



March 24, 2024

Ms. Kathleen Callister
Adaptive Management and Water Quality Division Manager
U.S. Bureau of Reclamation

Electronically submitted to: LTEMPSEIS@usbr.gov

RE: Draft Supplemental Environmental Impact Statement for the Glen Canyon Dam Long-Term Experimental and Management Plan

Dear Ms. Callister:

The Arizona Game and Fish Department (Department) appreciates the opportunity to provide input to the Bureau of Reclamation's (Reclamation) February 9, 2024 Federal Register notice regarding the Draft Supplemental Environmental Impact Statement for the Glen Canyon Dam Long-Term Experimental and Management Plan (LTEMP). The Department is aware of the changing conditions below Glen Canyon Dam, the risk of establishment of warmwater non-native fish in this section of the Colorado River, and the need to adjust the LTEMP high flow experiment sediment account window. The Department continues to manage fish and wildlife resources within the Colorado River watershed and its systems.

Under Title 17 of the Arizona Revised Statutes (ARS), the Department, by and through the Arizona Game and Fish Commission, has jurisdictional authority and public trust responsibilities to conserve and protect the state fish and wildlife resources. In addition, the Department manages threatened and endangered species through authorities of Section 6 of the Endangered Species Act and the Department's 10(a)(1)(A) permit. It is the mission of the Department to conserve and protect Arizona's diverse fish and wildlife resources and manage for safe, compatible outdoor recreation opportunities for current and future generations. As a cooperating agency on the development of the SEIS the Department provides the following comments in addition to the previously submitted comments based on the agency's statutory authorities, public trust responsibilities, and special expertise related to wildlife resources and wildlife-related recreation as they relate to the Federal Register notice.

Flow Alternatives to Address High Risk Warmwater Non-native Fish

Higher water temperatures coming through Glen Canyon Dam and the increased risk of fish entrainment due to low reservoir elevations are the driving factors for establishment of Smallmouth Bass (SMB) and other high risk non-native fish species downstream of the dam. Although these factors are a result of the existing water conditions within the Colorado River

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basin, both release temperature and entrainment can be influenced and managed by operations at Glen Canyon Dam. As a stakeholder within the Glen Canyon Dam Adaptive Management Work Group (AMWG), the Department is supportive of the implementation of flow options that disadvantage high-risk warmwater species, such as SMB.

Within the scoping comments, the Department encouraged Reclamation to plan for flexibility within the implementation of action alternatives to fit within the adaptive management framework of the program. While the Department recognizes that this can be a challenge within compliance documents that are not meant to be determinative (i.e., advocate for one alternative), it is important to contain options within the Alternatives (e.g., days in which flows should be implemented, ratios of bypass to powerplant discharge, shape of hydrographs) to either be more effective in their purpose or reduce impacts to other resources. Additionally, the flow Alternatives were specifically designed for SMB and may not be as effective for other cool- and warmwater species. Having a suite of parameters within flow Alternatives that could be manipulated would allow for a more focused response to a variety of high risk non-native species, without additional compliance, would be beneficial for adaptive management. In some cases, the Alternatives could contain more discretionary language to facilitate future improvements to the Alternative flows or needs established by the GCDAMP.

The inclusion of the predicted SMB population growth rates (lambda values) within Appendix A is a valuable addition to the draft SEIS. Reclamation should consider incorporating these graphs and analysis within the main text of the SEIS within the Alternatives' descriptions. Additionally, the graphs showing predicted SMB growth rates (lambda) by pool elevation and inflow developed by Grand Canyon Monitoring and Research Center (GCMRC) that were presented at the Technical Working Group (TWG) Annual Reporting and the February AMWG meetings should be included as well. It is evident from this modeling that Alternatives that incorporate sustained use of bypass (i.e., cool mix) to maintain release temperatures less than 16°C are more effective at reducing the probability of establishment of SMB with less uncertainty than cold spikes and alternatives without any bypass. Although this document does not prescribe or advocate for the use of one Alternative over another, establishing the relative effectiveness of each to accomplish the stated goal is critical information for the Leadership Team to have when discussing implementation of experimental or management flows. The Department has concerns with the inclusion of the non-bypass Alternative within this SEIS. Given the predicted effects stated within Appendix A, it does not appear to reduce the SMB population growth rate compared to the No Action Alternative and thus, does not meet the need as established in Section 1.4, nor the the Secretary's Designee directive from May 2022 AMWG to develop "operational alternatives that could help prevent cool- and warmwater invasive fish establishment".

