with respect to the commonly documented invasion curve which describes the theoretical relationship

[25] *See also id.* at 3-52. Flow Options B and D could have "Positive" impacts on the LTEMP Resource Goal of riparian vegetation management: "Flow spikes could provide a higher water table for plants during summer months and better conditions for germination, but spike flows may desiccate or erode seedlings."

> between the area occupied, time since introduction, and the cost of prevention, eradication, containment, and long-term management (U. S. Department of Interior 2021). The cost to control SMB if no action is taken, are likely to grow exponentially beyond the estimates presented in Table 3-2 of the EA.[26]

Western Area Power Administration (WAPA) and other stakeholders have expressed concern regarding the potential cost of replacement power.[27] However, as WAPA has noted, the financial impacts related to the increased cost of replacement power this summer could be mitigated with appropriations or other Reclamation funding sources.[28] The National Park Service (NPS) has further described opportunities to mitigate the costs of bypassing the generation units:

> Our understanding is that there are several ways to reduce costs from the use of bypass. If more SMB are not discovered in the Grand Canyon in 2023 or outyears, but only in the Lees Ferry reach in Glen Canyon, then it may be possible to use less bypass to cool only the Glen Canyon reach portion of the river. As other decisions are made on water allocations for the year, such as how much water is retained in both Lake Powell and upstream reservoirs, it's possible that temperature may not rise as much below the GCD as currently predicted, and this will decrease the need for bypass thereby decreasing costs. The action alternative has several options to choose from with differing costs, and while we feel strongly that option B is the most efficient, the action alternative appears to allow adjustment if needed in a given year between options and could be one way to control costs, as long as Reclamation still chooses options that are efficient enough for the goal of preventing SMB establishment. Finally, our understanding is that if these operations are anticipated in power purchase contracts well in advance, then replacement power is much less expensive than if those contracts do not anticipate this action. Accordingly, there are several ways to control the costs of this action, but not taking this action is likely to cause many negative impacts to the native species below the dam.[29]

Reclamation's implementation process for the Proposed Action should include development and implementation of measures to effectively mitigate impacts of GCD releases that forego power generation. There are multiple factors that have contributed to conditions favorable to SMB below GCD and the costs of management actions to address the problem should be allocated equitably, especially given the benefits of preventing SMB establishment will run to all Basin stakeholders.

Again, while the Proposed Action will likely have acute financial impacts this summer, not acting to prevent establishment of SMB below the dam would likely have much greater long-

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[26] Letter from Heather Whitlaw to Reclamation Regional Director (Mar. 10, 2023), p. 3.

[27] *See* letter from Brian Sadler to Sarah Bucklin (Dec. 15, 2022), p. 2.

[28] *Id.*

[29] *See* letter from Brian Drapeaux to Wayne Pullan (Mar. 10, 2023), p. 5.

term costs in the form of decreased development activities and/or increased compliance burden for such activities, and pose a greater threat to the economic viability of the Basin Fund.

III. Conclusion

We request that Reclamation staff consider these comments in finalizing the EA and identify the Proposed Action, Option B as the preferred alternative. We look forward to working with Reclamation and other stakeholders to implement the Proposed Action in the short-term and to develop additional long-term measures that will prevent the establishment of SMB and other invasive species below GCD.

Respectfully submitted

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RE: Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment (EA)

Ms. Bucklin:

On behalf of the Arizona Municipal Power Users' Association (AMPUA), Arizona Power Authority, and Grand Canyon State Electric Cooperative Association, we appreciate the opportunity to provide comments on the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment. We support the comments presented in the Colorado River Energy Distributors Association ("CREDA") letter of March 10th in response to request for comments. We also agree with the concerns raised by the Irrigation and Electrical District of Arizona ("IEDA") presented in its letter of March 3, 2023 and the concerns raised by the Arizona Electric Power Cooperative ("AEPCO").

AMPUA is an association of Arizona public and consumer owned power including irrigation districts, electrical districts, electric cooperatives, municipally owned electric systems, Salt River Project, and Central Arizona Project. Many of our members receive federal hydropower.

The Arizona Power Authority (Authority), a body corporate and politic of Arizona, was formed as a result of federal legislation (Boulder Canyon Project Act of 1928) that allocated Arizona a portion of power produced from the Boulder Canyon Project (Hoover Dam and Power Plant). The Authority markets and schedules this entitlement to 63 power customers in the state of Arizona consisting of cities and towns, irrigation and electrical districts, tribal entities and the Central Arizona Water Conservation District. The Authority works effectively with both publicly-owned and privately-owned utilities in making Hoover Power Plant hydro power available to all major load centers throughout Arizona at the lowest possible cost.

Grand Canyon State Electric Cooperative Association (GCSECA) represents Arizona's six distribution electric cooperative utilities, the generation and transmission cooperative that serves five of them, and numerous tribal utility authorities and electric districts within the state. Each of these entities relies on hydropower deliveries from the Glen Canyon Dam through the Western Area Power Administration as part of their power supply.

We have serious concerns regarding the draft EA's failure to sufficiently analyze the impact that the flow options will have on hydropower production and the risk that reduced hydropower production may have on the ability for utilities to provide power to the southwest region during the summer. On pages

3-32 and 3-33, the draft EA discusses the lost generation across the various flow options, as well as WAPA's estimated firming expense based on Flow Options A-D. While the EA acknowledges that power generated through Glen Canyon Dam would need to be replaced, it does not take into consideration the regional scarcity in energy generation faced by the Southwest nor the prices that accompany replacement power during the summer. A regional summer heatwave, like what was seen in 2020, with reduced hydropower generation could result in significant impacts to the grid and the potential loss of human life if enough energy is not available on the grid this summer. Significant reductions in the hydropower generation at Glen Canyon Dam should be avoided.

The draft EA acknowledges that "the effects described above may be most likely for power consumers in the surrounding counties and states. However, effects could be felt across the Western Power Grid because GCD can supply power to this area." While the draft EA argues that these effects would diminish further from the dam, it fails to recognize that the Western Grid already has limited reserve margins. The North American Electric Reliability Corporation (NERC) in its 2022 summer reliability assessment rated the Western Electricity Coordinating Council at an elevated potential for insufficient operating reserves in above-normal conditions. This reliability assessment under a scenario with reduced hydropower generation from Glen Canyon Dam would likely be worsened.

We recognize that balancing the priorities outlined in the draft EA is a complex and challenging task. As you move forward, we respectfully request that the significant risks that reduced hydropower generation will have on the region be taken seriously. If an alternative flow option or non-flow option that avoids significant impacts to hydropower cannot be identified, we urge you to adopt the "No Action" option to avoid these significant risks.

Sincerely,

Russell D. Smoldon,
Executive Director
Arizona Municipal Power Users' Association

Jordy Fuentes,
Executive Director
Arizona Power Authority

Dave Lock,
Chief Executive Officer
Grand Canyon State Electric Cooperative Association

March 10, 2023

Bill Stewart
Adaptive Management Group Chief
Bureau of Reclamation

Electronically submitted to: gcd_smb_ea@usbr.gov

RE: Request for comments on the draft Glen Canyon Dam/Smallmouth Bass Flow Options Environmental Assessment

Dear Mr. Stewart,

The Arizona Game and Fish Department (Department) appreciates the opportunity to provide input to the Bureau of Reclamation's (Reclamation) Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment (EA). The Department is aware of the effects long-term drought has had on fish and wildlife and their habitats in the Southwest and in the broader Colorado River Basin, and continues to manage fish and wildlife resources within the Colorado River watershed and its system of reservoirs, rivers, and canals of Arizona. We provide the following comments for consideration in preparation of the final EA.

The draft EA documents the anticipated negative effects resulting from the establishment of Smallmouth Bass on native fish communities in the Grand Canyon. The Department agrees with this assessment and supports actions to minimize this risk of establishment. Negative impacts to the economically important Rainbow Trout Fishery at Lees Ferry would also be expected with the establishment of high-risk warmwater non-native species, such as Smallmouth Bass. These impacts are addressed within the sections covering the no action alternative; however, we suggest they should also be included within the introduction of the document, which outlines the underlying need for addressing warming release temperatures at Glen Canyon Dam.

Section 2.2.1 states that operational flow actions would occur for up to three years. The EA acknowledges sustained long-term threats to LTEMP resources from the establishment of Smallmouth Bass, but does not fully address how the alternatives could be utilized for long-term prevention should it be needed, nor does it establish a process for deliberation and reinitiation of flow alternatives for long-term Smallmouth Bass establishment prevention.

Section 2.2.2 states, “however, since smallmouth bass were detected in the Glen Canyon reach in 2022, no smallmouth bass have been detected below RM 0.” The lack of detections downstream of RM 0 may be attributed more to the lack of sampling within this section of the river occurring from the first detection of juvenile SMB to present. Adult Smallmouth Bass have been detected downstream of Lees Ferry in the Department’s long-term fish monitoring since at least 2005, although in extremely small numbers (n<10). This is acknowledged further in the document, but should be clarified here.

The EA outlines an assessment of anticipated effects to recreational experience downstream of Glen Canyon Dam, but does not include an assessment of recreational impact in Lake Powell (e.g. boat ramp access) associated with changes in pool elevations for the proposed actions.

The term “fisheries” has traditionally been used in describing fish populations with economic use through commercial or recreational harvest. Although the term has expanded in use to include general description of fish populations, there are some instances throughout the document that the term could be considered misapplied to native fish communities.

Section 3.3.1 contains the statement, “fish in all waters within the GCNRA and GCNP are managed by the National Park Service (NPS), in coordination with the Arizona Game and Fish Department and the USFWS.” We respectfully request an amendment to “fish in all waters within the GCNRA and GCNP are managed jointly by the National Park Service (NPS) and Arizona Game and Fish Department in coordination with the USFWS.”

The Department continues to stress the importance of preventative measures in the management of high-risk warmwater non-native fish through temperature control. As such, we are supportive of Flow Options A-D as outlined within the EA as actions to achieve the stated purpose and believe that they serve as viable options to contribute to efforts designed to reduce the risk of establishment of Smallmouth Bass. We encourage Reclamation, as feasible, to plan for flexibility within the implementation of action alternatives to fit within the adaptive management framework that the program is built on. The Department also recommends Reclamation consider long-term solutions to maintaining cold water releases, including infrastructural changes, and identifying effective fish deterrents, or installing exclusion structures in the forebay of Glen Canyon Dam, in order to reduce entrainment of high-risk warmwater non-native fish through the dam.

The Department acknowledges that there are competing values assigned to stored water in Lake Powell and necessary tradeoffs in management of reservoir elevation levels and releases. Thank you for the opportunity to provide input on the Glen Canyon Dam/Smallmouth Bass Flow

Options Draft Environmental Assessment. We look forward to continued discussion within the Glen Canyon Dam Adaptive Management Program on operational alternatives and other measures for reducing the risk of warmwater non-native fish below Glen Canyon Dam to the benefit of all LTEMP resources.

Sincerely,

Julie Carter

Julie Carter
Aquatic Wildlife Branch Chief
AMWG Representative

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March 10, 2023

US Department of the Interior
Bureau of Reclamation
Upper Colorado Basin Region
125 South State Street, Room 8100
Salt Lake City, UT 84138

BlueRibbon Coalition (BRC) is writing to provide feedback for the Glen Canyon Dam/Smallmouth Bass Flow Options Environmental Assessment. BRC is a national non-profit organization that champions responsible recreation and encourages a strong conservation ethic and individual stewardship. We champion responsible use of public lands and waters for the benefit of all recreationists by educating and empowering our members to secure, protect, and expand shared outdoor recreation access and use by working collaboratively with natural resource managers and other recreationists. Our members use motorized and non-motorized means of recreation, including OHVs, horses, mountain bikes, and hiking to enjoy federally managed lands throughout the United States, including those of the National Park Service. Many of our members and supporters visit Glen Canyon National Recreation Area or travel across the country to visit GCNRA and use motorized vehicles to access both Lake Powell, and the Colorado River. BRC members visit these areas for motorized recreation, sightseeing, photography, hunting, wildlife and nature study, camping, water sports, and other similar

pursuits. We would like to add our support to any comment submitted by any other individuals or organizations that advocate for motorized use and increased recreation access overall. BRC members and supporters have concrete, definite, and immediate plans to continue such activities in the future.

BRC has concerns with all the proposed release options. If releases are based on preventing spawning by keeping water temperatures cooler by initiating “triggers” when the water reaches 60 degrees Fahrenheit then we believe these releases will be in vain. Many sources which we have included in Appendix A show conflicting science. Many studies indicate that smallmouth bass spawning can occur in temperatures ranging from 40-80 degrees fahrenheit. However, if lower water temperatures will in fact prevent spawning of smallmouth bass then the best long term solution will be to keep water levels in Lake Powell higher. We believe that the current trigger for the Lower Elevation Balancing Tier at 3525’ at Lake Powell is inadequate, and doesn’t allow the necessary flexibility to BOR decision makers to adjust to lowering lake levels. We believe 3588’ is a better level for maintaining the reservoir in a manner that benefits all users. We have prepared a policy brief entitled “The Path to 3588” that was developed by John Rickenbach. BOR needs a higher level for the equalization tier. Managing the lake around the current LEBT for a long period of time is damaging to wildlife and users of the Colorado River Basin.

Due to current precipitation within the Upper Colorado River Basin, water levels are predicted to rise within the reservoir which would in turn make the need for these releases due to low levels obsolete. We strongly oppose any prolonged high flow releases through the hollow jets until the reservoir is stabilized at a higher level.

It is also important to note that the Humpback Chub, the native species residing within the Colorado River, spawns best at temperatures above 60 degrees Fahrenheit. If water temperatures do in fact increase, it would only benefit the listed humpback chub species. Ultimately the best option for protecting the Humpback Chub is maintaining a higher lake level. All proposed options would immediately hurt this endangered species for a speculative benefit. Each option degrades the desired habitat for the humpback chub. For this reason, BOR should not move forward with any of the proposed options. We believe the science that justifies any high flow releases to prevent smallmouth bass spawning is weak, and we question whether any of the proposed experimental releases will have the intended effect. Periods of critical, prolonged drought are not the time to be engaging in speculative experiments. We recommend the bureau seriously consider our Path to 3588’ Plan which will address these issues long term.

Ecological Value of "Invasive" Species

We encourage BOR to review the findings of Fred Pearce's fresh thinking in his book, *The New Wild: Why Invasive Species Will be Nature's Salvation.* In a telling passage, Pearce writes, "The emerging picture, whether from the neutral theory or ecological fitting or the growing body of evidence of what actually happens inside ecosystems, is that they are more adaptive and random than is assumed in the old ecology [...] Nature undisturbed is not constant in form, structure or proportion, but changes at every scale of time and space. The idea of nature in balance, in a steady state, or even gravitating toward such a state through a process of succession is false, he says. So too is the idea that change in nature is somehow bad. Environmentalists raise money, legislators pass laws, and scientists spend careers trying to freeze nature in a state that is neither practical nor desirable. If nature is always in flux, then trying to stop that flux is anti-nature - and dangerous, because it builds up problems" (Pearce 146).

This plan is an attempt to stop or control what is an essential manifestation of nature in flux. The conservationists who are promoting these flow actions are mired in a form of ecological thought that is outdated and old. Nature isn't a balanced natural system being destabilized by humans. Nature is not in balance and is constantly changing. Perhaps the most enlightened thing BOR could do is present an alternative that recognizes the inherent value of both smallmouth bass and humpback chub as species that have the potential to occupy beneficial roles in a broad range of ecosystems - including the Colorado River. By excluding an alternative that acknowledges the potential benefits of nature's continual flux, BOR is starting with a predetermined desired outcome - justifying experimental high flows - and selectively bending the science towards this outcome. BOR should produce at least one alternative that includes no high flow options and makes an unbiased analysis of the risks *and benefits* of new species introductions into the planning area, where nature seems to be moving in that direction on its own.

Economic Benefits

The environmental assessment does not analyze the full impact of recreation opportunities and how each proposed option would affect recreation and economic benefits. Glen Canyon National Recreation Area is a significant national treasure as well as a spectacular producer of revenue. GCNRA averages $250 million to $450 million in annual revenue[1]. It gives rise to over 5000 jobs. Its economic multiplier is 10, giving rise to over $4 billion in direct economic value to

[1] 2019 National Park Visitor Spending Effects. *Economic Contributions to Local Communities, States, and the Nation* Natural Resource Report NPS/NRSS/EQD/NRR—2020/2110. National Park Service. April 2020.

its surrounding and regional areas. In order to keep water flowing to the Lower Basin users Lake Powell has depleted its storage of water and the level of the lake has dropped to the point that it has precluded any recreational (economic) activity on its north end. This began December 2, 2021 and continues to this point in time. Its south end has been compromised to the point that recreational utilization, and its attendant revenue, have almost vanished. The present low levels of Lake Powell have ruined an extensive part of its infrastructure and rendered those improvements unavailable to recreationists.

While we recognize the importance of economic benefit created by the reach of the Colorado River analyzed in the plan, it is disappointing that the EA fails to adequately recognize the importance of the economic benefits of recreation to the regional communities surrounding Lake Powell and the rights of recreational users throughout the greater region. These negative impacts disproportionately impact Navajo Nation tribal communities on the southern border of the GCNRA, as well as Page, Arizona and should be recognized in the deliberations involving these flow options. The economic analysis of the plan is simply too narrowly focused, and doesn't provide adequate information for determining a decision.

We feel that recreationists have a right to access and use stored water. So do the states of Colorado, Utah, and Arizona. As a natural resource, water is to be used for the benefit of all of us. It is in the public interest to allow recreational use of our natural resources that leads to no adverse effect or depletion of those assets. Colorado River water belongs to us all and we feel it is time to properly share it with all of the stakeholders.

Conclusion

We recognize that the proposal only contemplates releases consistent with governing statutes and regulations, but we question whether BOR is doing everything in its power to stabilize and raise the lake levels. BOR should at least analyze an alternative that considers holding back more water to raise the lake level to where the temperature of water passing through the dam penstocks would achieve the purpose and need of the proposed action.

We have reviewed the Modification to Flow Spike Alternatives (Option B and D) to Address Impacts to Sediment and have broad concerns regarding this section of the DEA. We do not support any high flow releases for long periods of time especially during consecutive years of drought and low water levels that Lake Powell is currently experiencing. In 2023, any flow scenario which contemplates high flows from May until July should be rejected.

BRC would like to be considered an interested public for this project. Information can be sent to the following address and email address:

Ben Burr
BlueRibbon Coalition
P.O. Box 5449
Pocatello, ID 83202
brmedia@sharetrails.org

Sincerely,

Ben Burr
Executive Director
BlueRibbon Coalition

Simone Griffin
Policy Director
BlueRibbon Coalition

Appendix A

Vol._III_Ch._8__Smallmouth_Bass.pdf

https://tforods.com/prespawn-smallmouth-tactics-with-ben-nowak/

https://www.gameandfishmag.com/editorial/seasonal-smallmouth-bass-fishing-tips/190243

https://strikeandcatch.com/when-do-smallmouth-bass-spawn/

https://www.bassmaster.com/how-to/news/spawn-time-smallmouth/ : depth and moon phase

https://www.bassresource.com/fish_biology/smallmouth-seasonal-habits.html

https://dnr.wisconsin.gov/topic/Fishing/species/smbass.html

https://littleriveroutfitters.com/pages/fishing/smallmouth-reproduction.html

https://www.tackleshare.com/resources/smallmouth-bass/

https://bonfirebob.com/when-do-smallmouth-bass-spawn/

https://www.in-fisherman.com/editorial/magic-temps-for-river-smallmouth/156196

https://www.northwoodsbass.com/spring-meteorology-and-smallmouth-bass/

https://majorleaguefishing.com/angler-columns/kevin-vandam-the-truths-about-water-temperature/

10 March 2023

SENT VIA ELECTRONIC MAIL

Responsible Officials
US Department of the Interior
Bureau of Reclamation
Upper Colorado Basin Region
125 South State Street, Room 8100
Salt Lake City, UT 84138
gcd_smb_ea@usbr.gov

RE: Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment

Responsible Officials:

The Center for Biological Diversity, Sierra Club Grand Canyon Chapter, Living Rivers and Colorado Riverkeeper, and Great Basin Water Network ("Conservation Groups") provide the following comments on the Bureau of Reclamation's ("BOR") "Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment."

The Center for Biological Diversity is a national, non-profit conservation organization dedicated to protecting and recovering endangered species and the habitats upon which they depend for their survival. The Center has 1.7 million members and supporters, including members who use and enjoy the Grand Canyon the Colorado River for recreation, natural history, spiritual renewal, photography, art, wildlife observation and scientific study. The Center has been involved in the preservation of threatened and endangered species and their habitats in the Grand Canyon region for decades including protection of the Grand Canyon's aquifers. Those species include the federally threatened humpback chub, the endangered razorback sucker, the endangered southwestern willow flycatcher, and the threatened Mexican spotted owl. Those habitats include the Colorado River, its springs and connected streams, and terrestrial habitats within and adjacent to Grand Canyon National Park's boundaries.

The Sierra Club's mission is "to explore, enjoy, and protect the wild places of the earth; to practice and promote the responsible use of the earth's ecosystems and resources; and to educate and enlist humanity to protect and restore the quality of the natural and human environments." The Grand Canyon (Arizona) Chapter was formed in 1965 in order to focus attention on stopping dams in Grand Canyon. Our work to protect the Colorado River and Grand Canyon National Park continues today. Our 13,000 members and supporters have a significant interest in the health of the Colorado River and the species that depend upon it.

Living Rivers is a non-profit corporation dedicated to the preservation, protection, and restoration of rivers and watersheds in the Colorado Plateau. Living Rivers works to ensure the long-term health and viability of human, animal, and plant species, as well as environmental quality threatened by mining and oil and gas operations in the region—with a principal focus of reestablishing a free-flowing Colorado River through Glen and Grand Canyons. Colorado Riverkeeper is a licensed organizational member of

Waterkeeper Alliance, which is a global movement of advocates working to protect rivers, streams, and coastlines around the world, including, through Colorado Riverkeeper, the Colorado River.

The Great Basin Water Network (GBWN) was formed to protect the water resources of the Great Basin for residents, animal and plants. The Network promotes effective water conservation programs including economic incentives for water smart-practices as opposed to multi-million dollar projects that would burden urban taxpayers while leaving rural communities in jeopardy.

1. Introduction: This is An Emergency Situation for Humpback Chub

The passage of warm water and smallmouth bass from near the surface of Lake Powell through still-unscreened penstocks of Glen Canyon Dam, into the Colorado River, threatens the survival and recovery of humpback chub. Once established, a reproducing population of smallmouth bass in the Grand Canyon would be impossible to suppress. Predation by bass would reduce the number and reproductive success of the largest remaining population of humpback chub at the Little Colorado River. This outcome would jeopardize humpback chub, sharply increase extinction risk, and would be catastrophic for humpback chub recovery efforts overall.

BOR must avoid that outcome. To do so, BOR must analyze, select, and implement alternative(s) and flow regime(s) that (1) maximally *prevent*, rather than only *disrupt,* smallmouth bass reproduction in Grand Canyon, and that (2) maximally safeguard against resultant predation of humpback chub and other endangered, threatened, and native fish. This requires selecting flow alternatives A and B. Legal mandates are many and clear for BOR to select flow regimes to maximally protect the humpback chub. BOR *lacks* a legal mandate to prioritize flow regimes for hydropower. BOR's analysis, selection, and implementation of flow regimes must advance actions maximally beneficial to the survival and recovery of federally listed fish to avoid jeopardy to humpback chub. Failure to do so will jeopardize humpback chub.

More broadly, BOR and its sister agencies (NPS, USFWS) must undertake planning now to ensure the survival, and recovery of threatened and endangered fish in the context of minimum power pool, dead pool, and a warm Colorado River flowing through Grand Canyon. Worsening greenhouse gas pollution, regional warming, aridification, and Colorado River flow declines provide little assurance that, in the long term, sufficient water will be available to maintain Lake Powell levels and cold water flows from Glen Canyon Dam. BOR and its sister agencies' duty to "carry[] out programs for the conservation"—i.e., recovery of listed species, should compel planning now to ensure for the survival and recovery of threatened and endangered fish. This planning must consider ways to avoid, minimize, or off-set impacts from warm Colorado River water flowing through Grand Canyon due to increasing risks of long-term minimum power pool and dead pool behind Glen Canyon Dam . 16 U.S.C. § 1536(a)(l).

2. The Department of the Interior and Bureau of Reclamation Have Multiple Statutory Mandates to Manage Colorado River Flows to Protect Grand Canyon's Endangered Fish and Grand Canyon National Park's Natural and Cultural Values. Hydropower is "Incident" and Subservient to Conservation Mandates.

The Department of Interior (DOI) and BOR have multiple statutory mandates to manage flows from Glen Canyon Dam to protect, improve, and mitigate adverse impacts to federally endangered species and the natural and cultural values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established. Because hydropower cannot be prioritized above other purposes, and because it is explicitly "incident" to flows for other purposes, BOR has both the authority and obligation to manage Glen Canyon Dam to effectively conserve water and natural resources without the additional burden of prioritizing the provision of hydropower from the dam.

The Secretary, acting through the Director of the National Park Service, must "promote and regulate the use of the National Park System by means and measures that conform to the fundamental purpose of the System units, which purpose is to conserve the scenery, natural and historic objects, and wild life in the System units and to provide for the enjoyment of the scenery, natural and historic objects, and wild life in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." 54 U.S.C. § 100101(a).

Further, and as discussed in more detail later as it relates humpback chub, Section 7 of the Endangered Species Act requires that"[e]ach Federal agency shall, in consultation with and with the assistance of [the Services], insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification" of designated critical habitat. 16 U.S.C. § 1536(a)(2). The regulations implementing the ESA define to "jeopardize the continued existence of" as "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." 50 C.F.R. § 402.02.2

Here, pursuant to the ESA, the BOR must ensure that flow regimes from Glen Canyon Dam are not likely to jeopardize the continued existence of humpback chub, result in the destruction or adverse modification of its critical habitat in Grand Canyon National Park, or directly or indirectly reduce its reproduction, numbers, or distribution.

The Grand Canyon Protection Act of 1992 (GCPA) specifies that Glen Canyon Dam "shall" be operated in a manner that is protective of Grand Canyon National Park and Glen Canyon National Recreation Area:

> "The Secretary shall 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, including, but not limited to natural and cultural resources and visitor use." (Grand Canyon Protection Act (GCPA) (1992), Section 1802(a))

Here, pursuant to the GCPA, BOR must operate Glen Canyon Dam to protect, improve, and mitigate impacts to humpback chub and the riverine ecosystem upon which it depends, and for which Grand Canyon National Park was established in part to protect.

Upon its passage, GCPA's House sponsor George Miller explained, "In the name of more electric power production mindless and unnecessary damage is being inflicted every day on the resources of the Grand Canyon, one of the most precious park resources in the world... the daily operation of Glen Canyon dam to produce hydroelectric power was wreaking havoc on the beaches and wildlife habitat at the bottom of Grand Canyon."

Upon its passage, GCPA's Senate sponsor John McCain explained, "widely fluctuating water releases from the dam, primarily for the maximum generation of hydroelectric peaking power, are contributing to the irreversible erosion of river beaches. It is critical to recognize that river beaches are not merely convenient resting spots for river rafters, hikers, and Grand Canyon campers. The beaches are extremely valuable biological resources which support riparian vegetation and diverse forms of wildlife. They are precious and fragile ecosystems which are as vital a part of the canyon as a view from the South rim and just as deserving of protection."

The GCPA specifically mentions compliance with the Colorado River Storage Project Act of 1956 (Public Law 84-485) (CRSP), the law that authorized the construction of Glen Canyon Dam, in reference to water:

> "The Secretary shall implement this section in a manner fully consistent with and subject to the Colorado River Compact, the Upper Colorado River Basin Compact, the Water Treaty of 1944 with Mexico, the decree of the Supreme Court in Arizona v. California, and the provisions of the Colorado River Storage Project Act of 1956 and the Colorado River Basin Project Act of 1968 that govern allocation, appropriation, development, and exportation of the waters of the Colorado River basin."

GCPA Sec. 1802(b).

Regarding hydropower, GCPA only discusses the need to replace Glen Canyon Dam's power with other power supplies. Through the GCPA, "the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established" were prioritized above Glen Canyon Dam's hydropower production:

> "The Secretary of Energy in consultation with the Secretary of the Interior and with representatives of the Colorado River Storage Project power customers, environmental organizations and the States of Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming shall identify economically and technically feasible methods of replacing any power generation that is lost through adoption of long-term operational criteria for Glen Canyon Dam as required by Section 1804 of this title. The Secretary shall present a report of the findings, and implementing draft legislation, if necessary, not later than two years after adoption of long-term operating criteria. The Secretary shall include an investigation of the feasibility of adjusting operations at Hoover Dam to replace all or part of such lost generation. The Secretary shall include an investigation of the modifications or additions to the transmission system that may be required to acquire and deliver replacement power."

GCPA, Sec. 1809.

Hydropower generation is "incident" to other purposes set forth in the Colorado River Storage Project Act of 1956 (Public Law 84-485), the act which authorized Glen Canyon Dam. The Secretary of the Interior was authorized to "construct, operate, and maintain" Glen Canyon Dam:

> ". . . for the purposes, among others, of regulating the flow of the Colorado River, storing water for beneficial consumptive use, making it possible for the States of the Upper Basin to utilize, consistently with the provisions of the Colorado River Compact, the apportionments made to and among them in the Colorado River Compact and the Upper Colorado River Basin Compact, respectively, providing for the reclamation of arid and semiarid land, for the control of floods, and *for the generation of hydroelectric power, as an incident of the foregoing purposes*…"

43 U.S.C. §620 (emphasis added).

The DOI and BOR have a clear responsibility to use Glen Canyon Dam to manage water according to the obligations in CRSP and GCPA. Because hydropower cannot be prioritized above other purposes under CRSP and GCPA, BOR has the authority and duty to manage Glen Canyon Dam to effectively conserve water and natural resources without the additional burden of providing hydropower from the dam.

Because of this, we recommend that BOR add to the description of the Colorado River Storage Project (CRSP) Act (April 11, 1956) in the EA at I-5 the following: The purpose of the storage projects is for water storage, flow regulation, and flood control, with hydroelectric power "as an incident of" the other purposes.

BOR and DOI must fulfill the Secretary of Interior's obligation to operate the dam "in such a manner as to protect, mitigate adverse impacts to, and improve" Grand Canyon, and to operate the dam in such a way that does not reduce the reproduction, numbers, or distribution of federally threatened humpback chub.

3. BOR's Operation of Glen Canyon Dam Must Prevent Jeopardy of Federally Threatened Humpback Chub and Reductions of its Reproduction, Numbers, or Distribution. Failure by BOR to Prevent a Reproducing Smallmouth Bass Population in the Colorado River of Glen, Marble, or Grand Canyons, or to Select an Alternative(s) or Flow Regime(s) Maximally Preventative of Small Mouth Bass Reproduction and Reductions in Humpback Chub Reproduction, Numbers, or Distribution, Will Jeopardize Humpback Chub in Violation of the Endangered Species Act

As relevant here, Section 7 of the ESA requires that "[e]ach Federal agency shall, in consultation with and with the assistance of [the Services], insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification" of designated critical habitat. 16 U.S.C. § 1536(a)(2). To "jeopardize the continued existence of" means "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." 50 C.F.R. § 402.02.2

This "mandate applies to *every discretionary agency action*—regardless of the expense or burden its application might impose." *Nat'l Ass'n of Home Builders v. Defs. of Wildlife*, 551 U.S. 644, 671 (2007) (emphasis added).

Formal Section 7 consultation may result in the issuance of a biological opinion, however, "[c]onsulting with the [Fish and Wildlife Service] alone does not satisfy an agency's duty under the Endangered Species Act." *Res. Ltd. v. Robertson,* 35 F.3d 1300, 1304 (9th Cir. 1994). The BOR would violate the ESA if it approves or implements an action in reliance on a legally flawed biological opinion or fails in its approval or implementation decision "to discuss information that would undercut the [biological] opinion's conclusion." *Ctr. for Biological Diversity v. U.S. BLM,* 698 F.3d 1101, 1127-28 (9th Cir. 2012); *see also WildEarth Guardians v. Steele,* 545 F. Supp. 3d 855, 881 (D. Mont. 2021) ("Ignoring information that would undercut the [biological] opinion's conclusions violates the [agency's] obligation under § 7 of the ESA.").

The ESA and section 7 consultation regulations mandate that biological opinions incorporate a comprehensive, aggregative approach to the effects analysis. The longstanding regulatory definition for "effects of the action" includes direct, indirect, and interrelated threats that are added to the environmental baseline in order to determine jeopardy. 50 C.F.R. § 402.02. The Ninth Circuit has held that a species may be jeopardized even "if there is no appreciable reduction of survival odds" because "a species can often cling to survival even when recovery is far out of reach." *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 524 F.3d 917, 931 (9th Cir. 2008).

The regulations recognize that "reducing the reproduction" of a species may jeopardize the species' survival or recovery. 50 C.F.R. § 402.02. Thus, Fish and Wildlife Service "must analyze effects on recovery as well as effects on survival." *Nat'l Wildlife Fed'n*, 524 F.3d at 932. Under the ESA,

"[r]ecovery means improvement in the status of listed species to the point at which listing is no longer appropriate under the criteria set out in section 4(a)(1) of the Act." 50 C.F.R. § 402.02.

The ESA mandates that all the impacts of the agency's discretionary activities on listed species, such as BOR's operation of Glen Canyon Dam, be assessed as an effect, not as part of the environmental baseline, in determining jeopardy. This principle was reaffirmed during the rulemaking process for the 2019 revisions to the 402 consultation regulations. 84 Fed. Reg. 44,976, 44,978 ("discretionary activities . . . that are part of the proposed action but for which no change is proposed" are to be analyzed "as part of the effects of the action, even those operations that the Federal agency proposes to keep the same.").

Establishing an environmental baseline that fails to consider factors harming the species or degrading the species' habitat violates the ESA. *See, e.g., Am. Rivers & Ala. Rivers All. v. FERC*, 895 F.3d 32, 46-47 (D.C. Cir. 2018) (holding Fish and Wildlife Service acted arbitrarily in establishing a baseline that failed to consider degradation caused by power plant); *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 524 F.3d 917, 929 (9th Cir. 2008) (finding that a biological opinion violated ESA where it did not "incorporate degraded baseline conditions into its jeopardy analysis.").

As a result, in order for the Bureau of Reclamation to meet the requirements of the ESA, it must engage in consultation with the Service to "insure" that the proposed actions, including existing operations, are "not likely to jeopardize" the continued existence of listed species. 16 U.S.C. § 1536(a)(2).

a. The fate of the Little Colorado River humpback chub population is critical to the species' overall survival and recovery.

The Little Colorado River population of humpback chub is the species' largest remaining population. More than 90% of humpback chub exist in Grand Canyon; the majority of these comprise the Little Colorado River population. Its size, reproductive success, and its role as a source population for translocations and dispersal make it critically important to the overall survival and recovery of humpback chub as a species. The importance of the Little Colorado River population is heighted further by the tenuous, declining, and uncertain status of remaining Upper Basin humpback chub populations.

Only five populations of humpback chub persist in the Colorado River basin. Four small and tenuous populations are in the upper Colorado River basin (Black Rocks, Westwater Canyon, Desolation/Gray Canyons, and Cataract Canyon) and one in lower basin population in the Grand Canyon, comprised primarily of fish in the Little Colorado River.[1] The U.S. Fish and Wildlife Service now considers a sixth upper basin population in Dinosaur National Monument to be functionally extirpated.[2] The Little Colorado River at and upstream of the Colorado River confluence harbors the largest remaining population of humpback chub in the Colorado River Basin, and the most important remaining habitat its survival and recovery. This reach of the Little Colorado River provides eight miles of designated critical habitat[3] and 11 miles of occupied habitat (inclusive of critical habitat).[4]

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[1] Humpback Chub (*Gila cypha*) 5-Year Review: Summary and Evaluation. 2017. U.S. Fish and Wildlife Service Mountain-Prairie Region Lakewood, Colorado. At 3.
[2] *Id*.
[3] U.S. Fish and Wildlife Service. 2017. Species status assessment for the Humpback Chub (*Gila cypha*). U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, CO. At 64.
[4] Van Haverbeke, David, Kirk Young, Dennis Stone and Michael Pillow. 2017. Mark-Recapture and Fish Monitoring Activities in the Little Colorado River in Grand Canyon from 2000 to 2016. U.S. Fish and Wildlife Document: USFWS-AZFWCO-FL-16-02. At 11. Accessed 12 Nov

The importance of the Little Colorado River population to the humpback chub's overall survival and recovery is heightened by the comparatively tenuous and uncertain status of the four remaining upper basin populations. In contrast to long-term declining humpback chub populations in the Upper Basin, which are comprised by a total of perhaps only 3600 individual fish,[5] the Little Colorado River is considered to be the "core" population of humpback chub in the Grand Canyon;[6] this population reproduces successfully and is stable and self-sustaining with 11,500 to 12,000 individuals.[7] In the Upper Basin, the U.S. Fish and Wildlife notes that the Black Rocks and Westwater Canyon populations "declined through 2007," that "declines have potentially been arrested," but that "there is uncertainty about this hypothesis."[8] The "abundance estimate data is insufficient to reach any reliable conclusion about the trajectory of the Desolation/Gray canyons population" and that "the Cataract Canyon population is small and the trajectory of adult numbers is unclear."[9]

In addition to being the largest remaining population of humpback chub world, the Little Colorado River population is a source population that supports dispersal into the mainstem Colorado River and translocations establishing new populations in service of survival and recovery.[10] Humpback chub in Grand Canyon are potadromous (fish that do not migrate to the ocean at any time during their life cycle); adults migrate from the Colorado to the Little Colorado River in the spring to spawn; young humpback chub then rear in the Little Colorado River and emigrate out of the Little Colorado River by seasonal flood events, likely thereby populating several small aggregations of humpback chub in the mainstem Colorado River where reproduction is for the most part absent.[11] In addition to dispersal, the Little Colorado River population is the source population for translocation efforts in Grand Canyon. The U.S. Fish and Wildlife Service's 2017 Species Status Assessment for the Humpback Chub (*Gila cypha*) states:

> A total of 2,971 juvenile Humpback Chub were translocated from the lower LCR [Little Colorado River] to above Chute Falls (RK 16.2) during 2003–2015 (citation omitted); many have survived and remained in the reach, and ripe and spent fish indicate that spawning is taking place (Stone

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2019: http://gcdamp.com/images_gcdamp_com/7/7a/VanHaverbeke_et_al_2017_USFWS_Mark_recapture_and_fish_monitoring_activies_in_the_LCR_2000-2016.pdf

[5] U.S. Fish and Wildlife Service. 2017. Species status assessment for the Humpback Chub (*Gila cypha*). U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, CO. At 101.

