



25 March 2024

SENT VIA ELECTRONIC MAIL

US Department of the Interior
Bureau of Reclamation
Attn: LTEMP SEIS Project Manager
Upper Colorado Basin Region
125 South State Street, Room 8100
Salt Lake City, UT 84138
LTEMPSEIS@usbr.gov

RE: Glen Canyon Dam Long-Term Experimental and Management Plan Draft
Supplemental Environmental Impact Statement to Address the Threat of
Smallmouth Bass Below Glen Canyon Dam, EIS No. 20240024.

LTEMP SEIS Project Manager:

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”) “Draft Supplemental Environmental Impact Statement for the December 2016 Record of Decision Entitled Glen Canyon Dam Long-Term Experimental and Management Plan.” 89 Fed. Reg. 02676-77 (Feb 9, 2024).

Attached and incorporated by reference to these comments are our March 10, 2023 comments on “Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment,” and our November 3, 2023 comments on “Scoping for Supplemental Environmental Impact Statement for the December 2016 Record of Decision Entitled Glen Canyon Dam Long-Term Experimental and Management Plan.” 88 Fed. Reg. 68667-69 (Oct. 4 2023).

As we stated in those comments, this is an emergency. Operation of Glen Canyon Dam’s penstocks, by passing warm water and warmwater invasive fish through the dam, is causing an ongoing and worsening invasion of non-native predator fish in the Colorado River. This threatens to decimate humpback chub’s last large source population at the confluence of the Little Colorado River, thereby jeopardizing the entire species. “Rapid response” measures to control invasive fish population expansion below the dam are failing. This expansion is enhanced by BOR’s ongoing, multi-year failure to enact conservation measures in the 2016 LTEMP

Biological Opinion to modify the dam with fish exclusion devices to prevent entrainment¹ and eliminate nursery habitats for invasive fish downstream.

We again urge immediate action to manage flows below 16 degrees Celsius (60.8 degrees Fahrenheit) to prevent further smallmouth bass production and concurrent immediate action to (1) install fish exclusion devices on Glen Canyon Dam to prevent further passage of warmwater invasive fish through the dam, (2) modify the 12-mile slough to prevent further warmwater invasive fish reproduction and population expansion below the dam, and (3) augment sediment to increase turbidity and reduce smallmouth bass predation downstream of the dam. This remains a critical issue this year as researchers expect that due to aridification this year will again see less than expected runoff into the system despite average snowfall.²

Conservation groups again urge BOR to plan now for the survival and recovery of the Grand Canyon's endangered fish in the context of the climate-inevitable deadpool and obsolescence of Glen Canyon Dam and Lake Powell. Conservation groups urge BOR to plan a phased decommissioning of Glen Canyon Dam that (1) maintains the relatively intact native fishery in the Grand Canyon upstream of Pearce Ferry Rapid; and, in the short and long terms, (2) prevents warmwater predator fish from invading the Grand Canyon from upstream or downstream of the dam site and Pearce Ferry, and (3) facilitates the restoration of the Colorado River's naturally warm, turbid flows through the Grand Canyon.

I. The Conservation Groups

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.

¹ Entrainment means passage of fish from Lake Powell through Glen Canyon Dam into the Colorado River downstream.

² <https://subscriber.politicopro.com/article/eenews/2024/03/13/researchers-expect-underperforming-spring-runoff-for-colorado-river-00146742>

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 Nevada and Utah for residents, animal and plants in the Great Basin and Colorado River Basin. The Network promotes effective water conservation programs and locally sustainable uses to ensure that water remains accessible for all living things.

II. Modeling Suggests “Cool Mix” and “Cool Mix Flow Spike” Are the Only Alternatives that Prevent Smallmouth Bass Population Growth in the Colorado River’s Mainstem

Conservation groups support the “Cool Mix” and “Cool Mix Flow Spike” alternatives because, per USGS modeling, these are the only two alternatives that will inhibit smallmouth bass (SMB) reproduction and population growth within the mainstem of the Colorado River downstream of Glen Canyon Dam through 2027. DSEIS at Figure 1, Appendix A. However, as detailed below, neither of these alternatives alone provide sufficient measures for protecting the humpback chub and its critical habitat.

