



## SIERRA CLUB COLORADO RIVER TASK FORCE

December 11, 2023

BY US POSTAL SERVICE MAIL RETURN RECEIPT REQUESTED TO:

Ms. Genevieve Johnson  
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PO Box 61470  
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and

Ms. Marcie Bainson  
Bureau of Reclamation Upper Colorado River Basin Region  
125 South State Street, Room 8100  
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BY EMAIL TO: [CRinterimops@usbr.gov](mailto:CRinterimops@usbr.gov)

Re: Reclamation Near-term Colorado River Operations Revised Draft Supplemental Environmental Impact Statement

Dear Ms. Johnson and Ms. Bainson:

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." Our members and supporters have a significant interest in the Near-term Colorado River Operations Revised Draft Supplemental Environmental Impact Statement ("RDSEIS," "the RDSEIS") and how it will affect the health of the Colorado River and water deliveries. Our members and supporters have a long history of protecting the Colorado River ecosystem; many

of us rely on the Colorado River for drinking water and livelihoods; we recreate in and along the river, watch wildlife, and cherish the lands that are nourished by the Colorado River's waters.

The Sierra Club submits the following comments and recommendations on the above-referenced Revised Draft SEIS through its Colorado River Task Force.

### **Ecosystem Protection**

Over the past hundred years the Colorado River ecosystem has been severely degraded by the construction of river-blocking dams, excessive water diversions, poor drought management, introduction of exotic species, and other human-directed activities. Despite legislative protections for Grand Canyon National Park and Glen Canyon National Recreation Area, these national treasures undergo continuing declines. Today and in the future, protecting the Colorado River ecosystem must be a top priority.

### **Conservation and Stabilization**

Conservation needs to be the first and foremost means of action to protect Colorado River flows over the next two to three years. A temporary one-year "surplus" should be managed to replenish reservoirs in order to stabilize operations for the likely upcoming dry years driven by climate change. Some water agencies are already rolling back conservation measures, such as a ban on watering non-functional turf, because there is more water in the reservoirs now—but there won't be in the future if existing conservation measures aren't maintained, and new ones introduced. Relying on historical river flows and long-past releases as a guide to the future is uninformed and highly risky. Because of low Powell/Mead volumes, one can only reasonably utilize river flow information from the last approximately one to three years for planning purposes in dam operation/diversions (rather than the ten-year moving average noted in RDSEIS, Figure 3-1). Yet, this is too short of a timescale to clearly confirm a steady climatic state (e.g., El Niño oscillations are on the order of ten years). It is therefore likely that the only "guaranteed" operating principle is to use what exists (accounting for evaporation, infiltration, diversion losses, etc.) of the last two or three years of river flow to inform current diversions.<sup>1</sup>

A recent (November 2, 2023) posting by Jack Schmidt (2023) emphasizes that after the abundant water years of 2011, 2017, and 2019 all of the water "gains" of those years were used up within two years. In assessing Basin-wide reservoir storage as of the end of October 2023, Schmidt reports that since the end of snowmelt (mid-July 2023) storage of water in Lakes Powell and Mead has declined by 400,000 af, but Basin-wide storage has declined by 1.6 million af, with nearly three-fourths of the decline occurring in reservoirs upstream of Lake Powell. Schmidt's calculations call into serious question whether by 2026 Basin-wide storage will be any higher than it was before the relatively abundant water year of 2023. He cautions "Let's continue to

keep track of the rate of decline in reservoir storage, lest we quickly overspend our surplus.” To prevent the surplus from quickly disappearing, he emphasizes that “It is imperative for the Basin States, Tribes, and federal government to agree on ways to significantly reduce basin consumptive uses and losses lest we repeat the past and quickly consume the gains of WY [Water Year] 2023.” Does the modeling done by Reclamation include the amount of water already “lost” from reservoirs upstream of Lake Powell, and how does Reclamation reconcile Schmidt’s conclusions with the projected figures in the RDSEIS?

We have also previously asked Reclamation to consult the work of the Utah State University Center for Colorado River Studies White Papers, in particular, Number 6 in the series (Wheeler, Kuhn, et al. 2021) for suggestions about alternative management scenarios, which think outside the box at a time when new river management approaches are needed. Reclamation should take a look at this body of work and hopefully utilize the models that have been developed by this research team.