[6] *Id* at ix.

[7] *Id*.

[8] *Id*.

[9] *Id*.

[10] Van Haverbeke, David, Kirk Young, Dennis Stone and Michael Pillow. 2017. Mark-Recapture and Fish Monitoring Activities in the Little Colorado River in Grand Canyon from 2000 to 2016. U.S. Fish and Wildlife Document: USFWS-AZFWCO-FL-16-02. At 10. Accessed 12 Nov 2019: http://gcdamp.com/images_gcdamp_com/7/7a/VanHaverbeke_et_al_2017_USFWS_Mark_recapture_and_fish_monitoring_activies_in_the_LCR_2000-2016.pdf

[11] *Id.*

> 2016). A total of 1,650 juvenile Humpback Chub were translocated from the LCR [Little Colorado River] to lower Havasu Creek during 2011–2015 (see section 4.5, Table 15); many have survived and remained in the tributary, and young unmarked fish found in 2014, 2015, and 2016 indicate that successful reproduction has taken place (citation omitted).[12]

Taken together, the health and stability of the Little Colorado River population and success of translocations have yielded an expansion of humpback chub populations over the past decade in the Lower Basin that undergirded the recommendation to downlist the chub from endangered to threatened status.[13]

b. Establishment of a smallmouth bass population in the Colorado River of Grand Canyon because of Glen Canyon Dam operations would jeopardize humpback chub by reducing the reproduction, numbers, and distribution of the Chub's Little Colorado River population.

Section 7 of the ESA requires that "[e]ach Federal agency shall, in consultation with and with the assistance of [the Services], insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification" of designated critical habitat. 16 U.S.C. § 1536(a)(2). To "jeopardize the continued existence of" means "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." 50 C.F.R. § 402.02.2

Here, BOR's operation of Glen Canyon Dam, by passing warm water and smallmouth bass from Lake Powell into the Colorado River downstream, threatens jeopardy of humpback chub by facilitating the establishment of smallmouth bass populations that will reduce the reproduction, numbers, and distribution of humpback chub.

There is little evidence to suggest that the failure to prevent the establishment and reproduction of a smallmouth bass between the Little Colorado River and Glen Canyon Dam would not decimate the Little Colorado River population's recruitment and overall size. To the contrary, abundant information indicates that humpback chub are vulnerable to predation by smallmouth bass generally,[14] that survival and recovery requires habitat with few nonnative predators so that young survive and recruit into self-sustaining populations,[15] that smallmouth bass predation has likely decimated breeding populations of humpback chub in the Yampa river,[16] and that the Little Colorado River population of humpback chub may be particularly prone to predation by non-native fish should a population become established in Grand Canyon.[17]

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[12] U.S. Fish and Wildlife Service. 2017. Species status assessment for the Humpback Chub (*Gila cypha*). U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, CO.

[13] Humpback Chub (Gila cypha) 5-Year Review: Summary and Evaluation. 2017. U.S. Fish and Wildlife Service Mountain-Prairie Region Lakewood, Colorado. At 13, 15.

[14] U.S. Fish and Wildlife Service. 2017. Species status assessment for the Humpback Chub (*Gila cypha*). U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, CO. At 24.

[15] Id at iiv.

[16] Id at 116.

[17] Marsh, P.C., and M.E. Douglas. 1997. Predation by introduced fishes on endangered Humpback Chub and other native species in the Little Colorado River, Arizona. Transactions of the American Fisheries Society 126: 343–346.

c. BOR should select "Cool Mix with Flow Spikes" and "Cool Mix" options (Flow Options B and A) to maximally prevent (rather than just disrupt) small mouth bass reproduction and establishment and to avoid jeopardy under the Endangered Species Act.

The emergency facing humpback chub demands BOR heed the flow recommendations of scientists who, informed by years of research and adaptive management, have carefully developed plans to experimentally manage federally listed and native fish with Glen Canyon Dam flow various regimes. Those actions must not be delayed. The proposed action should explicitly prioritize the actions that are likely to achieve the purpose and need of the EA: the "Cool Mix with Flow Spikes" and "Cool Mix" options (Flow Options B and A).

BOR must prevent smallmouth bass reproduction and safeguard Grand Canyon's fish species, several of which rely on Grand Canyon and its tributaries to sustain their populations. Environmental flow actions like this are the safest way to ensure a healthy Colorado River in Grand Canyon without potentially harmful and less effective chemical treatments or electrofishing.

Importantly, drought should not be used as an excuse to postpone or cancel any flow management action that would benefit native fish or redistribute sediment in Grand Canyon. In 2021 and again in 2022, a High Flow Experiment (HFE) was skipped despite U.S. Geological Survey scientists reporting the proper conditions for a 192 hour (8 day) HFE for the first time ever under LTEMP, and while sandbar size was the lowest in ten years. BOR decided not to implement the HFE because of "concerns about pool elevation and the Basin Fund, although there would have been a positive effect on sediments especially given the unprecedented drought conditions." This is despite the acknowledgement that HFEs do not affect annual water release volumes. Again, we point to the Grand Canyon Protection Act, which is clear about the mandate to "operate Glen Canyon Dam… in such a manner as to protect, mitigate adverse impacts to, and improve" Grand Canyon.

Flow spikes, which are likely to improve the effectiveness of the proposed action, should be employed every time there is enough sediment to ensure that beaches and sandbars will be improved, and never when sediment models predict detrimental impacts to sediment resources. Since sediment resources are favorable in 2023, a flow spike should absolutely be implemented with the Cool Mix (Flow Option B - Cool Mix with Flow Spikes) during the spring or summer of 2023.

BOR should implement Flow Options A and B because they are likely to "disrupt *or prevent* spawning of smallmouth bass and other nonnative, invasive warmwater fish species." EA at 3-7 (emphasis added). BOR should not rely on Flow Options C and D because, instead of preventing spawning, these flows are only designed to disrupt spawning, and are only likely to "result in population decreases" for fish that "are spawning at the time of these releases." EA at 3-7.

To be clear: Flow Options C and D risk decimating the Little Colorado River population and jeopardy to humpback chub overall by failing to prevent spawning of smallmouth bass. BOR, to ensure against jeopardy, must select alternatives and flow regimes that maximally prevent smallmouth bass spawning and reproduction, and that in turn maximally safeguard the humpback chub's Little Colorado River population.

For these reasons, we urge that BOR select and implement actions that are likely to achieve the purpose and need of the EA by preventing smallmouth bass spawning: the "Cool Mix with Flow Spikes" and "Cool Mix" options (Flow Options B and A). Flow Spikes should be employed every time there is enough sediment to ensure that beaches and sandbars will be improved, and never when sediment models predict detrimental impacts to sediment resources. In order to implement flow spikes during 2023 and in

other years when sediment is optimal, BOR must time dam maintenance activities to ensure that flow through the dam is not reduced when a flow spike is needed to protect Grand Canyon resources.

d. Given the likelihood that the establishment of smallmouth bass populations would reduce the reproduction, numbers, and distribution of humpback chub in Grand Canyon, failure of BOR's dam operations to prevent the establishment of smallmouth bass populations or to select alternative(s) maximally preventative (rather than just disruptive) of the smallmouth bass reproduction will jeopardize humpback chub, in violation of the Endangered Species Act.

BOR must avoid jeopardy to the Grand Canyon population of the humpback chub through consultation. Courts have recognized Fish and Wildlife Service's duty to consider project impacts on listed species on scales smaller than the entire population designated through ESA listing or recovery planning. *See Wild Fish Conservancy v. Salazar*, 628 F.3d 513, 529 (9th Cir. 2010); *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service*, 378 F.3d 1059 (9th Cir. 2004), *amended by* 387 F.3d 968 (9th Cir. 2004). In *Wild Fish Conservancy*, the court invalidated a biological opinion that failed to consider the decline of an isolated bull trout sub-population in Icicle Creek on the species as a whole. 629 F.3d at 525-29. The biological opinion there evaluated a project's impacts to the Icicle Creek sub-population, considered "the smallest local population in the Wenatchee River core area and the most vulnerable to extirpation." *Id.* at 526. Despite this sub-population experiencing long-term negative population trends, the Service concluded the project would not be expected to reduce the likelihood of survival and recovery of the larger Columbia River interim recovery unit. *Id.* The court invalidated the biological opinion, finding that because the Icicle Creek sub-population was important to the Wenatchee River core area, a relative stronghold for bull trout in the upper Columbia River area, a decline in this population could harm recovery. *Id.* at 528- 29. The court held that the Service failed to articulate a rational connection between the facts found and the no-jeopardy conclusion made. *Id.* at 529.

Similarly, in *Gifford Pinchot Task Force*, plaintiffs challenged the validity of several biological opinions alleging that they failed to consider local impacts from logging projects on the Northern spotted owl. 378 F.3d at 1075. The court stressed the importance of considering local impacts, stating that "[f]ocusing solely on a vast scale can mask multiple site-specific impacts that, when aggregated, do pose a significant risk to a species." *Id.* (citation omitted). Here, BOR and FWS must consider the local impacts to the Grand Canyon population of humpback chub from the proposed dam operations in their ESA section 7 consultation.

4. BOR Must Immediately Analyze and Implement Screens and Other Dam Modifications to Prevent Passage of Non-native Predator Fish through Glen Canyon Dam. BOR's Failure to Prevent Passage of Non-native Predator Fish through Glen Canyon Dam Violates the Endangered Species Act.

BOR should immediately analyze and then implement screening upstream of Glen Canyon Dam or dam modifications to prevent future exotic species passage through the dam. Powell reservoir is likely to fluctuate around its current level into the future, continuing the risk of allowing more warm water non-native fish in Grand Canyon, and the proposed action could also act to draw more nonnative fish through the dam. EA at 3-8. One possibility to prevent this is upstream screening. Because it will take some time to analyze the feasibility of this action, BOR should begin to study it now. By facilitating the passage of non-native predator fish from Lake Powell into the Colorado River through Grand Canyon, BOR's ongoing operations of Glen Canyon Dam in the absence of preventative screening or other dam modifications threatens humpback chub and other native fish.

5. **Pursuant to the Endangered Species Act's Section 7(a)(1), Department of the Interior Agencies Must Plan Now for Endangered Species Survival and Recovery Amidst Climate Inevitabilities of Minimum Power Pool, Dead Pool, and A Warm Colorado River Through Grand Canyon.**

BOR and its sister agencies (NPS, USFWS) must undertake planning now to ensure the survival, and recovery of threatened and endangered fish in the context of minimum power pool, dead pool, and a warm Colorado River flowing through Grand Canyon. Worsening greenhouse gas pollution, regional warming, aridification, and Colorado River flow declines provide little assurance that, in the long term, sufficient water will be available to maintain Lake Powell levels and cold water flows from Glen Canyon Dam. BOR and its sister agencies' duty to "carry[] out programs for the conservation"—i.e., recovery of listed species, should compel planning now to ensure for the survival and recovery of threatened and endangered fish. This planning must consider ways to avoid, minimize, or off-set impacts from warm Colorado River water flowing through Grand Canyon due to increasing risks of long-term minimum power pool and dead pool behind Glen Canyon Dam. 16 U.S.C. § 1536(a)(l).

Thank you for your consideration of these comments. Please do not hesitate to contact us with questions.

Sincerely,

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March 10, 2023

St.George
THE BRIGHTER SIDE

Sarah Bucklin
Regional NEPA Coordinator
U.S. Bureau of Reclamation, Upper Colorado Basin Region
Via Email only – sbucklin@usbr.gov

RE: Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment (EA)

The City of St. George Energy Services Department (SGESD) appreciates the opportunity to provide comments on the EA, issued February 24, 2023. As a member of the Colorado River Energy Distributors Association (CREDA), SGESD supports the comments presented in its letter of March 10 in response to a request for comments.

SGESD serves approximately 34,000 metered accounts. Located in the southwest corner of Utah, we see our highest demand for power during the summer months. SGESD has a diverse portfolio of energy that includes natural gas, coal, solar and hydrogeneration. The majority of our customers are residential; however, we also serve a diverse business base from manufacturing to hospitality industries as well as Utah Tech University.

SGESD has received power from the Colorado River Storage Project (CRSP) since it began generating in the 1960's. This valuable resource has been an important non-carbon emitting resource for SGESD. It has provided reliable power to meet our demand all year, however, it has been of particular value in meeting our high summer demand, providing a reliable and cost-effective resource for our customers.

Currently, the Bureau of Reclamation is evaluating experimental releases from Glen Canyon Dam at the expense of hydropower generation in an attempt to prevent the potential establishment of small mouth bass in the Colorado River. The scientific basis for additional releases is unproven. The Bureau of Reclamation has only proposed flow-related measures that bypass hydrogenation in summer months as an experimental means to address the small mouth bass establishment in the Colorado River. There is no discussion of potential non-flow alternatives.

The analysis of the EA is inadequate in its identification and analysis of potential impacts from the action. The Bureau of Reclamation has consistently failed to acknowledge there is not a readily available supply of replacement power available for purchase, even though Western Area Power Administration (WAPA) has identified this as an issue of concern in previous comments on this proposal.

If the small mouth bass experiment is approved to go forward, it will result in SGESD, a CRSP customer, having to find replacement power on the open market. Current projections indicate there may be little or no power available on the market when replacement power is needed and what power may be available will be at exceptionally high prices. As a public power, non-profit utility, our customers are the ones that will have to absorb the increased costs of power via their rates.

The EA fails to use the most current information regarding the future hydrology and its impacts on hydropower production. NEPA requires a disclosure of all the cumulative impacts of the action and an analysis of all reasonable alternatives to the proposed action. In this case, the Bureau of Reclamation must analyze, identify and disclose to the public all foreseeable impacts of the Action. This includes the ongoing impacts to FES customers from the last 20 years of limited hydropower production and the resulting increased reliance on purchased power.

SGESD understands that there is an environmental concern as it relates to small mouth bass, but decisions must be grounded in sound science and financial and technical impacts of those decisions must be fully addressed.

Laurie Mangum
St. George Energy Services Director

Cc: Colorado Energy Distributors Association (CREDA)
Commissioner Touton
WAPA Administrator Tracey LaBeau
Wayne Pullan – Reclamation UC Region
Rodney Bailey – WAPA CRSP Management Center

March 10, 2023

via e-mail to gcd_smb_ea@usbr.gov only

Sarah Bucklin
Regional Environmental Coordinator
Bureau of Reclamation
125 South State Street, Room 8100
Salt Lake City, Utah 84138-1147

Re: Comments on the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment

Dear Ms. Bucklin:

On February 24, 2023, the Bureau of Reclamation (Reclamation) released and announced its intent to seek public comment on the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment (EA). In that announcement, Reclamation stated the four potential operational flow options described in the EA were aimed at preventing smallmouth bass from successfully spawning and establishing downstream of Glen Canyon Dam. The following comments are submitted on behalf of the representatives from the Colorado River Basin States (collectively referred to as the "Representatives" hereafter) regarding the EA.

Support for Actions to Prevent the Establishment of Smallmouth Bass: The Representatives acknowledge the urgency to address smallmouth bass through flow-related actions in order to protect the native fish in the Grand Canyon, particularly the humpback chub. However, as described in the Nonnative Fish Strategic Plan approved at the February 2023 AMWG meeting, flow options alone will not be sufficient to prevent establishment. Additional actions, including implementation of a fish exclusion device(s) and fishery actions, such as targeted removals, will be necessary to achieve this goal and should be developed and deployed as expeditiously as possible – ideally by 2024.

Flow Options are Experimental and Require Monitoring: Flow Options A through D in the EA include bypass of the Glen Canyon Dam power plant. We do not oppose inclusion of these options as currently described in the EA, provided however, that such options are consistent with the Colorado River Storage Project Act (CRSPA) of 1956 and the Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs (LROC) of 1970. At a minimum, such approaches should be premised on the shared understanding that such flows continue to be experimental only, and that data from the experiments will be collected, analyzed, and compared to the impacts of other experiments implemented as part of the Glen Canyon Adaptive Management Program or associated management activities. Reclamation must include appropriate offramps should the monitoring indicate the implementation of the alternatives is failing to improve the sustainability of the native fish population below Glen Canyon Dam or if the costs outweigh the benefits. We expect Reclamation to address the terms of CRSPA and LROC before any flow activity that bypasses the Glen Canyon Dam power plant is considered a permanent management action. We reserve the right to oppose such a determination at the appropriate time.

Process for Implementing a Decision: The EA does not describe how implementation of the flow options would occur, nor how Reclamation may switch to another flow option to match changing conditions. The EA does not identify offramps or set forth criteria for whether an offramp is necessitated. Because the EA is narrow in scope and does not amend the LTEMP beyond that narrow scope, the decision making for implementing, switching between, or off-ramping of flow options should follow the same communication and consultation processes that have been developed according to Section 1.4 of the Long-Term Experimental and Management Plan Record of Decision. That process will allow for the Representatives to continue to be involved in the decisions to implement or not implement any of the options to continue to protect their significant interests in the subject waters and infrastructure. Reclamation should provide sufficient parameters on when to commence that process, as well as provide at least a 30-day notice to the Representatives prior to initiating implementation of any alternative(s) decided under that process.

Conclusion

We continue to support the goal of preventing the establishment of smallmouth bass below Glen Canyon Dam. We continue to believe that flow-related actions are only one tool to address the issue and that additional actions like the installation of fish exclusion device(s) are necessary and urgently needed for the long-term prevention of establishment of nonnative species from Lake Powell into the reach below Glen Canyon Dam.

We appreciate the opportunity to comment on the Draft EA. Should there be any questions or concerns regarding this letter or any other aspect of our interests regarding the EA, please contact us at your earliest convenience.

Sincerely,

Tom Buschatzke, Director
Arizona Department of Water Resources

Colby Pellegrino, Deputy GM - Resources
Southern Nevada Water Authority

Jessica Neuwerth
AMWG Representative, California

Ali Effati
AMWG Representative, New Mexico

Michelle Garrison
AMWG Alternate Representative, Colorado

Candice Hasenyager
AMWG Representative, Utah

Sara Price
AMWG Representative, Nevada

Charlie Ferrantelli
AMWG Representative, Wyoming

cc:
Wayne Pullan, Regional Director, Upper Colorado Basin, Bureau of Reclamation
Kathleen Callister, Resources Management Div., Upper Colorado Basin, Bureau of Reclamation

COLORADO RIVER COMMISSION
OF NEVADA

March 10, 2023

via e-mail to gcd_smb_ea@usbr.gov only

Sarah Bucklin
Regional Environmental Coordinator
Bureau of Reclamation
125 South State Street, Room 8100
Salt Lake City, Utah 84138-1147

Re: CRCNV Comments on the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment

Dear Ms. Bucklin,

The Bureau of Reclamation ("Reclamation") released the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment ("Draft SMB EA") on February 24, 2023, with an open comment period until March 10, 2023. We appreciate the expeditious efforts to complete this Draft SMB EA and thank you for allowing us the opportunity to comment at this stage.

The Colorado River Commission of Nevada ("CRCNV") is required to protect and safeguard the State of Nevada's allocation of Colorado River water and power resources granted to it by Congress. CRCNV has a significant interest in water matters impacting the Colorado River as well as hydropower resources from the Boulder Canyon Project, the Parker-Davis Generation Project, and the Salt Lake City Area Integrated Projects. The CRCNV provides hydropower from these projects to 23 contractors in southern Nevada including electric utilities (investor owned and public), municipalities, educational institutions, Nevada state agencies, and companies that produce goods and services.

Upon receiving the Draft SMB EA, the CRCNV worked closely with the other Basin State Adaptive Management Work Group ("AMWG") representatives to identify and synthesize shared comments. While we found numerous places of agreement in our comments (see Basin State AMWG letter, attached here too), the CRCNV offers these additional comments.

Analysis of ALL Flow Options: The CRCNV encourages Reclamation to more fully analyze Flow Option E (the non-bypass flow option). While a non-bypass flow option may not be as effective at preventing the establishment of smallmouth bass as the bypass flow options, there may be situations where this option may be desirable. Performing a full analysis in the EA could provide Reclamation with needed flexibility in the future.

Potential for Significant Impacts: While the analysis in the EA overall may show that some impacts are negligible or temporary, other impacts resulting from reduced hydropower generation may be significant. Reduced hydropower generation has the potential to impact the reliability of the electric grid in the Colorado River Basin, affect market prices, and have a significant financial impact on WAPA's customers.

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The CRCNV is concerned that the estimated impact to hydropower may be significantly understated. Based on the models developed by the federal agencies, in conjunction with National Renewable Energy Laboratory and Argonne National Laboratory, the estimated impacts to hydropower generation range from $41 to $81.2 million, depending upon which of the 4 bypass flow options is selected. Depending on the assumptions made about system operating conditions and market prices in those models, the cost may be much greater. For example, it is unclear from the draft EA whether normal operating conditions were simulated or whether stressed grid conditions were modeled such as those that occurred during the summer of 2022, when imports out of California were constrained and Western Area Power Administration ("WAPA") was called upon to provide emergency power to the grid. It is worth noting that hourly market prices during those constrained hours reached over $1000/MWh. It is also unclear whether the models take into consideration the possibility that market prices could rise in the region ***because of*** the loss of Glen Canyon Dam generation, impacting others in the region besides WAPA and its customers. The CRCNV recommends that the Bureau provide the modeling assumptions behind the impact calculations in the draft EA and, for each flow option, provide a range of impact calculations that reflect both normal operating conditions and stressed operating conditions.

The EA contains several references to the hydropower conclusions that were drawn during the Long-Term Experimental Management Plan ("LTEMP") process a number of years ago. It is worth noting that the power markets have changed ***dramatically*** since that time. Any reliance on data from that time period to draw conclusions about future market conditions is unreliable. The emergence of increased solar on the grid, the shutdown of traditional fossil fueled resources, the requirement to meet renewable portfolio standards, heightened concerns about resource adequacy and natural disasters have changed the energy landscape. In addition, purchased power prices during both the on-peak and off-peak periods, have increased significantly. To illustrate this point, in 2016, the average day-head price for on-peak power at Mead Substation in Southern Nevada was $27.83/MWh compared to $99.74/MWh in 2022. The average day-ahead price for off-peak power in 2016 was $20.88/MWh compared to $81.11/MWh in 2022. The CRCNV recommends that impacts to hydropower be evaluated over a range of market prices and assumptions to capture the complete range of possible impacts resulting from the different flow options.

Considering Section 3.6 "Hydroelectric Power Generation," and the above stated concerns, CRCNV urges Reclamation to conduct a cost/benefit analysis when considering the implementation of any of the alternatives. The CRCNV is concerned that the cost for supporting any of the flow options may significantly outweigh the efficacy of their implementation, particularly given the lack of any field testing or analysis. For this reason, it is imperative that Reclamation move forward as expeditiously as possible with implementation of a permanent fish exclusion device.

We reiterate our appreciation for expediting this EA. The threat of smallmouth bass establishment below Glen Canyon Dam is of serious concern to the CRCNV. However, while we understand the desire and urgency to implement these short-term flow options, a robust analysis of their impacts is essential.

Sincerely,

Eric Witkoski
Executive Director
Colorado River Commission of Nevada

CREDA
Colorado River Energy Distributors Association

ARIZONA
Arizona Municipal Power Users Association

Arizona Power Authority

Arizona Power Pooling Association

Irrigation and Electrical Districts Association

Navajo Tribal Utility Authority
(also New Mexico, Utah)

Salt River Project

COLORADO
Colorado Springs Utilities

Holy Cross Energy

Intermountain Rural Electric Association

Platte River Power Authority

Tri-State Generation & Transmission Association, Inc.
(also Nebraska, Wyoming, New Mexico)

Yampa Valley Electric Association, Inc.

NEBRASKA
Municipal Energy Agency of Nebraska
(also Colorado)

NEVADA
Colorado River Commission of Nevada

Silver State Energy Association

NEW MEXICO
Farmington Electric Utility System

Los Alamos County

UTAH
City of Provo

City of St. George

South Utah Valley Electric Service District

Utah Associated Municipal Power Systems

Utah Municipal Power Agency

WYOMING
Wyoming Municipal Power Agency

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March 10, 2023

Sarah Bucklin
Regional NEPA Coordinator
U.S. Bureau of Reclamation, Upper Colorado Basin Region
Via Email only – sbucklin@usbr.gov

RE: Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment (EA)

The Colorado River Energy Distributors Association (CREDA) appreciates the opportunity to provide comments on the EA, issued February 24, 2023.

CREDA and CREDA Member Interests

As a member of the Glen Canyon Dam (GCD) Adaptive Management Work Group (AMWG) and Adaptive Management Program (AMP), CREDA is one of the representatives of contractors who purchase federal hydropower and resources from the GCD, a primary feature of the Colorado River Storage Project (CRSP). CREDA is also a longstanding participant in the Upper Colorado River Endangered Fish Recovery Program. CREDA members serve over 4.1 million consumers in the Colorado River basin states of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming, and represents the majority of the firm electric service (FES) customers of the CRSP. As such, CREDA and its members have a unique interest and role in issues associated with Colorado River and CRSP operations, specifically GCD operations. CREDA members are all non-profit entities, composed of municipalities, rural electric cooperatives, irrigation and electrical districts, state agencies, political subdivisions and tribal utilities and communities. Each CREDA member is an FES customer with a long-term contract with the Western Area Power Administration (WAPA) for the purchase of CRSP resources. These resources are used in part by CREDA member utilities to meet their obligation to serve the electrical needs of their customers. Electric service is not discretionary or a convenience. This service is essential to health and human safety.

CREDA appreciates the inclusion of our December 13, 2022 comment letter as part of the EA documentation. We offer the following general and specific comments for your consideration.

General Comments and Conclusions

A. The impacts of the Proposed Action (Action) to the human environment will be significant and cannot be supported by an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the following reasons:
   - The impact of bypassing hydropower production will cause a significant increase in replacement power costs for CREDA members with firm electric service (FES) contracts for power from CRSP facilities.

from CRSP facilities.

- The result of the Action will require WAPA and FES customers to purchase replacement power on the market, yet current projections indicate there may be little to no power availability on the market when the replacement power is needed.
- The source of replacement power, should any be available, will not be carbon free; thus the Action will further exacerbate the impacts of a warming climate.

B. The analysis in the EA is wholly inadequate in its identification and analysis of potential impacts from the Action.
   - There is no analysis on the availability of replacement power or on the impacts to the environment of purchasing replacement power (including impacts to the power grid and a warming climate).
   - The EA fails to meaningfully identify or analyze the impacts on the Upper Colorado River Basin Fund (Basin Fund) and the implications those impacts have on the ongoing operation of the CRSP facilities and programs it funds.
   - The EA fails to meaningfully identify or analyze the affordability of replacement power for FES customers (many of which are at risk or tribal communities).
   - The EA is solely limited to alternatives regarding variations of flows bypassing power production. There is no discussion of potential non-flow alternatives.
   - The EA fails to use the most current information regarding future hydrology and its impacts on hydropower production. Potential impacts of the Action cannot be analyzed in a vacuum. NEPA requires a disclosure of the cumulative impacts of the Action. In this case, Reclamation must analyze the impacts of the Action in light of the ongoing impacts to FES customers from the last 20 years of limited hydropower production and the resulting increased reliance on purchased power.

C. The EA fails to acknowledge how the impacts of this Action will be inconsistent with the "beneficiary pays" construct that has been the cornerstone of Reclamation law and policy for 120 years. Smallmouth bass were not introduced into the CRSP at either the request of, or to benefit, hydropower customers, yet the costs of actions to limit the range and impacts of these fish on native populations are being placed wholly at the feet of WAPA and its FES customers. This must be disclosed.

For these reasons, CREDA believes that the EA is legally inadequate and cannot be the basis for a FONSI.

Specific Comments

Chapter 1. Introduction

1) Section 1.2, page 1-1 describes uses of Lake Powell. As this EA targets operations of GCD, please revise the Background section to refer specifically to GCD's authorizing legislation and stated purposes – the 1956 Colorado River Storage Project Act (see also comment 3) below).

2) Section 1.2, page 1-3 refers to the Secretary's Designee's charge directing Reclamation and GCMRC to work with the Adaptive Management Work group "to develop flow options to disrupt or prevent spawning of smallmouth bass…..". Please include the additional charge in that directive, which was "to minimize impacts to other resources." (May 2022 Directive). None of flow options within the Action include an attempt to minimize impacts to the hydropower resource, notwithstanding viable option(s) were proposed by biologists and hydropower experts from WAPA during the summer and fall of 2022 (WAPA November 18, 2022 and December 15, 2022 letters).

3) Section 1.3, page 1-5. The Purpose and Need Statement is broad enough to include "changes in flow velocity" along with temperature-only focused hypotheses and experiments. (See also comment 9) below regarding alternatives.) As the EA describes an *experimental* action, and the Action is based solely on modeling, please consider reinstating the word "help" prior to "prevent the establishment of…". As Upper Division States TWG

representatives have stated, operational alternatives are not a panacea; fish exclusion should be an immediate priority; the EA is deficient in that more than a single focus (bypass flows) alternative should have been included. Reclamation should prioritize and expedite installation of its preferred prevention technology, and NPS should take action regarding the slough at RM 12, and continue addressing nonnative invasive species as required in its Expanded Non-Native Aquatic Species Management Plan.[1]

4) Section 1.4, page 1-5, 6. Supplementing comment 1) above, please broaden the description of the Colorado River Storage Project Act to refer to its authorized purposes and Section 5, and not just reference to the creation of the Basin Fund. In referring to the Grand Canyon Protection Act of 1992 (GCPA), please include the full mandate of the GCPA, which includes not only Section 1802(a) but Section 1802(b), which requires the protection, mitigation and improvement be done "in a manner fully consistent with and subject to the Colorado River Compact, the Upper Colorado River Basin Compact, the Water Treaty of 1944 with Mexico, the decree of the Supreme Court in Arizona v. California, and the provisions of the Colorado River Storage Project Act of 1956 and the Colorado River Basin Project Act of 1968 that govern allocation, appropriation, development, and exportation of the waters of the Colorado River Basin." Reference to the GCD AMWG should be corrected to refer to that body's responsibility to "Advise GCDAMP and the Secretary of Interior or their designee…. regarding GCDAMP priorities and policies, proposed changes to the criteria and operating plans for Glen Canyon Dam, and the implementation of resource management objectives, research studies, and environmental or cultural commitments" (ROD, page 14). The AMWG does not have any responsibility to "organize and coordinate dam operations." Finally, in describing the GCD LTEMP EIS, please revise the current text to reflect language from p.1 of the ROD: "The LTEMP will provide a framework for adaptively managing Glen Canyon Dam operations and other management and experimental actions over the next 20 years, consistent with the Grand Canyon Protection Act (GCPA) **and other provisions of applicable Federal law**." (emphasis added).

5) Section 1.7, p. 1-7: CREDA recommends including in Operational Guidelines, the text from the LTEMP ROD, page B-7, section 1.2: "Reclamation also will make specific adjustments to daily and monthly release volumes, in consultation with other entities as appropriate, for a number of reasons, including operational, resource-related, and hydropower-related issues. Examples of these adjustments may include, but are not limited to, the following: … For hydropower-related issues, adjustments may occur to address issues such as electrical grid reliability, actual or forecasted prices for purchased power, transmission outages, and experimental releases from other Colorado River Storage Project dams."

6) Section 1.8, page 1-8: The EA refers to Reclamation's close coordination with USFWS through the EA process, which is important. However, in reviewing the USFWS letter (Appendix C), we question whether the statement in the EA that refers to "a potential future decline in humpback chub that **would** occur if smallmouth bass are allowed to establish" (emphasis added) accurately reflects the Service's description of risk and threats (i.e., uncertainty).

Chapter 2. Proposed Action and Alternatives

7) The EA should be clear in its Purpose and Need Statement that the duration of the EA/Action is "up to three years", which is not stated until Chapter 2, section 2.2.1. CREDA's understanding is that since the Table 3-2 impacts are only for 5 months in 2023, the EA only analyzed impacts over the 5 summer months of 2023, and not over the period of the EA, three years. For all resources analyzed, that level of analysis is insufficient.

[1] *See:* ParkPlanning - Expanded Non-Native Aquatic Species Management Plan/EA (nps.gov)

8) Section 2.2, p. 2-1: The description of the Proposed Action with Flow Options (Action) was challenging to understand. Assuming that the last three bullets on page 2-2 are the key drivers, we have the following questions:
    a. Implementation of the experiment appears to be determined by temperatures at the Little Colorado River (LCR). Is it a model that makes that critical determination? Is that the referenced "adapted" model, and has that model been peer reviewed?
    b. Is it feasible, since such a significant experiment is being considered, to use actual temperature data as the trigger? As opposed to projections based on mean daily air temperature from Page, Arizona (77 miles from the LCR), and mean solar radiation from Williams, Arizona (90 miles from the LCR).
    c. Flow Option A, p. 2-4: what percentage of time does "almost always" refer to in achieving the target temperature with all 4 bypass tubes in use?
    d. If "no smallmouth bass have been detected below RM 0, then why not target RM 45. And how is "effective" quantified?
    e. Flow Option B, p. 2-6: this section refers to two flow spikes; yet, page 2-4 refers to "up to three 36-hour flow spikes". Please clarify.
    f. Flow Option C, p. 2-6: is there more recent data (besides 1945, 1957 and 1963) available? And to what degree of certainty can the statement be made that "achieving a cold shock down to RM 0 or RM 15 **would** still be effective at disrupting spawning (emphasis added). How is "effective" defined?
    g. Flow Option D, p. 2-8: What is the science basis (or data supporting) the statement "even if it is not possible to achieve a temperature of 13 C, the flow would likely disrupt spawning, even though data from the Yampa and Green Rivers suggests that smallmouth bass can continue to spawn when temperatures drop to 13.9 C".
    h. An adaptively managed experiment of this significance and uncertainty must include a *description of the proposed experiment*, *the time or frequency of implementation of the experiment*, and *the triggers or other conditions that must exist prior to implementation of the experimen*t. The experiment must also include a description of the *hypotheses that will be tested by the experiment and benchmarks or other identifiable criteria* that will allow the Secretary and interested parties to assess the *success or lack thereof*, *when an experiment or action must be terminated* because of *unacceptable impacts (as specifically defined*) to the listed humpback chub or other legally protected resources. Finally, any *monitoring* included in an implementation plan or experimental design must meet legal standards necessary to implement adaptive management, including monitoring of impacts to LTEMP resources[2].

9) Section 2.3, p. 2-9: Please describe the science basis for concluding without detailed analysis that a penstock only release "does not meet the project's purpose and need." A penstock only release *could* meet the purpose and need if the purpose had remained as it was provided to the AMWG Stakeholders, with the word "help" as a modifier to "prevent". Further, it appears this option was rejected for including one of the same objectives as the Action options: abandoning nests v. disrupting/disturbing spawning. Disrupting/disturbing spawning may have the potential of "high mortality of offspring", which is a secondary objective of disrupting/disturbing spawning. Page 3-7, describing the Action impacts on nonnative fish, is very clear: "All flow options are designed to inhibit smallmouth bass spawning, displace male smallmouth bass from guarding nests, or both". The EA should clearly explain why Option E was rejected for analysis based on the same criteria that is included in all flow options of the Proposed Action.

Chapter 3. Affected Environment and Environmental Consequences

10) Section 3.2.1, page 3-1: Has the population of humpback chub observed in the western Grand Canyon been factored into a risk assessment of smallmouth bass impacts to the chub? From the numbers of fish reported out

at the recent TWG and AMWG meetings, it seems logical that although the dynamics are not fully understood, that sheer numbers should moderate the risk.

11) Page 3-3: Since over 250 juvenile smallmouth bass were found throughout the Glen Canyon reach in 2022, and this number "suggests successful spawning", does that translate to "establishment", and if so, the Purpose and Need as drafted should be reconsidered. In addition, some less impacting actions/operations could be considered, assuming there is already establishment.

12) Section 3.2.2, page 3-6: This section also states that under Options C and D, the cold temperatures **would reach downstream** to the confluence of the LCR. How does that risk to the humpback chub compare to the risk of smallmouth bass traveling down to the LCR? Finally, how can effects to razorback suckers be characterized as "minor" if flow changes "inundate or desiccate backwaters"?

13) Page 3-8: Fish dispersal is a concern inherent to all flow options and "an important consideration for establishment". Flow spikes are identified with dispersal. We know from previous high-flow experiments (HFEs) that dispersal is a key concern. In fact, a decision was made in the fall of 2022 to not undertake an HFE due in large part to concern about nonnative fish dispersal. Is the statement that "green sunfish already occur throughout the Grand Canyon **in low numbers** accurate? Just because there may be "an overall lack of quantitative research on green sunfish movement or dispersal in response to flows", we know that green sunfish is a predator/competitor of humpback chub, and actions that will disperse more of this species should be reconsidered.

14) Page 3-9: The impacts of Flow Options C and D appear to be contrary to the objective of the last 3 years of the bug flow experiment. The flow spikes…."represent a disturbance that would scour benthic substrates and reduce the food-base abundance and biomass." How is this trade-off assessed and evaluated?

15) Section 3.3, page 3-11: CREDA submitted extensive comments during the LTEMP process regarding the cited 1987 Bishop study. CREDA's November 16, 2016 letter states in part: "The Fluctuation Index utilizes information derived from a 1987 study (Bishop et al),[3] which addressed recreational user preference for fluctuating flow levels. In that study, however, 10,000 cfs (*not* 8,000 cfs) was defined as "constant flows". We recommend reference to the 1987 study be removed, as it was mischaracterized in LTEMP, in favor of the work done in 2016 by Bari.

16) Section 3.4.2, page 3-20: We question whether volume of water released during flow spikes "would be within the range analyzed in the LTEMP Final EIS", if the analysis included "up to three years" of flow options B and D and the frequency of flow spikes contained therein.