That modeling projects that all other alternatives will result in some amount of SMB reproduction and population growth by 2027. *Id.* This will result in ongoing SMB expansion further modifying adversely designated critical habitat for humpback chub, and heightening chances that SMB invasion will decimate the humpback chub’s Little Colorado River population. *Id.*

III. Additional Measures are Needed Because None of the Alternatives Will Prevent Smallmouth Bass Population Growth in Tributaries or Side Channels Whose Water Temperatures Don’t Change with Mainstem River Water Temperature

Conservation groups note that none of the DSEIS alternatives will prevent SMB (or other warmwater invasive fish) reproduction and population growth within portions of tributary streams or side channels that are accessible to those fish and whose temperatures are unaffected or minimally affected by mainstem water temperature changes.

Absent measures to stop dam entrainment and modify side channel habitats that enable warm water fish reproduction, the “Cool Mix” and “Cool Mix Flow Spike” alternatives may slow and limit but will not stop adverse modification of designated critical habitat for Grand Canyon’s endangered fish.

BOR cannot omit analysis and disclosure under NEPA or ESA of the effects of warmwater invasive fish entertainment, as it has and is likely to continue to facilitate expansion on nonnative fish populations within side channels (for example, the “slough”) and/or tributary streams whose water temperatures are relatively unaffected by mainstream water temperature changes.

IV. Smallmouth Bass Have Likely Reached the Little Colorado River

Since 1 July 2022, when juvenile SMB were originally detected below Grand Canyon, SMB have expanded downstream from Glen Canyon Dam at an average rate of about four miles per month. Federal reports of invasive fish surveillance in Grand Canyon National Park show that, as of October 2023, SMB had been detected as far downstream as River Mile 47, about 14 miles upstream of the Little Colorado River (at mile 61.5) and the largest remaining source population of humpback chub on earth.³ Given an expansion rate of four river miles per month, SMB populations can reasonably be expected to have expanded downstream to the Little Colorado River as of February of 2024, and to take refuge and begin reproducing this year in its relatively warm tributary waters. We note too the same monitoring shows that other warmwater invasive fish, like green sunfish have been widespread in the vicinity of the Little Colorado River. *Id.*

BOR’s failure in the DSEIS to analyze and disclose the rate and severity of downstream expansion of warmwater invasive fish resulting from entrainment, despite those data being at BOR’s fingertips, and its failure to discuss those data and trends in the context of threats posed to the Little Colorado River population of humpback chub is evasive, and it violates NEPA.

V. BOR’s Operation of Glen Canyon Dam’s Penstocks is Jeopardizing the Listed Fish, By Facilitating (1) Entrainment and Reproduction of Warmwater Invasive Fish, Causing an Ongoing, Worsening, and Uncontrolled Invasion of Warmwater Nonnative Fish into the Colorado River Downstream and Adverse Modification of Critical Habitat, and (2) Entrainment of Bonytail, Causing Harassment, Potential Mortality and Unauthorized Take.

a. Entrainment and Reproduction of Warmwater Invasive Fish

Conservation groups hereby incorporate by reference our March 10, 2023 comments on the “Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment” and our November 3, 2023 comments on “Scoping for Supplemental Environmental Impact Statement for the December 2016 Record of Decision Entitled Glen Canyon Dam Long-Term Experimental and Management Plan.” 88 Fed. Reg. 68667-69 (Oct. 4 2023).

³ Invasive Fish Surveillance, Grand Canyon National Park GCDAMP - TWG, November 8, 2023. Available at: <https://www.usbr.gov/uc/progact/amp/twg/2023-11-08-twg-meeting/20231108-InvasiveFishSurveillanceGrandCanyonNationalPark-508-UCRO.pdf>

Those comments describe “an emergency situation for humpback chub” whereby the passage of warm water and smallmouth bass from near the surface of Lake Powell through penstocks of Glen Canyon Dam into the Colorado River is facilitating an ongoing, expanding warmwater fish invasion that 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, particularly in tributary streams and warm side channels whose temperatures cannot be controlled via dam releases. 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.