One of the things that Reclamation should not do in selecting a Preferred Alternative is engage in creative water accounting. The water levels of Lake Powell and Lake Mead must reflect their measured levels rather than paper water levels. In 2022, Reclamation released 980,000 acre-feet (af) from reservoirs upstream of Lake Powell. 480,000 af of this water remained in Lake Powell, but the level of Lake Mead was adjusted on paper as if Lake Mead had received the 480,000 af . This very likely kept the level of Lake Mead from falling into a Level 2b cutback under the Drought Contingency Plan, potentially delaying further water use reductions by Arizona and Nevada and not forcing California to take a 200,000 af reduction for the first time since the Drought Contingency Plan was adopted (Allhands 2022). The discrepancy between the paper level of water in Lake Mead and its true, measurable level must be reconciled immediately in order to recover Reclamation’s credibility about how water releases and reservoir levels will actually be accounted for under the RDSEIS’s alternatives.

### **Evaporation and Fallowing**

The “cruel arithmetic” is unambiguous; the Colorado River is overallocated, and we must face that reality. The Sierra Club supports fully accounting for the estimated “1.5 million acre-feet of water lost to evaporation, transportation, and inefficiencies each year in Arizona, Nevada, and California ” (Naishadam 2023). We join the Arizona Municipal Water Users Association (Tenney 2022) in principle in “Section V. Evaporation and System Loss” of their letter, calling for Colorado River water users to bear a proportional reduction for water loss caused by evaporation, seepage, and other losses before, during, and after water delivery to a water user. We were disappointed to see that Reclamation did not even propose using losses from evaporation and seepage and other causes as an alternative in the RDSEIS or make it part of any existing alternatives, especially after Reclamation indicated it would be moving in the direction of assessing water users for such losses as a means of conservation. The burden of this

recognition of water lost in delivery to and use by water users would fall proportionally on all users in all states. This seems to us one of the fairest ways to share recognition of water use that should have been recognized long ago. Reclamation must include such an alternative or condition in arriving at the Preferred Alternative for the Final RSEIS and include proportional user accountability for water losses.<sup>2</sup>

Fallowing is a prime tool to reduce demand permanently or temporarily, and the full societal impacts of fallowing on vulnerable communities must be recognized. Fallowing need not take agricultural land out of production permanently but can be practiced on a seasonal basis, as the Quechan (Kwatsáan) do, or for one year out of a three-year rotation, as the Palo Verde Irrigation District and the Metropolitan Water District of Southern California are doing.

### **The Natural Environment and Lack of Mitigation**

A *sine qua non* of the SEIS is the need to prioritize the natural environment over certain other demands on the Colorado River, such as hydropower production and motorized recreation. In addition, project impacts on sensitive native species need to be fully analyzed and mitigated.

Table 1-1, “Resources Considered for Detailed Analysis” (p. 1-13, RSDEIS), needs to include ecological flows as a resource or as part of the Hydrologic Resources and Water Deliveries Resources and should be analyzed throughout the RDSEIS. Ecological flows are an important function of the Colorado River and have been greatly diminished, if not nearly eliminated, under current river management regimes. The impact of these dam-and-reservoir management regimes on the essential function of the Colorado River in providing ecological flows needs to be assessed, and the Proposed Action needs to consider to what degree ecological flows can be implemented under the current or Proposed Action river management regimes.

Another deficiency of Table 1-1 (p. 1-14) is its selectivity in including only certain groups of living organisms in its scope. Which plants are included is selective, and there is a bias in including only vertebrate animals. Even among the birds, raptors and waterfowl are the only “taxa” listed. The only invertebrates to make it into the analysis are special status species. Occasionally algae are mentioned.

The RDSEIS needs to include all of life’s kingdoms, including those that are no longer classified as plants or animals. The specific taxonomy Reclamation uses is less important than the fact that all kingdoms are included. The ecosystem functions as a whole, with each of its constituents playing a role, and Reclamation needs to assess how all such constituents (species, if you prefer) are affected by Reclamation’s No Action Alternative and Proposed Action.

The RDSEIS claims on several pages that “. . . given that the predicted flows are only marginally different, no population level impacts are expected . . .” (e.g., RSDEIS, p. 3-319). On what factual basis does Reclamation support this statement? We find none.