17) Section 3.6, page 3-27: Please include reference to the September 2022 emergency power supply from GCD to California. Please remove the incorrect reference to the Grand Canyon Protection Act in the last sentence.

18) Page 3-30: Please remove the following sentence which is implied to be a citation from DOI 2016a, p. 3-204): "This type of operation creates large fluctuations in water releases, which has negative impact on environmental resources". The prior three sentences of that paragraph are accurate cites from page 3-204 of DOI 2016a. This last sentence is not.

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[2] *See:* TechGuide.pdf (doi.gov), p. 9; Interior Environmental Statement Memorandum No. ESM 13-11, January 7, 2013, p. 5

[3] *See* FEIS Appendix C, P. C-27, section 4.5

19) Page 3-31: The Power Marketing section of the EA and Section 3.6.2 Environmental Consequences Analysis should disclose the impacts based on WAPA's implementation of WAPA-199 on December 1, 2021. The EA must also address the Action's impact on replacement power availability during the summer months of the experiment. See NERC Summer Reliability Assessment 2022 at pp.5-6: "Drought conditions create heightened reliability risk for the summer. Drought exists or threatens wide areas of North America, resulting in unique challenges to area electricity supplies and potential impacts on demand: Energy output from hydro generators throughout most of the Western United States is being affected by widespread drought and below-normal snowpack. Dry hydrological conditions threaten the availability of hydroelectricity for transfers throughout the Western Interconnection. Some assessment areas, including WECC's California-Mexico (CA/MX) and Southwest Reserve Sharing Group (SRSG), depend on substantial electricity imports to meet demand on hot summer evenings and other times when variable energy resource (e.g., wind, solar) output is diminishing. In the event of wide-area extreme heat event, all U.S. assessment areas in the Western Interconnection are at risk of energy emergencies due to the limited supply of electricity available for transfer." This is not just an issue for WAPA, but for the FES customers and all other utilities in the West. A significant loss of generation from GCD will have significant financial impacts on WAPA and economic and financial impacts on WAPA's FES customers and *their* customers. The EA analysis does not quantify the impact of customers having to replace GCD generation with other resources. The analysis should include the impact on those customers that count their CRSP generation toward meeting their resource adequacy requirements, as well as include their CRSP generation in their greenhouse gas and Renewable Energy Certificates (RECs) reporting. Reduced and/or bypassed generation at GCD/CRSP has implications and impacts to both direct contracts of that/those resources as well as exchange agreements that rely on the output of that/those resources. Consideration of resource adequacy requirements, replacement resource availability, and contractual impacts impacting utilities' obligation to serve customers are essential elements that must be addressed in the EA's effects analysis. On September 28, 2022, CREDA submitted comments to Reclamation regarding potential fall experiments under LTEMP. These comments apply to every experiment or changed operation that may be considered for CRSP generating units.

20) Page 3-33: Please consider revising the last sentence to the following: The replacement power purchased by WAPA and its customers would likely be from carbon-emitting resources and would increase GHG emissions in the region. The EA should assess the impact of the Action on GHG emissions. Previous analysis showed that without GCD, an additional 2.4 million metric tons per 1,000 GWh would be emitted by the WECC."[4] Given the Departments of the Interior and Energy's commitments to maintain and expand renewable generation capacity, the importance of hydropower capacity to the overall power supply for the western United States, and the existing benefits of hydropower that avoids alternate fossil fuel greenhouse gas production[5], strong consideration should be given to the air emission impacts resulting from the Action. Please also include a sentence stating that WAPA and its customers may not be able to find replacement power, whether or not the Basin Fund has sufficient funds available, given resource scarcity during summer months. The paragraph referring to additional analysis for Flow Option A is based on outdated data, as confirmed at the AMWG meeting on February 16, 2023. A more likely scenario, based on recent market prices, is that the values included in the EA on hydropower/Basin Fund impacts are understated. Finally, the discussion of transmission congestion should be modified to remove statements about "reverse direction of historical operations" and "reversal of power;" these statements are confusing and inaccurate. New text should be provided by WAPA to reflect more current modeling by WAPA/NREL/Argonne and should state that societal effects **will** be felt across the Western Power Grid based on that analysis (emphasis added).

[4] *See* Scientific Certification Systems, Life Cycle Impact Assessment (LCIA) of Glen Canyon Hydropower Generation System Compared to the WECC Baseline; Conducted in accordance with ISO 14044 LCIA Framework and the Draft SCS-002 Life Cycle Metrics Standard, Type III Life-Cycle Impact Profile Declarations for Materials, Products, Services and Systems, March 2009, p ii

[5] *See* New Energy Frontier. Balancing Energy Development on Federal Lands. A Joint Report to Congress on Siting Energy Development Projects on Federal Lands. U.S. Department of Interior and U.S. Department of Agricultural. May 2011, pp. 28-31

21) Section 3.7, page 3-34: CREDA disagrees that *only* the recreation resource should be analyzed for environmental justice impacts. Impacts to CRSP hydropower customers, particularly the smaller municipal, rural and tribal customers, should be analyzed in the context of environmental justice. The Proposed Action may disproportionately affect these customers as they will be paying more for an essential service that is necessary for human health; the GHG emissions impacts resulting from replacement power sources may also have a disproportionate impact on these communities. This analysis is required by the EA. The LTEMP Appendix K included a fair amount of impact analysis to tribal customers, in particular. As post-WAPA-199 impacts are direct and immediate to these (and all other) FES customers, the EA should analyze those impacts.

22) Page 3-38: The affected environment should be revised to include the environmental justice populations represented by CRSP FES customers. See section D. of CREDA's December 13, 2022 letter, which is included in the Appendix to this EA.

23) Page 3-39: In a post-WAPA-199 world, direct and immediate impacts are likely borne by *all* WAPA FES customers, not just the "largest of WAPA's customers". The impact assessment should be based not only on the size of an FES customer's CRSP allocation, but also the proportion of its CRSP allocation to its total resource mix. In addition, the ability of an FES customer to access market resources for replacement power is also a factor.

As representative of the Secretary of the Interior, Reclamation has the responsibility to fulfill the Secretary's obligation to meet multiple and sometimes competing statutory requirements applicable to the operation of GCD and the exercise of other authorities as required by the provisions of the GCPA. The United States has described the relationship between the objectives of the GCPA and the CRSP as being "in addition to rather than in substitution of the Secretary's obligations concerning the operations of Glen Canyon Dam for hydropower and other project purposes."[6] "The U.S. District Court for the District of Arizona further clarified that the broadly worded provisions of the Colorado River Storage Project Act (CRSPA) and GCPA impose on the Secretary an obligation to balance many different interests in operating Glen Canyon Dam. The Secretary must continue to recognize that power production is still a primary purpose of the Dam that must be balanced against other purposes, statutory requirements, and water delivery obligations as (s)he considers actions to implement the GCPA."[7] In fact, the failure to incorporate within the EA an experiment that provides a less impacting and more balanced approach to smallmouth bass experimentation is arbitrary and capricious given statutory requirements.[8] As Judge David Campbell stated in the Grand Canyon Trust v. United States case: "The Bureau of Reclamation, as the operator of the Dam, has a complex set of interests it must balance in operating the Dam. Those interests include not only the endangered species below the Dam, but also tribes in the region, the seven Colorado River basin states, large municipalities that depend on water and power from Glen Canyon Dam, agricultural, Grand Canyon National Park and national energy needs at a time when clean energy production is becoming increasingly important."

Leslie James
Leslie James
Executive Director

Cc: CREDA Board
Commissioner Camille Touton
WAPA Administrator Tracey LeBeau
Wayne Pullan – Reclamation UC Region
Rodney Bailey – WAPA CRSP Management Center

[6] *See Grand Canyon Trust v. US Bureau of Reclamation,* 623 F.Supp.2d 1015, 1036, Federal Defendants' Reply Memorandum In Support of Cross Motion for Summary Judgment on Claims 6-8 at p. 26, lines 25-27, (February 20, 2009)
[7] *See* Colorado River Basin State Representatives to LTEMP EIS Scoping, January 31, 2012
[8] CREDA raises here the issue of omission of a statutory requirement from the alternatives identified in a NEPA analysis and reserves the right to litigate the compliance with applicable statutory requirements.

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March 9, 2023

via e-mail to gcd_smb_ea@usbr.gov and sbucklin@usbr.gov

Wayne Pullan
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Upper Colorado Basin Regional Office
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Salt Lake City, Utah 84138

Re: Joint comments opposing proposed actions in draft environmental assessment regarding Glen Canyon Dam and smallmouth bass

Dear Mr. Pullan and Ms. Bucklin,

The Bureau of Reclamation (Reclamation) released a draft Environmental Assessment (EA) proposing flow modifications at the Glen Canyon Dam (GCD) for the next three years.[1] The proposed experimental actions would, theoretically, attempt to disrupt the spawning of nonnative fish. However, each of the proposed actions in the EA would cause new and significant negative impacts on existing hydropower production capacity at GCD. Additionally, the National Environmental Policy Act (NEPA) would likely require a more rigorous Environmental Impact Statement (EIS) before proceeding with any actions. For these reasons, among others listed herein, the undersigned organizations oppose the proposed actions identified in the EA.

In 1956, Congress enacted legislation creating the Colorado River Storage Project (CRSP). The focus of CRSP has been to develop water resources in the region, including the GCD.[2]

[1] https://www.usbr.gov/newsroom/news-release/4434
[2] CRSP Act also created the Upper Colorado River Basin Fund under 43 U.S.C. § 620d which uses revenue from power generation to pay for CRSP operations and maintenance, repayment of received CRSP funding and interest to U.S. Treasury, as well as environmental programs in Glen and Grand Canyons. https://www.usbr.gov/uc/rm/crsp/index.html

One of the listed purposes of the GCD is to generate hydroelectric power.[3] For nearly fifty years the GCD dam has been a major power contributor, as both a base load and peaking power generation facility, providing reliable and affordable power to more than 5 million customers across multiple states.[4]

All the proposed modified flow options in the EA would result in significant lost power generation at GCD ranging from 380 GWh to over 560 GWh over 5-month periods for each year. Additionally, the timing of the lost power generation would occur during peak summer months when electricity demands are at their highest. The impacts of the lost power generation would affect market prices, transmission congestion, and even potential cost-recovery charges for Upper Colorado River Basin Fund obligations. Power customers would be forced to find more expensive replacement power which may not be available at any price. The financial burdens created by the proposal will significantly impact the communities relying on power output from the GCD which will likely take years to recover from. Furthermore, those who would bear the increased costs of the proposed experiment are those from a region including underserved and disadvantaged populations—those who are least likely to afford these negative impacts.

The West is experiencing extreme drought conditions and water levels have been dropping at Lake Powell. This has caused a decrease in power generation at GCD. As a result, residents and customers are already experiencing increases in power rates. Now is not the time to be conducting costly experiments at GCD. The uncertainty of disadvantaging nonnative species is outweighed by the known negative impacts which will be felt by millions of individuals if the proposed actions in the EA are executed. One of the main reasons the GCD exists is to provide power to the region. The proposed experiment would directly conflict with this mission of the GCD.

Most notably, the proposed actions in the EA would likely constitute major federal action, thus requiring a more exhaustive EIS, as required by NEPA.[5] Additionally, Reclamation's own requirements for implementing NEPA would also likely require an EIS because of the foreseeable impacts on existing GCD operations as well as multiple entities relying on regularly programmed operations at GCD.[6] The EA fails to analyze alternative approaches to managing the invasive fish populations below the GCD. Each of the proposed options in the EA involves the use of the bypass tubes and, therefore, only considers a single solution. An EIS would include a more comprehensive analysis of a reasonable range of alternative choices to manage the nonnative fish populations while considering economic, technical, and other factors.

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[3] 43 U.S.C. § 602.
[4] GCD also produces 75-85% of the total power generation from all CRSP power generation sites. https://www.wapa.gov/newsroom/NewsReleases/2021/Pages/24-month-study-statement.aspx
[5] 43 C.F.R. § 46.400.
[6] 516 D.M. 14.4 (Major Actions Normally Requiring an EIS).

For these reasons, we encourage Reclamation to forego any plans to implement any of the proposed actions in the EA.

Respectfully,

Nathaniel Johnson
Executive Director
Utah Rural Electric Cooperative Association

Dave Lock
Chief Executive Officer
Grand Canyon State Electric Cooperative Association

Charise M. Swanson
Charise Swanson
Chief Executive Officer
New Mexico Rural Electric Cooperative Association

Shawn Taylor
Executive Director
Wyoming Rural Electric Association

Kent Singer
Executive Director
Colorado Rural Electric Association

Rick Nelson
General Manager
Nebraska Rural Electric Association

Carolyn Turner
Executive Director
Nevada Rural Electric Association

Additional organizations opposing proposed actions in EA include the following:

Andy Hewitt, CEO/General Manager, Bridger Valley Electric Association Inc.
David Crabtree, President/CEO, Deseret Power
LaDel Laub, President/CEO, Dixie Power
Dan McClendon, CEO/General Manager, Garkane Energy Cooperative
Yankton Johnson, CEO/General Manager, Moon Lake Electric Association Inc.
Kevin Robison, CEO, Mt. Wheeler Power
Chad Black, General Manager, Raft River Rural Electric Cooperative
Clay Fitch, CEO, Wells Rural Electric Company

GCDAMP Recreational Fishing
AMWG and TWG Representatives

March 10, 2023

Sarah Bucklin
Regional NEPA Coordinator
United States Bureau of Reclamation
Upper Colorado Basin-Interior Region 7

Dear Ms. Bucklin,

As the GCDAMP Recreational Fishing Representatives, we appreciate the opportunity to provide comments on the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment (EA). We also are grateful that the Bureau of Reclamation has expedited the timeline for this EA as the situation demands immediate action.

Recreational Fishing AMWG and TWG representatives, along with other members of the GCDAMP, have long advocated for a number of tools and potential modifications to the dam to address conditions that pose risks to the river inhabitants. These include: mechanisms to provide temperature control of the water delivered to the river, the ability to utilize the bypass tubes to generate power while delivering cooler water to the river, tools to predict and mitigate for low dissolved oxygen events, and effective strategies to minimize fish passage through the dam.

Our members have been very involved in the smallmouth bass ad hoc meetings, and have provided feedback throughout the process on the options presented to address the threat to the native protected fish as well as to the blue ribbon rainbow trout fishery below Glen Canyon Dam. We appreciate the five options described in this EA, and understand that they represent the best thinking from experts on strategies to utilize flow and water temperature to address the risk posed to the system by these warm water predators.

We know that these options will be considered in light of the positive and negative impacts these flow and temperature changes might have on all of the resources, not just native fish and the rainbow trout fishery. We appreciate the hefty cost that will come from these actions, and believe that those costs could have been significantly less burdensome if measures were taken years ago when the dam was built, or during times of much better water conditions.

The Upper Basin's history with warm water predators and the devastating impact that these fish have had on the native fish population upstream of Lake Powell is our guide to the need for immediate and decisive actions below Glen Canyon Dam. The window of opportunity is incredibly short to have any possibility of keeping these warm water predators at a level that can be effectively managed. While the flow strategies proposed in the draft EA are a critically important component in that effort, there must be a commitment by the Bureau and other agencies to implement multiple strategies simultaneously to have a chance against this threat. These strategies include, but are not limited to: effective devices or strategies to minimize fish passage through the dam, an ongoing monitoring plan for the entire river system including the confluences of warm water tributaries within the river corridor, trained staff, available equipment, and necessary permissions and funding to attend to pockets of warm water predators that monitoring uncovers.

We believe that of the options proposed, that Options B and A offer the greatest likelihood of success to protect native fish. The additional advantage of cold water releases to maintain water temperatures below 16 degrees Celsius during the potential spawning window for smallmouth bass means that these releases will also provide a benefit to the rainbow trout fishery. Summer and fall water temperatures have of late approached 20 degrees Celsius or more, and add quite a bit of stress to the trout in the Lees Ferry Reach.

While we think that Option B will likely be the most effective strategy, our recommendation would be to start with Option A, and move to Option B if warranted. We advocate for an effective monitoring process to accompany any flow option considered. In the case of Option A, if that option is employed, it would be very important to determine if the water level spikes associated with Option B are needed before they are implemented. Our concern is that these flow spikes could have a detrimental impact on young of year rainbow trout in the shallows. If smallmouth bass and other warm water predators are found in the backwaters in concerning numbers during Option A flows, we support the use of the flow spikes described in Option B.

Another aspect of this process that must be utilized is effective adaptive management. None of these options have been tried in this setting, and we advocate for the flexibility within the process to shift to the best likely strategy, or set of strategies, given expeditious analysis based on results from the last set of actions.

The larger problem is the unsustainable demand on the water supplied by the Colorado River system. The flow strategies undertaken in this EA will not address that. There must be a strong effort by the Bureau of Reclamation and the Basin States to impose stricter conservation measures to assure future water for homes, agriculture, and industry, and the ability to generate the needed hydropower from Glen Canyon Dam that the region has relied upon. The cold water releases provided by a much deeper Lake Powell are the best deterrent to keep warm water predators from becoming established below Glen Canyon Dam.

Sincerely yours,

Jim Strogen, Recreational Fishing AMWG Representative

Rod Buchanan, Recreational Fishing AMWG Alternate Representative

Bill Persons, Recreational Fishing TWG Representative

Bill Davis, Recreational Fishing TWG Alternate Representative

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To: Sarah Bucklin, sbucklin@usbr.gov
Bureau of Reclamation, gcd_smb_ea@usbr.gov

Re: Grand Canyon River Guides' Comments re: Smallmouth Bass Flow Options Draft EA

Date: March 10, 2023

Dear Ms. Bucklin,

Grand Canyon River Guides would like to submit the following comments regarding the Glen Canyon Dam Smallmouth Bass Flow Options Draft Environmental Assessment prepared by the Bureau of Reclamation (BOR) in February 2023. We understand that the BOR needs to respond to the dire threat of Smallmouth Bass (SMB) establishment below Glen Canyon Dam (GCD) which jeopardizes the federally protected humpback chub. The BOR's purpose is proposing multiple release (flow) options from the Glen Canyon Dam (GCD) that either in part or in combination cool the river below 16 degrees Celsius and introduce unfavorable flow velocities for SMB spawning.

The Proposed Action lists four different flow options which are:

- Flow Option A: Cool Mix
- Flow Option B: Cool Mix with Flow Spikes
- Flow Option C: Cold Shock
- Flow Option D: Cold Shock with Flow Spikes

The No action alternative was dismissed because it would not meet the purpose and need of this EA, and an alternative to release flows from the penstocks alone was considered, but not analyzed in detail for the same reason because it would not reduce water temperatures below 16 degrees Celsius.

Proposed Action with Flow Options

The range of alternatives in the EA is very narrow. In essence the BOR is presenting an Action/No Action EA while simultaneously dismissing the No Action alternative. This creates an all or none choice. With that in mind, GCRG believes the EA must consider modifying Flow Option B to include a larger magnitude (single) spike flow optimally timed in June to disrupt SMB spawning. A single flow above 40,000 CFS may be more beneficial than multiple flows at 30,000 CFS. Please refer to recent HFE optimization modeling conducted by Grand Canyon Monitoring and Research Center (specifically Paul Grams' September 1, 2022 presentation, Scenario C). Furthermore, because BOR is required to 'move water' through the dam this summer (i.e. DROA water that was held back in Lake Powell) adequate water should be available to increase the magnitude and duration of a spike flow. Based on Grand Canyon Monitoring & Research Center's recommendations, it may be possible to disrupt SMB spawning at a key juncture in order to inhibit their establishment, while also maximizing sediment deposition, and minimizing erosion throughout the Colorado River ecosystem. It is imperative that we capitalize on the current conditions that may not exist in the future – extra water and sediment enriched conditions.

The Proposed Action boxes BOR into a limited set of options to manage a dynamic system that has demonstrated an unwillingness to perform according to human expectations. With that in mind, the EA should build flexibility, adaptation, monitoring, and off-ramps into its decision-making process and implementation plan to ensure the desired outcome of inhibiting SMB establishment below the GCD. The very future of the humpback chub, camping beaches, and sandbars of Grand Canyon depend upon it.

Importance of Adaptive Management

The fact that four different flow options are being considered with no stated preferred option among the four demonstrates that preventing SMB establishment below GCD is full of conjecture. For example, the Proposed Action would allow BOR to *'utilize a flow option based on conditions at the time of implementation. Reclamation could switch to another flow option, as described below, to better match changing conditions.*' This statement acknowledges BOR's limitations in understanding viable solutions and underscores the necessity for adaptability, flexibility, and, most importantly, *data* on which to base decisions that meet the mandates of the Grand Canyon Protection Act of 1992. It also exemplifies why more variation in the range of flow options should be considered beyond the Proposed Action.

Many questions and concerns have been raised by GCRG and other stakeholders. What if the bypass infrastructure does not perform as expected? What if it is determined that spike flows have minimal effect? Or worse what if multiple spike flows exacerbate the deteriorating condition of sediment resources? Given the three-year planning window and the high stakes at hand, the EA should clearly describe the criteria and process by which the BOR would consider modifying or choosing flow options to meet the purpose and need of this EA. It is paramount that the BOR disclose how it intends to regularly monitor evolving conditions for multiple resources, track progress towards desired outcomes, mitigate adverse effects, and articulate the benchmarks it will use to formulate its decisions.

We must stress that monitoring should occur *subsequent to each component of flow action*. This data is critical to the success of this EA and its purpose and need. In turn, those critical decision points must be built into the implementation plan.

In addition, the decision-making process should not reside with an exclusive set of stakeholders, but rather be more inclusive of the varied interests represented by the full membership of the Glen Canyon Dam Adaptive Management Program (AMP).

Impacts to Sediment

Sediment is the foundational element for the entire ecosystem in Grand Canyon, and the lynchpin for the health of multiple resources – ecological, recreational, and cultural. With current climate conditions, aridification, and a significant, as yet unresolved supply/demand imbalance for the Colorado River, *we can no longer consider sediment to be a renewable resource*. Along with other GCD AMP stakeholders, GCRG submitted a letter prior to release of the EA that described our suggestions and concerns. After release of the EA we continue to be deeply concerned that Flow Options B and D (with potential for multiple spike flows) could be detrimental to sediment, resulting in substantial erosion of the sand that has accumulated in the channel from the Paria River over the last two seasons, and precluding the opportunity to conduct an HFE in 2023. The EA acknowledges this potential outcome.

This EA further describes an assumption of a maximum discharge of up to 32,000 cubic feet per second (cfs) (18,000 cfs through the penstocks and a maximum 14,000 cfs through the bypass tubes) yet releases of 34,000 to 37,000 cfs *or greater* are required to cause significant deposition at most long-term sandbar monitoring sites (Hazel et al. 2022). As a result, the spike flows could further exacerbate the deteriorating condition of sediment resources in the Grand Canyon ecosystem. However, the EA concludes that '*Flow Options B and D…would have the greatest potential for sandbar growth…*' This contradiction draws the EA analysis into question while failing to accurately disclose the potential impacts of these alternatives. What measures will BOR put in place to ensure that the spike flows not only meet the desired outcomes of preventing SMB establishment below the GCD but also do not denude the Grand Canyon ecosystem of its limited sediment resource?

The bottom line is – under this current operating range, if sediment enriched conditions exist, flow spikes under this EA should be as long in duration and as large in magnitude as possible. In sediment depleted conditions, any spikes should be as short and low as they can be. Again, we reiterate our valid concern for the already devastated beaches of Grand Canyon and our concern that multiple spikes may deteriorate conditions further. Decisions must be made on science, and in keeping with not only the EA purpose and need but sediment goals of the Long Term Experimental and Management Plan (LTEMP) EIS and the mandates of the Grand Canyon Protection Act of 1992.

We find ourselves at a critical juncture and inflection point regarding both the sediment resource and the future of native fish in Grand Canyon. This underscores the importance of capitalizing on the extra DROA water and the sediment enriched conditions this spring to implement the most robust flow option possible, in order to avoid adverse impacts to beaches while inhibiting smallmouth bass spawning to the best of our ability. These are our tools. Let's use them as wisely and as effectively as possible to maximize benefits across multiple resources while minimizing adverse impacts.

Recreational Boating Analysis

The EA has a sparse and inadequate analysis of impacts to recreational boating. It limits the analysis area to the reach between the dam and the Little Colorado River (LCR). In doing so it ignores over 160+ river miles below the LCR that includes critical camping beaches as well as the most severe impediments to

navigability (rapids), yet concludes that *'all four flow options would affect a relatively small portion of the Colorado River used by boaters in the Grand Canyon'* and further concludes (albeit limited to the analysis area) that '*Flow Options B and D would produce flows that would likely improve boater navigability in the Grand Canyon.'* The analysis area should be expanded to include the entire stretch of river impacted by the flow options proposed, while expanding the analysis of impacts, both positive or negative, to the camping beaches depended upon by over 24,000 river users annually.

Furthermore, important corrections to this section include:

1) The EIS incorrectly states that Colorado River Discovery has the concession for day trips between Glen Canyon Dam and Lees Ferry. CRD lost that contract to Wilderness River Adventures (Aramark) back in late 2017.
2) The EA states that visitor use from the Colorado River Management Plan (CRMP) is regulated by a lottery system. That is incorrect. Non-commercial and commercial use levels are specified in the CRMP, but only the non-commercial trips are awarded through a weighted lottery.

<u>Socioeconomic Analysis</u>

The socioeconomic impact fails to acknowledge the potential impacts to disadvantaged communities that rely on hydropower. As noted by the GCD AMP stakeholder Leslie James representing the Colorado River Energy Distributors Association, more than 50 tribes are customers of the Colorado River Storage Project who benefit from federal hydropower in ways as determined by the tribes. Ms. James further points out that reductions in hydropower could impact tribal customers 'n*ot only from a financial standpoint, but from a quality-of-life standpoint as well* .' The EA does not make any mention of this potential impact.

<u>Hydropower Impact Analysis</u>

The EA describes severe financial impacts from each flow option yet fails to disclose its core assumptions. The EA should disclose its calculations to estimate the costs for replacement power. Furthermore, those values should be scrutinized by an independent and qualified subject matter expert that can either substantiate or clarify information provided by the Western Area Power Authority (WAPA) and its contractors especially given WAPA has an inherent conflict of interest in preserving hydropower for its customers and fulfilling its contracts. Also considered in this analysis, how WAPA's new contracts address the cost of experiments. This is especially important because the values presented in the EA are high enough that it raises a concern of being deemed a 'significant impact', which would derail the possibility of reaching a Finding of No Significant Impact (FONSI). We acknowledge that the GCD plays a unique role in the Western electrical grid, which only substantiates the criticality for WAPA and its customers to act proactively, prudently, and urgently integrate replacement power sources into their energy portfolios which would minimize any adverse impacts from reduced hydropower. Difficult decisions need to be made to prevent SMB establishment below the GCD and those decisions should not be hindered because of a lack of contingency plans for low water conditions.

On behalf of our 1700 members and the broader river running public who care deeply about Grand Canyon and all that makes it unique, the importance of this Smallmouth Bass Environmental Assessment

cannot be understated. It is in fact, mitigation for the Supplemental EIS to come. We must act now. Thank you for your consideration of our comments.

Respectfully,

Lynn Hamilton, Executive Director, Grand Canyon River Guides, Inc.

David Brown, Adaptive Management Work Group representative

Ben Reeder, Technical Work Group Representative

GRAND CANYON RIVER OUTFITTERS ASSOCIATION

Authorized Concessioners

Date: **March 10, 2023**

To: **Sarah Bucklin, Bureau of Reclamation, sbucklin@usbr.gov**

From: **John Dillon, Executive Director, Grand Canyon River Outfitters Association**

Re: **Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment**

At this critical juncture when key resources of the Colorado River in Grand Canyon are in serious jeopardy, Grand Canyon River Outfitters Association (GCROA) respectfully submits our comments to the Bureau of Reclamation regarding the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment (also submitted via email to gcd_smb_ea@usbr.gov).

GCROA is the nonprofit trade association comprised of the sixteen professional river outfitting companies exclusively operating multi-day whitewater rafting trips on the Colorado River through Grand Canyon National Park. Together, we are the only commercially contracted, licensed, and authorized rafting concessioners of the National Park Service. As longstanding (for some, extending back to the beginnings of river-running decades before the dam was built) river stakeholders charged with providing a life-altering, world-class river running experience in Grand Canyon to nearly 22,000 commercial clients annually, we have a vested interest and keen responsibility to act as caretakers and defenders of all the resources and values that make the Colorado River experience so profoundly unique. We also represent the river-running industry, which generates tens of millions of dollars per year – a significant economic driver for our region and the state of Arizona, supporting goods, services, and jobs. By way of franchise fees, we also pay the Grand Canyon National Park millions of dollars which directly supports the National Park Service operations each year.

Clearly stated, the native fish of the Colorado River are under dire threat from the smallmouth bass (SMB) invasion due to lowering lake levels in Lake Powell, which allow this highly predatory warm water fish to pass through Glen Canyon Dam in ever greater numbers. If we fail to act immediately, the core population of the federally listed Humpback Chub could be lost, putting the species as a whole in peril of extinction. Scientific evidence has shown that if establishment of the smallmouth bass happens, at a certain point, it could simply be too late to save this emblematic fish that has evolved over the last 3.5 million years. We are also keenly aware of the significantly higher cost burden to try to manage rather than prevent small mouth bass establishment and an associated population explosion.

At the same time, GCROA would like to express our grave concerns about the continued viability of the recreational resource we depend upon -- the camping beaches and sandbars along the 277 miles of the Colorado River below Glen Canyon Dam. Frankly put, four years after the last High Flow Experiment (HFE), the sediment conditions continue to deteriorate significantly, exacerbated by violent monsoon storms as extreme weather events occur with greater frequency, and we are observing beaches experiencing severe erosion that can make camping extremely difficult, or in some locations impossible. Abundant scientific evidence supports the use of HFE's as the primary tool for sustaining shoreline habitats for native CRE fish and wildlife, and for rejuvenating recreational sandbars. Natural historical floods occurred during June, and CRE species and processes are adapted to a springtime flood cycle. In this time of prolonged drought, this is also potentially a more publicly acceptable timing.

GRAND CANYON RIVER OUTFITTERS ASSOCIATION

Authorized Concessioners

We understand the desire for a range of flow options for flexibility and adaptability in preventing the establishment of smallmouth bass in Grand Canyon over the three-year period covered by this EA. Two of the proposed flow options include flow spikes. Naturally timed, cooler water high flow releases can disrupt the spawning of smallmouth bass - a strategy that has proven effective on the Green River below Flaming Gorge Dam.

Accordingly, GCROA supports the unique opportunity to conduct a LARGER MAGNITUDE FLOW SPIKE under sediment-enriched conditions this June by taking advantage of water that was held back in Lake Powell but must be released this summer. In particular, we suggest modifying Flow Option B: Cool Mix with Flow Spikes to utilize this "extra DROA water," which could also potentially help extend cooler water and spawning disturbance downriver below the Glen Canyon reach, as the best, most effective tool for benefitting multiple resources and inhibiting smallmouth bass establishment. We absolutely must capitalize on these conditions which are not likely to exist in the near future, given the climate responses we are experiencing.

By the same token, we caution that especially under low water and sediment depleted conditions, multiple flow spikes as outlined in Flow Options B and D may further erode the sediment resource that is key to the health of the Colorado River ecosystem as well as an absolute necessity for the river recreation industry in Grand Canyon. Therefore, in sediment depleted conditions we urge that flow spikes be as low, short, and few as possible, and we urge that regular monitoring of resource conditions, especially after each proposed flow action component concludes, must be conducted in order to provide the data necessary to ensure that the purpose and need of the EA is being met, as well as the resource goals of the Long Term Experimental and Management Plan, and the mandates of the Grand Canyon Protection Act. The decision-making matrix and implementation plan must be based on current science to ensure that proposed actions are actually benefiting resources while minimizing any adverse effects to the extent possible.

A river trip through Grand Canyon has the ability to impact people's lives in profound and lasting ways -- a wilderness experience that is unequaled in few places on earth today. Our passengers fall in love with Grand Canyon and become lifelong stewards and advocates. Taking the broader view, people all over the world demand that Grand Canyon be protected in perpetuity, whether they have visited the national park or not. *Failing to act at this juncture is not an option*. We urge you to maximize a flow spike this June as discussed above, under the sediment enriched conditions we have right now, in concert with the cool mix (Option B), as our best and most effective tool for preserving and mitigating impacts to the resources of concern, native fish and the sediment resource of Grand Canyon.

Thank you for your consideration.

John Dillon
Executive Director
Grand Canyon River Outfitters Association

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GRAND CANYON TRUST

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March 10, 2023

Sarah Bucklin
Regional NEPA Coordinator
U.S. Bureau of Reclamation, Upper Colorado Basin Region
125 South State Street, Room 8100
Salt Lake City, Utah 84138
gcd_smb_ea@usbr.gov

Sent via email

RE: Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment dated February 2023

Dear Ms. Bucklin,

The Grand Canyon Trust ("Trust") submits this letter to provide comments on the U.S. Bureau of Reclamation's Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment dated February 2023 ("EA"), which proposes to modify flows released from Glen Canyon Dam to disrupt smallmouth bass spawning and prevent establishment of the species in Marble and Grand Canyons where it threatens the recovery of native fish species.

The Grand Canyon Trust is a 501(c)(3) non-profit advocacy organization founded in 1985 with a mission to safeguard the wonders of the Grand Canyon and the Colorado Plateau, while supporting the rights of its Native peoples. We are headquartered in Flagstaff, Arizona and have more than 3,000 members and supporters. For decades, we have worked across the four corners region to secure protections for important cultural landscapes, safeguard water from uranium mining pollution, defend the unsustainable withdrawal of groundwater for development, protect the Grand Canyon ecosystem, and restore healthy forests and springs. We appreciate the opportunity to comment on the proposed modified flow options at Glen Canyon Dam related to smallmouth bass and to consider how this proposal fits into a broader backdrop of the Colorado River Basin.

This EA is being developed in an ever-evolving landscape including changing hydrology and policy. As you are aware, Reclamation is currently undertaking the revision of the 2007 Interim Guidelines of the operations of Lakes Powell and Mead by preparing a Supplemental Environmental Impact Statement. 87 Fed. Reg. 69042 (2022). These revisions may authorize a reduction in the annual amount of water released from Glen Canyon Dam and establish a new target elevation for water storage in Lake Powell, among other actions. These policy changes have implications for the Grand Canyon ecosystem, interests of tribes and Native communities, as well as other economies, communities, and environments throughout the Colorado River

Basin. Further, other plans and evaluations (both short and long-term) are underway to determine what other measures may be needed to combat the impacts of low reservoir elevations and low Colorado River flows including possible reengineering of Glen Canyon Dam, construction of physical barriers in Lake Powell to prevent the transfer of lake fish below the dam, and ultimately the renegotiation of the post-2026 guidelines for operating Lakes Powell and Mead into the future. These actions are all interrelated and need to be considered collectively to ensure their effectiveness at a basin-wide scale. Integration of these pivotal components and maximizing the benefits to multiple interests is also key to balancing the many competing mandates of the law.

The Trust is supportive of the proposed action with flow options outlined in this EA and agrees that the time is now to prevent smallmouth bass from establishing in Marble and Grand Canyons. Based on the EA's analysis, Flow Option B stands out as providing the highest effectiveness to reach the target temperature of 16°C for the greatest distance downstream from Glen Canyon Dam and including flow spikes to ensure these cool waters reach backwater habitats where smallmouth bass are known to spawn. We endorse this option, but also understand the need for different tools given changing conditions on the river. While it appears difficult to achieve outside of Marble Canyon, Flow Option D also may be effective to address smallmouth bass in the upper reaches of Marble Canyon where spawning occurred in 2022.

The Trust would also like to see this effort used to benefit broader resource goals set forth the in the Long-Term Environmental Management Plan ("LTEMP"), including protecting archaeological and cultural resources, enhancing natural processes, honoring tribal values and resources, increasing sediment transport and sandbar building, improving riparian vegetation, and enriching recreational experiences. While the priority of these flows should be to disrupt smallmouth bass spawning, secondary benefits should be actively pursued where multiple successes can be achieved. Based on the laser focus of this proposal, we fear Reclamation may miss a key opportunity to carry out its mandate under the Grand Canyon Protection Act of 1992 ("GCPA")[1] to ensure that Glen Canyon Dam is operated:

> 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, including, but not limited to natural and cultural resources and visitor use.

In the spirit of this broader focus, we support the proposed modifications to Flow Options B and D proposed by the National Park Service to address the potential conflict between smallmouth bass spike flows and High Flow Experiments ("HFEs") and to revise the HFE protocol for low water conditions.[2]

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[1] Grand Canyon Protection Act of 1992, Pub. L. No. 102-575, 106 Stat. 4600 (1992).

[2] *See* National Park Service's Letter to Regional Director, Wayne Pullen containing its comments in response to the "Glen Canyon Dam Smallmouth Bass Flow Options Environmental Assessment" to be prepared by the Bureau of Reclamation date December 14, 2022 p. 6-7. https://www.usbr.gov/uc/DocLibrary/EnvironmentalAssessments/GlenCanyonDamSmallmouthBassFlowOptions/StakeholderInput/20221215-NPSComments-508-UCRO.pdf

Finally, the Pueblo of Zuni, the Hopi Tribe, and other tribes have expressed significant ongoing concerns regarding taking of life in the Marble and Grand Canyons. Specifically, the tribes oppose many, if not all, of the measures proposed by Reclamation to prevent the establishment of smallmouth bass in the Colorado River downstream of Glen Canyon Dam detailed in this EA and otherwise. Given these concerns, we strongly encourage Reclamation and other partners to prioritize and elevate consultation with the Grand Canyon affiliated tribes to understand their interests, consider alternate solutions that do not conflict with their culture and values, and do so in a way that allows adequate time and engagement to ensure meaningful consultation and to influence outcomes. This consultation should be ongoing, not just during the EA process, including during planning, design and implementation of actions related to preventing establishment of nonnative fish in the Grand Canyon, and should include travel to respective reservations to reduce barrier to conversation and consultation. Further, preventative methods—such as creating a barrier in Lake Powell to ensure non-native species do not pass through the dam—have long been advised as an action Reclamation could take that may not conflict with values of and cause harm to tribes and Native communities. We strongly recommend that these proactive solutions be expedited and prioritized to carry out the agency's trust responsibility to the tribes and Native communities with ties to the Colorado River and its canyons.