Those comments describe regulations implementing the ESA which 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. The comments further describe how, in this instance, pursuant to the ESA, the BOR must ensure that operations of 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 Glen Canyon National Recreation Area or Grand Canyon National Park, or directly or indirectly reduce its reproduction, numbers, or distribution.

Since conservation groups’ March 10 and November 3, 2023 comments, BOR’s actions and inaction have caused the nonnative warmwater fish invasion to worsen rather than improve, where:

- BOR’s operation of the Glen Canyon Dam’s penstocks is causing, on an ongoing basis, an invasion of nonnative warmwater predator fish by transporting warm water above 16 degrees Celsius and warmwater invasive fish from Lake Powell into the Colorado River. This is facilitating the ongoing establishment, reproduction, and downstream expansion of warmwater invasive fish populations into and immediately upstream of designated critical habitat for razorback sucker, humpback chub, and humpback chub’s last large source population at the Little Colorado River;
- Smallmouth bass populations have expanded an average of four river miles per month downstream of Glen Canyon Dam since juvenile SMB were first recorded downstream of the dam on 1 July 2022. As of October of 2023, SMB were recorded as far downstream as mile 47; given downstream expansion of four miles per month, SMB can be expected to have arrived at the Little Colorado River in February of 2024 and to take refuge and reproduce in its relatively warm waters this year;
- Populations of some warmwater invasive species, like and including SMB, may be impossible to control if they become established, and could eliminate the humpback chub’s last large source population at the Little Colorado River. Researchers estimate that long-term reductions in smallmouth populations require nearly 70% removal of young of year for at least ten consecutive years. This type of intensive, long-term smallmouth bass management is likely not physically possible in GCNRA and GCNP.

- The warmwater fish invasion owes in large part to BOR’s chronic failure and refusal to implement required conservation measures. Conservation measures to protect humpback chub and razorback sucker from warmwater invasive fish, as set forth in the Biological Opinion for the Glen Canyon Dam Long-Term Experimental and Management Plan (LTEMP Bi-Op) and relied on to support the incidental take statement, either aren’t being implemented by BOR, or aren’t working;
 - BOR has failed, and continues to fail, to implement conservation measures that the 2016 Biological Opinion for the Glen Canyon Dam Long-Term Experimental and Management Plan (LTEMP Bi-op) presumed would prevent the introduction and downstream expansion of warmwater invasive fish into the Colorado River. This includes BOR’s ongoing failure in Grand Canyon to (1) construct barriers on the dam that prevent the passage of warmwater invasive fish, (2) eliminate side-channel nursery habitat below the dam, like the “12-mile slough,” and (3) manage river temperatures and flows to prevent spawning and reproduction of smallmouth bass; and
 - In the absence of measures to prevent warmwater fish from passing through Glen Canyon Dam, “rapid response” conservation measures to control resultant warmwater fish invasion with chemical and mechanical eradication are failing. Despite detection and removal with chemical and mechanical treatments of 345 smallmouth bass from the Lee’s Ferry reach in October of 2022, NPS reported 667 smallmouth bass (SMB) in one portion of the Lee’s Ferry reach by August 2023, including dozens of young-of-year bass, and thousands of green sunfish, which have become established throughout Grand Canyon. Agency monitoring reports show downstream expansion of smallmouth bass in 2023 below the Paria River; and
 - Glen Canyon Dam discharge temperatures in 2023, as in 2022, remained above 16 degrees Celsius from early summer, thereby likely facilitating spawning, reproduction and expansion of smallmouth bass populations below the dam in locations beyond just the 12-mile slough.