The Department recognizes that the flow regimes outlined by the GCMRC and Reclamation to suppress SMB will disrupt recreational opportunities at Lees Ferry during high flows; however, they also represent an overall benefit to the LTEMP resource if effective in their suppression of SMB by maintaining colder water releases below the dam. The Department does appreciate the inclusion of considerations for mitigating impacts to anglers within each of the alternatives. The Department continues to recommend Reclamation consider implementing peak flows during times of lowest use (i.e. weekdays), as feasible, to minimize impacting recreational users, and to

provide adequate time for public announcements for recreationalists to adjust plans and minimize impacts to boating and angling trips.

It should be stressed that although the Department agrees that the mechanisms of the flow options proposed should disadvantage warmwater species, the efficacy of such actions to elicit population-level effects on unwanted species is yet unknown. Reliance on flow operations exclusively to disadvantage warmwater species at Lees Ferry ***is likely not an effective long-term strategy, unless paired with other preventative measures***. The Department is encouraged by pursuit of technologies in preventing or limiting entrainment of warmwater fish through Glen Canyon Dam that Reclamation is exploring, including tailrace trawls and forebay exclusion nets and/or temperature curtains. These preventative actions, together with the modification of the slough by the National Park Service are critical components to work in tandem with the flow alternatives outlined in the SEIS to minimize biological and economic impacts to existing resources from high risk non-natives.

Sediment Accounting Window

The Department is supportive of the changes to the sediment accounting window proposed within the SEIS. The Department has long advocated for adjustments to the accounting window to allow for additional spring high flow events as they fit more closely with natural processes of rivers. Further, these adjustments will address the changing precipitation conditions within the basin, which preclude current winter sediment triggers from being met. Changes to the sediment accounting window are needed to meet sediment resource goals outlined in the LTEMP and are in the spirit of the adaptive management framework.

The Department has previously expressed concerns with combining flow actions to address SMB and High Flow Experiments to address beach building by way of the sediment accounting window within the same SEIS. The Department continues to stress the importance that these actions should not be considered mutually exclusive because the intended purpose benefits separate resources goals. Related to this concern, implementation of each should not be influenced by the other (e.g. cost, impact to water, or hydropower resources). Additionally, the Department has concerns that the current decision process through the implementation process does not allow for adequate time to thoroughly discuss, deliberate, and make a determination on implementation for these actions together or separately. While the draft SEIS establishes new management options that are needed, this may put additional strain on the decision process. Thus, the Department continues to recommend Reclamation identify clear guidance that ensures adequate time for review and coordination of flow experiments to be considered for implementation.

Dissolved Oxygen

The factors contributing to dissolved oxygen (DO) levels in the Colorado River below Glen Canyon Dam are complex, and are influenced by conditions in Lake Powell and dynamics below the dam. In the introduction to water quality on 3-152, the document implies that DO is the exception to water quality parameters being “highly defined” by the water quality in Lake

Powell, because of the rapid effect downstream biotic and abiotic processes have on DO within the water passed through the dam. However, low DO in the Colorado River directly below the dam (e.g. 5 miles) is directly correlated with DO levels at the level of the penstocks, and low DO events have been observed in this section of Lees Ferry. The replenishment of DO through photosynthetic processes only occurs during daylight hours and may not be adequate to provide refugia from significantly low DO events coming through the dam at night. It is also important to acknowledge that despite this section being a relatively small area of the Colorado River ecosystem, it also represents the most important reach of the Rainbow Trout fishery, an LTEMP resource, to fishing guides and recreational anglers.