The Trust details its comments below:

1. Broader purpose and need could help meet additional LTEMP resource goals

Reclamation engages in this targeted EA to address the immediate threat to the humpback chub in Marble and Grand Canyons from establishment of smallmouth bass below Glen Canyon Dam. Reclamation articulated this very specific purpose and need in the EA at 1-5. The Trust appreciates the urgency of this situation and the need to address it in a focused manner; however, we also believe that with a slightly broader purpose, Reclamation could consider, evaluate, and prioritize the benefits of these actions—not only to remove the threat of smallmouth bass for the humpback chub—but also to contribute to furthering other important resource goals enumerated in the LTEMP that ensure compliance with the mandates of the Grand Canyon Protection Act.

A primary example of this would be designing flow spikes in Flow Options B and D of the proposed action that disrupt smallmouth bass spawning but also operate like or with HFEs to build sandbars and mobilize sediment to enhance archeological and cultural resources, natural processes, riparian vegetation, and recreational camping. If the purpose and need is too narrow, however, Reclamation may be passing up an important opportunity to create much needed environmental benefits to Marble and Grand Canyons.

2. No Action Alternative Should Not Assume HFEs are implemented when triggered

The No Action Alternative suggests that without the proposed action HFEs will continue to occur if triggered by sediment conditions as set forth in the HFE protocol. However, it is not that simple, as HFEs are not always implemented even if sediment triggers are reached. A number of other factors are weighed in deciding whether or not to implement a HFE, including if humpback chub could be impacted by a HFE (e.g. HFE leading to passage of smallmouth bass through the dam or moving nonnative fish further downstream) or the impact on reservoir elevations of the

water release, among other possible impacts to LTEMP resources. Since the LTEMP was finalized in 2016, only one HFE was implemented (fall 2018) after three fall and zero spring HFEs were triggered by sediment. The LTEMP HFE protocol actually authorizes (if triggering conditions exist) 38 HFEs over the 20-year period, but LTEMP modeling suggests that 15 fall HFEs and an additional 5 to 7 spring HFEs (a total of 22 HFEs) were anticipated during the 20-year period.[3] But in nearly 7 years, we have seen only 1. So, the assumption that HFEs will occur as triggered by sediment conditions is not entirely accurate. This matters because the proposed action's flow options with flow spikes are not only important in the context of smallmouth bass, but also important to protect and improve sediment resources in Marble and Grand Canyons.

3. Process for deciding between flow options in the proposed action is unclear

The proposed action with flow options analyzed in the EA will provide Reclamation and its partners with the authority to operate Glen Canyon Dam flows in ways that disrupt spawning in smallmouth bass. This is in addition to the *Framework to prevent nonnative fish species establishment below Glen Canyon Dam* that was recently finalized and approved by the Glen Canyon Dam Adaptive Management Work Group ("AMWG"). What is not clear from either of these documents is how Reclamation or its partners will make decisions related to which flow option(s) may be pursued in a given year or what other management actions will be taken. While we understand the agency needs flexibility in this decision making, it would be helpful for the process to be transparent. Further, given the interaction of the flow options with spike flows and the existing HFE protocol (see the discussion below), it would be helpful for Reclamation to clarify when and if the HFE decision trees will be used in that context or if similar tables will be established for determining smallmouth bass flow options. Finally, it is not clear what role, if any, AMWG will have in providing recommendations to Reclamation regarding these flows and Reclamation's process and commitment to tribal consultation.

4. *Releasing water through bypass tubes has important dual purpose to control smallmouth bass*

All of the proposed action's Flow Options (A-D) expressly rely on releases from the bypass tubes in Glen Canyon Dam to lower temperatures in the Colorado River to create inhospitable conditions for smallmouth bass spawning. However, the other important purpose that is not emphasized in the EA, is that bypass releases are also critical to avoiding additional smallmouth bass passing through the dam. Therefore, until Reclamation can construct a barrier to downstream passage of nonnative fish through the dam, measures should be taken, not just to disrupt spawning of smallmouth bass already in Marble and Grand Canyons, but also to prevent as few nonnative fish as possible pass through the dam.

5. Reclamation should use this EA to resolve the conflict between flow spike alternatives and HFEs by revising the sediment accounting window in the existing HFE protocol

In January, in addition to the dire concern expressed regarding smallmouth bass, Glen Canyon Monitoring and Research Center ("GCMRC") scientists sounded the alarm regarding the

[3] U.S. Geological Survey's Evaluation of High-Flow Experiments during Aridification AMWG Reporting Meeting Presentation dated January 25, 2023.

downward spiral of sediment resources in the Colorado River in Marble and Grand Canyons. At least 28 million metric tons of sand has eroded since the dam was closed in 1963 and about half of that eroded in the late 1990s, including six metric tons from each Marble and Grand Canyons.[4] Further, sandbar monitoring indicates that 67 percent of sites in Marble Canyon had less high-elevation sand in 2022 than in June of 1990; that percentage was 11 percent for Grand Canyon sites.[5] These scientists urged the AMWG representatives to help reverse this negative trend by implementing a series of HFEs as required by LTEMP. The last HFE implemented in the Grand Canyon was in 2018. This is the only HFE that has been implemented since LTEMP was finalized in 2016. This is very concerning given the mandate in the Grand Canyon Protection Act to operate the dam in a manner "to protect, mitigate adverse impacts to and improve the values for which the Grand Canyon National Park" was established.

This EA seemingly sets up a conflict between conducting smallmouth bass flow spikes and HFEs. Flow Options B and D in the proposed action include up to three 36-hour flow spikes between late May and mid-July. The effects analysis concludes that these options will have both negative and positive effects on sediment including that the "flow spikes would export sediment from Marble Canyon, which could reduce the amount available for HFEs, but would contribute to beach building in Grand Canyon." Table 3-5, EA at 3-51. These smallmouth bass flow spikes may compete with the ability to implement fall HFEs under LTEMP due to the existing sediment accounting windows. For example, if a flow spike is conducted in July, it would likely mean that an HFE would not be possible in the fall because the sediment trigger may not be reached.

Given these concerns and the strong need to balance both smallmouth bass and ensure sandbar building in the canyons, this EA may serve as an excellent vehicle for revising the sediment accounting window in the HFE protocol as GCMRC scientists[6] and members of the AMWG have been requesting for some time. In fact, the National Park Service has proposed a modification to the flow spike alternatives (Options B and D) to address the impacts to sediment as a part of this EA.[7] The Trust endorses this proposal and encourages Reclamation to use this EA as an opportunity to prioritize HFEs over the next three years, including revising the sediment accounting window in the current HFE protocol to run annually starting and ending on July 1 each year. Adapting the HFE protocol and the alternatives in this EA to address the issues arising due to "low water conditions" helps to address both the smallmouth bass issue, the sediment issue, as well as ensure better compliance with the Grand Canyon Protection Act.

This proposed change to the sediment accounting window would reduce the total number of HFEs possible for the remainder of the LTEMP 20-year period, but it could also ensure that HFEs are conducted more regularly to produce positive outcomes for sediment resources. The LTEMP HFE protocol appears to authorize (if sediment trigger is reached during the accounting

[4] Topping, D. J., Grams, P.E., Griffiths, R.E., Dean, D.J., Wright, S.A., & Unema, J.A. (2021). Self-limitation of sand storage in a bedrock-canyon river arising from the interaction of flow and grain size. *Journal of Geophysical Research: Earth Surface, 126,* e2020JF005565. https://doi.org/10.1029/2020JF005565

[5] *See* GCMRC, Project A Update and Evaluation of LTEMP Sand Management, January 25, 2023 AMWG Reporting Meeting Presentation.

[6] *See* USGS 2023, above.

[7] *See* National Park Service's Letter at 6-7, above.

window) 38 HFEs over the 20 year period, but based on the modeling analysis, LTEMP anticipated 15 fall HFEs and an additional 5 to 7 spring HFEs (a total of 22 HFEs) during the 20-year period.[8] To date, only one HFE in 2018 was implemented during the LTEMP period, which leaves 15 fall HFEs and 5 to 7 additional spring HFEs through 2036. With the proposed modification to the sediment accounting window, the maximum number of sediment triggered HFEs for the remainder of the LTEMP period would be one per year or 13.

6. Reclamation needs to take advantage of the opportunity in 2023 to create environmental benefits in the Grand Canyon as mandated by the GCPA

Based on several factors that appear to be aligning in 2023, Reclamation may have a unique opportunity to move water through Marble and Grand Canyons—even under lower annual releases and reservoir elevations—in a way that could protect and improve resource conditions in the canyon as mandated by the GCPA. First, "sediment-enriched conditions are anticipated to exist in Marble Canyon through summer 2023, resulting from high sediment inputs from the Paria River during the fall HFE accounting period in 2022." EA at 3-23. GCMRC scientists indicated that "current sediment conditions support a high flow of up to 40,000 to 45,000 cubic feet per second and up to 72 hours anytime between fall 2022 and summer 2023."[9] Second, based on water that was released from Upper Basin Reservoirs and held in Lake Powell under the Drought Response Operations Agreement ("DROA"), 523,000 acre-feet of water will need to be released from Glen Canyon Dam this summer. And, finally, this EA, if modified as suggested by the National Park Service and GCMRC to revise the sediment accounting window, could allow for various opportunities for cool water releases, smallmouth bass flow spikes, and/or a rare spring HFE to both address smallmouth bass and build sandbars[10] for the first time in nearly 5 years. The last time a spring HFE was created in the Grand Canyon was in 2008.

7. *14-day Public Comment Period Inadequate*

The Trust understand the urgent need to prevent the establishment of smallmouth bass in Marble and Grand Canyons and we appreciate the actions undertaken by Reclamation to provide flow options to address this challenging situation. However, the agency's emergency actions on an expedited timeline only ensures that the process is rushed, critical voices and concerns are excluded and/or not addressed, and that the solution does not consider or meet the larger challenges the region is facing. A 14-day public comment period on a 158-page EA is not adequate for meaningful engagement by stakeholders in this process. This is especially true for tribes and tribal communities that have stated strong objections to similar proposals in the past and that stated their continued objections as recently as the February 15-16, 2023 AMWG meeting.

Reclamation has been aware of the need to prevent passage of nonnative species through Glen Canyon Dam at least since the Record of Decision for the LTEMP was finalized in 2016 (six

[8] See USGS 2023, above.
[9] *Id*.
[10] "Sandbars form a fundamental element of the river landscape and are important for vegetation, riparian habitat for fish and wildlife, cultural resources, and recreation." EA at 3-25 "Low-elevation sandbars are also a source of sand for wind transport that may help protect archaeological resources." *Id*.

years ago) and likely long before. In fact, the Biological Opinion for the LTEMP ROD specifically contemplates temperatures to be warmer under lower reservoir elevations and that options to "minimize or eliminate passage through the turbines or bypass intakes" and to "hinder expansion of warmwater nonnative fishes" were warranted at that time. LTEMP ROD BO at E-12. Further, the importance of "regulation and control of nonnative fish" has been a "management action identified in the humpback chub and razorback sucker recovery goals since 2002." LTEMP ROD BO at E-12. Reclamation, however, only acted after smallmouth bass were found reproducing in Marble Canyon in 2022.

As mentioned above, Reclamation was aware for decades of the concerns of the tribes regarding the taking of life of nonnative species in the Grand Canyon. Thus, despite the sensitivity around this matter and the opportunity to take preventative measures over the past six years, Reclamation waited until the problem reached a critical point. We emphasize this here, not to place blame, but to encourage the agency to ensure that it has the resources and the foresight to advocate for measures before the issue reaches emergency status. We realize this is easier said than done, but it should be considered all the same.

The Trust appreciates the opportunity to comment on the Smallmouth bass flow operation EA. We support the proposed action with flow options to disrupt spawning of smallmouth bass. This, as well as other dam operations such as restored HFEs, are necessary "to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established." We believe Flow Options B and D, as proposed to be modified by the National Park Service to adjust the sediment accounting window in the HFE protocol, have the most potential for meeting the needs of native fish as well as the mandates under the Grand Canyon Protection Act to enhance archaeological and cultural resources, natural processes, tribal values and resources, sediment transport and sandbar building, riparian vegetation, and recreational experiences as designated in LTEMP. We look forward to working with you to integrate this solution with the larger challenge of sustainable management of the Colorado River Basin.

Sincerely,

Jen Pelz
Water Advocacy Director
Grand Canyon Trust

March 10, 2023

Via E-Mail to sbucklin@usbr.gov

Sarah Bucklin

Regional NEPA Coordinator

U.S. Bureau of Reclamation, Upper Colorado Basin Region

Via Email only – sbucklin@usbr.gov

RE: Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment (EA)

Dear Ms. Bucklin,

Heber Light & Power (HL&P) appreciates the opportunity to provide comments on the EA, issued February 24, 2023. HL&P is located in a beautiful valley along the back of the Wasatch mountains in Utah where we serve three growing communities. The local cost of living has skyrocketed to more than eleven percent above the national average. Retirees living on fixed incomes, young people just starting out, and our low income and disadvantaged customers cannot afford the high cost of living in our area. Our teachers, health care workers, and other essential workers cannot afford to live in our valley. For over 100 years, we have supplied reliable affordable energy to our customers with low-cost Federal Hydropower as the foundation of our portfolio. Providing affordable energy is our mission and our obligation as a Public Power utility.

HL&P is an FES customer with a long-term contract with the Western Area Power Administration (WAPA) for the purchase of CRSP resources. This resource makes up 30 percent of our energy portfolio, and because CRSP is our largest energy resource we have an interest and role in issues associated with Colorado River and CRSP operations. We have carefully reviewed the draft EA and its assessment of impacts. As HL&P has already been negatively impacted by the reduction in available federal hydropower due to the drought, it is concerning to find the draft EA fails to provide any meaningful analysis on the financial or economic impacts of this proposed action on CRSP customers.

In 2022, the reduction in available hydropower due to drought and experimental actions forced us to purchase replacement market power which increased our power costs by more than thirty percent. To recover these high costs, we implemented a five percent rate increase in 2022, and will raise rates again by five percent in 2023 and 2024. Additionally, we are implementing a power cost adjustment which will further increase our customer bills.

The draft EA does not address the ability of ratepayers in communities such as ours to afford the increase in power costs or whether there is available power on the market that can be purchased to make up for this shortfall. Shortfalls in hydro have already put us in the position of competing for the same market resources that WAPA is purchasing to replace hydropower. As WAPA would be out on the market for substantially more power than in a case without the Proposed Action, the added competition for resources will most likely drive market prices higher, and further reduce availability for everyone.

While the draft EA fails to provide analysis into the financial or economic impact the proposed action will have on our bottom line, we project the impacts will be severe. Natural gas and energy market futures indicate market volatility will continue through 2023, and the added market exposure from hydropower reductions puts our customers at risk for further rate hikes. Reclamation has failed to show the impacts to communities such as ours are not significant as required by the National Environmental Policy Act, we do not support the Proposed Action as articulated in the draft EA.

Jason Norlen

General Manager

Cc: CREDA Board

Wayne Pullan – Reclamation UC Region

Rodney Bailey – WAPA CRSP Management Center

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Ms. Sarah Bucklin
Regional Environmental Coordinator
Bureau of Reclamation
125 South State Street
Room 8100
Salt Lake City, Utah 84138-1147

March 10, 2023

Sent via eMail to: gcd_smb_ea@usbr.gov & sbucklin@usbr.gov

Re: Environmental Assessment (EA) for Smallmouth Bass Flow Options from Glen Canyon Dam.

Dear Ms. Bucklin,

The following conservation organizations present public comments for the Environmental Assessment to implement water releases from Glen Canyon Dam (GCD) to disadvantage non-native smallmouth bass:

Living Rivers & Colorado Riverkeeper, Center for Biological Diversity, River Runners for Wilderness, Save The Colorado and Great Basin Water Network.

1.0 - Introduction

The Colorado River Basin (CRB) is currently suffering from the consequences of poor reservoir management, deliberate overconsumption of water resources, and exceptional regional aridity, all of which are exhausting the contents of reservoirs and aquifers.

Velocity currents, near the unscreened intakes for hydropower generation (penstocks) at GCD, has facilitated the entrainment of predatory smallmouth bass from Lake Powell Reservoir to the Colorado River below GCD. The suction from these currents arrive when the reservoir elevation approaches 3525 feet,[1] which happened last March in 2022, and again in December of 2022.

Therefore, it is not surprising that non-native fish will successfully bypass through penstock tubes and spinning turbines, and then inhabit the critical habitat below GCD, which was designated by the recovery program for non-native species that are either

[1] Penstock withdrawal characteristics; USBR, 2008: http://www.riversimulator.org/2025Guidelines/USBR/DROAub/GlenCanyonDamPenstockWithdrawalCharacteristics2007to2008USBR.pdf

threatened, endangered or extirpated. This discovery of invasive smallmouth bass below GCD occurred on July 1, 2023 by scientists from Grand Canyon Monitoring and Research Center.

The suction of water moving at high velocity through penstocks and river outlet tubes will continue to occur 75- to 80-percent of the time for the next 30- to 40-years, according to scenario planning documents located in the appendix called *Technical Report G* from the 2012 Colorado River Basin Supply and Demand Study, and prepared jointly by Reclamation and the seven states of the CRB.[2]

It should not be forgotten that the entrainment of non-native species through penstocks has been occurring for some time and passing other types of invasive species, such as quagga muscles and green sunfish. We do understand that this incident should have been foreseen and prevented by the members of the Glen Canyon Dam Adaptive Management Program (GCDAMP).

2.0 - Our Purpose

The organizations Save the Colorado, Living Rivers, and Center for Biological Diversity are currently engaged in litigation in regards to the Environmental Impact Statement and Record of Decision for the 2016 Long-term Experimental Management Plan (LTEMP) and specifically about reforming hydropower operations at Glen Canyon Dam under a paradigm of ongoing impacts caused by climate change.

The lawsuit challenges specific provisions within the National Environmental Policy Act (NEPA), which we outlined during scoping in January of 2012.[3] Our incentive is to protect habitat for endangered species in a National Park and a World Heritage Site, and because human-caused climate change is accelerating the aridification of the Colorado Plateau and with signifiant consequences, as described above.

The current LTEMP 20-year plan is a **revision** of a previous 20-year framework, which Center for Biological Diversity and Living Rivers litigated in 2005,[4] and specifically about how the preferred alternative was insufficient toward the recovery of endangered and extirpated fish species in Grand Canyon National Park.

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[2] Reclamation Bureau, *Supra* note 19: http://www.riversimulator.org/Resources/USBR/BasinStudy/Final/09TechnicalGReportSystemReliability.pdf

[3] 2012 LTEMP Scoping Comments by Living Rivers et al: http://www.riversimulator.org/Resources/NGO/LTEMP/LTEMPeisCommentsLivingRivers31Jan2012.pdf

[4] 60-day Notice: http://www.riversimulator.org/Resources/Legal/CBD/CBDvBoR.pdf

Additionally, there is a behavior problem that is impeding the ability of the stakeholders in the GCDAMP, and specifically to be precautionary and proactive about the fulfillment of their mission statement. References are in footnotes below: Feller; [5] Camacho; [6] Susskind et al. [7]

We interpret the present smallmouth bass EA as another urgent action item for a program that is chartered to be timely and adaptive about the changes in this geography and its climate. Various discussions about the characteristics of reservoir water discharging through turbines and outlet works at GCD has been a perpetual conversation for parts of four decades now.

3.0 - Need: To immediately provide a new Environmental Impact Statement that vacates Glen Canyon Dam and that properly addresses the global impacts of climate change and respects the mission of the national park system.

This invasion of non-native species is a problem that won't be solved successfully. We would prefer to be wrong about this conclusion, but the primary purposes of this recovery program has entered a compromised position that is quite serious.

The recent decision to down list the humpback chub from the endangered position to the threatened position, was premature, and we strongly recommend that the biological assessment that will be prepared for this EA will address this topic and consider reinstating the humpback chub to its endangered status.

Though the endangered fish populations above Lake Powell Reservoir are not yet thriving, they do exist and are not yet extirpated. They exist in the upper basin because the sediment load in the Green, Colorado and San Juan rivers disadvantages non-native, hunt-by-sight predators, such as smallmouth bass. The food web is much more nutritious (by four times) than the carbon deprived ecosystem below Glen Canyon Dam.[8] [9] Warm water, sediment, leaf litter, driftwood, and abundant insect hatches is what will save these fish from extinction, and not the dials and switches at GCD.

It's time to decommission Glen Canyon Dam and let Nature and protected landscapes do what they do best—fill ecosystems with living things. Removing GCD will restore approximately 500 miles of historic habitat, and also reconnect all the tributary habitats that converge at Cataract, Glen, Marble and Grand canyons.

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[5] Feller; 2008: http://www.riversimulator.org/Resources/GCDAMP/GCDAMPchronicle/FellerGlenCanyonArticle.pdf

[6] Camacho; 2008: http://www.riversimulator.org/Resources/GCDAMP/GCDAMPchronicle/Camacho2008ampGCD.pdf

[7] Susskind et al.; 2010: http://www.riversimulator.org/Resources/GCDAMP/GCDAMPchronicle/aCautionaryTaleColumbiaSusskind2010.pdf

[8] Driftwood—an alternative habitat for macroinvertebrates in a large desert river; 1999: http://www.riversimulator.org/Resources/AquaticResearch/DriftwoodAnAlternativeHabitatHaden1999.pdf

[9] Benthic community structure of the Green and Colorado rivers through Canyonlands National Park, Utah, USA; 2003: http://www.riversimulator.org/Resources/AquaticResearch/BenthicCommunityColoradoRiverCanyonlandsHaden2003.pdf

4.0 - Conclusion:

Our collective ask to the technical and working groups of GCDAMP is to please ask the Secretary to initiate a new Environmental Impact Statement with a preferred alternative that decommissions Glen Canyon Dam. We also suggest that Glen Canyon National Recreation Area be re-designated as a national park with critical habitat for the recovery of all eight threatened and endangered fish species, and that the mission statement for the Adaptive Management Program be repurposed, accordingly.

Sincerely yours,

John Weisheit - Co-founder, Living Rivers and Colorado Riverkeeper

Robin Silver - Co-founder, Center for Biological Diversity

Gary Wockner - Executive Director for Save the Colorado

Kyle Roerink - Executive Director, Great Basin Water Network and Great Basin Waterkeeper

Tom Martin - Program Director for River Runners for Wilderness

Navajo Nation

From: Erik Stanfield, Anthropologist, Navajo Nation Heritage and Historic Preservation Department,
Brent Powers, Zoologist, Navajo Nation Natural Heritage Program, and
Richard Begay, Department Manager, Navajo Nation Heritage and Historic Preservation Department

To: Sarah Bucklin, Regional NEPA Coordinator, US Bureau of Reclamation, Upper Colorado Basin Region

Date: 3/10/2023

Re: Comments on Glen Canyon Dam/ Smallmouth Bass Flow Options Draft Environmental Assessment

Dear Ms. Bucklin:

The Navajo Nation (NN) appreciates the opportunity to participate in the Glen Canyon Dam Adaptive Management Program and contribute to the Smallmouth Bass (SMB) Flow Options Draft Environmental Assessment (EA). Below we have made seven general comments and attached a Position Statement on the Management of Non-Native Fish originally drafted 3/9/22.

1. The EA does not appear to consider that spawning activity of SMB occurs along a gradient and does not simply turn off or on once certain environmental conditions are met (i.e., 16°C). Rather, individual bass may initiate spawning activities and behaviors at a temperature that is below and above the referenced 16°C. The proposed actions and flow options do not consider that spawning may occur at a temperature below 16°C. The triggering event for any action should reflect this variability in spawning and should encompass the full time period in which SMB could be spawning.

2. We recognize that SMB flow options presented in this document are experimental in nature and as such, the effectiveness of the treatments is unclear. Under this assumption we recommend that only one flow option should be selected and implemented during any one spawning season. Immediately after the flow option has concluded, a rigorous survey/monitoring effort should be undertaken to assess the relative impact of the implemented flow so that the BOR can scientifically determine the effectiveness of the treatment. If the selected flow option was unable to achieve success of limiting or eliminating spawning in the river, then another flow option could be selected for the upcoming spawning season. This approach is not only more scientifically rigorous but also in line with the principles of adaptive management.

3. We also understand that the flow regimes outlined here are intended to be short-term and will be difficult to test and retest before longer term solutions become available. For this reason, it

seems prudent to limit flow options in order to better understand their overall effectiveness. Measures like exclusion curtains and bypass generators, while planned for implementation in the next 3-5 years, are likely to encounter roadblocks and delays common in large scale projects, so it may be wise to expect these flow options to be utilized for longer than expected.

4. Flow Option E should be analyzed in detail as this option appears to have the potential to have the greatest impact on spawning smallmouth bass in the Colorado River. Penstock only flow options may have a lesser potential to be effective as the multi-pronged approach that include temperature, velocity, higher elevation flows, but they have less consequences to hydropower and water storage. In this case, because Flow Options A, B, C, & D are experimental in nature and therefore lack the data to demonstrate their effectiveness, we would hesitate to lend full support to those options when Option E has a similar potential to be effective and has fewer negative consequences.

5. A robust analysis of the flow options is not possible without more detailed information on the short- and long-term costs to hydropower. From the analysis, it is not possible to assess the cost of replacement power to Navajo utilities or how these costs will be mitigated. There are other unanswered questions surrounding effects to hydropower: How will flow options affect direct costs to consumers? What are the effects on the overall power market? How does this affect grid reliability? There are likely many other related questions, but without expert analysis it is not possible to comfortably make a decision on the effects of the flow options. This uncertainty is, what for us, tips the balance toward a more in-depth analysis of Flow Option E.

6. It is the Navajo Nation's position that the taking of life through mechanical removal should be minimized as a management action and we appreciate that these flow options serve this purpose to some extent. However, the flow options presented in the EA are not considered a guaranteed way to limit or prohibit SMB spawning, so they are also not guaranteed to limit mechanical removals, yet they are still a disturbance to all species, native and invasive. It is therefore, not necessarily correct to indicate that these options would not negatively impact tribal concerns and values for the Colorado River and LCR systems (as stated in section 3.9.2). Undoubtably, other aquatic species will be disturbed so we would urge further analysis on the effects to other species and general ecology.

7. In general, the Navajo Nation prefers a flow option that mimics natural (pre-dam) hydrology, as this will also restore natural processes and ecological function of the river system. See also our attached March 9, 2022 statement on Non-Native Fish management in the Colorado River.

Again, thank you for the opportunity to comment and please contact Erik Stanfield (erikstanfield@navajo-nsn.gov), Richard Begay (r.begay@navajo-nsn.gov), or Brent Powers (bpowers@nndfw.org) if you require follow up for any reason.

POSITION STATEMENT ON NON-NATIVE FISH MANAGEMENT IN THE COLORADO RIVER

Submitted March 9, 2022 by:

Erik Stanfield, Anthropologist, Navajo Nation Heritage and Historic Preservation Department
Richard M. Begay, THPO, Navajo Nation Heritage and Historic Preservation Department
Tim Begay, Navajo Cultural Specialist, Navajo Nation Heritage and Historic Preservation Department
Brent I. Powers, Zoologist, Navajo Nation Natural Heritage Program
Kim Yazzie, Fish Biologist, Navajo Nation Management and Research Program

"*Navajoland is a comprehensive landscape described in legends and ceremonies. To separate out one resource, such as water is to do an injustice to this complicated, interwoven landscape. To discuss the ceremonial and ecological knowledge of water in the Navajo cosmology thus requires considering other aspects of the natural world including plants, air, animals, fish, all wildlife, mountains, earth, sky, sun, and moon.*" [1]

On Non-Native Fish Management and Management Flows, we look to *Nahasdzáán dóó Yádiłhił Bitsąądęę Beenahaz'áanii or Diné* Natural Law[2] for guidance. In sharing these values, we hope to encourage the Bureau of Reclamation (BOR) and the National Park Service (NPS) to manage traditionally associated lands in a manner that is consistent with our tribal values. Specifically, *Diné* Natural Law (1 N.N.C. § 205.C, E, & F) declares and teaches that:

- All creation, from Mother Earth and Father Sky to the animals, those who live in water, those who fly and plant life have their own laws, and have rights and freedom to exist.
- Mother Earth and Father Sky is part of us as the *Diné* and the *Diné* is part of Mother Earth and Father Sky; The *Diné* must treat this sacred bond with love and respect without exerting dominance for we do not own our mother or father.
- The rights and freedoms of the people to the use of the sacred elements of life as mentioned above and to the use of the land, natural resources, sacred sites and other living beings must be accomplished through the proper protocol of respect and offering and these practices must be protected and preserved for they are the foundation of our spiritual ceremonies and the *Diné* life way.

Ceremonial histories also teach us that *Łóó Dine'é* or fish people inhabited the first world and those *Diné* who stayed behind in the third world are said to have become fish and other water creatures. These ceremonial references express an important ancestral and pedagogical relationship to fish. The stories do not differentiate species of fish as these categorical distinctions where less important in Navajo pre-western society. It is, however, recognized that the stories are almost certainly referencing native fish but despite this distinction and because of a general respect of life, we wish to express that management actions (inclusive of native and non-native) be carried out with great respect. There are also historical observations of fish in the Colorado River by local

[1] Warburton, Miranda. 2020. WE DON'T OWN NATURE, NATURE OWNS US: The Ceremonial and Esoteric Nature of Water in the Little Colorado River Basin and Dine Bikeyah. Expert Testimony, Window Rock: Navajo Nation Department of Justice Water Rights Unit
[2] Navajo Nation Law Council Resolution CN-69-02.

Navajos, who described their presence as an important indicator of environmental health and abundance.[3]

By spiritual and legal obligation under *Diné* Natural Law, the Navajo Nation considers the protection of native endangered species such as the humpback chub in the Colorado River and its tributaries as an important *Tribal Value* (LTEMP Goal #8). In the execution of these values, we support a "comprehensive landscape" approach (noted above). LTEMP Goal #2, *Natural Processes,* closely corresponds to this comprehensive approach and to *Diné* Natural Law in "restoring, to the extent practicable, ecological patterns and processes within their range of natural variability, including the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to those ecosystems."

The restoration of natural processes creates the conditions necessary to advantage *Humpback Chub* (Goal #3) and *Other Native Fish* (Goal #5), while disadvantaging *Nonnative Invasive Species* (Goal #10) through management flows or other actions that mimic natural processes. Our overall ethic in resource management is to find balance and beauty in our relationship with the natural environment through avoiding invasive management practices that are in conflict with the paramount tribal value of maintaining natural and self-sustaining processes. This ethic also includes the avoidance of introducing and/or maintaining non-native populations of any species.

We would further like to note that restoring natural processes contributes to several other LTEMP EIS goals such as the increase of *Sediments* (Goal #7) in the river system and the maintenance of *Riparian Vegetation* (Goal #11), both of which contribute to the preservation of Archeological and Cultural Resources (Goal #1). Additionally, flow management that more closely resembles natural flows/processes would benefit benthic invertebrate communities and Navajo Endangered Species and Federally listed wildlife such as Yellow-billed Cuckoo and Southwestern Willow Flycatcher. We also believe that the restoration of natural processes improves *Recreational Experiences* (Goal #6) in terms of boating, camping, and the economic benefits that may provide to local Navajos. The more holistic attunement of management goals as outlined above reflects our wish to guide natural processes with as little intervention as possible.

It is understood that in maintaining natural processes and native species in a dramatically altered environment, there may be circumstances that require intervention. In these cases, the least invasive, least traumatic measures are preferred. In accordance with our tribal values, we request that these interventions be carried out with respect. When life must be taken it is important to reciprocate to the environment what has been lost through the careful and thoughtful use of the fish for consumption, in aviaries, or as fertilizer, etc.

Please note that we do not support the use of Rotenone or other chemical treatments, as these approaches do not discriminate between species and will ultimately make their way to other species barriers, both in the aquatic and terrestrial systems. Physically removing non-native fishes (netting or shocking for example) can be expensive and very time and equipment consuming. We understand that it is not an "air tight" method, but it is also not titrating a chemical throughout a pristine ecosystem where unintended effects will occur. Catch rates are often unpredictable and

[3] Roberts, Alexa, Richard M Begay, and Klara B Kelley. 1995. *Bits'íís Ninéézi* (The River of Neverending Life): Navajo History and Cultural Resources of the Grand Canyon and the Colorado River. Window Rock: Navajo Nation Historic Preservation Department.

are not likely to entirely remove non-native fish, this then becomes a maintenance practice where the ecosystem becomes dependent on human intervention. This maintenance and dependence is in conflict with the overall value for natural and self-sustaining processes

On trout management flows, we find it important to highlight that these activities are in conflict with tribal values in their support and maintenance of non-native species. Our understanding of these flows is that they are not intended to mimic natural flows/processes but are in fact more narrowly oriented to limiting the spread of rainbow trout below Lees Ferry, though not an attempt to reduce or eliminate them. We, however, must recognize the limitations of LTEMP and the mitigative effects of these flows on the spread of rainbow trout. This activity does not support a natural process, highlights a conflict in balanced environmental management by actively supporting the existence/management of non-natives, and promotes an incoherent management strategy in the Colorado River. Overall, trout management flows are not in line with our values or with the natural process (and other compatible) LTEMP goals, though it is still recognized they are still important in providing some protection for native species.

Please contact Richard Begay (r.begay@navajo-nsn.gov) or Erik Stanfield (erikstanfield@navajo-nsn.gov) with questions or comments on the contents of this document.

United States Department of the Interior

NATIONAL PARK SERVICE
INTERMOUNTAIN REGION
12795 West Alameda Parkway
P.O. Box 25287
Denver, Colorado 80225-0287

IN REPLY REFER TO:
IMRO-RSS-COR (1241)

VIA ELECTRONIC MAIL: NO HARD COPY TO FOLLOW

Memorandum

To: Wayne Pullan, Regional Director, Upper Colorado Basin, Bureau of Reclamation
Sarah Bucklin, Project Manager, Bureau of Reclamation

From: Brian Drapeaux, Acting Superintendent, Grand Canyon NP
Michelle Kerns, Superintendent, Glen Canyon NRA MICHELLE KERNS Digitally signed by MICHELLE KERNS Date: 2023.03.10 11:54:48 -07'00'

Subject: NPS Comments in response to the Draft "Glen Canyon Dam Smallmouth Bass Flow Options Environmental Assessment" prepared by the Bureau of Reclamation

The National Park Service (NPS) appreciates the opportunity to provide input on the Bureau of Reclamation's (Reclamation) "Glen Canyon Dam/ Smallmouth Bass Flow Options Draft Environmental Assessment" released on February 24, 2023. The following statements represent the views of the National Park Service.

The comments below are consistent with our scoping comments and our primary concerns include the future of the native and federally listed fish in Glen and Grand Canyons and the interactions of this Environmental Assessment (EA) with the concurrent Reclamation Interim Guidelines Supplemental Environmental Impact Statement (SEIS). We continue to work closely with Reclamation, with USGS Grand Canyon Research and Monitoring Center (GCMRC) as science advisors, and with US Fish and Wildlife Service (USFWS) as the regulatory agency for endangered species.

Our major/overall comments on this EA include:

- We believe consideration of the action alternative in this EA is important and urgent to address the impacts of dam operations on the native fish communities and the federally listed fish below the Glen Canyon Dam (GCD). There is a danger to the federally threatened humpback chub and other native fish in Glen and Grand Canyon downstream of the dam from the escapement of warmwater non-native fish through the dam and the warmer river temperatures that occur in the lower operating range of Lake Powell (falling below the 3525'-3540' level). If smallmouth bass (SMB) or other highly predatory non-

native fish breed and establish in the Colorado River downstream of the dam, there is a strong possibility of their establishment in both the mainstem and tributaries in Grand Canyon. This could result in negative impacts to many of these native fish populations, including the federally listed fish populations, over the coming years. There is evidence from the upper basin that the presence of invasive fish like smallmouth bass (SMB) has been the largest determining factor in declines in native and federally listed fish in the last 20 years (Johnson *et al.* 2008, Martinez et al. 2014). The 2018 USFWS species status assessment for Humpback Chub concluded that, "Predation is a major threat to the Humpback Chub in the Grand Canyon—as in the upper basin," and that "Smallmouth Bass present the highest potential impacts to Humpback Chub because the species can co-occur with Humpback Chub in certain canyon habitats and is a potential predator across its entire life history" (USFWS 2018). Recent statistics suggest that the Grand Canyon is home to over 90% of the known population of adult humpback chub (based on updated information from USFWS – see graph and citations in figure legend). All of the other remaining subpopulations of humpback chub have been impacted by the presence of SMB and other predatory non-natives (USFWS 2018). SMB are a threat to the Grand Canyon humback chub population and to the species as a whole.