Imminent and ongoing downstream expansion of warmwater invasive fish populations caused by BOR’s operation of Glen Canyon Dam’s penstocks is adversely modifying designated critical habitat and, with resultant predation, threatens to decimate humpback chub’s last core source population at the Little Colorado River. FWS’ determination of non-jeopardy in the 2016 LTEMP Bi-Op is predicated on assumptions that do not include dam operations causing the now ongoing, worsening, and uncontrolled invasion of warmwater invasive fish into the Colorado River upstream and within designated critical habitat for humpback chub and razorback sucker.

b. Entrainment of Bonytail

A federally endangered bonytail documented by federal biologists in the 12-Mile Slough was presumably entrained in Glen Canyon Dam after being stocked in into Lake Powell at

Wahweap Bay, perhaps in October of 2022.⁴ Further entrainment of bonytail is possible given the ongoing presence and apparent reproduction of bonytail in Lake Powell. We note that Utah Division of Wildlife Resources' Lake Powell larval fish sampling in 2022 was confirmed by the Larval Fish Laboratory at Colorado State University to have detected two bonytail protolarvae at lake miles 122 and 123.

VI. High Flow Experiments

Conservation groups generally support modifying HFE protocols to time HFEs in late spring and early summer, which more closely reflects the timing of historical high flows resulting from snowmelt in the Rocky Mountains. BOR should refrain from HFE experiments pending modification of Glen Canyon Dam penstocks with fish exclusion devices and other measures to ensure against further entrainment of warmwater invasive fish, and to prevent "flushing" warmwater invasive fish already in the Colorado River farther downstream into designated critical habitat for humpback chub and razorback sucker.

VII. Concurrent with the SEIS, BOR Must Immediately Advance Conservation Measures to Prevent Nonnative Fish Entrainment and Expansion in the Colorado River

The ongoing warmwater fish invasion now resulting from BOR's Glen Canyon Dam operations and BOR's failure since the 2016 LTEMP Bi-Op to implement conservation measures to prevent warmwater invasive fish from passing through the dam warrants BOR immediately advance modifications to Glen Canyon Dam that (1) prevent passage of warmwater fish from Lake Powell into the Colorado River in the first place, and (2) augment sedimentation and increase turbidity sufficient to reduce or inhibit predation of humpback chub by smallmouth bass and other warmwater invasive fish.

Thus, in addition to the SEIS, BOR must immediately and concurrently initiate action to:

- Modify the dam with fish exclusion devices to prevent entrainment of warmwater invasive fish; and
- Modify the 12-mile slough to prevent warmwater invasive fish reproduction;

BOR must also immediately and concurrently initiate action to augment sediment and increase turbidity downstream of the dam in order to reduce smallmouth bass predation. The 2015 Biological Assessment for LTEMP, which preceded the 2016 Biological Opinion, acknowledged that the failure of LTEMP to provide methods to manage river temperature and sediment effectively excluded from LTEMP "the most important potential conservation tools" for humpback chub in the Grand Canyon. It states:

Methods to actively manage temperature releases from Glen Canyon Dam sediment

⁴ See, for example: "Field Notes: Young Bonytail Found in Lake Powell." Available at: <https://coloradoriverrecovery.org/blog/field-notes-young-bonytail-found-in-lake-powell/>

augmentation below the Paria River are not included in the Long-Term Experimental Management Program (LTEMP), for Glen Canyon Dam. Inclusion of infrastructure options including these were eliminated from detailed study in the LTEMP alternatives for a variety of reasons. We mention them here because these methods may still represent the most important potential conservation tools that could be used for the long-term conservation of HBC in Grand Canyon and the concepts should not be lost.⁵

VIII. BOR and FWS Must Consider Climate Change, Regional Aridification, Declining Colorado River Flows and Lake Powell Elevations, That All Contribute to Warmwater Fish Invasion Downstream of Glen Canyon Dam, As Part of the Degraded Baseline Conditions in Consultation for Humpback Chub and Razorback Sucker

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.”).