Although the Alternative flows outlined in this SEIS were not designed to address low DO concerns, Alternatives which include bypass will mitigate low DO in some capacity, assuming flows occur during periods of low DO, which are most prominent in the fall. The effect of Alternatives that utilize bypass on DO is likely understated within the SEIS. This is because the discharge from the bypass tubes may only marginally affect DO when measured directly below the turbine outflows (as they are modeled in the SEIS), but could have a much more significant increase to DO even just hundreds of meters downstream.

Additional Editorial Comments

There are some instances of Lees Ferry being mistakenly described as being at river mile (RM) 15; however, Lees Ferry is traditionally considered at RM 0. This has led to some errors within the text related to river miles. The modeling for SMB lambdas appears to be done at RM 61 (the Little Colorado River) and 15 miles below Lees Ferry, which may be contributing to the confusion. Examples of river miles for Lees Ferry that need to be corrected occur on page 2-1, 2-10, and 3-3, but should be corrected throughout. References of locations further downstream seem to be in relation to Lees Ferry and are correct (e.g. Little Colorado River at river mile 61, Pumpkin Springs, RM 213). Additionally, the description of river mile contained within the Glossary is misstated as “Numbered along the Colorado River from south to north starting with RM 0.0 at the Southerly International Boundary (SIB) with Mexico. Dam locations are noted at their respective river miles”. This is incorrect, river miles are listed in reference to Lees Ferry being 0. River miles upstream of Lees Ferry are denoted as negative river miles (e.g. the slough at -12 mile)

Figure 3-25 should be updated to include relative abundance from 2016-2023, which is contained within the Department’s most recent Lees Ferry monitoring annual report (Rogowski et al. 2023). The Department has observed catch per unit effort below one fish/min since 2021, which falls below the management goal outlined in the Department’s fisheries management plan for Lees Ferry. It is important that the status of the Rainbow Trout fishery is accurately reported within the SEIS.

With expansion of Humpback Chub (HBC) into the western Grand Canyon, especially into the areas previously inundated by Lake Mead, the Department’s perception of suitable or preferred habitat for this species is being challenged. The information that is contained within the Habitat section for HBC (pg. 3-118) is based on observations that were made when HBC were relatively

rare in the system. As populations have increased the specific habitat that this species was and is reliant on is broadening. A recently published manuscript by Department staff considers this change in perspective and may be a beneficial reference for this section (Boyer et al. 2024).

On pg. Reference-31, the reference “Rogowski, D., C. Madonia, K. Manuell, R. Osterhoudt, L. Winters, and P. Wolters. 2023. Arizona Game & Fish Department, Lees Ferry Long-Term Monitoring. Grand Canyon Monitoring and Research Center, Flagstaff, Arizona.” does not exist. The correct citation for the 2022 Lees Ferry annual report is “Rogowski, D., J. Fennell, and D. Fonken. 2023. Status of the Lees Ferry Trout Fishery 2022. Annual Report, prepared by the Arizona Game and Fish Department, Research Division, for the US Geological Survey, Grand Canyon Monitoring and Research Center, Flagstaff, Arizona. Arizona Game and Fish Department, Phoenix, Arizona”. Additionally, on pg. Preparers-2, Scott Roger's title should be corrected to "Aquatic Wildlife Program Manager, Region 2”.

Thank you for the opportunity to provide input on the SEIS for the Glen Canyon Dam Long-Term Experimental and Management Plan. For further coordination, please contact Ryan Mann at rmann@azgfd.gov or by phone call to 623-236-7538.

Sincerely,



Acting for
Luke Thompson
Habitat, Evaluation, and Lands Branch Chief

AGFD # M24-02091439

Cited:

Boyer, J., Fonken, D., Rogowski, D. 2024. Why new scientific information is important for native fish conservation: a case study from the humpback chub (*Gila cypha*) in the Grand Canyon, U.S.A. *Aquatic Conservation: Marine and Freshwater Ecosystems* 34 (1): e4075.

Rogowski, D., J. Fennell, and D. Fonken. 2023. Status of the Lees Ferry Trout Fishery 2022. Annual Report, prepared by the Arizona Game and Fish Department, Research Division, for the US Geological Survey, Grand Canyon Monitoring and Research Center, Flagstaff, Arizona. Arizona Game and Fish Department, Phoenix, Arizona