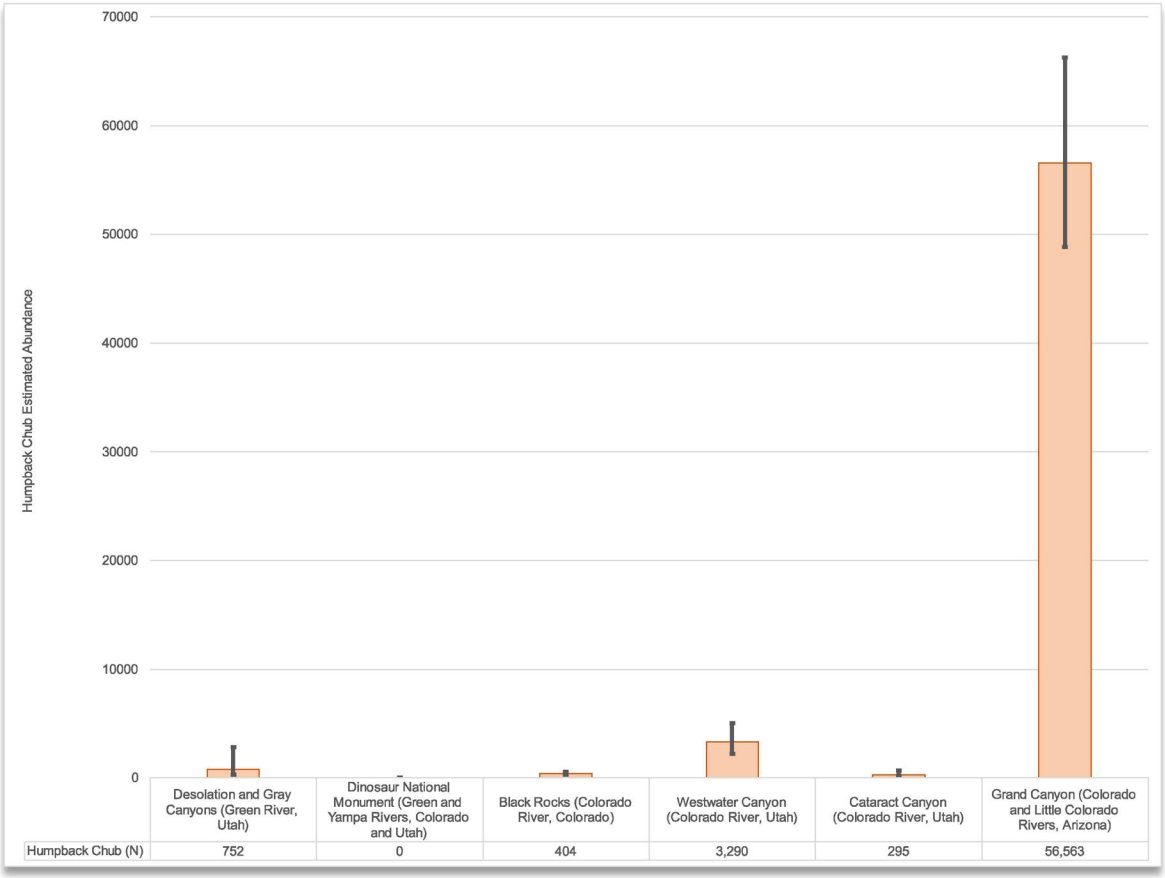

Figure 1. Current adult population abundance estimates (N) with upper and lower confidence intervals for Humpback Chub (*Gila cypha*) at six locations throughout its range. Estimates taken from most current and available reports (Badame 2008; Francis et al. 2016; USFWS 2018; Hines et al. 2020; Caldwell 2021; Van Haverbeke et al. 2022, 2023).

- SMB, other warmwater non-native species, and increasing river temperature are potentially detrimental to the recreational rainbow trout fishery in Lees Ferry. SMB are direct predators of rainbow trout, and rainbow trout are not tolerant to river temperatures that exceed 20°C. The rainbow trout are also sensitive to low dissolved oxygen (DO) events that are more likely to occur in elevated temperature ranges. The action alternative in this EA would lower the river temperatures, decrease low DO events, and reduce the predation and competition pressure on the rainbow trout and maintain the economic benefits from the recreational trout fishery for the local economy. We would consider these benefits from the action alternative to be improvements to the resources of concern we've identified.

- As stated in our scoping letter from December 2022, the Department of Interior (DOI) has collective responsibilities to address the issue of non-native fish passing through the dam and impacting the native and federally listed fish below the dam under the Endangered Species Act (ESA), 1992 Grand Canyon Protection Act (GCPA), the NPS Organic Act and under the conservation measures in the biological opinion from 2007 related to annual operations and the 2016 biological opinion related to monthly, daily and hourly operations. For instance, the Grand Canyon Protection Act (GCPA) is a federal law that mandates the Secretary of the Interior to "protect, mitigate the adverse effects to, and improve" the resources downstream of the dam that are impacted by dam operations. The humpback chub and other native fish are expected to be negatively impacted by the presence and potential establishment of invasive fish that have passed through the dam into a warmer river. The action alternative in this EA would mitigate the dam operations and protect the native and federally listed fish in compliance with the GCPA. NPS understands the analysis presented in this EA illustrates the action alternative as the most efficient available tool to comply with these acts, mandates and DOI policies for protecting endangered species.

- The action alternative in this EA, including the use of bypass and flow spikes was conceptually analyzed and recommended by the SMB task force led by the USFWS last year (link to AMWG notes) and is the tool most likely to be effective at preventing the establishment of SMB below the dam by reducing breeding behaviors. Consequently, the use of this SMB EA was discussed in the Technical Work Group (TWG) SMB strategy as an important part of the response to be considered because of its expected efficiency to address the problem. Ultimately, due to the collective efforts of the management agencies involved with the TWG, we have more than three decades of data on non-native fish below the dam that indicates that warmwater non-native fish have always been present in the system in small numbers, but there has been little to no evidence of breeding of SMB until this past year when river temperatures reached levels much higher into the breeding range for warmwater non-native fish such as SMB and green sunfish (GSF). The action alternative here has been identified as the most effective way to prevent future breeding of SMB.

- For success in preventing the establishment of SMB we need to use multiple tools together (Integrated Pest Management). This is consistent with the SMB task force findings and the TWG SMB strategy document. Reclamation has the authority over dam operations and the role of NPS is limited to conducting fish control actions within our park units. The multiple tools have been referred to in TWG discussions as the "three-legged stool" of this EA for 1) modifying dam operations to include bypass cooling and spike flows, 2) escapement prevention devices, and 3) rapid response actions for removing non-native fish in breeding and aggregation areas. Rapid response actions such as mechanical or chemical means are very unlikely to be successful at preventing the establishment of SMB and other non-natives if used alone and if the river-water temperatures are highly suitable for their breeding. Trying to stop the SMB invasion with mechanical or chemical means alone would require a high level of expense and effort for most of each of multiple years. These methods would also require a great deal more taking of life of fish over many years, which is a concern for some Tribes. The action alternative would reduce the need for such large-scale fish control operations by using larger, cooler flows at the times of year they would have naturally occurred to proactively address the problem. Under the action alternative, less manual fish control operations would be necessary, and taking of life would be reduced. These actions would fulfill an important role, in conjunction with the action alternative in this EA, by removing small aggregations of non-native fish breeding in warmer backwater areas. The powerful combination of a cooler river, targeted manual fish control operations, and increased escapement prevention in the form of a barrier or nets at or near the dam would be much more likely to succeed than one tool alone.

- Many past government efforts on invasive species have shown there are large economic benefits of responding early in the invasion curve rather than trying suppression later in the invasion curve (Blaalid et al 2021). The largest subpopulation of humpback chub (over 90% of the adults in the total population) are in the Grand Canyon and may be negatively impacted by the SMB, as has happened to all the other subpopulations known in the Colorado River upstream of GCD. If this subpopulation experiences a rapid decline, it will likely affect the future trajectory and possibly the ESA status of the species as a whole. This could also lead to increased restrictions, regulations and costs for users along the Colorado River as a whole, as seen in other systems.
    - Proactive action via implementation of the action alternative described in this EA, even if the cost is in the range of $30-80M in the first year (we believe the lower end of that is more likely to be representative of the actual costs than the high end), could still be less expensive than the costs of trying to recover the species after the impacts are realized. Invasive species have cost the North American economy at least $1.26 trillion between 1960 and 2017 (Crystal-Ornelas et al. 2021). Many studies have found that investment early in an invasion is much less costly than expenditures later in the invasion (Blaalid et al 2021). A large amount of money on the scale of hundreds of millions spent by federal, state and non-governmental agencies has already been invested in the humpback chub and other endangered fish through recovery programs in the upper and lower Colorado River basins. These efforts, over the past 20 years, could be negated if the population in Grand Canyon is severely impacted by SMB.

- In the Colorado River upper basin from 1989 through 2021, recovery programs spent $209 million in capital, and were federally funded starting at $8 million per year for annual base funding, adjusted for inflation. The upper basin programs spend nearly $2 million per year on invasive species control in the rivers as well as having spent tens of millions on reservoir escapement prevention.
- In the Colorado River lower basin, the Multispecies Conservation Program (MSCP) spent more than $381 million during the first fourteen years of program implementation. This includes $28.3 million for fish augmentation; $118.5 million for research, monitoring, and adaptive management; $22.8 million for securing land and water; and $172 million for habitat development.
- Historically WAPA, through the Upper Colorado River Basin Fund, provided $20 million per year to endangered fish recovery programs and to the adaptive management program below GCD; in three of the last five years, they have not provided that funding and federal appropriations have been used instead. This is $60 million over the past five years that they have not had to spend on endangered fish protection that could be used now. Our understanding is that part of the reason the Upper Colorado River Basin Fund was established is -- to fund costs such as these to mitigate dam and power operations in the Colorado River system.
- If the action alternative is not chosen and we allow SMB breeding and establishment to occur, this would likely lead to negative impacts to the humpback chub population and would increase costs to NPS and Colorado River users as a whole.

- While NPS recognizes the economic impact of bypassing the hydropower turbines, we would also point out that there are major costs being incurred up and down the Colorado River from lower water levels brought about by climate change and overallocation. NPS has spent or is contemplating a major investment of hundreds of millions of dollars at Glen Canyon National Recreation Area and Lake Mead National Recreation Area to address recreation in the face of greatly reduced reservoir levels. We may lose amounts of that scale due to lost revenue, and our surrounding gateway communities and states may lose amounts greater than that in regional economic expenditures from lost visitation to these national park units if Lake Powell and Lake Mead elevations are allowed to continue to decline. So, while the cost of this river management action to protect resources in the Grand Canyon could be costly to WAPA, it would be happening within a context where many costs are being incurred by government agencies, other users, and land mangers along the Colorado River as a result of dropping water levels.

- Our understanding is that there are several ways to reduce costs from the use of bypass. If more SMB are not discovered in the Grand Canyon in 2023 or outyears, but only in the Lees Ferry reach in Glen Canyon, then it may be possible to use less bypass to cool only the Glen Canyon reach portion of the river. As other decisions are made on water allocations for the year, such as how much water is retained in both Lake Powell and upstream reservoirs, it's possible that temperature may not rise as much below the GCD as currently predicted, and this will decrease the need for bypass thereby decreasing costs. The action alternative has several options to choose from with differing costs, and

while we feel strongly that option B is the most efficient, the action alternative appears to allow adjustment if needed in a given year between options and could be one way to control costs, as long as Reclamation still chooses options that are efficient enough for the goal of preventing SMB establishment. Finally, our understanding is that if these operations are anticipated in power purchase contracts well in advance, then replacement power is much less expensive than if those contracts do not anticipate this action. Accordingly, there are several ways to control the costs of this action, but not taking this action is likely to cause many negative impacts to the native species below the dam.

- NPS has concerns about whether no action and action are being compared for the full range of possible Lake Powell elevations in which the dam could be operated. For instance, if the dam were operated between 3500'-3515' for an extended period of time, it is our understanding that the differences between action and no action would be greatly increased. The no action alternative would pass a large amount of non-natives into a warmer river and very likely greatly increase SMB passthrough and reproduction below the dam, greatly increasing the chances of SMB establishment. If the action alternative were chosen and Option B (the Cool Mix with Flow Spikes) was used, the river would remain below 16°C for the most part and SMB would be much less likely to establish and much less likely to impact native fish and humpback chub. If Reclamation were to choose to operate in that range of 3500'-3515' for an extended period, then NPS views the action alternative as the appropriate mitigation for that operational choice, under the GCPA. It would also be good to clarify if flow spikes can be used when operating close to 3500' or whether there is a minimum elevation above that like 3505' or 3510' at which flow spikes would no longer be able to be considered because of the temporary drop in elevation they might cause.

- Another aspect of this EA that has been noted by GCMRC researchers is that it could benefit sediment and mitigate the lack of High Flow Experiments (HFEs) in recent years and higher summer flows that may happen as a result of the Drought Response Operations Agreement (DROA) redistributions of water or the balancing decisions for the remainder of water year 2023. The DROA distributions have had positive benefits by helping to minimize the impacts of fish passthrough at the dam, but they have also had negative sediment impacts by moving more releases to the summer. The flow spikes in options B and D of the action alternative may be a way to have positive benefits for both native fish and sediment. The flow spikes can either negatively impact or positively impact sediment depending on the sediment in the channel present when they are deployed. It would be important to design the spikes in a given year to minimize negative impacts and maximize positive benefits for sediment per the GCPA. The rebuilding of beaches and sandbars affects recreation and cultural resource protection, both of which are resources that the GCPA mandates dam operations to protect, mitigate adverse effect to, or improve. Taking advice from GCMRC on the design of flow spikes to ensure they are consistent with the principles of the HFE protocol – that they have the right timing magnitude and duration to affect the non-native fish as the first priority and then secondarily that they are at the best timing magnitude and duration to maximize sediment rebuilding in sediment rich conditions or minimize sediment erosion in sediment poor conditions. The draft EA states in section 3.5.2 that flow spikes implemented after July 1

have the potential to erode sediment and limit the ability to implement an HFE following the LTEMP HFE protocol. To mitigate this impact in compliance with the GPCA, this EA should contemplate designing the first flow spike to be as large in magnitude and long in duration as possible to redistribute sediment and rebuild eroded sandbars as much as possible. This recommendation is based on the statement in Section 3.5.2 that a flow spike with the same magnitude as included in options B and D (40,000 cfs) but with longer duration (potentially up to 72 hours) has better sandbar building potential. We further recommend that subsequent flow spikes be as few and as small as are needed to achieve non-native fish reduction goals. GCMRC may be able to provide advice tailored to the specific sediment, fish and hydrology conditions of each specific year. Vegetation effects should also be monitored and taken into account as July spikes are more likely to have negative impacts by increasing shoreline vegetation density than June spikes. NPS staff believe fish concerns should take priority given the current situation and staff believe we can try to maximize sediment benefits and minimize sediment erosion within that prioritization.

- We believe more information is needed about whether the use of bypass in the action alternative may have potential effects to the water quality in Lake Mead. In the past year there was a low dissolved oxygen (DO) plume in Lake Mead that may have been caused by increased river temperatures and our understanding is that Southern Nevada Water Authority may be analyzing the effects of the action alternative in this EA and it would be beneficial to know if this action alternative would decrease the likelihood of those low DO spikes in the future. Our understanding is that the action alternative would likely provide a temporary benefit to Lake Mead's DO levels when this action was operational.

- NPS has concerns about the action alternative in terms of how many years this may be used and how the process would be implemented for choosing which options in the action alternative to employ in a given year. The EA states it may be used for up to three years, but it appears that it might be four years before another Reclamation EIS (the Post 2026 process) may be in place leaving one year without this control measure before any other compliance might be in place to address these issues. NPS has described throughout this response that to protect the largest subpopulation of the federally listed humpback chub (more than 90% of the adults in the entire population), a combination of three major tools (this action alternative to cool the river, escapement prevention devices, and rapid response efforts in 'hotspots') may be needed for several years to stop the establishment of SMB if GCD operations stay in the operating range near powerpool. If the tools in the action alternative in this EA are used for a period of years and the level of Lake Powell is able to increase above the 3550' or 3560' l within a few years and is maintained above that elevation, this tool may not be necessary again, but it is uncertain at this point, and it seems prudent to allow this tool to be available for the years preceding future EIS processes related to GCD operations.

- NPS has concerns about the action alternative in terms of how the process would work for choosing which options would be employed each year. As we stated in the scoping letter, we expected Option B: Cold Mix with Spike Flow to have high certainty of prevention of SMB establishment under most conditions. The analysis presented in this document appears to demonstrate that this will indeed be the most effective at preventing the establishment of new warmwater invasive fish below the GCD. However, we do see the advantage of allowing for consultation with GCMRC and other agency experts in a given year to determine which option may be most appropriate in that year. However, it would be important to separate out the technical determinations of which tools would be more efficient under what conditions versus policy or legal issues that may arise.

- This draft has a restriction built into the action alternative that "monthly volumes will not be adjusted specifically to implement the flow options." However, under DROA operations the last two years, monthly volumes have been adjusted resulting in more water being delivered out of the dam in some months than the 2016 Long Term Experimental and Management Plan (LTEMP) monthly pattern. This has resulted in higher levels of sediment erosion, while also having no HFEs to rebuild beaches. The LTEMP Record of Decision (ROD) has operational flexibility (in section 1.2) that allows for: *"specific adjustments to daily and monthly release volumes [...] for resource-related issues that may occur uniquely in a given year, release adjustments may be made to accommodate nonnative species removal, to assist with aerial photography, or to accommodate other resource considerations separate from experimental treatments under the LTEMP."* If we are adjusting monthly flows for other purposes that increase resource impacts, NPS does not believe we should be limiting the flexibility currently in the LTEMP when putting in place flows that could mitigate those impacts. The flow spikes under the SMB EA present both an opportunity for a way to use water being redistributed already and a mitigation for the additional erosion that is created by the DROA adjustments that were not anticipated under the LTEMP. The GCPA directs the Secretary to manage the dam in a manner to mitigate the adverse effects to downstream resources, and as adjustments are being made to monthly volumes for other purposes, it is important that this law be applied to ensure the adverse effects created by these adjustments are mitigated. We would question if the LTEMP ROD allows the flexibility to adjust monthly volumes for DROA, then why would it not be allowable to adjust monthly volumes to mitigate the fish and sediment issues caused by those other adjustments in order to mitigate as required under the GCPA? This restriction should not preclude a comprehensive adjustment that allows for larger flow spikes if it makes sense for the conditions of the year to maximize sandbar building or minimize erosion.

Thank you for the opportunity to comment on this important and expedited process. See additional specific text edits suggested in the table below in Attachment A. Please contact Rob Billerbeck, NPS Colorado River Program Coordinator, at 303-987-6789 or ob_p_billerbeck@nps.gov if you have questions on these comments or wish to discuss further.

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National Park Service Interior Regions 6, 7, & 8

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Attachment A
Specific Edits Suggested by Page and Paragraph#

Page #, Paragraph # or part of page	Existing Text	Suggested Replacement Text	Additional Comment/ Explanation or Reference
I-1, 6	As the water elevation at Lake Powell has declined, the epilimnion1 where most fish reside has become closer to the intakes for GCD. The drop 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 into the Lees Ferry reach of the Colorado River. While some level of fish mortality occurs during passage through the turbines, some fish survive.	As the water elevation at Lake Powell has declined, the epilimnion1, where most fish reside, has become closer to the intakes for GCD. The drop in water elevation means that nonnative fish in Lake Powell are now **much** more likely than in prior years to become entrained passing through the dam and into the Lees Ferry reach of the Colorado River. While some level of fish mortality occurs during passage through the turbines, **many** (25% or more [EPRI 1992]) fish survive.	Consider adding commas around 'where most fish reside,' adding 'much more' in middle sentence, and changing 'some' to 'many (25% or more [EPRI 1992])' in the last sentence
I-3, 1	Warm water temperatures below the dam amplify the risk of invasive fish establishing in the Colorado River (Dibble et al. 2021). This is a concern because smallmouth bass and other predatory fish pose a threat to federally listed fish species and other native fish downstream of GCD. To respond to the changing conditions, the Secretary of the Interior's designee directed Reclamation and the Grand Canyon Monitoring and Research Center (GCMRC) to work with the Adaptive Management Work Group to develop flow options at GCD to disrupt or prevent spawning of smallmouth bass and other invasive fish	Warm water temperatures below the dam amplify the risk of invasive fish establishing in the Colorado River (Dibble et al. 2021). This is a concern because smallmouth bass and other predatory fish pose a threat to federally listed fish species and other native fish downstream of GCD. **A small mouth bass task force led by USFWS and including agency staff and researchers, recommended the development of flow options to respond to this situation in April and May 2022 meetings of the Adaptive Management Work Group.** To respond to these changing conditions, the Secretary of the Interior's designee directed Reclamation and the Grand Canyon	Consider additions to recognize the work originated with the SMB task force (they presented this idea at the April 2022 TWG and the May 2022 AMWG) and to specify the temperatures

	species that pass through the dam. Although invasive fish, including smallmouth bass, have been detected below the dam previously, the thermal conditions in the river (that is, warmer waters) are now conducive for smallmouth bass reproduction and establishment.	Monitoring and Research Center (GCMRC) to work with the Adaptive Management Work Group to develop flow options at GCD to disrupt or prevent spawning of smallmouth bass and other invasive fish species that pass through the dam. Although invasive fish, including smallmouth bass, have been detected below the dam previously, the thermal conditions in the river **(that is, warmer waters over 16 C) are** now conducive for smallmouth bass reproduction and establishment.	
I-4	Good text and diagram	Don't change this text or diagram - it is well done and clear!	
I-5	This was enacted to "protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park (GCNP) and Glen Canyon National Recreation Area (GCNRA) were established."	**The Grand Canyon Protection Act of 1992 (Public Law 102-575) directed the Secretary of the Interior to manage Glen Canyon Dam in such a way 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."** (from https://www.usbr.gov/lc/phoenix/AZ100/1990/grand_canyon_protection_act_1992.html)	Please consider quoting it as it is quoted on USBR websites to include that **it directs the dam to be managed in such way to**... protect mitigate adverse effect to and improve...
2-1	Smallmouth bass are predatory and invasive and would likely prey upon the federally protected humpback chub and eventually impact the humpback chub population status. This alternative does not meet the project's purpose or need	Smallmouth bass are predatory and invasive and would likely prey upon the federally protected humpback chub and eventually impact the humpback chub population status. **The 2018 USFWS species status assessment for humpback chub concluded that "Predation is a major threat to the Humpback Chub in the Grand Canyon—as in the upper basin." and that "Smallmouth Bass present the highest potential impacts to Humpback Chub because**	Consider including quotes from the 2018 USFWS SSA for humpback chub (HBC) to provide background for this conclusion.

		the species can co-occur with Humpback Chub in certain canyon habitats and is a potential predator across its entire life history." (USFWS 2018). This alternative does not meet the project's purpose or need	
2-1, near bottom	Operational flow actions would occur for up to 3 years, starting in water year 2023.	Operational flow actions would occur for up to **4 years**, starting in water year 2023.	Consider allowing for the action to be applied for 4 years so there is not a gap if needed before a post 2026 ROD.
2-2 near bottom	If temperatures at the Little Colorado River are below 16°C, it is not necessary to implement the proposed action. Dam operations would allow for the emergency exception criteria to continue as needed and as outlined in the LTEMP FEIS (DOI 2016a).	If **river** temperatures at the **confluence of the** Little Colorado River **and the Colorado River** are below 16°C, it is not necessary to implement the proposed action. Dam operations would allow for the emergency exception criteria to continue as needed and as outlined in the LTEMP FEIS (DOI 2016a).	Consider added words for precision
2-2 near bottom	Monthly volumes will not be adjusted specifically to implement the flow options	Monthly volumes may be adjusted for flow options as part of an overall adjustment of monthly volumes under the DROA adjustments	NPS would propose rewording since the LTEMP ROD allows for adjustments for natural resource issues and this would be consistent with the GCPA to consider how to best protect, mitigate adverse effects to and improve resources while making adjustments
2-9	Dismissal of Flow Option E – Penstock Only Release	Add supporting material from preliminary analysis as to why this was dismissed. Also consider writing this in a way that does not preclude experimental use of a flow spike only option when the river is between 14-16° C if its use would	NPS supports the idea of dismissing this option as a stand-alone option to be used instead of cooling the

		decrease any remaining potential for SMB to spawn if still present below the dam.	river when it is above 16°C, however we believe this option may be useful in the range where the river is between 14-16°C and we are seeing SMB still present below the dam. Perhaps there is a way to allow experimental use of this option under some circumstances.
3-1, bottom	The Little Colorado River (at Colorado River RM 61) hosts the core population of humpback chub (Figure 3-1) below GCD and serves as important habitat for humpback chub, both for migrating adults for spawning and for rearing habitat for young-of-the-year.9 More recently, a population of humpback chub has been observed in the western section of Grand Canyon (approximately RM 180–280), although the dynamics of that population are not fully understood.	Consider including that the Grand Canyon population of the HBC was estimated to be 77% of the entire population of the species in the data from 2012-2015 that was summarized in the 2018 USFWS species status assessment. Recent projections presented at the 2023 annual reporting meeting suggest that Grand Canyon is over 90% of the total adults of humpback chub in the total world population. (Badame 2008; Francis et al. 2016; USFWS 2018; Hines et al. 2020; Caldwell 2021; Van Haverbeke et al. 2022, 2023)	It is important for decision makers and the public to be aware of the risk to the entire humpback chub species if SMB established and threatens the Grand Canyon subpopulation that makes up over 90% of the adults of this species.
3-3 bottom	In summer 2022, some smallmouth bass were found at the -12-mile slough (including fish <20 mm in total length), and over 250 juveniles were found throughout the Glen Canyon reach over the next few months. This large number of young fish suggests successful spawning occurred in Lees Ferry	In summer 2022, **several** smallmouth bass were found at the -12-mile slough (including fish <20 mm in total length), and over 250 juveniles were found throughout the Glen Canyon reach over the next few months. This large number of young fish suggests successful spawning occurred in Lees Ferry **when river temperatures exceeded 16°C**	Consider changing 'some' to '19' and adding 'when river temperatures exceeded 16°C' as that is an important factor.

3-5, near top	Considering the warmer dam releases due to the low elevation of Lake Powell resulting from a 20-year drought (Reclamation 2022b), the no action alternative could allow for an expanded range of invasive fish in the Colorado River below GCD.		NPS strongly agrees with this statement based on our understanding of the science.
3-5 middle	Assuming smallmouth bass and other invasive fish become established, despite management actions to prevent further distribution, it is likely that the no action alternative would detrimentally affect native species (including ESA-listed fish).	Assuming smallmouth bass and other invasive fish become established, despite management actions to prevent further distribution, it is likely that the no action alternative would detrimentally affect native species (including ESA-listed fish). **Smallmouth bass are predatory and invasive and would likely prey upon the federally protected humpback chub and eventually impact the humpback chub population status. The 2018 USFWS species status assessment for humpback chub concluded that "Predation is a major threat to the Humpback Chub in the Grand Canyon—as in the upper basin." and that "Smallmouth Bass present the highest potential impacts to Humpback Chub because the species can co-occur with Humpback Chub in certain canyon habitats and is a potential predator across its entire life history." (USFWS 2018).**	Consider adding additional information from the 2018 USFWS SSA to back up this statement
3-6, middle	Flow Option A would likely have minor effects on federally listed fish. The conditions of the flow and water temperature under this flow option would be the same as those analyzed in the LTEMP Final EIS (DOI 2016a). In addition, the flows are designed to disrupt spawning of smallmouth bass and prevent establishment. Smallmouth bass would	Flow Option A would likely have minor **direct negative** effects on federally listed fish. The conditions of the flow and water temperature under this flow option would be the same as those analyzed in the LTEMP Final EIS (DOI 2016a). In addition, the flows are designed to disrupt spawning of smallmouth bass and prevent establishment. Smallmouth bass would likely have	Might clarify with these additions to clarify effects.

	likely have a negative impact on humpback chub and other native fish.	a **large** negative impact on humpback chub and other native fish, **so flow Option A would be expected to have an indirect positive effect on federally listed fish.**	
3-7 top	Since most native fish reside below the affected area, the flow would not likely have more than minor effects.	Since most native fish reside below the affected area, the flow would not likely have more than minor **direct negative** effects.	
3-7 top	Although the cold shock in Flow Options C and D could negatively affect some native fish species, most native fish in the affected environment reside near and below the Little Colorado River confluence. This means that only the fish near the Little Colorado River confluence would be affected. Native fish species typically spawn in spring or summer, which means that cold shocks could negatively affect the survival of eggs and newly hatched larvae of native species if they spawn in the affected reach during the flow option's implementation.	Although the cold shock in Flow Options C and D **could have direct negative effects** to some native fish species, most native fish in the affected environment reside near and below the Little Colorado River confluence. This means that only the fish near the Little Colorado River confluence would be affected. Native fish species typically spawn in spring or summer, which means that cold shocks could negatively affect the survival of eggs and newly hatched larvae of native species if they spawn in the affected reach during the flow option's implementation. **There would be indirect positive benefits to native fish from Flow Options C and D by reducing SMB breeding.**	Shouldn't this paragraph also list the indirect positive benefits to native fish from reducing the SMB breeding?
3-7 middle	Rainbow trout None of the flow options would likely significantly affect adult rainbow trout population size; however, the cold shocks (Flow Options C and D) and flow spikes (Flow Options B and D) could displace young rainbow trout from shoreline habitats and increase downstream displacement (Avery et al. 2015; Korman and Campana 2009). Downstream displacement of rainbow trout could lead to increases in interactions with	Rainbow trout None of the flow options would likely significantly affect adult rainbow trout population size; however, the cold shocks (Flow Options C and D) and flow spikes (Flow Options B and D) could displace young rainbow trout from shoreline habitats and increase downstream displacement (Avery et al. 2015; Korman and Campana 2009). Downstream displacement of rainbow trout could lead to increases in interactions with other rainbow trout and humpback chub (Avery et al. 2015).	This appears to be missing the major benefit that these flows would have to rainbow trout by not allowing SMB to establish and compete and prey upon the rainbow trout.

	other rainbow trout and humpback chub (Avery et al. 2015).	**These flow options would be expected to indirectly benefit rainbow trout by inhibiting SMB establishment in Lees Ferry, thereby avoiding increased levels of competition and predation on rainbow trout.**	
3-7, middle	While colder water temperatures may negatively affect warmwater nonnative fish species, such as smallmouth bass, they may beneficially affect cold-water nonnative fish species, such as the recreational trout fishery in Lees Ferry. Flow Options C and D are meant to create a cold shock to quickly reduce water temperatures to below 13˚C. It is unclear how this change would affect rainbow trout, but reduced feeding behavior and metabolic and growth rates may be anticipated.	While colder water temperatures may negatively affect warmwater nonnative fish species, such as smallmouth bass, they may beneficially affect cold-water nonnative fish species, such as the recreational trout fishery in Lees Ferry. **Rainbow trout have reduced survival in water temperatures above 24° C and temperatures above 20°C can limit growth and survival (Benjamin et al. 2012, Brunds and Jones 1977, Rogers 2015; Korman et al., 2022). Flow Options A, B would reduce river temperatures below these levels and C and D would at least do so for shorter periods of time.** Flow options C and D options are meant to create a cold shock to quickly reduce water temperatures to below 13˚C. It is unclear how this change would affect rainbow trout, but reduced feeding behavior and metabolic and growth rates may be anticipated. **These flow options would be expected to indirectly benefit rainbow trout by inhibiting SMB establishment in Lees Ferry, thereby avoiding increased levels of competition and predation on rainbow trout.**	Again, this paragraph fails to articulate that these flows would avoid the much higher river temperatures that could negatively impact rainbow trout, thought that is mentioned elsewhere in the document.
3-12 bottom and 3-13 top	The Colorado River Management Plan (NPS 2006, Table 2 and Table 3) allows up to approximately 1,100 total yearly launches (598 commercial trips and 504 noncommercial trips). Up to 24,567 boaters could be accommodated annually if all trips were taken	The Colorado River Management Plan (NPS 2006, Table 2 and Table 3) allows up to approximately 1,100 total yearly launches (598 commercial trips and 504 noncommercial trips). Up to 24,567 boaters could be accommodated annually if all trips were taken and all were filled to capacity	Please add important information about how flow spikes might influence sandbars and beaches in the Grand Canyon and therefore

	and all were filled to capacity (NPS 2016). Historically, not all available noncommercial trips have been taken, and not all available trips have been filled to capacity.	(NPS 2016). Historically, not all available noncommercial trips have been taken, and not all available trips have been filled to capacity. **The size and capacity of campsites for river trips in Grand Canyon are heavily influenced by sediment erosion from normal operational range flows or sediment deposition from higher flows followed by aeolian transport. The flow spikes that are part of options B and D would affect sediment deposition and aeolian transport and therefore campsite availability. See section 3.5.2 for more information about how flow spikes may impact campsites for river recreation.**	camping beaches and refer to the later section where the sediment effects of flow spikes are addressed in full.
3-25, bottom	Sandbars form a fundamental element of the river landscape and are important for vegetation, riparian habitat for fish and wildlife, cultural resources, and recreation (Reclamation 1995).	Sandbars form a fundamental element of the river landscape and are important for vegetation, riparian habitat for fish and wildlife, cultural resources, and recreation (Reclamation 1995). **The size and capacity of campsites for river trips in Grand Canyon are heavily influenced by sediment erosion from normal operational range flows or sediment deposition from higher flows followed by aeolian transport.**	Please consider pointing out the important link between sediment and the capacity for camping for river trips through the Grand Canyon
3-25, bottom	Under the no action alternative, operations of GCD would not change. HFEs would occur when triggered, as described in the LTEMP Final EIS. When conducted, the HFEs would continue to contribute to sandbar building and sediment export in the Colorado River downstream of the dam. The exact impacts on sediment resources would continue to be highly dependent on water availability for	Under the no action alternative, operations of GCD would not change. **In the lower operating range of Lake Powel HFEs are not occurring when triggered and have not occurred since 2018, so beaches and sandbars are in a depleted and eroding condition as was stated at the GCMRC research and monitoring presented at the January 2023 annual review meeting. No Action would continue to contribute to the**	NPS would like to point out that HFEs have not actually been occurring when triggered since 2018, so it would be more accurate and realistic to compare to what is actually happening in these low water conditions that was not originally

	HFEs, the operational releases, and sediment input from tributaries.	**eroding conditions of the sandbars in the Colorado River downstream of the dam.**	anticipated during the LTEMP planning.
3-27, middle	If a flow spike occurs during the fall accounting period, it would reduce the amount of sand available to perform a fall HFE. This would cause a reduction in sandbar size, because HFEs are the only mechanism for providing substantial deposition of high-elevation sand bars (Hazel et al. 2022). Overall, a single flow spike released at 40,000 cfs would be the most beneficial for sediment resources	If a flow spike occurs during the fall accounting period, it would reduce the amount of sand available to perform a fall HFE. **This could be a positive or negative effect on sandbars depending on the size and duration of the flow spike and whether it occurred in a sediment enriched condition or not. This could cause a reduction in sandbar size, if a fall HFEs were possible or an increase in sandbar size if the July flow spike were to happen and a fall HFE were unlikely to happen based on other factors.** Higher flows are the only mechanism for providing substantial deposition of high-elevation sand bars (Hazel et al. 2022). Overall, a single flow spike released at 40,000 cfs would be the most beneficial for sediment resources **as long as it occurred in sediment enriched conditions.**	NPS does not think this statement is necessarily accurate as stated for the reality of what is actually occurring with current operations. If a flow spike occurred in July in a sediment enriched condition it would build sandbars, and based on what has occurred in the last 4 years, it seems a fall HFE may be very unlikely to action happen in this operating range, so a July flow spike would seem to be very likely to actually build beaches in reality versus a paper solution not likely to be implemented as a fall HFE that would not likely get approved.

3-33	Financial impacts would be directly correlated to impacts from power generation. Therefore, Flow Option B would have the most financial impacts, with an estimate firming expense of $81.2 million; Flow Option A would have the second-most financial impacts, with an estimated firming expense of $78.4 million; Flow Option C would have the least financial impacts, with an estimated firming expense of $41.0 million; and Flow Option D would have the second-least financial impacts, with an estimated firming expense of $48.6 million. If there is insufficient funding available in the Basin Fund, WAPA would not be able to secure replacement power, which could result in reduced power deliveries to customers. […] The amount of bypass needed will vary based on the elevation of Lake Powell, the inflows that can affect release temperature and the monthly outflow volumes, and whether the flows are conducted during months when alternate power is more expensive. The costs in Table 3-2 were calculated based on a single trace from the August 24-month projections and are likely an overestimate of the actual cost of implementing any of the flow actions.		As stated, the amount of bypass needed varies with reservoir elevation, but the estimates were a single trace that overestimates the amount. Our understanding is that this may be an outside edge extreme cost that is not very representative of the range of possible costs. Our understanding is that the low end may be 20% of what this high-end cost is being relayed as. We feel this is very problematic on this issue and that this should be relayed as the extreme worst-case cost, not a representative cost. There is a lot of potential change to the summer reservoir levels as we get new updates based on the increasing snowpack but also based on changes from DROA and holdback decisions.

3-33	If replacement power is required, it could put pressure on parts of the transmission system. Any replacement power must travel along the transmission system in the reverse direction of historical operations. This reversal of power along the transmission system could result in congestion and additional maintenance costs on the transmission system. The extent of impacts would correlate with the amount of replacement power purchased. WAPA's modeling shows the potential transmission congestion would increase 2 percent under Flow Option B compared to existing conditions, and 1 percent under Flow Options A, C, and D.		NPS understands that there is often more power available on the grid than is needed during the day when a lot of new solar is available. If WAPA were to contract well in advance anticipating this bypass use, we wonder if that would both lower costs and increase the reliability, versus waiting for this FONSI to be signed before planning for this contingency.
3-33 bottom, 3-34 top	Overall, the effects described above may be most likely for power consumers in the surrounding counties and states. However, effects could be felt across the Western Power Grid because GCD can supply power to this area. The effect's intensity would diminish farther from the dam. This is because while GCD is a major power supplier for the immediate surrounding counties and states, other power suppliers would have increased influence in more distant portions of the Western Power Grid.		NPS would request an estimate of the per capita costs of these increases because our understanding is that those may be very very small on a monthly basis. These should be estimated for the whole range of potential costs under the scenario where it was contracted in advance with the quarterly contracting – not just the worst-case costs stated above or adding purpose costs that were not anticipated in advance.

