



November 18, 2019

Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, D.C. 20426

RE: Comments on Little Colorado River Pumped Storage Project P-14994

Dear Ms. Bose:

The Arizona Game and Fish Department (Department) has reviewed the preliminary permit application for the Little Colorado River Pumped Storage Project #14994, published in the Federal Register on September 23, 2019. The Project as proposed is a pumped storage hydroelectric generating facility, with construction of a lower dam and reservoir on the Little Colorado River and an upper dam and reservoir constructed on the plateau above the Little Colorado River gorge. This pumped storage project (PSP) will operate as an open-loop system because of existing baseflow of 228 cfs in the Little Colorado River flowing through the lower dam. Approximately 15,000 acre-feet of stream flow will be stored in the lower reservoir to be available for pumping to the 15,400 acre-foot upper reservoir and then returned.

The Department has reviewed the subject application and has the following comments regarding the project and its potential impacts to the riverine ecosystem and aquatic fauna of the Little Colorado River. The project location is downstream from the confluence with Big Canyon, which joins from the east at a location 11.3 km (7 miles) upstream from the confluence with the Colorado River and 9.8 km (6.1 miles) downstream from Blue Spring, the source of much of the perennial flow in the lower Little Colorado River. Four native fishes inhabit this section of the river: Humpback Chub (*Gila cypha*), Flannelmouth Sucker (*Catostomus latipinnis*), Bluehead Sucker (*Catostomus [Pantosteus] discobolus*), and Speckled Dace (*Rhinichthys osculus*). The two suckers are sensitive species that have declined in distribution and abundance and are now managed under a range-wide conservation agreement involving all six states in the Colorado River basin (Utah Division of Wildlife Resources 2006). Humpback Chub are protected as endangered under the Endangered Species Act. Following the completion of a recent species status assessment (SSA), the U. S. Fish and Wildlife Service recommended down-listing Humpback Chub from endangered to threatened, but this recommendation was based on trends and future scenarios outlined in the SSA that did not include potential impacts from the construction of two dams in core spawning habitat in the lower Little Colorado River (LCR PSP and Salt Trail Canyon PSP). Such an impact was unforeseen. Currently there are only five remaining viable populations of Humpback Chub on Earth, four of which occur in canyons of the upper Colorado River basin. Two former populations became extinct following the inundation of

azgfd.gov | 602.942.3000

5000 W. CAREFREE HIGHWAY, PHOENIX AZ 85086

**GOVERNOR: DOUGLAS A. DUCEY COMMISSIONERS: CHAIRMAN, ERIC S. SPARKS, TUCSON | KURT R. DAVIS, PHOENIX
LELAND S. "BILL" BRAKE, ELGIN | JAMES E. GOUGHNOUR, PAYSON | JAMES S. ZIELER, ST. JOHNS DIRECTOR: TY E. GRAY DEPUTY DIRECTOR: TOM P. FINLEY**

Hideout Canyon by Flaming Gorge Reservoir on the Green River and the inundation of Black Canyon by Lake Mead. In addition, the range of the species has contracted by 38% in response to the construction of dams that have inundated or fragmented formerly suitable habitats. The only population remaining in the lower Colorado River basin inhabits the riverine ecosystems of the Grand Canyon and depends on the Little Colorado River for primary spawning and juvenile habitat (U.S. Fish and Wildlife Service 2017). The proposed Little Colorado River Pumped Storage Project would fragment and alter this habitat and jeopardize the down-listing from endangered status to threatened status and the potential recovery of the Humpback Chub. It could also realistically lead to the complete extirpation of the Grand Canyon population in the foreseeable future.

The Grand Canyon population of Humpback Chub includes aggregations of adults at nine locations ranging from Marble Canyon to areas formerly inundated by Lake Mead, but the Little Colorado River aggregation is the largest of these aggregations and is estimated to account for more than 90% of the Humpback Chub in the Grand Canyon. The lower 21.1 km (13.1 miles) of the Little Colorado River has perennial flow maintained by groundwater inputs from a cluster of springs, the largest of which is Blue Springs. Groundwater emerging from Blue Spring averages 20° C (68° F) and is supersaturated with calcium carbonate, that produces formation of a benthic limestone layer in places, as well as travertine deposits that create small waterfalls and cascades (Robinson et al. 1996; Stone 2010). The importance of the Little Colorado River to Humpback Chub stems from the fact that it provides the largest amount of suitable spawning and juvenile habitat (Coggins et al. 2006; Van Haverbeke et al. 2013). Adults migrate from the mainstem Colorado River into the Little Colorado River to spawn during the spring when flows are high and the water temperatures exceed 14° C (57° F). Larvae occupy rocky interstitial spaces in relatively warm and shallow water. Larval and juvenile growth rates are highest at 16-22° C (61-71.6° C). The modified hydrologic regime and colder water of the mainstem Colorado River downstream from Glen Canyon Dam likely result in thermal shock and death for larvae that drift downstream from the Little Colorado River (Gorman and Stone 1999), and juvenile growth rates and survival are positively correlated with the amount of time spent in the Little Colorado River before migrating downstream (Limburg et al. 2013). Juveniles tend to migrate downstream into the Colorado River during monsoon rains, but return as adults to spawn (Yackulic et al. 2014).