Here, BOR and FWS must consider in the context of consultation the observed and predicted future climate change, regional aridification, Colorado River flow declines, declines in Lake Powell surface elevations, and resulting transport of warm water and warmwater invasive fish from Lake Powell into the Colorado River as degraded environmental baseline conditions that are degrading designated critical habitat for humpback chub and razorback sucker.

IX. Department of the Interior Agencies Must Plan Now for Endangered Species Survival and Recovery Amidst Climate-inevitable Minimum Power Pool, Dead Pool, Obsolescence of Glen Canyon Dam and Lake Powell, and A Warm Colorado River Through Grand Canyon. This Should Include Developing Replacement Power and Planning a Phased Decommissioning of Glen Canyon Dam.

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,

⁵ LTEMP Biological Assessment at D-4.

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 to ensure critical cold water flows from Glen Canyon Dam to protect fish can be achieved. 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 must include planning for the climate inevitable obsolescence of Glen Canyon Dam and Lake Powell, and, in that context, it must provide for replacement power, a phased decommissioning of the dam, and associated engineering solutions that will exclude non-native fish invasion, maintain Grand Canyon as a native fish stronghold in the Colorado River system, and provide for the survival and recovery of endangered fish in the mainstem of the Colorado River in Glen Canyon National Recreation Area and Grand Canyon National Park.

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

Sincerely,



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Attachments:

March 10, 2023 comments on “Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment.”

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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

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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.

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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 offset 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)(1).

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]ecoverey 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 heightened 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 habitat³ and 11 miles of occupied habitat (inclusive of critical habitat).⁴

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

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

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)(1).

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

Sincerely,



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3 November 2023

SENT VIA ELECTRONIC MAIL

US Department of the Interior
Bureau of Reclamation
Attn: LTEMP SEIS Project Manager
Upper Colorado Basin Region
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Salt Lake City, UT 84138
LTEMPSEIS@usbr.gov

RE: Glen Canyon Dam/Smallmouth Bass Flow Options SEIS

LTEMP SEIS Project Manager:

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”) “Notice of Intent To Prepare a Supplemental Environmental Impact Statement for the December 2016 Record of Decision Entitled Glen Canyon Dam Long-Term Experimental and Management Plan.” 88 Fed. Reg. 68667-69 (Oct. 4 2023).

This is an emergency. Operation of Glen Canyon Dam’s penstocks, by passing warm water and warmwater invasive fish through the dam, is causing an ongoing and worsening invasion of non-native predator fish in the Colorado River. This threatens to decimate humpback chub’s last large source population at the confluence of the Little Colorado River, thereby jeopardizing the entire species. “Rapid response” measures to control invasive fish population expansion below the dam are failing. This expansion is enhanced by BOR’s ongoing, multi-year failure to enact conservation measures in the 2016 LTEMP Biological Opinion to modify the dam with fish exclusion devices to prevent entrainment and eliminate nursery habitats for invasive fish downstream.

Conservation Groups urge immediate action to manage flows below 16 degrees Celsius to prevent further smallmouth bass production and concurrent immediate action to (1) install fish exclusion devices on Glen Canyon Dam to prevent further passage of warmwater invasive fish through the dam, (2) modify the 12-mile slough to prevent further warmwater invasive fish reproduction and population expansion below the dam, and (3) augment sediment to increase turbidity and reduce smallmouth bass predation downstream of the dam.

Conservation groups urge BOR to plan now for the survival and recovery of the Grand Canyon's endangered in the context of the climate-inevitable obsolescence of Glen Canyon Dam and Lake Powell. Conservation groups urge BOR to plan a phased decommissioning of Glen Canyon Dam that (1) maintains the relatively intact native fishery in the Grand Canyon upstream of Pearce Ferry Rapid; and, in the short and long terms, (2) prevents warmwater predator fish from invading the Grand Canyon from upstream or downstream of the dam site and Pearce Ferry, and (3) facilitates the restoration of the Colorado River's naturally warm, turbid flows through the Grand Canyon.

I. The Conservation Groups

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.

