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WILDLANDS
COUNCIL
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Attn. LTEMP SEIS Project Manager
US Bureau of Reclamation
Upper Colorado River Basin Region
125 South State Street, Room 8100
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For the past nearly quarter of a century, Wild Arizona's Grand Canyon Wildlands Council (GCWC) has vigorously and creatively pursued its goals by serving as an environmental stakeholder in the Glen Canyon Dam Adaptive Management Program, and we are intimately familiar with the environmental, cultural, and economic trade-offs of Glen Canyon Dam management on the Colorado River ecosystem (CRE) downstream. GCWC staff, members, supporters and volunteers visit, recreate, conduct research and restoration projects, and volunteer in Grand Canyon and the CRE.

In this document, we provide comments to Reclamation in response to the Federal Register notice dated 10/4/23 (https://www.federalregister.gov/documents/2023/10/04/2023-22077/notice-of-intent-to-prepare-a-supplemental-environmental-impact-statement-for-the-december-2016). We previously provided comments and suggestions on the first iteration of the Glen Canyon Dam Smallmouth Bass Environmental Assessment (SMB EA) for the Long Term Experimental and Management Plan (LTEMP) early in 2023. We expect that Reclamation will include consideration of those comments and suggestions, in addition to those provided here as scoping comments to this LTEMP Supplemental EIS process.

Virtually all of the substantive environmental comments received by Reclamation in the previous SMB EA recognized the urgent need for action with regards to the on-going invasion of highly predatory smallmouth bass (SMB) downstream in Glen Canyon. That invasion is taking place primarily because southwestern aridification is reducing water levels in Lake Powell leading to warmer water releases downstream, conditions that allow SMB and other piscivorous non-native fish to survive and reproduce in the Glen Canyon Dam tailwaters. Based on much knowledge of SMB impacts on native fish populations in the upper Colorado River Basin and elsewhere, this invasion poses extreme threats to the existence and condition of native fish populations in Grand Canyon, particularly those of Threatened Humpback Chub.
We expect Reclamation to use the results of this SEIS to respond immediately and vigorously to the SMB invasion by taking diverse measures across several time scales to reduce or eliminate SMB and prevent other non-native piscivorous species establishment downstream from Glen Canyon Dam. As stated in the Federal Register, "…reductions in water temperature combined with changes in flow velocity may be vital tools that can be used to disrupt smallmouth bass

from successfully spawning and establishing a population." Consequently, Reclamation's purpose with this SEIS is to identify methods to prevent this from happening by proposing multiple release (flow) options from the dam that cool the river below 16^{o}C and introduce unfavorable flow velocities for SMB spawning. Reclamation's four options in the flow actions alternative as presented in the SEIS notice (from the previous draft EA) are summarized below:

Action Alternative Option A: Cool Mix

"(W)ater would be released from both 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). The amount of water released through the bypass tubes would be based on predicted temperatures at the bypass tubes and penstocks at the time of the flow; the minimum amount of water to meet the water temperature goal would be released through the bypass tubes. The amount of water released through the bypass tubes would vary over the course of the year, depending on monthly volumes of water available and the temperature." (US Bureau of Reclamation 2023: 2-3).

Action Alternative Option B: Cool Mix with Flow Spikes

"(W)ater 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. During a flow spike, as much water as possible (up to 45,000 cfs) would be released through the penstocks and bypass tubes. The amount of water released through the bypass tubes during the cool mix portion of the hydrograph is based on predicted temperatures at the bypass tubes and penstocks at the time of the flow. The minimum amount of water would be released through the bypass tubes to meet the water temperature goal. The amount of water released through the bypass tubes would vary over the course of the year, depending on monthly volumes." (US Bureau of Reclamation 2023: 2-4).

Action Alternative Option C: Cold Shock

"(W)ater would be released for at least 48 hours through the bypass tubes, releasing the minimum amount of water required to create a cold shock all the way down to the Little Colorado River (RM 61) to disrupt smallmouth bass spawning and rearing. A cold shock is achieved through a sudden drop in temperature, with a target temperature of 13°C or below… This option would begin as soon as daily water temperatures near the Little Colorado River reached 16°C; after this, weekly use of the bypass tubes, anticipated to occur during weekends, would be initiated and would last for up to 12 weeks.

The amount of water released through the bypass tubes during the cold-shock portion of the hydrograph would be based on predicted temperatures at the bypass tubes and penstocks at the time of the flow. The minimum amount of water required to meet the water temperature goal would be released through the bypass tubes and depends on constraints due to maintenance. The discharge volume released through the bypass tubes would vary over the course of the year based on water temperatures at the depths of the bypass tubes and

penstocks. Releases on other days of the week would be primarily determined by the monthly volume." (US Bureau of Reclamation 2023:2-6).

Action Alternative Option D: Cold Shock with Flow Spikes

"(W)ater would be released for at least 48 hours through the bypass tubes for the minimum amount of time required to create a cold shock all the way down to the Little Colorado River (RM 61) to disrupt 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 mainstem river. As much water as possible (up to 45,000 cfs, depending on water availability) would be released through the penstocks and bypass tubes during flow spikes. This option would begin as soon as daily water temperatures near the Little Colorado River reach 16°C. This option would provide weekly 48-hour cold-shock releases and at least one 36-hour spike flow, and it would last for up to 12 weeks.

The amount of water released through the bypass tubes during the cold-shock portion of the hydrograph is based on predicted temperatures at the bypass tubes and penstocks at the time of the flow. The minimum amount of water required to meet the water temperature goal would be released through the bypass tubes and depends on constraints due to maintenance. The amount of water released through the bypass tubes could vary over the course of the year, based on the water temperatures at the depths of the bypass tubes and penstocks. Releases during other days of the week would be primarily determined by the monthly volume." (US Bureau of Reclamation 2023:2-7).