3-34 middle	If less hydropower generation occurs at GCD, replacement power would most likely be provided from natural gas power plants, with a smaller portion supplied by coal-fired power plants. Non-renewable replacement power sources would be associated with increased greenhouse gas emissions as compared to hydropower generation.		NPS understands that solar power is increasingly providing more peak power during the day, and would like to ask why would this not be part of the assumption for replacement power?
3-38 top	The no action alternative would not likely change regional recreation-related economic activity. There would be no change in direct and indirect employment and income in Coconino County.	The no action alternative **could impact the rainbow trout recreational fishery over time with warmer water ranges and compared to the action alternative. It could also have impacts to river recreation in Grand Canyon with loss of recreational beaches. These impacts to regional recreation-related economic activity would not be likely occur in the first 3 years; however, we expect** no change in direct and indirect employment and income in Coconino County **during the 3-year period.**	NPS is concerned that the warmer river may impact the recreational rainbow trout fishery in Lees Ferry, and that the lack of spike flows may impact recreation in the Grand Canyon and these effects do not seem to be reflected here. Since the effect of the action alternative is stated as ". This would benefit the rainbow trout fishery because water temperatures would be reduced to a range more suitable for the cold-water species" why wouldn't the negative impact of no action also be stated?
3-39 middle	Although there is considerable variation in the amount of power sold by WAPA to customer utilities, only a small portion of power sales for all eight of the largest customer utilities comes	No changes here, but point should also be made in Socioeconomics and EJ sections	NPS considers this a very important point that should be repeated in the Socioeconomics and

	from WAPA. This means that the cost of additional capacity required under the proposed action with options to replace capacity lost at GCD would have only negligible impacts on electric bills paid by residential customers of the eight largest WAPA customer utilities (DOI 2016a). […] Changes in retail electricity rates and the corresponding impacts on residential customer bills would depend on the timing and magnitude of capacity expansion; however, these changes would likely be small (DOI 2016a).		Environmental justice section so there is not a misunderstanding of the level of impact to tribal communities from this action.
3-43 top	Changes in flow could have direct, indirect, and cumulative impacts on cultural resources. Specifically, impacts could occur on historical properties that would alter the integrity of the characteristics that make the properties eligible for listing in the NRHP. The impacts considered in Glen Canyon in the LTEMP Final EIS consisted of direct impacts from changes to terraces from flow effects and on the stability of the Spencer Steamboat, indirect effects from visitors' time off the river, and cumulative effects. GCD flow effects can be seen most prominently in the reach below the dam. This is because there is less sediment in this reach to buffer the effects, and cultural resources are found close to the river below the dam (DOI 2016a, p. 4.236). In addition, visitor effects on cultural resources may occur when people camp or hike at stops during river trips; these effects are most likely in the summer	Please consider inserting text from the LTEMP regarding aeolian transport dynamics (see pages 3-39, 3-147-149 and 4-237 of the LTEMP EIS). At least this section: As discussed in LTEMP Section 3.8, research has shown that sediment within the active river channel and/or deposited by HFEs can be transported by the wind to terraces and source-bordering aeolian deposits that contain historic properties (East et al. 2016). That wind-deposited sediment can help stabilize and preserve the archaeological properties in place (East et al. 2016) and effects should state if used correctly spike flows could benefit sediment deposition to keep archeological resources that would otherwise be exposed through erosion under no action since no HFEs are occurring in this operating range under no action currently. 74% of archaeological sites in the APE for LTEMP downstream of Lees Ferry are on or within river derived sediments. The stability of these locations is linked to maintaining	The background section on cultural resources on pages 3-40-3-43 fails to articulate the dynamics of aeolian transport to keep archeological resources covered by sediment. This is a very important dynamics that preserves both known archeological sites and ones that are currently unknown because they have been buried. When exposed those irreplaceable resources are subject to degradation or vandalism. Spike flows, if used correctly could rebuild beaches and maintain

	when most people use the river for recreational purposes (see Section 3.3, Recreation).	a modern sediment supply. Current dam operations and the absence of HEFs decreases the potential for in-situ preservation.	aeolian transport to keep them covered. Under no action there are no HFEs occurring in this operating range.
3-43 middle	No Action Alternative Under the no action alternative, Reclamation would not change GCD's current operations. No new impacts on terraces in Glen Canyon, where archaeological sites are located, would occur beyond those expected from current dam operations. No change would occur from the current amount of time people spend stopped during river trips; therefore, no change would occur to the potential that these people could impact historical properties. Impacts on the Spencer Steamboat would be the same as those analyzed in the LTEMP Final EIS for the dam's current operations (DOI 2016a, p. 4.248)	No Action Alternative Under the no action alternative, Reclamation would not change GCD's current operations. No new impacts on terraces in Glen Canyon, where archaeological sites are located, would occur beyond those expected from current dam operations. No change would occur from the current amount of time people spend stopped during river trips; therefore, no change would occur to the potential that these people could impact historical properties. Impacts on the Spencer Steamboat would be the same as those analyzed in the LTEMP Final EIS for the dam's current operations (DOI 2016a, p. 4.248). **In the Grand Canyon No Action in this operating range would likely continue what is happening currently, which is a lack of HFEs. No HFEs result in the absence of sediment deposited on higher elevation sandbars, no sediment available for aeolian transport to upper terrace deposits and increased vegetation encroachment on existing aeolian deposits. 2021 classification updates document 148 archaeological sites no longer receiving aeolian sand deposition due to sandbar erosion and vegetation encroachment. The number of archaeological sites with the potential for impacts caused by exposure will continue to increase.**	Please consider adding text to reflect the current dynamics occurring in this operating range – which is there are no HFEs being used, so beaches are eroding increasing the exposure of cultural resources.

3-43 bottom	Proposed Action with Options Impacts from the proposed action with flow options would be the same, as described for the no action alternative. The proposed action consists of four possible flow options (A through D); all of these are within the range of permitted flows under the LTEMP Final EIS. Therefore, Reclamation would not anticipate additional impacts on historical properties beyond those analyzed for the LTEMP Final EIS. It is probable that the flow spikes (Options B & D) could contribute to sand bar building, which may positively impact archaeological sites within those elevations by replacing sediment lost to erosion.	Proposed Action with Options Impacts from the proposed action with flow options would be the same, as described for the no action alternative. The proposed action consists of four possible flow options (A through D); all of these are within the range of permitted flows under the LTEMP Final EIS. Therefore, Reclamation would not anticipate additional impacts on historic properties beyond those analyzed for the LTEMP Final EIS. It is probable that the flow spikes (Options B & D) could, **if adjusted in magnitude and duration for the sediment conditions,** contribute to sand bar building, which may positively impact archaeological sites within those elevations by replacing sediment lost to erosion.	Addition of a qualifier. Our understanding is that spike flows may be beneficial and in this operating range are likely the only flow that would realistically be considered that could rebuild beaches. To be beneficial it may require the advice of GCMRC for how to adjust the magnitude, duration and timing/number of these spikes to have beneficial effects on the sediment. Our understanding is that one larger/longer spike in June followed by fewer or small spikes if repeated may be a compromise between impacting the fish successfully and mitigating sediment issues. NPS staff believe the invasive fish issue should take priority at this time if there is a conflict between these two.
3-45	No Action Alternative Under the no action alternative, Reclamation would not change GCD's current operations. Tribal concerns	May need to add additional input from other Tribes here for the effect of no action on the loss of native fish.	In this Tribal Resources section, NPS is concerned that the perspectives we have heard from some

	would not be different from those described in the LTEMP Final EIS Proposed Action with Options Flow Options A and B are meant to stop spawning before it occurs, which means there would be no taking of life, but in backwater or margin habitats some mortality could occur under Option B if fish are moved off of nests. Since Flow Options C and D include a cold shock, this could result in mortality of eggs or larval fish. The tribes hold the Canyons sacred. Rather than interventions, they prefer nature to take its course regarding fish management (DOI 2016a, p. 4.257). In particular, the Pueblo of Zuni has expressed that the taking of life is an adverse impact on the TCP and is culturally offensive. Such actions have corresponding highly negative effects within the Pueblo of Zuni and, thus, have far-reaching consequences beyond the Colorado River itself. Flow Options C and D of the proposed action could result in fish mortality; Flow Option B would only result in fish mortality if fish in backwater or margin habitats were moved off of nests; and Flow Option A would deter spawning, meaning that no smallmouth bass mortality would occur as related to the flow. Any adverse effects on the contributing elements of TCPs would be mitigated through the Nonnative Fish Management Memorandum of Agreement that Reclamation is preparing.		Tribal representatives doesn't seem to be captured. We have heard that the loss of native fish from these invasive fish may also be an adverse impact and we are not seeing that represented. Also several have expressed the colder, higher flows in the spring as being more naturally timed flows that would suppress breeding of the non-native fish in a more natural way than other more management intensive alternatives. NPS does not want to presume to speak for Tribes but would ask Reclamation to ensure that the different voices from all Tribes are reflected in this section.

3-49	Therefore, Flow Options B and D would more likely result in higher rates of germination success and establishment when compared with the other options; however, widespread, dense establishment and maturation of seedlings would be unlikely	Perhaps need to reflect that this may be based on the timing of flow spikes – we would suggest followup with GCMRC researchers Emily Palmquist and Brad Butterfield about differences of the effects of flow spikes depending on whether the spikes occur in June or July and and on their magnitude and duration. We understand that the sediment recommendations are to have a larger first spike in June and smaller/short spikes after that and we would suggest followup conversations with vegetation researchers because that same pattern may mitigate some vegetation effects.	For the potential effects of flow spikes on vegetation, the NPS understands that flow spikes in June may be more favorable to native vegetation and flow spikes in July may be less favorable, but we don't see that reflected in this section. We'd ask for more input on that from GCMRC researchers and would suggest an adaptive approach to the flow spikes.
3-50	Table 3-5 Archaeological and Cultural Resources	No action – under no action in this operating range, HFEs are not likely to be implemented, resulting in beaches and sandbars continuing to erode in the Grand Canyon increasing exposure of cultural resources	NPS agrees with the evaluation of flow options, as long as spikes are optimized to benefit sediment resources but disagrees with the no action conclusion because currently no HFEs are being run in this operating range.
3-50	Table 3-5 Natural Processes Humpback Chub Other Native Fish		NPS agrees with assessment of effects as listed
3-50	Table 3-5 Recreational Experience No Action	No Action Negative—Could lead to smallmouth bass establishment below GCD, which may result in	NPS would ask you incorporate the effects discussed above about the

	Negative—Could lead to smallmouth bass establishment below GCD, which may result in smallmouth predation on rainbow trout, thus degrading the quality of recreational angling; no change to boater or camper recreational experience	smallmouth predation on rainbow trout **as well direct impacts to rainbow trout from temperature and lower dissolved oxygen**, thus degrading the quality of recreational angling; **may be some impact to river rafting and camper recreational experience from loss of beaches as a result of no HFEs.**	other likely direct impacts to rainbow trout from no action, and the effects to river rafting from no HFEs
3-50	Table 3-5 Recreational Experience Flow Options B and D [...] flow spikes may also preclude some boat types and prevent access to certain campsites, and may cause erosion at some campsites	Table 3-5 Recreational Experience Flow Options B and D [...] flow spikes may also preclude some boat types and prevent access to certain campsites, and may cause erosion at some campsites, but it is probable that the flow spikes (Options B & D) could, **if adjusted in magnitude and duration for the sediment conditions,** contribute to sand bar building.	NPS would ask that you incorporate the conclusion you make in the cultural section in 3-43 that flow spikes may have beneficial effects to sandbars and thereby may be positive for recreational river rafting and camping in the Grand Canyon
3-50	Table 3-5 Sediment – No Action	No action –under no action in this operating range, HFEs are not likely to be implemented, resulting in beaches and sandbars continuing to erode in the Grand Canyon	
3-50	Table 3-5 Sediment – Flow Option B and D Negative and Positive— Flow spikes would export sediment from Marble Canyon, which could reduce the amount available for HFEs, but would contribute to beach building in Glen Canyon	Sediment – Flow Option B and D Negative and Positive— **If flow spikes are conducted in sediment poor conditions** flow spikes would export sediment from Marble Canyon, which could reduce the amount available for HFEs **(if they were being considered in this reservoir operating range),** but **if adjusted in magnitude and duration for sediment rich**	NPS would ask that you use this language to explain why it might be positive or negative… and reflect that the current reality is that HFEs aren't happening in this operating range

		conditions, would contribute to beach building in Glen Canyon	
3-50	Table 3-5 Tribal Resources	No action – impact from the loss of native fish in the canyon from the smallmouth bass invasion	See comment above about other Tribal perspectives that may be missing regarding the impact of losing native fish in the canyon. Consider more dialogue with some Tribes to see if loss of natives is a negative impact from no action
3-50	Table 3-5 Nonnative Invasive Species	Could add positive effect of flow spikes suppressing SMB reproduction	
3-50	Table 3-5 Riparian Vegetation	Perhaps need to reflect that this may be based on timing – whether spikes occur in June or July as well as their magnitude and duration?	For the potential effects of flow spikes on vegetation, the NPS understands that flow spikes in June may be more favorable to native vegetation and flow spikes in July may be less favorable, but we don't see that reflected in this section. We'd ask for more input on that from GCMRC researchers and would suggest an adaptive approach to the flow spikes.

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RE: Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment (EA)

The Salt River Project Agricultural Improvement and Power District ("SRP") is a community based, not for profit organization, providing affordable, reliable water and power to more than two million people in Arizona. SRP has a long history of cooperation with the U.S. Bureau of Reclamation ("Reclamation") and Department of the Interior ("DOI") on a wide variety of issues, including Cooperating Agency status with Reclamation and the National Park Service ("NPS") on the Glen Canyon Dam Long Term Experimental and Management Plan ("LTEMP") Environmental Impact Statement ("EIS"). SRP holds a Colorado River Storage Project hydropower allocation and an exchange agreement with Western Area Power Administration ("WAPA") that relies on sufficient generation at Glen Canyon Dam ("GCD") to facilitate the energy transfer.

SRP acknowledges the importance of protected species and recognizes the risks associated with smallmouth bass ("SMB") proliferation in the river reaches below Lees Ferry. However, SRP has several significant concerns about all of the flow options proposed in the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment ("EA"). Most notably, SRP relies on GCD hydropower and other resources in its portfolio to provide reliable electric service to over 2 million customers in the Phoenix area, and the proposed flow options create a significant risk that SRP may not be able to continue to fulfill that obligation.

Subject matter experts within SRP have reviewed the EA and respectfully submit the following comments:

A) In riverine environments, SMB typically spawn in off-channel waters (e.g., backwaters and sloughs) where little, if any, flow exists. As observed in the Lees Ferry reach below GCD, these waters are notably higher in temperature than the main channel. The alternatives outlined in this EA that utilize steady "bypass flows" to decrease riverine temperatures below 16 degrees Celsius may not sufficiently affect temperatures in these off-channel waters to preclude SMB spawning, as warmer aquatic refugia will

almost always be available. Of the four proposed thermal treatments, cold shock-related flow options (Flow Options C and D) appear to be most likely to accomplish the stated Purpose and Need. Combined with the flow spikes utilized in Option D, that alternative would be more likely to disrupt warmer off-channel waters by creating more opportunities for mixing. Options C and D have less impact on total hydropower production than Options A and B, consistent with the hydropower LTEMP Resource Goal, but SRP has concerns that all of the proposed flow options could have an impact on the power production at times when the power is needed the most; i.e., at times of peak electricity demand.

B) One of the most significant impacts of the EA's proposed options is reduced hydropower generation. SRP is particularly concerned about short-term reliability impacts associated with unavailability of capacity, whether due to GCD generators being unavailable or due to increased demand on regional markets for summer peaking power. While GCD generation may be available for regional emergency utilization, its expected absence on a forward-looking basis changes the dynamics of the regional power markets and may challenge the ability of SRP or others in the region to procure adequate capacity for emergency system needs. GCD's unavailability would further compound regional challenges in maintaining reliability, with an increased potential for rolling blackouts if remaining regional capacity is insufficient.

C) GCD hydropower is a unique and critical part of SRP's power portfolio. In addition to the Federal Preference Power Contracts, SRP holds an exchange agreement with WAPA that allows Colorado generation to be delivered to Arizona via GCD output. SRP depends on the execution of this exchange to meet summer peak capacity, which drives SRP resource needs. There is a significant risk that these resources could become stranded in Colorado, resulting in significant reliability and financial risks to SRP. While a power emergency may allow for full availability of GCD generation, it may not allow SRP to recover the capacity provided by these Colorado resources.

Additionally, SRP plans its load and generation five years in advance—the current iteration of which includes GCD hydropower. To implement a change as impactful to hydropower generation as those proposed in the EA less than three months before summer season would result in a significant risk that SRP may not have sufficient resources to meet reliability needs.

D) While SRP's time of use pricing programs and customer demand response programs have proven more effective on weekdays, its service area has demonstrated a possibility of high electric system demands on weekend afternoons. Over the past decade, three of SRP's last ten system peaks have occurred on summer weekend afternoons. Flexibility around scheduled days of hydrogeneration unavailability could benefit regional reliability as well as the economic value of limited GCD hydrogeneration.

E) SRP's power generation resource needs are increasing in the coming years, driven by projected continued significant growth in its service territory and commitments to retiring coal generation facilities. In addition, the western power grid lacks surplus capacity due to resource retirements and delays in replacement resources created by supply chain and other challenges. As a result, SRP will not be able to count on the market to provide the capacity that is needed in the coming year. The scarcity of capacity has been validated by third party studies, including a recent study of the Desert Southwest by E3, an independent environmental and economic consulting firm. [1] E3 found that "*load growth and resource retirements are creating a significant and urgent need for new resources in the Southwest region; maintaining regional reliability will hinge on whether utilities can add new resources quickly enough to meet this growing demand and will require a pace of development largely unprecedented for the region*." E3 also found that *"[e]xisting and committed resources alone will be insufficient to meet the region's reliability needs. Filling this gap will require close to 4,000 MW of new effective capacity by 2025…*." For these reasons, SRP has made deliberate efforts to not rely on short-term purchases to cover resource needs and counts on GCD hydropower resources in its near-term planning. The E3 study included an exploration of drought impacts on reliability related to Colorado River Generation. As the report concludes, "*Utilities in the region who rely on these resources for a share of their capacity needs should plan proactively for the full range of future outcomes, lest they be caught unprepared and without recourse to cure a deficiency caused by drought conditions. Utilities that do not rely on these resources to meet their needs may not be impacted as directly; however, hydro resource availability will have impacts on wholesale markets, and critical conditions could reduce these utilities' opportunities for short-term transactions that may be needed in real-time operations to maintain reliability.*" While SRP has taken steps to plan for unavailability in future years based on hydrologic conditions, SRP does not have near-term solutions to replace GCD's capacity for near-term proposed policies. If GCD is not generating power during peak summer months at critical hours in a region that is already without surplus capacity, SRP does not anticipate replacement power to be available for purchase during those times. The PLEXOS model referenced in the EA assumes free exchange and allows dispatch of any amount on any transmission path; the model does not include assumptions for unexpected outages, operation and capacity margins, or summer peak conditions.

F) As stated in the EA, entities that receive GCD generation allocations will be required to source replacement power under all four proposed scenarios. This resource loss will occur during peak demand periods for Arizona, during which replacement power is often difficult to source and cost-intensive to purchase. While this EA proposes much of this replacement power "may be wind [or] solar" (pg. 3-32), it subsequently acknowledges that it would most likely come from natural gas or similarly emitting resources via unspecified market purchase. Thus, the loss of GCD as a carbon-free

[1] https://www.ethree.com/wp-content/uploads/2022/02/E3_SW_Resource_Adequacy_Final_Report_FINAL.pdf

power resource will most likely result in increases of regional greenhouse gas emissions across many GCD customers. The EA should give additional serious consideration to these elevated emission and economic impacts in each of the proposed scenarios.

G) The EA notes that the 2007 Interim Guidelines ("2007 Guidelines") govern GCD annual releases, and the LTEMP operates within those guidelines and underlying authorities. However, the ongoing Supplemental Environmental Impact Statement (SEIS) process could significantly alter operations under the 2007 Guidelines, including annual release volumes and other GCD operational adjustments during the flow implementation period. While this EA acknowledges that sub-annual releases must be consistent with the outcome of the SEIS and will not result in a cumulative impact to water resources, it does not reflect the potential for cumulative impacts to hydropower resources. This EA cannot fully assess potential impacts of the proposed flow options to the hydropower LTEMP Resource Goal until more information is available in the SEIS process. In addition to the timing challenges noted above for managing reliability of power supplies with the shortened timeframe proposed in this EA, the full impacts of the Proposed Action cannot yet be fully quantified, which further exacerbates any reliability concerns.

SRP appreciates the opportunity to provide comments on the proposed EA. SRP believes the analysis in the proposed EA is not sufficient to adequately analyze the impacts to the human environment as described above, in particular the impacts to the hydropower resources and associated socioeconomic impacts. SRP would look forward to the opportunity to work with Reclamation and other stakeholders to develop alternate approaches to mitigate impacts on hydropower from GCD, given its critical role in maintaining the reliability of the western grid. If you have any questions regarding these comments, we are available to discuss them at your convenience.

Sincerely,

Bobby Olsen
Sr. Director Corporate Planning, Environmental Services, & Innovation

UPPER COLORADO
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March 10, 2023

Sarah Bucklin
Regional NEPA Coordinator
U.S. Bureau of Reclamation, Upper Colorado Basin
Region 125 South State Street, Suite 8100
Salt Lake City, UT
84138

VIA ELECTRONIC MAIL
sbucklin@usbr.gov

RE: Upper Colorado River Commission Technical Comments to the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment

On February 24, 2023, the Bureau of Reclamation (Reclamation) released and announced its intent to seek public comment on the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment (EA).

The Upper Division States' technical representatives through the Upper Colorado River Commission (UCRC), appreciate the opportunity to submit these comments to the Bureau of Reclamation's Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment (EA) in support of, and in addition to, the comments submitted by the Basin States.

In light of the nature of the issue and short time frame that some Glen Canyon Dam Adaptive Management Program members have previously identified as too short for them to route comments through their internal processes and submit, we would also appreciate Reclamation considering additional comments received outside of the 14-day comment window.

Purpose and Need

Analysis of Flow Option E

The Draft EA states "[t]he proposed action's Purpose and Need are to prevent the establishment of smallmouth bass below the GCD." The Draft EA further states the goal of all flow options is to "disrupt smallmouth bass spawning." The Draft EA concludes that Flow Option E does not meet the Purpose and Need and therefore does not provide any analysis for Option E. While Flow Options A through D primarily focus on reducing or preventing spawning through lowering stream temperatures below Glen Canyon Dam (GCD), all Flow Options, A through E, focus on disrupting smallmouth bass spawning.

The EA provides that Flow Option E *would disturb* spawning and rearing, drive male smallmouth bass off nests, and result in high mortality of offspring. The language reflects that Flow Option E meets the Purpose and Need of the EA and the stated goal of the flow options and therefore should be retained as an option in the Proposed Action Considering the potential three-year life span of the actions proposed in the EA, there is an extensive amount of time to learn from these actions. Flexibility should be retained in the EA in the event that future data or analyses prove one alternative is less or more effective than previously understood.

Flow Option E is the only flow option that does not require use of the bypass tubes. If, in the future, some or all of the bypass tubes are unavailable for use, the ability to implement Flow Option E may be critical to help prevent the establishment of smallmouth bass below GCD. Additionally, Flow Option E will minimize impacts to hydropower generation, grid stability, the Upper Colorado River Basin Fund (Basin Fund) and, importantly, disadvantaged and Tribal communities that are recipients of hydropower. Flow Option E warrants further consideration and may provide beneficial information regarding important tradeoffs and impacts for all flow options.

Nonnative Fish Strategic Plan

As described in the Nonnative Fish Strategic Plan adopted by the Adaptive Management Work Group (AMWG) in February 2023, prevention of establishment of smallmouth bass below the GCD cannot be achieved solely through flow manipulation. Other actions including installation of fish exclusion device(s), detection efforts, and rapid response are critical to preventing smallmouth bass establishment and must be implemented as expeditiously as possible.

Target Temperature – Lower Colorado River:

The Upper Division States, through the UCRC, strongly encourage Reclamation to provide additional information and clarifying text regarding the choice of 16 °C at the confluence with the Lower Colorado River as the target temperature, given that the following information in the EA appears inconsistent with that decision:

- Recognition that the desired temperature will not be achievable at the Lower Colorado River confluence under some conditions.
- Recognition that "[e]ven if it is not possible to achieve a temperature of 13°C, the flow would likely disrupt spawning even though data from the Yampa and Green Rivers suggests that smallmouth bass can continue to spawn when temperatures drop to 13.9°C (Bestgen and Hill 2016)."
- Recognition that "since smallmouth bass were detected in the Glen Canyon reach in 2022, no smallmouth bass have been detected below RM 0. This means that even if it is only possible to change the temperature down to RM 45, implementation of the flows would still be effective at preventing spawning of smallmouth bass."

Proposed Action Alternative: Flow Options

All flow options must be consistent with the Colorado River Storage Project Act (CRSPA) of 1956 and the Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs (LROC) of 1970. At a minimum, such approaches should be premised on the shared understanding that such flows continue to be experimental only, and that data from the experiments will be collected, analyzed, and compared to the impacts of other experiments

implemented as part of the Glen Canyon Adaptive Management Program or associate management activities.

To ensure sufficient information is included in the EA regarding flow options, we recommend the following:

1. Process: The decision-making process for implementing, switching or cessation of options should follow the same communication and consultation processes that have been developed according to Section 1.4 of the Long-Term Experimental and Management Plan Record of Decision. Reclamation should provide sufficient parameters on when to commence that process, as well as provide at least a 30-day notice to the representatives prior to initiating implementation of any alternative(s) decided under that process.
2. Monitoring, Criteria, Effectiveness, Offramps, Futility: Identify the metrics that will be monitored to determine effectiveness in all years, offramps for emergency exception criteria including replacement power being unavailable, and futility of the operational alternative. There is little discussion and no criteria provided in the EA for timely determination as to whether flow options may be futile given certain conditions, such as temperatures and elevations in Lake Powell. The EA should describe the circumstances under which Reclamation might switch to another flow option to match changing conditions or when and whether an offramp is implemented.
3. Spike Flows: Provide data to support the implementation of spike flows. There is no data provided on smallmouth bass movement in response to flow spikes or cold-water releases in regulated rivers. Moreover, there may be negative impacts to other resources, such as sediment, with the implementation of successive spike flows, as discussed in Section 3.5.2 of the EA.
4. Effect on Entrainment: Provide information regarding possible entrainment through the bypass tubes. The purpose of the proposed flow options is to prevent smallmouth bass establishment below GCD. The EA does not discuss the potential and likelihood for entrainment of smallmouth bass through the bypass tubes, or the survival probability of smallmouth bass entrained through the bypass tubes.
5. Technical Analysis, Table 3-2: Provide additional cost information based on a hydrological range rather than relying on a single trace from the August 24-month projections. Clarify the relationship between potential 5-month impacts to power generation and firming expenses for each flow option and the proposal to use Flow Options C and D for a maximum of 12 weeks.

Impact Analyses and Technical Support:

The Upper Division States, through the UCRC, strongly encourage Reclamation to provide additional explanation in the text of the EA regarding the analyses conducted on the economic impacts and effectiveness of preventing establishment of smallmouth bass, and to provide supporting technical documents as appendices.

The EA would be greatly strengthened with the inclusion of the following information:

- Additional information regarding cumulative impacts for the possible implementation timeframe of up to 3 years.

- Additional description of the purpose, uses, and importance of the Basin Fund and a description of impacts to the Basin Fund from the Proposed Action in light of the already reduced hydropower revenues due to the ongoing drought.
- Additional information regarding the possibility of a Cost Recovery Charge.
- Expansion of the socio-economic impacts analysis beyond Coconino County residents to adequately include :
- Impacts to all hydropower customers, customers of the Western Power Grid and, importantly, Tribal CRSP hydropower customers facing energy shortages.
- Impacts to rural electric utility and Native American hydropower users from a reduction in hydropower generation and subsequent need to purchase more costly replacement power, and the possible consequences of "reduced power deliveries to customers" if sufficient affordable replacement power is not available.
- Acknowledgement that if replacement power includes non-renewable energy sources, greenhouse gas emissions will increase.

We strongly encourage Reclamation to consider mitigation that could be undertaken to avoid significant impacts so that a mitigated Finding of No Significant Impact (FONSI)[11] might be issued within the necessary timeframe to complete this NEPA process. Timely completion of the NEPA process is necessary to implement flow options to help prevent establishment of smallmouth bass below GCD.

RESERVATION OF RIGHTS

These comments from the Upper Division States, through the UCRC, are intended to highlight overarching issues that will require acknowledgment, specification, or clarification as the EA process continues to progress. Failure to provide specific comments regarding details of the EA shall not be construed as an admission with respect to any factual or legal issue or the waiver of rights for the purposes of any future legal, administrative, or other proceeding. Furthermore, the Upper Division States, through the UCRC, reserve the right to comment further on any EA documentation during this NEPA process.

We look forward to additional coordination and consultation with Reclamation throughout this NEPA process.

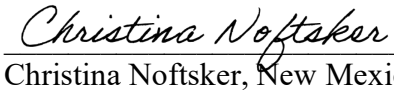
Sincerely,

[Signatures on next page]

[1] Final Guidance for Federal Department and Agencies on the Appropriate Use of Mitigation and Monitoring to Clarify the Appropriate Use of Mitigated Findings of No Significant Impact, 76 Fed. Reg. 3843, 3846 (Jan. 21, 2011).

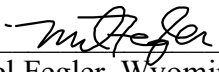
Signatures:

Michelle Garrison, Colorado TWG Representative



Christina Noftsker, New Mexico TWG Representative

Scott McGettigan, Utah TWG Representative



Mel Fegler, Wyoming TWG Representative

Sara Larsen, UCRC

Cc:
Wayne Pullan, Regional Director, Upper Colorado Regional Office, Reclamation
Kathleen Callister, Manager, Upper Colorado Regional Office, Reclamation
Bill Stewart, Upper Colorado Regional Office
Seth Shanahan, Nevada TWG Rep and TWG Chair

March 10, 2023

Sarah Bucklin
Regional Environmental Coordinator
Bureau of Reclamation
125 South State Street, Room 8100
Salt Lake City, Utah 84138-1147
gcd_smb_ea@usbr.gov

Re: Glen Canyon Dam/Smallmouth Bass Flow Options Environmental Assessment

Dear Ms. Bucklin:

Summary:

Thank you for the opportunity to provide comments on the Glen Canyon Dam/Smallmouth Bass Flow Options Environmental Assessment (EA). UAMPS supports those comments filed by Colorado River Energy Distributors Association (CREDA). We feel that the EA does not provide sufficient analysis into the financial impact of bypassing hydropower production for those UAMPS members with firm electric services (FES) contracts and find that the EA cannot be the basis for a finding of no significant impact (FONSI).

About UAMPS:

UAMPS is a political subdivision of the State of Utah headquartered in Salt Lake City, whose membership consists of 50 municipal and other community-owned electric utilities located in seven western states 37 of which are located in Utah. UAMPS is a joint action agency (JAA); a JAA is an entity formed to provide services, including the sale of wholesale power, to member public power utilities (and, in some instances, electric cooperative utilities). Most UAMPS members own and operate a local electric utility system that provides integrated retail electric service to residential, commercial, and industrial customers. UAMPS partners with its members to ensure that electricity is affordable and reliable.

UAMPS currently manages 17 separate projects that provide power supply, transmission, and other services to participating members. In addition to owning interests in or directly operating power plants and other sources of electrical power, UAMPS and its members regularly purchase power off the grid, and are, therefore, sensitive to market and regulatory forces that impact electricity affordability and reliability.

UAMPS' interest in the EA:

Western Area Power Administration (WAPA) is one of the country's four power marking administrations ("PMAs") in the United States that sells wholesale power to public customers, such as municipally owned utilities, irrigation districts, and electric cooperatives which then resell the power to end-use consumers in the retail market. While Congress found there to be multiple purposes of providing preference power, one is to directly benefit the public through nonprofit entities like UAMPS members. The hydroelectric plants were constructed, and continue to be owned and operated, by the U.S. Army Corps of Engineers and Interior's Bureau of Reclamation (BOR).

In today's energy market, with rapidly declining capacity generation, rising inflation, and interest costs, developing replacement capacity resources like the energy generated on the Colorado River is incredibly difficult. Further, as nonprofit entities, retail customers of UAMPS members absorb the higher costs of energy.

UAMPS supports CREDA's comment:

As entities representing preference customers throughout the State of Utah, UAMPS supports the comments submitted by the Colorado River Energy Distributors Association (CREDA). In particular, UAMPS joins CREDA's comments addressing the following three issues in particular:

1. The impact of the proposed action to the human environment will be significant and cannot be supported by the EA and FONSI. There will certainly be a cost to ratepayers in replacement power costs. Additionally, it is very likely that most replacement power will not be carbon-free and exacerbate the impacts of a warming climate.
2. The analysis in the EA is inadequate in its analysis of the proposed action. There is no analysis of replacement power costs or under the affordability of replacement power costs. In particular, there is no discussion of potential no-flow alternatives and consistent with the National Environmental Policy Act (NEPA) the cumulative impact of the Action should be disclosed.
3. The EA fails to acknowledge how the impacts of the Action will be inconsistent with the "beneficiary pays" construct that has been the cornerstone of Reclamation law.[1]

Sincerely,

Mike Squires
Government Affairs Director
UAMPS

[1] James, Leslie, Executive Director CREDA, comment letter re: Glen Canyon Dam/Smallmouth Bass Flow Options Environmental Assessment (March 10, 2023).

Via email address: gcd_smb_ea@usbr.gov

March 10, 2023

Secretary Haaland
Department of the Interior
1849 C Street NW
Washington DC 20240

Sarah Bucklin
Regional NEPA Coordinator
US Bureau of Reclamation, Upper Colorado Basin Region
125 South State Street, Room 8100
Salt Lake City, UT 84138
sbucklin@usbr.gov

Subject: **Grand Canyon Dam/Small Mouth Bass Flow Options Draft Environmental Assessment (EA)**

Dear Secretary Haaland:

On behalf of Utah Municipal Power Agency (UMPA), we submit the following comments in response to the Draft Environmental Assessment (EA).

UMPA represents six Utah cities[1] receiving power and energy from contracts to the Colorado River Storage Project (CRSP) federal hydropower system. UMPA is a non-profit joint action agency with the obligation to provide electricity to these six cities and manage the CRSP contract for federal hydropower. The contract for federal power is a major energy source for UMPA's member cities, supplying about 25% of its overall requirements in 2020. Impacts from the drought have resulted in reducing our federal allocation by 40%, raising contract energy costs by 14%, and causing us to purchase replacement power in the energy market at higher prices and from gas fired sources. In 2022, UMPA's wholesale rates were increased by $5.2 million, or about 11% increase caused from drought conditions. This impact along with other inflationary costs, supply chain challenges, and higher natural gas pricing are placing a strain on our ability to deliver reliable and affordable electricity to the customers.

UMPA's federal power is relatively minor compared to the more than 5 million customers across the regional states receiving federal power from CRSP. However, Glen Canyon Dam (GCD) and the federal facilities are major contributors to providing customers with clean, renewable (carbon-free) power to maintain the reliability of the grid and offer an affordable price

[1] UMPA member cities are Provo, Spanish Fork, Salem, Nephi, Levan, and Manti. These cities provide electrical service to over 57,000 residential and business customers.

to the consumers. Simply stated, any reduction in federal power from GCD compromises the integrity of the grid system and raises rates for our consumers.

EA's Lack of Addressing Hydropower Resources.

The EA fails to adequately address the impacts to hydropower customers. On page 3-29, there is a focus on the eight largest customers of WAPA with a statement that "to replace capacity lost at GCD would have only negligible impacts on electric bills paid by residential customers of the eight largest WAPA customer utilities." However, there is no further analysis offered in the EA in researching the impacts on the remaining customers of WAPA. How can the EA make a statement that impacts to residential customer bills would likely be small with providing an assessment to support that finding? The basin fund cannot support the cost for the replacement power impacted by the proposed flow options. The results will be passed on to the customers of WAPA. Many municipalities, rural co-operatives and tribes are not included in the big eight and the EA does the consumer a disservice by not fully examining the impacts. It appears that there is an effort to present a desired outcome without examining the complete picture.

On page 3-50 , in Table 3-5: Summary of Anticipated Effects on LTEMP Resource Goals, there is an error in the summary of anticipated effects on resource goals. Under the resource titled "Hydropower and Energy", all four proposed action flow options fail to address the obvious obligation for replacement power purchases by grossly understating it. The statement "would reduce hydropower generation and load following capacity, and would likely increase the need for replacement power" needs to be revised. In Table 3-2, page 3-32, the flow option impacts are provided resulting in millions of dollars for replacement power. This is inconsistent.

The drought has already impacted CRSP customers causing them to enter the energy market to replace power not supplied by WAPA. Selecting any of the flow options would cause WAPA to enter into the energy market to replace the lost power. Customers will then be competing with WAPA as a buyer in the markets. Prices will increase for all utilities in the market from the constraint of energy supplies, transmission path congestion and fuel conditions. The EA has not considered the added operational constraints in the already competitive energy market.

Cost estimates for replacement power in the EA are simply estimates and may not reflect all of the contributing factors in energy supply. We are concerned that these WAPA estimates may be low and undervalue the real impact in the market. WAPA's estimates should be further scrutinized by others knowledgeable in the market structures to ensure proper assessment of the impacts.

GCD is a major power source of power on the transmission grid system and offers spinning reserves and other emergency supporting services. With the rapid retirement of the coal fired base load and dispatchable facilities in the west and by adding intermittent renewable sources, the grid become more unstable and subject to disruptions and quality of service. Reducing any generation from GDC will add to this already compromised grid system. The EA should consider examining the impacts to the stability of the grid and the significant role of GCD.

The replacement power will not be clean, green, carbon-free, and renewable as a substitute for hydropower generation. If power utilities already have solar and wind, these renewable sources are already economically dispatched in conjunction with CRSP power before any carbon fueled generation is operated. The EA has not addressed impacts to climate change caused by the additional coal and natural gas resources that will be called upon to replace the reduced hydro power. How can we ignore the concerns of air quality and greenhouse gases over the fishery?

The impact to the "Basin Fund" managed by WAPA has not been adequately addressed in the EA. Failure to identify the funding for purchasing the replacement power required to offset the impact of the flow options is lacking in the EA. Protecting the endangered fishery below GCD is in the best interest of all the parties. However, placing the burden for funding these experimental fish flow options on the backs of the power customers is unfair. The power customer did not introduce the small mouth bass, a non-native fish, into Lake Powell. No one expected the low elevation and entrainment of fish caused by the drought. The federal agencies should seek federal funding or use their federal budgets to address this matter if the decision to proceed with by-pass flow happens. The EA should examine the beneficiary use and pay structure of GCD caused by the impacts of the drought. There are several beneficial uses with GCD not being recovered through an appropriate pay structure.

Three years is a long time for this experimental flow along with the costly replacement power. Reclamation should immediately begin the work on a barrier device in the forebay as discussed for the long-term solution to this challenge. The EA is deficient by only focusing on using mixing of flows using the bypass tubes to address the small mouth bass matter and did not seriously examine other options.

As a member of CREDA, we support those comments filed by CREDA. We ask that those detailed comments from CREDA supplement these comments.

We recognize the challenge for Reclamation in balancing the complex issues related to operating the dam. However, we believe the interest of the hydropower resource has not adequately been addressed in the EA. For these reasons presented above, we urge Reclamation to not implement any of the proposed bypass flow actions in the EA.