II. BOR is Operating Glen Canyon Dam in an Ongoing State of Unlawful Jeopardy Because Dam Operations Are Causing an Ongoing, Worsening, and Uncontrolled Invasion of Warmwater Nonnative Fish into the Colorado River Downstream

Conservation groups hereby incorporate by reference our March 10, 2023 comments on the “Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment” (Attachment 1).

Those comments describe “an emergency situation for humpback chub” whereby:

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.

Attachment 1 at 2.

The comments describe regulations implementing the ESA which 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. The comments further describe how, in this instance, pursuant to the ESA, the BOR must ensure that operations of 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 Glen Canyon National Recreation Area or Grand Canyon National Park, or directly or indirectly reduce its reproduction, numbers, or distribution.

Since conservation groups’ March 10, 2023 comments, BOR’s actions and inaction have caused the nonnative warmwater fish invasion to worsen rather than improve, where:

- BOR’s operation of the Glen Canyon Dam’s penstocks is causing, on an ongoing basis, an invasion of nonnative warmwater predator fish by transporting warm water above 16 degrees Celsius and warmwater invasive fish from Lake Powell into the Colorado River. This is facilitating the ongoing establishment, reproduction, and downstream expansion of warmwater invasive fish populations into and immediately upstream of designated critical habitat for razorback sucker, humpback chub, and humpback chub’s last large source population at the Little Colorado River; and
- Populations of some warmwater invasive species, like smallmouth bass, may be impossible to control if they become established, and could eliminate the humpback chub’s last large source population at the Little Colorado River. Researchers estimate that long-term reductions in smallmouth populations require nearly 70% removal of young of

year for at least ten consecutive years. This type of intensive, long-term smallmouth bass management is likely not physically possible in GCNRA and GCNP.

- Measures to protect the chub and sucker from warmwater invasive fish, as set forth in the Biological Opinion for the Glen Canyon Dam Long-Term Experimental and Management Plan (LTEMP Bi-Op), either aren't being implemented by BOR, or aren't working;
 - BOR has failed, and continues to fail, to implement conservation measures that the 2016 Biological Opinion for the Glen Canyon Dam Long-Term Experimental and Management Plan (LTEMP Bi-op) presumed would prevent the introduction and downstream expansion of warmwater invasive fish into the Colorado River. This includes BOR's ongoing failure in Grand Canyon to (1) construct barriers on the dam that prevent the passage of warmwater invasive fish, (2) eliminate side-channel nursery habitat below the dam, and (3) manage river temperatures and flows to prevent spawning and reproduction of smallmouth bass; and
 - In the absence of measures to prevent warmwater fish from passing through Glen Canyon Dam, "rapid response" conservation measures¹ to control resultant warmwater fish invasion with chemical and mechanical eradication are failing. Despite detection and removal with chemical and mechanical treatments of 345 smallmouth bass from the Lee's Ferry reach in October of 2022, NPS reported 667 smallmouth bass (SMB) in one portion of the Lee's Ferry reach by August 2023, including dozens of young-of-year bass, and thousands of green sunfish, which have become established throughout Grand Canyon. Agency monitoring reports show downstream expansion of smallmouth bass in 2023 below the Paria River.
 - Glen Canyon Dam discharge temperatures in 2023, as in 2022, have remained above 16 degrees Celsius since early summer, thereby likely facilitating spawning, reproduction and expansion of smallmouth bass populations below the dam in locations beyond just the 12 mile slough.

Imminent and ongoing downstream expansion of warmwater invasive fish populations caused by BOR's Glen Canyon Dam operations is adversely modifying designated critical habitat and, with resultant predation, threatens to decimate humpback chub's last core source population at the Little Colorado River. FWS' determination of non-jeopardy in the 2016 LTEMP Bi-Op is predicated on assumptions that do not include dam operations causing the now ongoing, worsening, and uncontrolled invasion of warmwater invasive fish into the Colorado River upstream and within designated critical habitat for humpback chub and razorback sucker.