The Humpback Chub SSA outlines eight factors or ecological conditions considered most important in meeting the ecological requirements of Humpback Chub. Four of these factors that would be negated or substantially degraded by the presence of a dam in the lower Little Colorado River include diverse rocky canyon river habitat, favorable flow and temperatures regimes, minimal influence from nonnative predators and competitors, and unimpeded range connectivity. The most obvious impact would be the impediment to migration in the form of the dam itself. Additionally, the project would alter the natural flow regime and reduce water temperatures by releasing relatively cold water from the hypolimnion of the resultant “lower reservoir.”

In addition to impacting factors identified in the SSA as critical to the growth, reproduction, and survival of endangered Humpback Chub, the proposed dam and reservoir would interfere with sediment transport and complicate efforts to improve beach, gravel bar, and backwater habitats in the Grand Canyon. Following the construction of Glen Canyon Dam, which greatly reduced

downstream sediment transport, the Little Colorado River and Paria River became the two major sources of sediment in the Grand Canyon portion of the Colorado River (Dolan et al. 1974).

Development of the project would result in predictable, widespread, and potentially irreversible negative impacts to the aquatic ecosystem of the Little Colorado River. The area impacted would far exceed the footprint of the project and would likely reverse progress made as a result of several decades of adaptive management aimed at restoring aquatic ecosystems and the proper functioning condition of riparian and floodplain areas in the Grand Canyon. It would also result in a major decline and the possible extirpation of the only remaining population of Humpback Chub in the lower Colorado River basin.

The most significant potential outcome of permitted development of this project would be the potential reversal in status of the Humpback Chub from a recommendation to make it a threatened species, a decision to keep it listed as endangered, and the potential to jeopardize its continued existence. A significant negative change in the future viability of this species may affect the operation of dams and diversions elsewhere in its range, including Glen Canyon Dam, and numerous structures in the upper basin of the Colorado River. This project would impact species, water conservation, and management throughout the Colorado River Basin states.

The Department appreciates the opportunity to provide comments on this project. If you have any questions or would like to further discuss the concerns raised in this letter, please contact me at 623-236-7607 or at dweedman@azgfd.gov.

Sincerely,



David weedman
Aquatic Habitat Program Manager

AGFD Log # M19-10022925

Literature Cited

Coggins LG Jr., Pine WE III, Walters CJ, Van Haverbeke DR, Ward DL, Johnstone L. 2006. Abundance and status of the Little Colorado River population of humpback chub *Gila cypha*. North American Journal of Fisheries Management 26:233-245.

Dolan R, Howard A, and Gallenson A. 1974. Man's impact on the Colorado River in the Grand Canyon. American Scientist 62:392-401.

Gorman OT, Stone DM. 1999. Ecology of spawning humpback chub, *Gila cypha*, in the Little Colorado River, near Grand Canyon, Arizona. Environmental Biology of Fishes 55:115-133.

- Limburg KE, Hayden TA, Pine WE, Yard MD, Kozden R, Valley JW. 2013. Of travertine and time: otolith chemistry and microstructure detect provenance and demography of endangered Humpback Chub in Grand Canyon, USA. PLoS ONE 8:e84235.doi:10.1371/journal.pone.0084235.
- Robinson AT, Kubly DM, Clarkson RW, Creef ED. 1996. Factors limiting the distributions of native fishes in the Little Colorado River, Grand Canyon, Arizona. Southwestern Naturalist 41:378-389.
- Stone DM. 2010. Overriding effects of species-specific turbidity thresholds on hoop-net catch rates of native fishes in the Little Colorado River, Arizona. Transactions of the American Fisheries Society 139:1150-1170.
- 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 Colorado. 220 pages.
- Utah Division of Wildlife Resources. 2006. Range-wide conservation agreement and strategy for Roundtail Chub *Gila robusta*, Bluehead Sucker *Catostomus discobolus*, and Flannelmouth Sucker *Catostomus latipinnis*. Prepared for Colorado River Fish and Wildlife Council by Utah Department of Natural Resources, Division of Wildlife Resources. Publication 06-18. 64 pages.
- Van Haverbeke DR, Stone DM, Coggins LG Jr., Pillow MJ. 2013. Long-term monitoring of an endangered desert fish and factors influencing population dynamics. Journal of Fish and Wildlife Management 4:163-177.
- Yackulic CB, Yard MD, Korman J, Van Haverbeke DR. 2014. A quantitative life history of endangered humpback chub that spawn in the Little Colorado River: variation in movement, growth, and survival. Ecology and Evolution 4:1006-1018.

Document Content(s)

AGFD comments in Little Colorado River PSP P-14994.PDF.....1-4