Respectfully,

Kevin Garlick

Kevin Garlick,
UMPA – SVP Generation
AMWG Member

C: Leslie James, CREDA

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

March 10, 2023

SENT ELECTRONICALLY

Ms. Sarah Bucklin
Regional Environmental Coordinator
Compliance and Water Resources, UC-443
125 State Street
Salt Lake City, UT 84138
sbucklin@usbr.gov

Dear Ms. Bucklin:

The Western Area Power Administration (WAPA), Colorado River Storage Project (CRSP) Management Center, provides the following comments on the draft Environmental Assessment (EA) for Glen Canyon Dam/Smallmouth Bass Flow Options in response to warmwater invasives for your consideration. 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.

It is difficult for WAPA to adequately comment on this action due to the unprecedented scope of the potential impacts and the short time to evaluate them. Although our initial assessment of the annual cost of the experiment ranges from about $40-80 million in hydropower firming costs, the impacts could be much larger as prices are incredibly volatile during the summer months. Any attempt to quantify actual firming costs is at best challenging. As the experiment is proposed for 3 years, hydrology and energy prices could fluctuate significantly.

The scope of this experiment, and its potential impacts, far exceed any prior experiment executed or envisioned as part of the 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 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 executing 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.

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 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 this experiment. 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 operations and maintenance expense to be recovered through WAPA's cost-based power rates. Reclamation should consider the experiment proposed in this EA as a non-reimbursable expense under the Grand Canyon Protection Act.

By bypassing the electrical generators at Glen Canyon Dam, the experiment will reduce hydropower generation. Accordingly, WAPA will be required to purchase replacement power to fulfill its contractual obligations to customers. The draft EA incorrectly states 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 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 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 also carry longer 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, discussed further below, that would modify or terminate the experiment if the Basin Fund balance falls below $70 million or reaches a level otherwise insufficient to fund project needs. Based on the financial impacts identified in the EA, this could happen as early as summer 2023, and a balance reduction of this magnitude would be likely in 2024 and 2025 if the experiment continues through to 2025.

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 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.

In the event of an electrical emergency, as could result from insufficient generation on the electrical system to meet demand causing citizens to lose power through blackouts and brownouts, WAPA will request that Reclamation modify the experiment for the duration of the

emergency. If it becomes evident that this experiment is contributing to increased instances of electrical emergencies, WAPA will ask that Reclamation suspend the experiment.

As noted in the hydropower impact summary in the EA, the modelers at the National Renewable Energy Laboratory (NREL), using the PLEXOS model, projected that replacement power would generally be available for this experiment. However, the PLEXOS model assumes free exchange of power within the Western Electricity Coordinating Council (WECC) footprint. Thus, if additional generation exists in the model, and a transmission path is available, the model will dispatch the energy to meet demand without regard to generator ownership or contractual obligations. The PLEXOS model also assumes all utilities in the market have situational awareness and perfect foreknowledge. This model is an approximation, and in many ways does not reflect the reality of WAPA's transactions to secure replacement power.

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 10s 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 purchase the amount of power needed (100's of megawatts per hour) to offset the impact of the experiment. WAPA's established trading partners have indicated they may be unable or unwilling to offer excess power during projected scarcity events in the coming summer.

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. It could also increase the likelihood of scarcity events on the power grid and contribute to power emergencies. The EA does not address these potential impacts.

WAPA Requires Six 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 water releases. Under each of the proposed flow options, WAPA will be required to purchase substantial amounts of power and possibly transmission before the experiment is implemented to meet its obligations. 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 six weeks to arrange the purchases necessary for any flow option. This will require determining bypass volumes at least six 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.

The Impacts Analysis Does Not Include the Entire Compliance Window

The analysis of impacts on hydroelectric power generation is incomplete, as it only addresses the first year (i.e., 2023) of the proposed 3-year experiment (i.e., 2023-2025). The analysis should include the entire period of the experiment in order to adequately assess and disclose the multi-year impacts to power operations, power generation, and the Basin Fund. For example, assuming the most probable annual cost to hydropower identified in the EA, a $50 million replacement power cost in 2023, the Basin Fund might be able to provide the necessary funding for the financial impacts in FY2023, though still potentially incurring significant impacts and risks to the CRSP system identified above. If the experiment is implemented again in 2024 and 2025, assuming another $50 million expense each year, the Basin Fund would simply not have sufficient funds to cover the additional expense and fund project costs.

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 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 Will Increase Energy Prices at Exchange Nodes and Ultimately Costs to Consumers

Based on the PLEXOS model runs for June to October 2023, the reduction of electrical power production caused by the experiment will 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 2024 and 2025.

Forecasted Locational Marginal Price Impacts ($/MWh) in the Western Electric Coordinating Council (WECC) Footprint with implementation of the Experiment when compared to the No Action.

	Option A	Option B	Option C	Option D
June	-0.48*	1.80	-1.11	4.16
July	7.68	8.15	-1.98	1.34
August	9.43	9.43	3.38	3.38
September	6.11	6.11	9.22	9.22
October	0.76	0.76	-2.38	-2.38
Average	4.70	5.25	1.43	3.14

*Note that there are negative LMP differences in some months for Options A, C & D. These negative numbers indicate that, compared to the baseline case, the PLEXOS model was able to dispatch generators to meet WECC electrical demand in a way that resulted in a lower cost.

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. WAPA provided a summary of this to Reclamation, but it was not included in the EA. Reclamation should fully evaluate economic impacts of the change of energy prices.

The Draft EA Should Include Option E – Penstock Only Release

The EA states on page 2-9 that Option E is likely to "disturb smallmouth bass spawning and rearing…" and "…cause males to abandon nests, resulting in high mortality of offspring." Based on this statement, it appears this option would help prevent smallmouth bass becoming established in the section of river between Glen Canyon Dam and the Little Colorado River. Additionally, because flow fluctuations are transmitted all the way through the Grand Canyon to Lake Mead, it seems this alternative could be more effective at preventing establishment in the Grand Canyon as a whole, and particularly below the Little Colorado River, than the experiment of relying on temperature control. Using flows to control smallmouth bass is supported by Bestgen and Hill (2016). Their research on the Green River showed smallmouth bass reproduction was delayed for up to 2 weeks past reaching 16 degrees C, apparently because of the flow effects from releases at Flaming Gorge Dam.

The EA states that Reclamation excluded Option E because "it does not meet the project's purpose and need of preventing establishment of smallmouth bass below Glen Canyon Dam." The Purpose and Need for this EA is very specific, stating that flow options are those that will "*prevent* the establishment of smallmouth bass." The Purpose and Need does not align with the Secretary's Designee's guidance from May 2022 which directed Reclamation and Grand Canyon Monitoring and Research Center (GCMRC) to work with the TWG to "…develop two to four operational alternatives that could *help prevent* cool- and warmwater invasive fish establishment, while minimizing potential adverse effects to other resources."

WAPA presumes Option E was excluded because it would not provide cooler release temperatures and therefore would not completely prevent spawning below Glen Canyon Dam. However, the temperature target of 16 degrees C at the Little Colorado River appears unlikely to *completely prevent* smallmouth bass spawning in the project area or protect humpback chub and razorback sucker from smallmouth bass establishment in western Grand Canyon (see following section on temperature).

Initial modeling of Option E indicated it may be neutral to slightly beneficial to hydropower power production depending on how it was implemented. Additionally, it would be much easier to operationally implement when compared to the flow options evaluated in the EA. Accordingly, WAPA would encourage Reclamation to further evaluate Option E as an alternative for controlling smallmouth bass below Glen Canyon Dam.

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

The metric of preventing establishment is not well defined in the EA, but the EA appears 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 states 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)." The Habitat Suitability Index models for smallmouth bass developed by the USFWS supports this observation by stating "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 goal of not higher than 16 degrees C at the Little Colorado River would require a release temperature from Glen Canyon Dam below 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 is unlikely to completely prevent it. Additionally, Bestgen and Hill (2016) found that smallmouth bass do not spawn in the mainstem but 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, smallmouth bass were found spawning and establishing in the -12 mile slough just below Glen Canyon Dam. Temperature monitoring showed about 2 degrees C of warming in the slough during normal weekday operations. However, there was about 12 degrees C of warming during the steady weekend flows associated with a Bug Flow experiment (NPS data presented at the October 2022 TWG). The warming during the Bug Flow experiment presents a robust data set that raises significant concerns about the slough and the potential impact of the Bug Flow experiment, and other steady flow components of experiments like options C and D, on the successful spawning and establishment of smallmouth bass in Glen Canyon. WAPA and the Basin States expressed this concern during the technical team process but were dismissed.

When considering the proposed flow options, it appears unlikely that any of them will prevent warming above the 16 degrees C spawning threshold in the -12 mile slough and keep smallmouth bass from spawning and establishing there again in 2023. Additionally, there are several other sloughs, backwaters, and tributary mouths between Glen Canyon Dam and the

Little Colorado River where smallmouth bass may establish like they did at the -12 mile slough last year. Establishment would be more likely for flow options that stabilize releases for an extended period like Options C and D and the Bug Flow experiment. Additionally, the flow options evaluated for this EA 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 the threat to humpback chub and razorback sucker populations, translocations, and reintroductions in western Grand Canyon.

To prevent spawning and thus prevent establishment between Glen Canyon Dam and the Little Colorado River, release temperatures would have to be kept below 12 degrees C. This would establish a temperature trigger at the Little Colorado River of 13.5 degrees C and would greatly increase impacts to hydropower generation at Glen Canyon Dam.

Additionally, we ask that National Park Service (NPS) begin work on physically modifying the -12 mile slough before smallmouth bass begin spawning and establishing there again in 2023. We also ask that Reclamation begin modifications in the forebay with a thermal curtain or some other short to mid-term fix to prevent smallmouth bass entrainment and provide cool-water releases without bypass before smallmouth bass begin spawning and establishing in the dam tailwater.

The Experiment Appears Inconsistent with the LTEMP Goal of Restoring Natural Variability in Water Temperatures

The draft EA describes the potential effect of the experiment on natural processes in Table 3-5 and indicates there would be no anticipated change under the no action alternative. The EA describes each of the proposed flow options as having a positive impact on natural processes because "colder water temperatures in the Colorado River during the flow operation could temporarily move ecological processes toward pre-drought conditions." These statements contradict the description of natural processes at section 3.4 of the LTEMP EIS.

The goal identified in the LTEMP EIS is to "restore, to the extent practicable, ecological patterns and processes within their range of natural variability, including the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to those ecosystems." The EIS identifies the "major drivers of natural processes in river ecosystems, including regulated rivers below dams, are river flow, water temperature, sediment transport, and water quality (including nutrients and turbidity)" (LTEMP EIS at p. 3-58). Water temperature is a key driver, especially for plants, aquatic invertebrates, and fish.

The LTEMP EIS identifies that "the construction and operation of Glen Canyon Dam has altered the ecosystem both above and below the dam" and "prior to construction of the dam, there was considerable seasonal and annual variability in flow and water temperature." The LTEMP EIS goes on to say that "water temperatures fluctuated seasonally between 0 degrees C (32 degrees F) and 30 degrees C (86 degrees F), with highest water temperatures occurring in summer" (LTEMP EIS at p. 3-58). Section 3.4 also states "the physical changes that have resulted from dam construction and operation include … a decrease in mean main channel water temperatures."

Thus, it seems contradictory to the LTEMP that cooler summer temperatures under the experiment, that would return the river to similar cold conditions as pre-drought, would be

considered a positive effect on natural process. The LTEMP as described above, makes the argument that greater changes in temperature are needed to support natural processes, with warmer temperatures in the summer when the river used to get quite warm. We suggest a re-consideration of the impacts as they seem contrary to prior arguments made in the LTEMP EIS.

The EA Fails to Consider Best Available Science in Evaluating Impacts to the Aquatic Food Base (Section 3.2.1)

The EA, at Section 3.2.1, identifies several important drivers to food-base production and diversity including flow, nutrients, and temperature. However, it omits discussion of how sediment and turbidity drive of food-base production and diversity, especially below the Paria River. The EA also omits discussion of the results from Stevens et al. (2020), which experimentally and statistically showed that macroinvertebrate production and diversity, especially with respect to Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies), collectively referred to as "EPT" species, were affected more by sedimentation of mainstem habitats than by other variables including cooler water temperatures, water chemistry, or flow fluctuations. These findings should be included along with and a more balanced discussion of other factors that may be affecting food-base quantity and diversity below Glen Canyon Dam.

The EA includes an extensive discussion on the Bug Flow experiment (see page 3-4). However, the proposed experiment is not about modifying daily releases from the dam, but about releasing cooler water and conducting periodic flow spikes. The EA should focus on evaluating the impacts of the proposed changes in operations rather than providing an extensive discussion on the merits of other unrelated experiments. Reclamation should omit the paragraphs speculating on how daily flow fluctuations are impacting the food base as they are irrelevant to the impacts analysis of the EA.

The EA is correct that managing for cold and relatively constant water temperatures will probably continue to select for cold-water-adapted algae and macroinvertebrate species, such as midges and blackflies. The EA should say that limiting warm-water releases during the experiment will likely continue to contribute to the low diversity and production of EPT, a negative effect, and that Reclamation intends to limit the proliferation of warm-water nonnative fish rather than allow the natural diversification and increased production of the aquatic food base by allowing increased temperature variation in releases from the dam (see our discussion of Natural Processes above). The EA should reflect these points in Table 3-5: Summary of Anticipated Effects on LTEMP Resource Goals, which does not include an impacts analysis of the food base and is an omission. Specifically, the table should state that cold shock options C and D could lead to high rates of macroinvertebrate drift and potentially disrupt macroinvertebrate development and life cycles and that this could lead to a decrease macroinvertebrate production and diversity. The same table should also state that the flow spike options B and D would scour benthic substrates and reduce the food base abundance and biomass. The food-base section correctly states that recovery of the food base after a spike flow could be rapid, but it fails to point out that the experiment includes options for up to three, HFE-like spike flows occurring back-to-back during the summer growing season for the next three years. Back-to-back HFE-like spike flows could prevent the aquatic food base from recovering by periodically scouring it with sequential spike flows. The EA should state there is a high likelihood that the experiment would have substantial negative impacts to food base production over the next three years especially if back-to-back spike flows are implemented.

Reclamation Should Consider Options to Raise Reservoir Levels

Reclamation could potentially avoid or reduce the impacts of the experiment by taking measures to increase elevations at Lake Powell from 2023 to 2025. Higher reservoir elevations would also reduce the entrainment risk of smallmouth bass. The February 2024, 24-Month Study suggests that keeping Water Year (WY) 2023 releases at 7.0 million acre feet (maf) would keep elevations at Powell above 3565 feet from June to October 2023. Additional releases from upstream reservoirs in WY23 would also aid in increasing elevations at Lake Powell. WAPA asks that Reclamation consider these actions to reduce impacts of the experiment.

The EA Does Not Evaluate the Impacts on Greenhouse Gas Emissions

The EA does not 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 the Draft EA, the experiment requires WAPA to use other generating resources to replace Glen Canyon Dam generation. Based on NREL's analysis, this replacement power will mostly come from fossil-fuel driven generators. Increased greenhouse gas emissions are among the impacts of generating electricity using fossil fuels sources and the EA should include an estimate of the additional greenhouse gasses that will be emitted due to the experiment. The table below includes estimates of the amount of replacement power expected to be generated from fossil fuels and the reduction of hydropower production under the experiment.

Difference in Electrical Generation by Type (GWHs) with implementation of the Experiment when compared to the No Action.

	Coal	Natural Gas (combined cycle)	Hydropower
Option A	-13.4*	567.5	-551.0
Option B	226.9	571.8	-623.5
Option C	179.6	138.2	-321.6
Option D	188.8	169.3	-365.3

*For Option A, the PLEXOS model dispatches only natural gas as a replacement for Glen Canyon Dam production and reduces coal sources by a small amount. However, under Option B the model dispatches a combination of coal and natural gas as replacement. As explained (above, the PLEXOS model dispatches generators and finds solutions for every model run. The model run for Option A is independently derived from the model run for Option B. Apparently, the PLEXOS model found the least-cost solution for Option A required a small reduction in coal dispatch and replacing Glen Canyon generation with natural gas. For Option B, the least-cost solution included more generation from both coal and natural gas.

The table below shows an estimate of the number of tons of greenhouse gas emissions that would be produced by replacement power for each of the flow options. These estimates are based on the amount of bypass for each option provided by GCMRC. The figures also include equivalent carbon emissions from internal combustion engine vehicles that would produce the same amount of greenhouse gas emissions.

Estimated Greenhouse Gas Emissions by Option & Auto Emissions/Year Equivalent with implementation of the Experiment when compared to the No Action.

	Greenhouse Gas Emissions (tons)*	Annual Equivalent of Automobile Emissions (number of vehicles)**
Option A	249,212	52,000
Option B	265,569	55,000
Option C	142,489	30,000
Option D	168,086	35,000

*EPA Greenhouse Gases Equivalencies Calculator - Calculations and References, June 23, 2022
**EPA Greenhouse Gas Emissions from a Typical Passenger Vehicle, March 2018

All of Today's Releases are "Steady, Unfluctuating Flows" according to the Bishop Study

Bishop et. al. 1987 is cited in the first paragraph of page 3-12 to suggest that anglers prefer "steady, unfluctuating flows." It is inappropriate to cite the Bishop study here for that conclusion. The Bishop study sought to identify flow preferences from boaters and anglers in the pre-1996 ROD era and defined "steady flows" as those with daily fluctuations of less than 10,000 cfs. Daily fluctuations have been limited to 8,000 cfs since the 1996 ROD making all contemporary releases (aside from HFEs) "steady flows" as defined by Bishop et. al. 1987.

The EA Does Not Evaluate Potential Impacts to Underserved and Disadvantaged Rural and Tribal Communities

Section 3.7 of the EA incorrectly states that no 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 dated January 27, 2021). Therefore, the EA has the potential to impact those disadvantaged communities that are CRSP firm electric service customers.

WAPA Recommends Reclamation Revise the Draft EA's Discussion of Emergency Operations

The Draft EA states, at p. 3-36: "None of the four options would result in a decrease of reserve and emergency power available. Operations would follow LTEMP requirements for emergency situations." To better describe this situation, we suggest that Reclamation add the following considerations to the EA:

- Glen Canyon Dam regulation requires that +/- 40 MW be available to the Balancing Authority.
- During the experiment, Glen Canyon Dam will respond to Western Power Pool electrical emergencies. This requires sufficient "spinning" reserves be available for 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 these emergencies.

Also, on page 3-30 the document states that "WAPA will continue to operate under the emergency exception criteria, as stipulated under the 1996 ROD, which allows GCD 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)." However, this citation is incorrect and needs to be updated. 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. This comment was provided on an earlier draft but not updated for the public draft. WAPA can provide this document to Reclamation if needed.

CONCLUSION

WAPA appreciates Reclamation's efforts in preparing the Draft EA and shares the goal of addressing smallmouth bass 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. 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 experiment, WAPA anticipates the experiment will significantly impact hydropower operations 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 this action. Financial mitigation is critical even with the implementation of off-ramps. WAPA also urges Reclamation to consider additional alternatives, including Option E, the non-bypass alternative. As noted in the EA, Option E will 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 water and power operations in the CRSP 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 establishment. We look forward to continuing to work with Reclamation to address these comments and concerns.

Sincerely,

Rodney G. Bailey
Senior Vice President
and CRSP Manager

Enclosure
Appendix

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

APPENDIX

Brief Description of the Methodology and Modeling Completed by NREL and Argonne National Laboratories for Reclamation's Smallmouth Bass Environmental Assessment

NREL and the PLEXOS Model

The Western Electrical Coordination Council (WECC) electrical system footprint was modeled for this analysis using the PLEXOS model. PLEXOS is a high-resolution power systems model that determines the least cost unit commitment schedule and dispatch of generating resources to meet a given power demand subject to the technical characteristics and capabilities of each generator.

For the No Action alternative, National Renewable Energy Laboratory (NREL) modeled the WECC system under current conditions, reflecting existing system retail load, generators, and transmission system, using economic dispatch. Within the operating parameters of the generating unit, the PLEXOS model allows a generator to "flex" to meet retail load at the lowest cost. Since the proposed smallmouth bass experiment would be implemented as soon as June 2023, no new generation, transmission additions, or upgrades were included. The time scope for this analysis was June to October 2023, even though the proposed experiment extends into 2025. Hydropower analysis for impacts of the experiment has not been completed for 2024 or 2025.

WAPA provided hourly generation data for Glen Canyon Dam for the no action alternative and the four experimental options. This generation data was put into the PLEXOS model as "must run" units, such that no deviation occurred from Glen Canyon Dam specified releases (i.e., Glen Canyon Dam was not "optimized" to meet retail load in the experiment cases). Assumptions and data used for the no action model run were also used for each of the four experimental options.

The PLEXOS model assumes that a market condition exists for electrical power distribution and purchases. That is, electrical power generation that is available to meet demand can be dispatched to meet demand, subject to transmission constraints.

The objectives of the PLEXOS modeling were to assess the following:

- Is replacement energy available and can be dispatched to meet demand?
- If so, are there transmission paths available to meet demand, without exceeding line limits?
- As a result of reduced electrical generation at Glen Canyon Dam during the experiment, will exchange prices change?

Results[1] [2] [3]

Increases in Transmission Line Congestion:

The PLEXOS model allows transmission lines to exceed their designed thermal limits up to a point. During the hours in which this occurs, PLEXOS records this as "congestion." The PLEXOS model indicated energy transfers from the generators replacing Glen Canyon Dam energy production to load without significant transmission capacity exceedances. Transmission line congestion increased by less than 1 percent for flow options A, C, and D, and 2 percent for flow option B compared to the No Action alternative.

Sources of Replacement Generation:

Figure 1 illustrates the electrical generator types that are expected to be dispatched during the proposed Glen Canyon Dam flow experiments to replace Glen Canyon Dam generation. The chart shows deviations from the No Action, in Gigawatt hours (GWHs), by generation type, recorded over the months of the experiment. These results are the sum of changes in generation in WALC, AZPS NEVP, SRP, WACM, PSCO, and SPPC Balancing Authorities. Glen Canyon Dam hydropower is replaced primarily by natural gas generators (combined cycle and combustion turbine) and coal generation. Table 1 shows replacement generation by the numbers. Other generator types changed too, but to a much smaller extent and are not included in this graph.[4] [5]

For Option A, the PLEXOS model dispatches only natural gas as a replacement for Glen Canyon Dam production and reduces coal sources by a small amount. However, under Option B the model dispatches a combination of coal and natural gas as replacement. The PLEXOS model dispatches generators and finds solutions for every model run. The model run for Option A is independently derived from the model run for Option B. While one would expect that a reduction in Glen Canyon Dam hydropower would result in increased generation in all other generation types, the PLEXOS model found the least-cost solution for Option A required a small reduction in coal generation and replaced Glen Canyon generation with natural gas. For Option B, the least-cost solution included more generation from both coal and natural gas.

[1] The PLEXOS model was run several times using different assumptions. This is because the initial run of PLEXOS resulted in "nonintuitive" results or included "no solution" hours.
[2] The PLEXOS model concluded that replacement power was available and dispatchable for each of the experimental options. More explanation about this is included later in in this document.
[3] Note that WAPA and Argonne are still working with NREL regarding the PLEXOS model runs and results. We are confident that the latest PLEXOS model run represents an estimate of what would happen under the condition of the experiment, given our assumptions of how the experiment would be implemented.
[4] WAPA and NREL are still studying the data from the PLEXOS model runs.
[5] The total generation for each option doesn't sum up to the same total as the baseline case. However, it differs by less than one half of 1 percent and may be explained by differences in transfers in and out of the BAs listed.

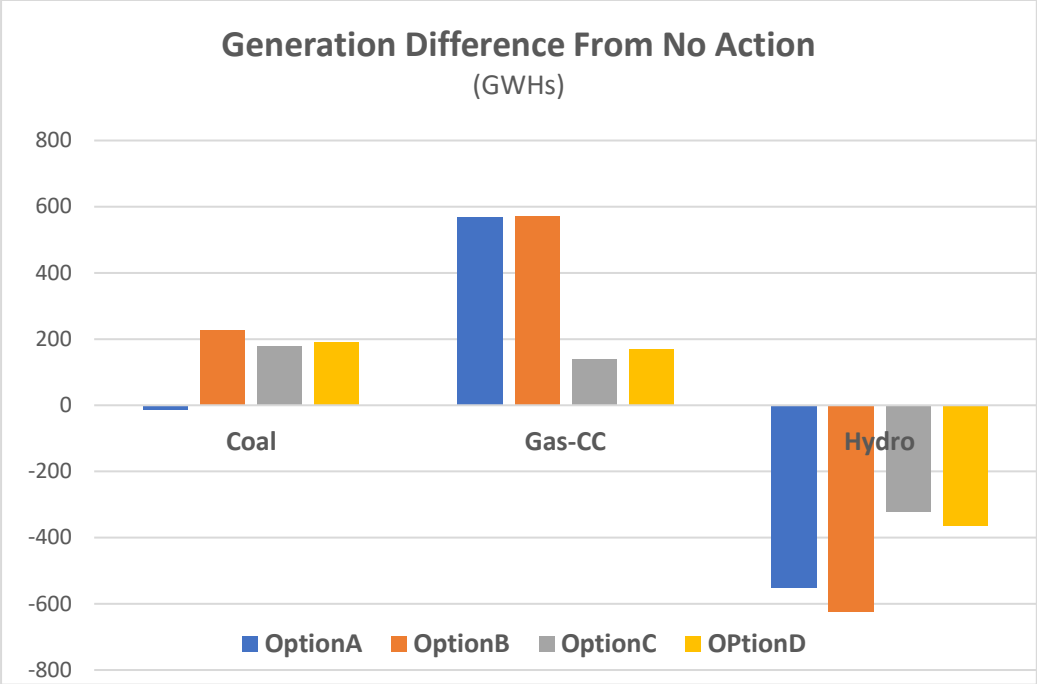


Figure 1: Electrical generator types that are expected to be dispatched during the proposed Glen Canyon Dam flow experiments to replace Glen Canyon Dam generation.

Below is Table 1, presenting the data shown in the above figure, but in tabular form.

Table **1: Replacement generation by type (GWHs)**

	Coal	**Natural Gas (combined cycle)**	**Hydropower**
Option A	-13.37	567.52	-551.04
Option B	226.87	571.78	-623.51
Option C	179.63	138.23	-321.62
Option D	188.75	169.31	-365.37

Locational Marginal Price (LMP): Table 2 shows changes in LMP from the No Action in dollars per MWh.

Increases in Locational Marginal **Prices** (LMP):

Table 2 shows changes in LMP from the No Action in dollars per MWh.

A change in LMP is an estimate of the effect on energy prices in the WECC associated with the loss or significant reduction of Glen Canyon Dam generation. For example, if Option A is implemented, the cost of meeting retail load in the WECC, on average, would be expected to increase by $4.70 per MWh of all electricity produced during the 5 months modeled by PLEXOS. Since this is an increase in societal costs, this would be considered an economic impact[6].

Note that there are negative LMP differences in some months for Options A, C, & D. These negative numbers indicate that, compared to the No Action, the PLEXOS model was able to dispatch generators to meet WECC electrical demand in a way that, in June for Option A for example, resulted in a lower cost. Each PLEXOS model run is a new solution uninformed by any other model run. With a reduction in electrical power production, one would expect higher LMPs in all months. However, the reduction in LMPs in June and October in Options A, C, and D, are a result of PLEXOS choosing a solution where relatively expensive coal plants are taken offline and replaced with relatively cheaper natural gas power plants. This can happen in shoulder months (June, October). It doesn't happen in peak power months (July, August, September) because all available generators are needed to meet peak demand[7].

TABLE 2 changes in Locational Marginal Price (LMP) from the No Action in dollars per MWh.

Difference from No Action	**Option A**	**Option B**	**Option C**	**Option D**
June	-0.48	1.80	-1.11	4.16
July	7.68	8.15	-1.98	1.34
August	9.43	9.43	3.38	3.38
September	6.11	6.11	9.22	9.22
October	0.76	0.76	-2.38	-2.38
Average	**4.70**	**5.25**	**1.43**	**3.14**

PLEXOS Modeling vs the Reality that Replacement Power Might Not Be Available: A Note on the Reality of the PLEXOS Assumption that the Generation at Glen Canyon Dam Can Be Replaced:

PLEXOS assumes market conditions exist in the WECC. All generators are available for dispatch to meet electrical demand as long as a transmission path is available. PLEXOS seeks

[6] The exception is the month of July for Option C.
[7] The exception is Option C which has a negative LMP value in July as well as in June and October.

the least-cost solution. It assumes that if power is available, WAPA will be able to acquire and transmit that energy to its load. It also assumes power is not constrained by contractual obligations, service area boundaries or generation ownership. Moreover, the PLEXOS model has perfect foresight and situational awareness.

However, WAPA purchases replacement power through bilateral trades. This method of trading tends to be frictional. Trades are made with habitual trading partners who have existing contractual agreements and who seek "reasonable prices." Therefore, replacement of Glen Canyon Dam power, through traditional bilateral trading methods may be frictional and may take considerable staff effort. In addition, there are institutional barriers in buying and selling. Sellers tend to only want to sell in "blocks" of power. Even though a utility may only need 5 MW of power to meet a 4-hour afternoon peak, the utility may only be able to find willing sellers who will sell a 25 MW "block" for an 8 peak hour period. These "blocky" trades and institutional constraints are common and may make it difficult to find replacement power for peak hour time periods despite there being a margin of capacity withing the WECC region.

GTMAX Model

The GTMax SuperLite (SL) model models flow of electricity, water, and financials for the CRSP power system. The model optimizes hourly water releases to meet customer demand at the lowest cost or to maximize the value of energy produced.

GTMAX-SL was used to estimate hourly Glen Canyon Dam power production from June through October of 2023 for the No Action and the four proposed flow options. GTMAX-SL was used to estimate hourly Glen Canyon Dam power production from June through October 2023 for the No Action and the four proposed flow options. It should be noted, however, that the experiment has the potential to extend to 2025. Hydropower analysis for impacts of the experiment has not been completed for 2024 or 2025. Hourly generation results were input into the PLEXOS model; and were treated as "must run" values for PLEXOS modeling. PLEXOS was then run to determine the least-cost dispatch of generators, by hour, in the WECC to meet a given demand over this time frame.

The cost to replace bypassed generation for the four flow options was also estimated using GTMax SL. Hourly generation values for the four flow options were compared to hourly values for the No Action. The difference in hourly generation was multiplied by an hourly energy market price to estimate the cost to purchase bypassed energy in that hour. Estimated hourly cost to purchase bypassed power were then summed to provide monthly estimates of costs to replace bypassed power.

GRAND CANYON WILDLANDS COUNCIL

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Ms. Sarah Bucklin
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10 March 2023
sent via electronic mail

Ms. Bucklin:

Introduction

Grand Canyon Wildlands Council (GCWC) and the Center for Biological Diversity (CBD) appreciate this opportunity to provide our comments on the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment (EA). Please note that additional formal comments on the EA submitted separately by CBD, including legal underpinnings and references, are herein incorporated and appended to these comments.

GCWC has participated as a GCDAMP stakeholder for the past two decades as an environmental science-based voice, and we are intimately familiar with the environmental, cultural, and economic trade-offs of Glen Canyon Dam management on the Colorado River ecosystem (CRE) in Grand Canyon. GCWC staff and collaborators include scientists, river runners, land and wildlife professionals, teachers, outdoors people, and artists, merging our talents to provide creative, collaborative, science-based solutions for conserving the Canyon's and the River's natural habitats and native wildlife. GCWC is an affiliate of Wild Arizona, a statewide non-profit science and stewardship-driven conservation organization with 2,400 members and supporters who highly value the Grand Canyon region's wild lands and waters. In 2009 GCWC staff and volunteers partnered with NPS, USFWS, and AZGFD personnel to help lead the first successful translocation of humpback chub into Shinumo Creek above its tributary mouth in Grand Canyon.

CBD is a national non-profit conservation organization dedicated to protecting and recovering endangered species and the habitats on which they depend for their survival. The Center has 1.7 million members and supporters, including members who use and enjoy the Grand Canyon and the Colorado River for recreation, natural history, spiritual renewal, photography, art, wildlife observation and scientific study. The Center has been involved in the preservation of threatened and endangered species and their habitats in the Grand Canyon region for decades, including protection of the Grand Canyon's aquifers. Species at risk here include the federally threatened humpback chub, the endangered razorback sucker, the endangered southwestern willow flycatcher, and the threatened Mexican spotted owl. Their habitats include the Colorado River, its springs and connected streams, and terrestrial habitats within and adjacent to Grand Canyon National Park's boundaries.

Overview

We thank Reclamation's staff for recognizing the urgent need for NEPA assessment and for developing the Draft EA. Recent increases in non-native smallmouth bass (SMB), green sunfish, brown trout, and other species in the Glen Canyon Dam tailwaters, as well as non-native invasive aquatic mollusks and fish diseases constitute critical threats to the Colorado River Ecosystem (CRE) and its native species. The drought-driven reservoir level and water quality conditions under which Glen Canyon Dam is currently operating facilitate the release of warm water, carrying higher numbers of invasive warm

water fish that benefit from thermal and habitat conditions in the Colorado River downstream. These conditions are now conducive to non-native fish spawning and establishment in the Glen Canyon Reach, and possibly downriver in Grand Canyon where rapid detection and responses are far more challenging.

We know from the Green, Yampa, and Colorado River reaches above Lake Powell that establishment of SMB is a primary factor in population declines of humpback chub and other native fish species outside of Grand Canyon. The Yampa River invasion provides the cautionary tale of the ecological consequences that arise from failing to pursue intervention early in the non-native fish colonization process (Dr. Rich Valdez, personal communication). The costs involved in controlling established SMB through long-term management and keep federally listed native fish from jeopardy and the brink of extinction there are orders of magnitude greater than the cost of early prevention of establishment and have proven impossible. We have also repeatedly heard from our Tribal colleagues in the AMP that taking of life in the Colorado River significantly harms indigenous cultural integrity and therefore should be avoided.

Coupling treatments to control undesirable resource elements while benefiting desired natural resources, such as sandbar and beach habitats, is core to adaptive ecosystem management, and should play a strong role in prioritization in the selection of a preferred option in the alternatives for this EA. It has repeatedly been shown that single-species management is ineffective as an ecosystem management approach due to the complexity of habitat X species X assemblage interactions. Therefore, we emphasize the importance of evaluating whole-system impacts and recognizing the complexity and uncertainty of these dynamic systems, especially under accelerating climate impacts. We additionally emphasize that the preferred Option(s) needs to provide the greatest benefit to ecosystem and program integrity, by coupling prevention of SMB establishment with other resource benefits, particularly those related to improvement or enhancement of habitat, such as sandbar rejuvenation.

While we recognize the urgent need for this action to disadvantage specific non-native warm water invasive species, we remain concerned that primary focus on SMB in the forebay and Glen Canyon reach tailwaters may have unintended consequences related to other natural resources, as well as other nonnative invasive species that also pose severe threats to the downstream river (e.g., other non-native fish, several non-native invertebrate taxa, etc.). Unintended consequences often exacerbate threats to native species and natural processes, including increased cost to remediation and monitoring, and potentially limiting future management options.

Therefore, we highlighted in our earlier AMP stakeholder input the need to carefully evaluate potential negative effects of the preferred action and develop robust contingency plans to cope with issues that arise unexpectedly. These include unexpected interaction effects among the various SMB flow and non flow treatment options, which require careful consideration in implementation planning. We continue to hold this concern and urge that contingency planning be explicitly addressed during decision-making and as guidance for monitoring. Such planning should be conducted in the context of the recently completed Non-native Fish Strategic Plan and in relation to Tribal stakeholder cultural concerns.

The analysis included in Table 1 (below) is based on the Strategic Plan to help guide flow option implementation planning and integrated action sequencing. We ranked these non-flow options based on simple numerical scoring of estimated cost, time, compliance, and implementation (low or short-term=1, medium = 2, high or long-term = 3) and simple summing of those scores (Table 1). Our analysis indicated that physical barrier screens, in-reservoir nets, floating barriers, turbine mortality, and electrofishing are all equally easy, cheap, short-term (emergency) options. If all are undertaken simultaneously, these may be the best collective strategy considered to reduce the likelihood of SMB establishment. The deeper water withdrawal and sorting facility options are intermediate management options, having higher cost or greater complexity, respectively. The lowest ranked long-term solutions are installation of an air bubble screen and/or an acoustic barrier, with greater management costs to the

Table 1: Numerical scoring and summation of non-flow-related, non-native fish management options at Glen Canyon Dam.

Treatment	Cost	Time	Ease of Compli-ance	Ease of Imple-mentation	Total Rank Score	Result
Physical Barrier Screens	1	1	1	1	4	Easy, cheap, short-term
In-Reservoir Net	1	1	1	1	4	Easy, cheap, short-term
Floating Barriers	1	1	1	1	4	Easy, cheap, short-term
Turbine Mortality	1	1	1	1	4	Easy, cheap, short-term
Electrofishing	1	1	1	1	4	Easy, cheap, short-term
Deeper Water Withdrawal	3	1	1	1	6	Intermediate cost, time, medium time
Sorting Facility	2	2	1	2	7	Intermediate cost, time, medium time
Air Bubbles	2	2	2	4	10	More difficult & costly, long-term
Acoustic Barriers	3	2	1	4	10	More difficult & costly, long-term
Multi-Stimulus Barriers	3	2	2	4	11	More difficult & costly, long-term
Carbon Dioxide Barriers	3	2	2	4	11	More difficult & costly, long-term
Energy Dissipating Valve	3	2	2	4	11	More difficult & costly, long-term
Electrical Barriers	3	3	3	4	13	Difficult, expensive, long-term

implementation of multi-stimulus, CO^2, and energy dissipation, and with electrical barrier as the most costly and difficult to implement option.

Another unconsidered option would be propagation and release of a large number of mature, predatory endangered Colorado River pikeminnow. This option would require low cost in a medium-to-long-term timeframe, with medium levels of compliance, and low implementation cost. It would lead to a maximum possible ranked score of "7", tying it with implementation of a sorting facility. All non-flow options will also require continued monitoring, likely in perpetuity.