In assessing effects of the Proposed Action on vegetation, wildlife in general and special status species in particular within the river segment from Hoover Dam to the SIB, Reclamation repeatedly states that the Proposed Action will have a greater impact than the No Action Alternative (RSDEIS, pp. 3-201, 3-202, 3-203, 3-218, and 3-219). Reclamation points out that the Proposed Action would have a greater impact on backwaters in general and on the bonytail population on the Cibola National Wildlife Refuge in particular (p. 3-202) and on marsh vegetation. What is left unsaid is that marshes along this stretch of the river are habitat for the endangered Yuma Ridgway’s Rail. This issue needs to be openly addressed by Reclamation. How does Reclamation propose to mitigate these losses if the impacts can’t be avoided?

Similarly, Reclamation states that the Proposed Action will have a greater impact on special status species at the Salton Sea because of decreased water level and increased salinity (p. 3-219). Again, how does Reclamation propose to mitigate this loss, given that the Proposed Action prevents it from being avoided?

The Salton Sea is physically, historically, and practically part of the Colorado River watershed and has become an essential stopover and wintering area on the Pacific Flyway. If subjected to further diminished inflows, this area promises to become a major biological, economic, health, and social justice disaster. Preventing such a disaster in the Salton Sea region (i.e., parts of Imperial and Riverside Counties) will require maintaining adequate inflows, which are nearly wholly dependent on runoff from Imperial County farms and wastewater from Mexicali. The RDSEIS has failed to fully analyze, avoid, minimize, or mitigate all potential direct and indirect project impacts on biological, health, and economic resources at the Salton Sea and other areas affected by its Proposed Action. Indeed, the Imperial Irrigation District declined to sign on to the 2019 Colorado River Drought Contingency Plan (DCP) and went to court over it against the Metropolitan Water District largely because of the DCP’s failure to mitigate for impacts to the Salton Sea. We recognize that establishing a sustainable environment at the Salton Sea is a challenging problem that will require effort and resources from the Bureau, the State of California, the Federal Government, and others, but it needs to be done without further delay.

The RDSEIS has failed to fully analyze operations. impacts on natural resources, including biodiversity and ecosystems in areas that are outside of the river basin but receive its water (e.g., coastal southern California and coastal northern Baja California) These areas should be included in the analysis.

It appears that Reclamation proposes no mitigation for any of the myriad effects on nature and human activities envisioned in both alternatives. Mitigation needs to be simultaneous with the actions proposed in the RDSEIS. Mitigation delayed is too often mitigation denied.

There is another listing of special status species that Reclamation appears not to have consulted for the RDSEIS. Each state in the Colorado River Basin has a State Wildlife Plan. Each of these plans has a listing of Species of Greatest Conservation Need (SGCN). Reclamation needs to include these species in the analysis of impacts on wildlife and vegetation. Each of the seven Basin states' wildlife agencies should be able to provide this list to Reclamation. We strongly recommend that in future scoping and draft environmental documents (EIS, EA) Reclamation refer to these lists of SGCN in the document and assess the impacts of the alternatives on these species as well as those that Reclamation has included in the RDSEIS.

The RDSEIS (p. 3-183) states, "Information pertaining to Endangered Species Act (ESA)-listed species is still being drafted in the biological assessments. Updated information will be incorporated into the final SEIS when it is available." This is putting the cart before the horse. The biological assessment from the Fish & Wildlife Service (FWS) should be included as part of any Draft SEIS. Otherwise, how are we to know from the proper authority (FWS) to what degree ESA species are impacted? The degree to which they are impacted determines whether mitigation is required. If mitigation is not feasible, what will Reclamation do to compensate for the loss of ESA-listed and other special status species? And will lack of mitigation put them in greater jeopardy? We don't know because we don't have the biological assessment. The opportunity to comment when the Final SEIS is released is much more limited than for the Draft, so the biological assessment needs to be appended to the draft NEPA document.

### **Water Quality**

Water within the Colorado River Basin must not only be of adequate quantity but it must also be of an acceptable quality. In light of the recent Presidential and Environmental Protection Agency initiative (United States President 2023) on assessing and reducing PFAs in our nation's water supply, we believe that Reclamation must add PFAs to the list of water quality constituents of concern (RDSEIS, p. 3-157). Indeed, Reclamation needs to assess the impacts of all chemicals which may be harmful to humans, both organic and inorganic, because research is finding an increasing number of connections between chemical pollution of water and health problems.