With regards to these four action options, we continue to recommend emphasis on option B, but remain concerned that selection of a single flow Alternative may not be sufficient to solve the problem. Therefore, multiple flow configurations, other non-flow options and altered timing of implementation may be needed to effectively control SMB, Green Sunfish, and other non-native piscivores in this system.

Coupled with the actions alternative are two additional alternatives about which GCWC is concerned. The first is a hydropower flow option to not use the bypass tubes to reduce water temperature. Impacts of the preferred alternative should not unfairly burden any one group, and such burdens as may arise from such management actions should be recognized by Reclamation and mitigated, where possible. However, the threats posed by non-native SMB and other species invasions are dire and very likely irreversible. Therefore, GCWC does not support limitations on management actions to benefit hydroelectric power production or downstream water delivery that may reduce the effectiveness of the flow management actions. Such limitations could ultimately increase the costs to hydropower and water users by orders of magnitude to try to obtain minimal, or even net zero effectiveness in preventing extirpation and extinction. Again, analysis of impacts under this alternative needs to be conducted across multiple time scales.

The second issue addressed among these alternatives is revision of the annual sediment accounting period and HFE implementation window. High flow events are essential for conservation of fine sediment mass balance, and springtime is the period when such floods occurred in pre-dam time. Because many native species and ecological processes are timed with springtime, rather than autumn, high flows, GCWC strongly endorses revision of the sediment accounting period and implementation window, which benefit not only the native species, other resources, and river running recreation by rejuvenating camping beaches immediately prior to the summer recreation season. But such policy revisions will not protect river sandbars if, as occurred in 2023, a springtime flood is followed by continuously elevated summer flows. Springtime high flow events should be the norm, not the exception, for conservation of sediment mass balance.

While the focus on discharge-related options is the primary emphasis of this SEIS, multiple non-discharge-related control measures also are needed, such as measures that reduce through-dam transport of non-native fish, tailwater control efforts (including management of the -12L Mile Slough), and other methods. 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 to 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 those goals have proven impossible to obtain. 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 when possible.

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 Alternative 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 Alternative 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, as we highlighted in our earlier AMP stakeholder input, we emphasize 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 maintain 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.

Our previously submitted analysis of non-flow-related options indicated that physical barrier screens, in-reservoir nets, floating barriers, turbine mortality, and electrofishing appeared to be equally easily accomplished and inexpensive short-term (emergency) management actions. If all were to be undertaken simultaneously, these may be the best collective strategy considered to reduce the likelihood of SMB establishment. Withdrawal of deeper water from the forebay and sorting facility options are intermediate management options, having higher cost or greater complexity, respectively. Our lowest ranked long-term solutions were installation of an air bubble screen and/or an acoustic barrier, with greater management costs to the 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 we recommended was propagation and release of a large number of mature, predatory, endangered Colorado River pikeminnow. This option would require low cost at a medium-to-long-term timeframe, with medium levels of compliance and low implementation cost. In addition to applying additional pressure to non-native fish, this option would help achieve an essential goal of the AMP and GCPA, namely returning a top aquatic predator to the Colorado River ecosystem. Like all Alternatives and non-flow Options, such an action would require continued monitoring, likely in perpetuity.

GCWC recommends that Reclamation more fully examine how different flow alternatives will impact riverine resources, including native species, cultural resources, recreation, as well as hydropower and water delivery, and interactions among those resources. To do so will require refined definition of objectives for some resources, particularly including those for natural processes, recreation, and cultural values. In terms of interaction effects, improving understanding of how the selected flow alternative affects sediment mass balance, to prevent the kinds of system-wide scour that occurred in reservoir balancing or equilibration years (e.g., 2011).

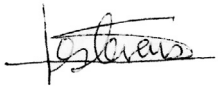
Because of the high levels of uncertainty about how well treatments related to the preferred alternative and/or to non-flow measures, such as construction of a larval fish curtain in the forebay, or reduction of habitat suitability for non-native fish at -12L Slough will address the issues under consideration, flow and non-flow options may have to be pursued over time. Such decision-making will require this SEIS to be a "live and learn" adaptive management document, one kept up-to-date with active monitoring, and capable of flexibility as new treatment considerations (e.g., a single large flow peak) are needed or arise. Integration of such information, and feedback that improves management are crucial to long-term success of this effort, and hopefully will help satisfy the BOR's Section 10 responsibilities to species listed under the Endangered Species Act.

Lastly, and like Grand Canyon River Guides, many of the Native American Tribes, and others, GCWC encourages Reclamation to revisit the HFE decision-making about its Planning and Implementation (PI) team membership. More comprehensive involvement is critical to realizing the spirit of the 1992 Grand Canyon Protection Act to adaptively manage 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". The PI Team needs to include the voices of all AMP stakeholders, as we have previously requested.

We appreciate Reclamation's efforts to develop this SEIS to the Long Term Experimental and Management Plan so that we can provide the essential tools, nimbleness, and flexibility necessary for management of this complex river ecosystem. Thank you for the opportunity to provide additional scoping comments on this SEIS. Please contact us if you have any questions about these comments, or if we can be of further assistance.

Thank you,

Kelly Burke, Director



Dr. Larry Stevens, Senior Ecologist

References Cited: US Bureau of Reclamation. 2023. Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment (EA) Public Comment Analysis Report May 2023. US Bureau of Reclamation Salt Lake City.