Federally-listed Humpback Chub Vulnerability

Humpback chub was recently downlisted by the US Fish and Wildlife Service from endangered to threatened status. This change was partially influenced by the expansion of the breeding population into the Colorado River mainstem, especially in western Grand Canyon and overcoming the existential threat of losing the sole breeding population in the Little Colorado River. With the possibility of SMB establishment looming, once again humpback chub face the threat of a catastrophic crash of the core population in the Colorado River. The EA under-represents the importance of the Grand Canyon population to the species' recovery. Should SMB successfully establish under the no-action alternative or a less than optimal option in the Action alternative, the impacts of cost and limits on dam operational flexibility on hydropower interests would be far more significant. Such financial and other impacts are not clearly and accurately presented in the EA.

Hydropower Impact Analysis

The EA describes severe financial impacts from each flow option, yet it fails to disclose its core assumptions. We are concerned that the analysis of these impacts to hydropower may be relying on cost metrics and comparisons that are no longer consistent with the LTEMP EIS by measuring from a reference baseline of power revenue that existed before drought impacts affected reservoir levels.

In addition, we understand that a primary concern for Western Area Power Administration (WAPA) is the financial impact on the Basin Fund. Several sources of financial mitigation in the form of recent legislation appear to be available to Reclamation including the following:

> INFRASTRUCTURE BILL OF 2022 TITLE IX--WESTERN WATER INFRASTRUCTURE SEC. 40901. <> AUTHORIZATIONS OF APPROPRIATIONS.
>
> "There are authorized to be appropriated to the Secretary of the Interior, acting through the Commissioner of Reclamation (referred to in this title as the ``Secretary''), for the period of fiscal years 2022 through 2026-(12) $50,000,000 for endangered species recovery and conservation programs in the Colorado River Basin in accordance with- (A) Public Law 106-392 (114 Stat. 1602); (B) the Grand Canyon Protection Act of 1992 (Public Law 102-575; 106 Stat. 4669); and (C) subtitle E of title IX of the Omnibus Public Land Management Act of 2009 (Public Law 111-11; 123 Stat. 1327)."

The EA should disclose its calculations to estimate the costs for replacement power. Information provided by WAPA and its contractors holds an inherent conflict of interest in the form of preserving hydropower for its customers and fulfilling its contracts at the expense of natural resource losses and contradicting the Grand Canyon Protection Act (GCPA, 1992). Also not considered/presented in this analysis is how WAPA's new contracts address the cost of experiments, contracting that appears to be used as a circular argument for a finding of significant impact to the Basin Fund and their financial stability. We acknowledge that Glen Canyon Dam plays a unique role in the Western electrical grid,

which only substantiates the criticality for WAPA and its customers to act proactively, prudently, and urgently to integrate replacement power sources into their energy portfolios. Such actions would minimize adverse impacts from reduced hydropower production. Difficult decisions need to be made to prevent SMB establishment below the dam, but those decisions should not be delayed by a lack of contingency planning for low water impacts on energy pricing.

Action Alternative - Options Recommendation

We understand the desire for a range of flow options for flexibility and adaptability in preventing the establishment of smallmouth bass in Grand Canyon over the three-year period covered by this EA. Two of the proposed flow options include flow spikes. Naturally timed, cooler water high flow releases can disrupt the spawning of smallmouth bass—a strategy that has proven effective on the Green River below Flaming Gorge Dam.

The four different flow options in the Action alternative are presented with no stated preferred option indicating that the flow options aimed at preventing SMB establishment below GCD are accompanied by considerable uncertainty. For example, the Proposed Action would allow BOR to 'utilize a flow option based on conditions at the time of implementation. Reclamation could switch to another flow option, as described below, to better match changing conditions.' This statement underscores the necessity for adaptability, flexibility, and, most importantly, rigorous monitoring data on which to base decisions that meet the mandates of the GCPA (1992). It also exemplifies why more variation in the range of flows under the options should be considered.

Under Flow Option B a single flow above 40,000 cfs may be more beneficial than multiple flows at 30,000 cfs. Please refer to recent HFE optimization modeling conducted by Grand Canyon Monitoring and Research Center (i.e., Dr. Paul Grams' 1 September 2022 presentation, Scenario C). Furthermore, because BOR is required to 'move water' through the dam in the summer of 2023 (i.e., DROA water that was held back in Lake Powell), sufficient water should be available to increase the magnitude and duration of the flow spike. Based on Grand Canyon Monitoring & Research Center's recommendations, it may be possible to disrupt SMB spawning at a key juncture to inhibit establishment, while also maximizing sediment deposition, and minimizing erosion throughout the Colorado River ecosystem. It is imperative that we capitalize on the current conditions of flow and sediment that may not exist in the future. In particular, we suggest modifying Flow Option B: Cool Mix with Flow Spikes to use this "extra DROA water," which could also potentially help extend cooler water and spawning disturbance downriver below the Glen Canyon reach. This appears to us to be the best, most effective tool for benefiting multiple resources and inhibiting SMB establishment. We must capitalize on these conditions, which are unlikely to exist in the near future, given the climate aridification the West is experiencing.

The Proposed Action as presented in the Draft EA constrains Reclamation to a limited set of tools to manage a dynamic river ecosystem that is changing more rapidly than expected. With that in mind, the EA should embrace flexibility, adaptation, rigorous monitoring, and include contingency off-ramps in decision-making and implementation to ensure the desired outcome of inhibiting SMB establishment below the GCD. The future of the humpback chub, sandbars, and the ecological integrity of the CRE in Grand Canyon depend upon such wisdom. Implementation of Option B with our recommended modification included, will require monitoring and feedback to improve management in perpetuity.

We note that threats of non-native fish invasion in the CRE in Glen and Grand canyons are multi-directional. The warmer river water temperatures also allow striped bass and other non-native fish to uprun the river from Lake Mead, and perhaps may allow other non-native species to invade through the Little Colorado River drainage. Therefore, we recommend that monitoring be conducted in the lower Colorado River and Little Colorado reaches as well.

Non-native fish management has been and will continue to be an on-going challenge in the CRE and at Glen Canyon Dam, a challenge that requires well-trained and committed staff. We recommend

that, rather than a simple “informed consent” approach to cultural compliance, Reclamation and the participating agencies develop a fisheries monitoring education program for Native American students. Such a program will build a future workforce that is technically capable, consonant with federal trust obligations, and would be a program that would directly benefit the Tribes.

We thank Reclamation for the opportunity to comment on this Draft EA for preventing SMB invasion into the CRE. We are available to answer any questions that Reclamation may have about these comments.

Sincerely,

Ms. Kelly Burke
Executive Director, Grand Canyon Wildlands Council
GCD AMWG Alternate

Lawrence E. Stevens, PhD
Senior Ecologist, Grand Canyon Wildlands Council
GCD AMWG Member

Taylor McKinnon
Senior Public Lands Advocate
Center for Biological Diversity

Attachment A (PDF format): Center for Biological Diversity and Others, Comments on Glen Canyon Dam/Smallmouth Bass Flow Options Draft EA.

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March 10, 2023

Sarah Bucklin
Regional NEPA Coordinator
U.S. Bureau of Reclamation, Upper Colorado Basin Region
Via Email only – sbucklin@usbr.gov

RE: Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment (EA)

Dear Ms. Bucklin,

Wyoming Municipal Power Agency (WMPA) appreciates the opportunity to comment on the EA that was issued on February 24, 2023. In future NEPA processes, WMPA would ask that the Bureau of Reclamation (Reclamation) provide a longer public comment period. WMPA is a four-person office and short comment periods are burdensome for its staff.

WMPA strongly opposes the bypass of Glen Canyon Dam (GCD) generators for the purpose described in the EA.

WMPA's Members and Customers

WMPA is a not-for-profit entity, that was formed to provide cost-based wholesale power to the municipalities of Cody, Fort Laramie, Guernsey, Lingle, Lusk, Pine Bluffs, Powell, and Wheatland. These rural communities serve 24,000 Wyomingites.

Inflation has negatively impacted every household in America. Rural areas, which often have no public transportation available, have been disproportionately impacted by the enormous increase in the cost of fuel. As a result, the retail customers that WMPA serves are already facing financial challenges.

WMPA is a Colorado River Storage Project (CRSP) customer. WMPA uses the power from CRSP and other sources to serve its loads.

Drought Impacts to CRSP Federal Electric Service (FES) Customers

Since December 2021, CRSP FES customers have been receiving approximately 65% of the CRSP contracted capacity and energy, but have been paying all of the costs associated with the contract which include: operations, maintenance, and replacements for the power plant, purchased power, transmission, participating project costs, interest, annual principal payments, and non-power expenses such as Salinity, Glen Canyon Dam Adaptive Management, Endangered Fish Recovery Implementation, aid to irrigation, and Water Quality and Consumptive Use Studies. Also, in December 2021, the CRSP FES customers experienced a rate increase of 11%. Finally, CRSP FES customers have to replace the 35% of the capacity and energy that is not supplied under the CRSP FES contract.

Grid Reliability Concerns

Dispatchable generation, such as coal, hydro, nuclear, and gas, keep the power grid reliable. Dispatchable generation must equal non-dispatchable generation, such as solar and wind, minus customer usage. When there is not enough dispatchable generation on the grid, customers' power is turned off to maintain the frequency, which is necessary to keep the grid interconnected.

The American people depend on electricity. Most people do not have alternative methods to supply the water that they need, manage their sewage, or keep their food safe without electricity. In addition, the heat in the southwest can been so extreme that human life can be at risk without air conditioning.

In September 2022, California once again called upon the generation at GCD for an electricity emergency. Without GDC, many Californians may have suffered harm.

Removing dispatchable generation is a very serious concern.

General Comments

1) The impacts of the Proposed Action (Action) to the human environment will be significant and cannot be supported by an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the following reasons:
    a. The impact of bypassing hydropower production will cause a significant increase in replacement power costs for CRSP FES customers for power from CRSP facilities.
    b. The result of the Action will require WAPA and CRSP FES customers to purchase replacement power on the market, yet current projections indicate there may be little to no power available on the market when replacement power is needed.
    c. The potential impact of removing dispatchable generation from the electric grid is substantial. Reliable electricity is vital to the American public.

2) The analysis in the EA is wholly inadequate in its identification and analysis of potential impacts from the Action.

a. There is no analysis on the availability of replacement power.
b. The EA fails to meaningfully identify or analyze the impacts on the Upper Colorado River Basin Fund (Basin Fund) and the implications those impacts have on the ongoing operation of the CRSP facilities and programs it funds.
c. The EA fails to meaningfully identify or analyze the affordability of replacement power for CRSP FES customers.
d. The EA is solely limited to alternatives regarding variations of flows bypassing power production. There is no discussion of potential non-flow alternatives.
e. The EA fails to use the most current information regarding future hydrology and its impacts on hydropower production. Potential impacts of the Action cannot be analyzed in a vacuum. NEPA requires a disclosure of the cumulative impacts of the Action. In this case, Reclamation must analyze the impacts of the Action in light of the ongoing impacts to CRSP FES customers from the last 20 years of limited hydropower production and the resulting increased reliance on purchased power.

3) The EA fails to acknowledge how the impacts of this Action will be inconsistent with the "beneficiary pays" construct that has been the cornerstone of Reclamation law and policy for 120 years. Smallmouth bass were not introduced into the Colorado River at either the request of, or to the benefit of, hydropower customers, yet the costs of actions to limit the range and impacts of these fish on native populations are being placed wholly at the feet of WAPA and its FES customers. This must be disclosed.

WMPA requests that Reclamation considers options other than bypassing the generators at GCD to address the smallmouth bass issue due to the negative impacts on the people that receive electricity from this facility.

Respectfully,

Rosemary Henry

Rosemary Henry
Executive Director

Cc: WMPA Board
WAPA Administrator Tracey LeBeau
Wayne Pullan – Reclamation UC Region
Rodney Bailey – WAPA CRSP Management Center

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Birdena Sanchez
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Edward Wemytewa
Councilman

10 March 2023

Sarah Bucklin
Regional NEPA Coordinator
U.S. Bureau of Reclamation, Upper Colorado Basin Region
125 South State Street, Room 8100
Salt Lake City, UT 84138

RE: Zuni Comments on the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment

Dear Ms. Bucklin,

The Pueblo of Zuni has reviewed the draft environmental assessment (EA) for the Glen Canyon Dam/Smallmouth Bass Flow Options and have the following comments for your attention and due consideration.

The draft EA fails to adequately address and consider the impacts of flow options on the long-standing concern that the Pueblo of Zuni has expressed regarding the taking of aquatic life that exists within this very sacred land/waterscape: the Colorado River in Grand Canyon. In 2009, the Pueblo of Zuni conveyed grave concerns on the intentional taking of life associated with mechanical removal of rainbow trout in a letter from Zuni Governor Cooeyate to Mr. Larry Walkoviak, Regional Director of the Bureau of Reclamation. In 2010, the Zuni Tribal Council passed Tribal Council Resolution M70-2010-C086 formalizing the Zuni Government's opposition to lethal management actions on aquatic life in the Grand Canyon. The full language of this resolution was formally and directly provided to your agency. To remind you, in this resolution the Zuni Tribal Council formally declared:

> the government of the United States of America, especially the Department of the Interior, and all agencies thereof, has a trust responsibility to manage Zuni cultural and natural resources, including tangible and intangible cultural resources valued by the Zuni people wherever such resources may occur, in a manner responsive to the interests of the Zuni Tribe and its members; and the cultural values and beliefs of the Zuni people are intimately related to its ancestral lands, to natural places, and to the plants, animals, and spiritual qualities of such land and places.

Since this time, Zuni has consistently and persistently made objections to any and all forms of lethal management of aquatic life to Reclamation, the National Park Service, the Grand Canyon Monitoring and Research Center, the U.S. Fish and Wildlife Service, and the Arizona Game and Fish Department.

Given this well documented history and Reclamation's full awareness of these concerns, it is demonstrably negligent that this draft environmental assessment fails to both substantively engage the direct, indirect, and cumulative impacts of these practices on Zuni people and kin and thoughtfully consider the design and consideration of prophylactic measures to disrupt capacities and close opportunities for passage of non-native, sport fish through the dam. The failure of the federal government to take constructive steps to address this issue when the smallmouth bass were first detected in 2000 (page 3-3 of the EA) in the Colorado River below Glen Canyon Dam underscores the repeated failures of Interior agencies to effectively respond to a known emerging issue. Moreover, by not proactively working to prevent Lake Powell sport fish from entering the system through the dam, Reclamation has repeatedly made a conscious and willful decision to maintain standard reactive measures which

knowingly and disproportionately impact the Zuni community, including direct, indirect, and cumulative effects on and impacts to opportunities and capacities for fulfillment of Zuni traditional practices and protocols, experiences of health and wellbeing, and possibilities for Zuni elected leadership to fulfill their oaths of office that require us to "cherish and protect all that contains life; from the lowliest crawling creature to the human" (Constitution of The Zuni Tribe, Article XVI – Oath of Office).

Complete evasion and failure to substantively consider these known concerns coupled with the wholesale inadequacies of the employed sciences in the EA to meaningfully account for let alone make valid and sound conclusions on the impacts and effects of the proposed actions of the Glen Canyon Dam/Smallmouth Bass Flow Options on Zuni renders this a *highly controversial matter* that Reclamation's own *NEPA Handbook* (2012) states necessitates a more in-depth and comprehensive Environmental Impact Analysis (EIS). The Zuni Tribe further reminds Reclamation that your agency's *NEPA Handbook* (2012:6-1) also states that "[t]he average EA should be about 30 pages or less. As the length of the EA increases, the chances increase that an EIS is the correct documentation under NEPA, simply because the number of issues is one indication of the possibility of significant impacts." The current EA is over four times this length, and that is *without any meaningful engagement, analysis, or study of the direct, indirect, and cumulative adverse effects and significant impacts the proposed actions will have on the Zuni people and Zuni Tribe.*

Section 1.8.1. Tribal Consultation and Coordination

The account of "consultation" with Tribes in this document is understood by the Pueblo of Zuni as not fulfilling actual Government-to-Government consultation requirements. Rather, what is reflected in this document is Reclamation's minimalist efforts to superficially inform the Pueblo of Zuni about the agency's intentions toward managing smallmouth bass in the Colorado River below Glen Canyon Dam. Public meetings held on October 25, November 18, November 21, and December 01, 2022, and January 18, 2023, do not suffice nor fulfill Government-to-Government consultation with the Pueblo of Zuni as required by numerous laws, Executive Orders, and court findings. These are documented facts that Reclamation is fully aware of and should not be represented in this document as such. This is especially true given that Reclamation has had specific knowledge for the past 14 years about the Zuni objections to any lethal management of aquatic life. Moreover, and importantly, Zuni Adaptive Management Work Group and Technical Work Group representatives have repeatedly expressed the *Zuni opposition and why* to lethal management at meetings of the Glen Canyon Dam Adaptive Management Program. It is insulting to the Pueblo of Zuni, as a federally recognized Indian Tribe and sovereign government, and the community of Zuni people as citizens of both the Pueblo of Zuni and the United States of America that a federal agency would knowingly and intentionally describe these routine activities as meaningful or in good faith "consultation and coordination" efforts.

Section 3.7. Socioeconomics and Environmental Justice

The scope of the environmental justice analysis in this environmental assessment is purposefully narrowly defined to only Coconino County, Arizona, and only considers the impacts on recreation from changes in dam operations (p. 3-34). This EA fails to consider the disproportionate environmental adverse effects of the various operational alternatives, including the cumulative effects of implementing over a decade of lethal management actions, on the community of Zuni located in the Zuni Reservation, McKinley County, New Mexico. This environmental justice analysis demands inclusion of the adverse effects to the community of Zuni from lethal management actions; including flows that are intended to retard, restrict or disadvantage smallmouth bass reproduction. To impose pre-determined standards, metrics, checkboxes, are artificial spatial containers on environmental justice matters, as Reclamation has attempted to do so far with this EA, is itself to *perform a social and environmental injustice on and serves as a barrier to building equity for* the Zuni people and Zuni Tribe. This fact was documented in a letter

to U.S. President Joe Biden on July 1, 2021, by the Pueblo of Zuni, a letter which was provided to Reclamation that same month and year.

The various dam operational alternatives defined in the EA are understood through the Zuni concept "*Deshamik'ya,*" which is imagining or acting out an undesirable behavior that results in negative effects to a family or community of people. In this instance, purposefully altering dam operations as a method to prevent or disrupt the continuing of life and which could result in mortality can be understood through the translation of the word karma, with the harmful effects and impacts being directed on and toward the Zuni community. These adverse effects and impacts will exponentially contribute to greater vulnerability and precariousness, which Indigenous people experience at greater frequency and intensity than do the industrial nations. Consideration and analysis of these effects and impacts are lacking from an equitable and meaningful environmental justice analysis and must be included lest this EA and NEPA process itself serve as part of systemic social and environmental injustice and continually imposed barriers and obstacles for equity. An additional consideration that is need of attention is that any increase in power rates due to the need for purchasing contracted power as a result of changes to operations in Glen Canyon dam that the low-income Zuni community members will have to pay will compound and intensify the emotional and psychological trauma experienced.

Section 3.8 Cultural Resources

According to Reclamations' *NEPA Handbook,* the purpose of NEPA, as defined by Congress and the President, is:

- To declare a national policy that will encourage productive and enjoyable harmony between man and his environment;
- To promote efforts that will prevent or eliminate damage to the environment and biosphere and stimulate health and welfare of man;
- To enrich the understanding of the ecological systems and natural resources important to the nation.

In addition, Reclamation's handbook provides guidance on compliance with EO 13007 by directing the agency to "avoid adversely affecting the physical integrity of such sacred sites." This EA and this section abjectly fail in this regard. For example, Table 4-1 presents a list of preparers and contributors to this document. In reviewing this list, there is not one individual listed that possesses the knowledge or expertise to evaluate the impacts of the proposed alternative options from a credible Zuni perspective. These people are not qualified to perform or think they can perform an assessment of the effects to the community of Zuni; therefore, the only conclusion one can reasonably reach is that this document is insufficient with respect to necessary considerations and attention to Zuni impacts and cumulative effects. Reclamation has failed in its responsibility to the Pueblo of Zuni and the Zuni community.

The document also cites the 2017 GCD LTEMP Programmatic Agreement and the required Memorandum of Agreement (MOA) for resolving adverse effect created by lethal management actions; however, the document fails to acknowledge that the MOA is nowhere near a final draft, or even close to identifying appropriate types or measures for avoidance, minimization, or mitigation, if any of the latter are required because avoidance is unfeasible. Under the regulations (36 CFR 800.6 and 800.7), an MOA is required prior to implementing the agency action/undertaking; however, Reclamation insists on implementing undertakings that result in adverse effects on and significant environmental impacts to the Zuni National Register-eligible traditional cultural landscape and traditional cultural property in spite of the fact that a MOA has not been finalized or executed in clear violation of their own 2017 PA.

Cumulative Effects: The claims made in this section are incorrect; the Glen and Grand Canyons and the Colorado river are "historic properties" eligible for listing on the National Register with TCP significance for Zuni relational

life/ways, including the indelible and inextricable tangible capacities they present and embodied meanings and associative values they convey for the maintenance and perseverance of Zuni traditional cultural knowledge and science systems, beliefs, and practices, experiences of health and wellbeing, and capacities for collective continuance *as a people* always connected to the past through the present and the future. The cumulative impacts to Zuni traditional cultural property and the resultant adverse effects on the community of Zuni have been not addressed in this document.

Section 3.9. Tribal Resources

This section is deficient in addressing Zuni resources that will be impacted by the various flow options because it only cites one twelve year old reference. This is woefully insufficient and elides the numerous correspondence from the Pueblo of Zuni to Reclamation from 2008 to present (see above). In fact, there are other more recent publications that are available and speak directly to this issue that Reclamation appears to have conveniently ignored:

> Dongoske, K and M. Yeatts. 2018. Tribal perspectives on nonnative fish removal, *in* Runge, M.C., Yackulic, C.B., Bair, L.S., Kennedy, T.A., Valdez, R.A., Ellsworth, C., Kershner J.L., Rogers, R.S., Trammell, M.A., and Young, K.L., Brown trout in the Lees Ferry reach of the Colorado River—Evaluation of causal hypotheses and potential interventions: *U.S. Geological Survey Open-File Report* 2018–1069, p. 63–66.
>
> Dongoske, K. and Kelley Hays-Gilpin, 2016. Parks, Petroglyphs, Fish, and Zuni: An Emotional Geography of Contemporary Human-Animal-Water Relationships in *Relating to Rock Art in the Contemporary World: Navigating Symbolism, Meaning, and Significance* edited by Liam M. Brady and Paul S. C. Taçon. University Press of Colorado, Boulder; and
>
> Dongoske, K., T. Pasqual and T. King. 2015. National Environmental Policy Act (NEPA) and the Silencing of Native American Worldviews, *Environmental Practice* 17:36-45.

Cumulative Impacts: This entire section which addresses the "cumulative impacts to the community of Zuni is specious, because it implies that mitigation will be accomplished through consultation. Consultation is not mitigation, and the first options are avoidance and minimization—mitigation, if it is even possible, is the last option, not the first. Further, what counts as mitigation for the cultural damage and loss that Reclamation continues to impose on the Zuni people through mismanagement and disregard for proper treatment of the traditional cultural property and the integrity and the capacities it provides for relational life and relational lifeways can only be defined by the Zuni Tribe.

Each of these identified matters will require direct Government-to-Government consultation between Zuni leadership and that of Reclamation, if not also executive leadership in the Department of Interior.

Sincerely,

Arden Kucate
Governor

Bureau of Reclamation
Smallmouth Bass EA
Project Manager – Sarah Bucklin
Via Email only – sbucklin@usbr.gov

RE: Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment (EA)

The Salt River Pima-Maricopa Indian Community (SRPMIC) has a contract for federal power from the Western Area Power Administration, Salt Lake City Area Integrated Projects and provides these comments on the EA, issued February 24, 2023.

SRPMIC appreciates the inclusion of these comments in the record for the EA.

SRPMIC does not believe the impact analyses supports a Finding of No Significant Impact by Reclamation.

The impacts of the Continuing Drought on the Colorado river basin are significant on the western United States and federal generation. These federal generators have a critical reliability and market value in the western markets. In addition, the current energy markets are significantly higher than a few years ago like 2019. The hourly prices are multiples of the prices they were in 2019 and bilateral capacity resources are scarce and exceedingly expensive like the Local Capacity costs in the CAISO Valley DLAP zone that exceed $30,000 per MW for some months.

Unsustainably high, some believe and for a myriad of reasons including insufficient generation resources to manage the daily "duck curves" resulting from the integration of tremendous amounts of renewable energy and retirement of significant western generation. Therefore, dependable capacity like Glen Canyon Dam (GCD) that are strongly interconnected and generating across two EIM footprints can impact the western energy markets. As identified by WAPA, GCD and the WAPA transmission system are critical to SPP West being able to form efficiently and as explained below GCD has always been critical to the western markets including the CAISO and California Power Exchange.

Review of the California Energy Crisis hourly data demonstrates a direct correlation between the reduction in Glen Canyon Dam flexible capacity, due to environmental flow restrictions, with the market shortages that were not expected nor readily filled. Therefore, Enron and every utility across the west struggled to balance resources across the west when that reduction occurred in what was an already tight market and the markets collapsed. The reduction in GCD peaking generation correlates directly to the initiation of the California Energy Crisis! The current energy prices are multiples of 2019. Will a market collapse happen again, and will the federal government hold the regional purchasers whole if there is a crisis created?

We also support CREDA's comments that the impacts analyses, while understated in many ways, are sufficient to prevent Reclamation from issue a Finding of No Significant Impact (FONSI). From what we have reviewed, the analyses is missing numerous impacts identified by the California Energy Crisis like insufficient regional capacity. WAPA has recently commented that if it purchases resources to firm the SLCA/IP obligations WAPA will be competing with its own customers for scarce resources and likely increase costs for everyone. Clearly not a liquid market situation to experiment with generation resource dispatch decisions without accurate analyses of the complete impacts beforehand.

Archived: Tuesday, March 14, 2023 11:02:14 AM
From: Bucklin, Sarah A
Sent: Mon, 27 Feb 2023 20:51:51
To: Clayton McGee
Cc: David Scott
Subject: first comment email on GCD/SMB EA
Importance: Normal
Sensitivity: None

From: Parsons, Curtis <cparsons@fmtn.org>
Sent: Monday, February 27, 2023 11:58 AM
To: Bucklin, Sarah A <sbucklin@usbr.gov>
Subject: [EXTERNAL] Small Mouth Bass Enviroment

First of all I would like to ask why is this assessment even being considered? You have on the eastern seaboard humpback whales dying at a very unusual rate and the only change in the environment out there is the green energy Wind farms that are being produced in record setting amounts.

How do you have these numbers if the population is declining " The U.S. Geological Survey's (USGS) Grand Canyon Monitoring and Research Center oversees monitoring and research activities for the Grand Canyon population under the auspices of the Glen Canyon Dam Adaptive Management Program (GCDAMP). Analysis of data collected through 2006 suggests that the number of adult (age 4+ years) humpback chub in Grand Canyon increased to approximately 6,000 fish in 2006, following an approximate 40–50 percent decline between 1989 and 2001 (Coggins, 2007). Increasing numbers of adult fish appear to be the result of steadily increasing numbers of juvenile fish reaching adulthood beginning in the mid- to late-1990s and continuing through at least 2002 (Coggins, 2007)."

Why was the fish placed on the February 16 2022 endangered species list at this particular time. Is the lower Colorado river basin considered a cold water river? If so then why is the smallmouth bass considered a warm water fish? Especially since one of the largest populations of small mouth bass that I have ever fished for are in the cold cold water lake of the San Juan Reservoir in Southwest Colorado and Northwest New Mexico. Since these fish are such massive predators of other fish then why is the San Juan river below the lake considered as one of the best trout fishing grounds in the United States. These are actual facts from real people that fish for the small mouth and the trout. No one fishes for humpback chub because it is a very foul tasting fish and it is what is known as a TRASH fish.

Now the most important issue of the entire study. You want to route water around the wicket gates of the dam where that water is used to turn generators that produce GREEN power for customers below the lake and Western Power grid as it is. Was it not just last summer that governor Newsome of California ws calling on people not to charge their electric cars during the day because there was insufficient power for the Western power grid.So we are going to reduce the generation in the western power

IRRIGATION & ELECTRICAL DISTRICTS'
ASSOCIATION OF ARIZONA

Secretary Haaland
Department of the Interior
1849 C Street NW
Washington DC 20240

March 3, 2023

Sarah Bucklin
Regional NEPA Coordinator
US Bureau of Reclamation, Upper Colorado Basin Region
125 South State Street, Room 8100
Salt Lake City, UT 84138
sbucklin@usbr.gov

Re: Grand Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment

Dear Secretary Haaland:

On behalf of IEDA, we submit the following comments in response to the Draft Environmental Assessment we received on February 24, 2023.

IEDA represents 25 members, 15 of whom hold contracts with the Colorado River Storage Project. IEDA has been in existence since 1962, with a primary purpose of protecting the contracts of its members for federal hydropower. We write to you today with that goal in mind, as the proposed bypass flows will further reduce generation from Glen Canyon Dam, crash the Basin Fund, trigger a cost-recovery-charge, and put additional strain on the already limited summer energy resources in the West.

I have been a member of the Adaptive Management Work Group in the past (as the Federal Purchase Power Contractor's alternate) and witnessed a dismissive if not targeted approach towards hydropower. Despite the expressed goal of maintaining or improving hydropower in the LTEMP, the majority of the alternatives in the LTEMP reduced generation at Glen Canyon Dam, and every alternative in the Draft EA (except the "No Action") does the same.

The inherent bias against hydropower is evident in the Draft EA, beginning with the refusal to evaluate Flow Option E – Penstock Only Release. Western Area Power Administration's (WAPA) letter outlines sound scientific reasons regarding how the flow releases, without bypass, would disrupt smallmouth bass nesting and aid in preventing establishment below the dam without impacting hydropower. The ramping proposed in this option could benefit hydropower as well.

Further, the Draft EA goes to great lengths to distort or minimize the impacts to hydropower. For example, in Table 3-5: Summary of Anticipated Effects on LTEMP Resource Goals, the word "likely" is used when describing the need for replacement power purchases. This is a mischaracterization, as the CRSP contracts require firming from WAPA. On page 60 of the Draft EA, it states, "Replacement energy sources would need to cover the decrease in power generation." How does "need" convert to "likely" without an inherent bias?

Hydropower and Energy	No change	Negative—Would reduce hydropower generation and load following capacity, and would likely increase the need for replacement power purchases	Negative—Would reduce hydropower generation and load following capacity, and would likely increase the need for replacement power purchases	Negative—Would reduce hydropower generation and load following capacity, and would likely increase the need for replacement power purchases	Negative—Would reduce hydropower generation and load following capacity, and would likely increase the need for replacement power purchases

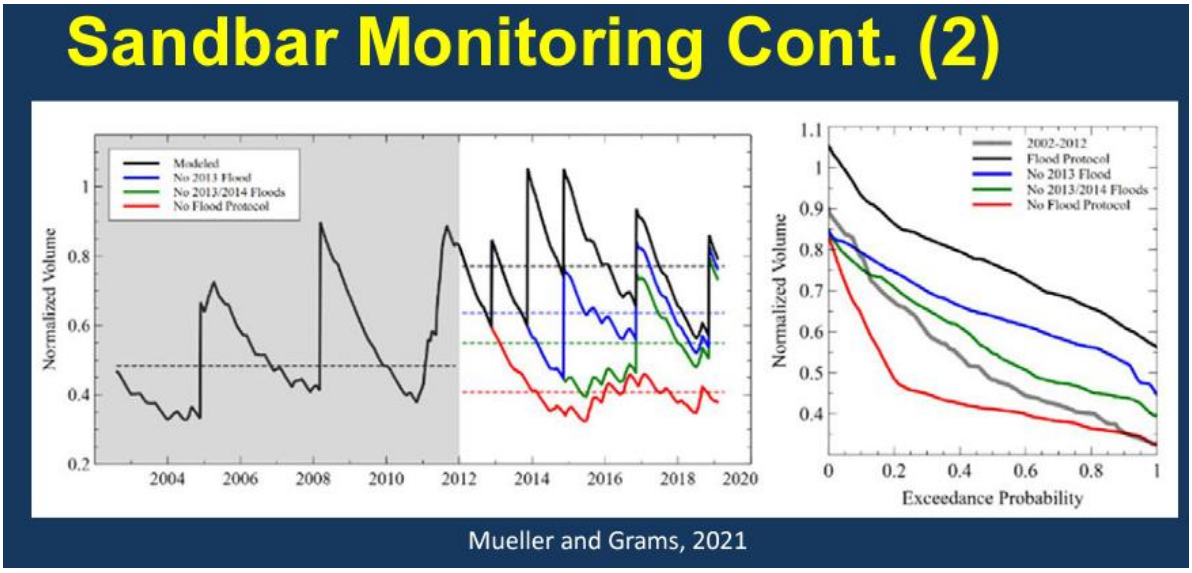
On page 61, an analysis is discussed based on the average (median) predicted bypass over the 30 traces that might reduce the cost of firming expenses, but there was no discussion of the resource scarcity and possibility of escalated prices to balance this argument. WAPA's pre-draft letter expressed their concern of market availability for replacement power given the current constraints. With a footprint of over 15 states, WAPA is fully aware of the constraints of the current energy market. Yet this, as well as the overall diminishment of the resource, is excluded from the Draft EA.

To put the hydropower impacts in perspective, the 322-600 GWH estimated would translate to 9.2%-17.1% reduction for the entire CRSP system in WY 2023 and an 11.5%-21.4% reduction in generation at Glen Canyon Dam. During August of 2020, power prices spiked to $2,000/MWH, which far exceeds the $250-$300/MWH summer pricing. The average pricing used for the replacement power for Flow Option B is $135.17/MWH. This is far below current summer power prices, but no mention of this is included in the Draft EA.

IEDA's biggest concern is reducing the capacity of Glen Canyon Dam down to a minimum of 40 MW for regulation from its peak capacity of 1,500 MW if called upon in an emergency. This will lead to loss of human life if we experience another regional heat wave like the one that occurred in 2020.

In my opinion, science experiments have been proposed under the guise of helping the environment for purposes of building beaches for river rafters and flatten flows for fishermen. When some people discovered that high-flow experiments only improved beaches for 3-6 months, they shifted their focus to advocate for a Spring HFE for summer river rafters. If you look at the series of photos from Brewster Stanton (1889) and the series 100-years later from

Franklin Nims (post-dam), you will see no discernible difference in the beaches except for non-native vegetation. That is because the river hydraulics haven't changed, and the gradation of sand that is thrown up on the beaches easily erodes and washes back into the river.



Is this Draft EA another example of seeking outcomes (Spring HFE, colder water for rainbow trout) under the guise of protecting endangered species? The Draft EA stated that smallmouth bass have been detected downstream of the dam since 2003 yet no establishment has occurred to date. The National Park Service (NPS) acknowledged their existence below for the last 20 years in a news release dated July 11, 2022. If smallmouth bass have been present for the last two decades, why the sudden urgency? Isn't this the responsibility of the NPS anyway, as they performed a non-native fish EIS a few years ago?

Despite the supposed urgency of reducing downstream water temperatures, the scientific support for this was not self-evident in the Draft EA. The Draft EA admits as much stating, "There is no literature on smallmouth bass movement in response to flow spikes or cold-water releases." (page 36) Can someone definitely say that colder water is the best solution to prevent establishment?

Since my involvement in the AMWG, there has been at least one other non-native predator that has made its way through the dam downstream, the green sunfish (2015). A decision was made to poison the slough that they were in with rotenone. This didn't solve the problem; they are still around, and yet we continue to perform high flow experiments. Maybe someone should study how far HFEs convey non-native fish downstream, since humpback chub populations tend to be centered around certain mile markers. I am not the only one who shares this opinion; it was stated in multiple pre-draft letters included in Appendix A.

Prior to Glen Canyon Dam, the Colorado River water temperatures fluctuated from 0* to 30* C. With its construction, it has been attributed to be an effective fish barrier when the water is high, preventing establishment of non-native fish establishment, but isn't responsible for the

introduction of these non-native fish. The Wildlands Council's letter highlights physical barrier options that were not included. So why are the only alternatives in the Draft EA flow related?

A major problem with Glen Canyon Dam is its design. Intake tubes are 100' higher than the bypass tubes. This not only threatens the ability to generate hydropower at low lake levels, it creates a temperature problem between surface water and water below the thermocline. When the lake was higher, we didn't face that problem because the penstocks were pulling cold water. Now, we are facing an either-or situation, at the cost of hydropower generation. What happened to the temperature control devices that we have talked about for years, the upstream netting that we discussed after the green sunfish arrived or other non-flow options? Why does it seem like the only allowable option from the majority of the AMWG members are flow and release related? If certain parties insist that these as the only options, why aren't they paying for the costs of these experiments instead of hydropower? In addition, why is the Adaptive Management Program elevated to parity with legislation in section 1.4 of the Draft EA?

Despite tens of millions of dollars spent each year studying the different aspects of system (HFE, Bug Flows, etc.), there hasn't been any definitive conclusions that I have heard why humpback chub are improving. One article I read suggested that it was due to the warmer water being released due to the lower lake levels (https://www.cpr.org/2022/09/19/colorado-river-trout-chub-populations-drop/). Could the chub benefit from additional warm water releases? It was also stated in the article that warm water could kill the trout. Are the cold-water releases planned to save the chub or the trout?

The proposed actions and duration (3 years) are too catastrophic to hydropower for an unproven theory. These alternatives impact salinity and recreation as well, despite how the Draft EA downplayed their true effects. For example, recreation impacts are described as "temporary" and affected "slightly" with no quantification of what that means. If you gave an accurate representation of the real impacts of hydropower in the Draft EA (and other categories), there is no way that you could determine a Finding of No Significant Impact (FONSI).

I understand that balancing these priorities are incredibly complex. However, given the current shortage of energy available during the summer months, the scarcity pricing that accompanies that, and the only option available in the EA that doesn't do exorbitant harm to hydropower is the "No Action" option. If you fail to consider any non-flow options (mixing of the water strata, siphons to below the thermocline, etc.), then must we implore you to select the "No Action" alternative.

Sincerely,

Ed Gerak
IEDA