III. BOR Must Take Immediate Action to Modify Glen Canyon Dam Operations and Flows to Prevent Reproduction of Smallmouth Bass

BOR must expedite actions evaluated in the 2023 Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment to manage dam operations in a way that

¹ Attachment 1 at 2.

maintains river temperatures below 16 degrees Celsius and prevents (rather than merely disrupts) smallmouth bass reproduction and expansion downstream. We discuss this in our attached March 2023 comment.

We support revising the sediment accounting window for the LTEMP High Flow Experiment (HFE) protocol to favor HFEs timed during the spring or summer and lengthening the window so that a spring or summer HFE could occur anytime in the spring or summer. BOR should refrain from HFE experiments pending modification of Glen Canyon Dam penstocks with fish exclusion devices and other measures to ensure against further entrainment of warmwater invasive fish, and to prevent “flushing” warmwater invasive fish already in the Colorado River farther downstream into designated critical habitat for humpback chub and razorback sucker.

IV. Concurrent with the SEIS, BOR Must Immediately Advance Conservation Measures to Prevent Nonnative Fish Entrainment and Expansion in the Colorado River

The ongoing warmwater fish invasion now resulting from BOR’s Glen Canyon Dam operations and BOR’s failure since the 2016 LTEMP Bi-Op to implement conservation measures to prevent warmwater invasive fish from passing through the dam warrants BOR immediately advance modifications to Glen Canyon Dam that (1) prevent passage of warmwater fish from Lake Powell into the Colorado River in the first place, and (2) augment sedimentation and increase turbidity sufficient to reduce or inhibit predation of humpback chub by smallmouth bass and other warmwater invasive fish.

Thus, in addition to the SEIS, BOR must immediately and concurrently initiate action to:

- Modify the dam with fish exclusion devices to prevent entrainment of warmwater invasive fish;
- Modify the 12 mile slough to prevent warmwater invasive fish reproduction;

BOR must also immediately and concurrently initiate action to augment sediment and increase turbidity downstream of the dam in order to reduce smallmouth bass predation. The 2015 Biological Assessment for LTEMP acknowledged that the failure of LTEMP to provide methods to manage river temperature and sediment effectively excluded from LTEMP “the most important potential conservation tools” for humpback chub in the Grand Canyon. It states:

Methods to actively manage temperature releases from Glen Canyon Dam sediment augmentation below the Paria River are not included in the Long-Term Experimental Management Program (LTEMP), for Glen Canyon Dam. Inclusion of infrastructure options including these were eliminated from detailed study in the LTEMP alternatives for a variety of reasons. We mention them here because these methods may still represent

the most important potential conservation tools that could be used for the long-term conservation of HBC in Grand Canyon and the concepts should not be lost.²

V. BOR and FWS Must Consider Climate Change, Regional Aridification, Declining Colorado River Flows and Lake Powell Elevations, as Contribute to Warmwater Fish Invasion Downstream of Glen Canyon Dam, As Degraded Baseline Conditions in Consultation for Humpback Chub and Razorback Sucker

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.”).

Here, BOR and FWS must consider in the context of consultation the observed and predicted future climate change, regional aridification, Colorado River flow declines, declines in Lake Powell surface elevations, and resulting transport of warm water and warmwater invasive fish from Lake Powell into the Colorado River as degraded environmental baseline conditions that are degrading designated critical habitat for humpback chub and razorback sucker.

VI. Department of the Interior Agencies Must Plan Now for Endangered Species Survival and Recovery Amidst Climate-inevitable Minimum Power Pool, Dead Pool, Obsolescence of Glen Canyon Dam and Lake Powell, and A Warm Colorado River Through Grand Canyon. This Should Include Planning a Phased Decommissioning of Glen Canyon Dam.

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.

² LTEMP Biological Assessment at D-4.

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)(1). This must include planning for the climate inevitable obsolescence of Glen Canyon Dam and Lake Powell, and in that context provide for a phased decommissioning of the dam and associated engineering solutions that will provide for the survival and recovery of endangered fish in the mainstem of the Colorado River in Glen Canyon National Recreation Area and Grand Canyon National Park.

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

Sincerely,



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