### **Environmental Justice**

As a component of the United States Department of the Interior of the Executive Branch of the United States Government, Reclamation must strive for a just, equitable, and inclusive process and outcome of the RDSEIS. There are thirty federally recognized Tribes in the Colorado River Basin. President Biden's Memorandum of January 26, 2021 (Memorandum on Tribal

Consultation and Strengthening Nation-to-Nation Relationships) states that “American Indian and Alaska Native Tribal Nations are sovereign governments recognized under the Constitution of the United States, treaties, statutes, Executive Orders, and court decisions. It is a priority of my Administration to make respect for Tribal sovereignty and self-governance, commitment to fulfilling Federal trust and treaty responsibilities to Tribal Nations, and regular, meaningful, and robust consultation with Tribal Nations cornerstones of Federal Indian policy.” (United States President 2021).

Historically, the original inhabitants of the Colorado River Basin have been left out of water negotiations despite their sovereign status, the U.S. government’s trust responsibility to Tribal nations, and the deep interest that Tribal members have in water protection. As far as we know, Native American Nations, Tribes, Communities, Bands, Rancherias, and Pueblos are still excluded from negotiations occurring among the states of the Colorado River Basin. These Native American sovereign governments of the Colorado River Basin need to be included in the negotiations among the Basin states immediately.

Reclamation must address the Guiding Principles in the Colorado River Basin Tribal Coalition’s letter and work collaboratively in partnership with the Tribes. The U.S. government must fulfill its trust responsibility to Tribes and resolve water rights for the twelve Tribes whose water rights remain unsettled and must assist Tribes in finding ways to provide safe water to all Tribal members. The current drought should not be used as an excuse to further delay these processes; quite the opposite: the need to provide every person with safe clean drinking water is now more urgent than ever. The COVID-19 crisis, which disproportionately affected Tribal members in the Southwest because of their lack of access to adequate water supplies, tragically reinforced the need for everybody to have access to reliable, clean water. Where the U.S. government and others are benefitting from the use of unallocated water to Tribes, those Tribes should be compensated so they can work toward achieving equitable water supplies for all their members.

Reclamation needs to cooperatively work to provide for the needs and values of Tribes and Tribal members, including what are commonly referred to as non-use values: flowing water, ecosystems, and springs may hold importance for Tribal members of which the Bureau is unaware. While we appreciate that Reclamation recognizes these values exist and are under application to be recognized as Traditional Cultural Properties, including the Colorado River and its tributaries and canyons (RDSEIS, p. 3-151 to 3-152), the values and rights that Native Americans hold regarding rivers and natural features need to be incorporated into the RDSEIS analysis of effects of implementing the No Action Alternative and the Proposed Action.

The RDSEIS recognizes adverse effects in environmental justice, socioeconomics, and Indian Trust Assets, but no mitigation is proposed. Is Reclamation claiming that the effects on these communities are insignificant? Or rather that the predicted effects won’t happen so that no

mitigation is required? We fail to understand why Reclamation does not include a plan for the mitigation of these effects.

### **Modeling**

As requested in our scoping comments, Colorado River management and decision-making should be informed by (1) an ensemble of vetted physico-hydrological-ecological models from both government and academia; (2) both current weather/climate conditions as well as climate change scenarios driven by CO<sub>2</sub>, and (3) Native American cultural knowledge. Such models should be fed by real water and not paper water, and the assumptions of models should be tested and appropriately parameterized. By these criteria, the RDSEIS falls short.

### **Alternatives Analyzed and Identified Weaknesses of Alternatives**

In considering only the Proposed Action and a No Action Alternative, the RDSEIS fails to analyze a reasonable range of other Alternatives. By its own admission, the Bureau recognizes that the Proposed Action and the No Action Alternatives are not the only possible scenarios. The main goal of the Proposed Action seems to be to keep reservoir levels high enough so that Lake Powell, and perhaps to a lesser extent, Lake Mead, can continue to produce hydroelectricity. While this will attempt to ensure that the reservoirs stay at a level above dead pool, it nonetheless causes environmental, socioeconomic, and environmental justice effects that are significant and unmitigated. The Bureau must analyze a resource protection alternative that acknowledges its obligations under the Grand Canyon Protection Act, Executive Order 12114, and the Endangered Species Act, as well as other laws and Native American rights.

On a broader scale, the RDSEIS is weakened by not including Mexico's plans for Colorado River water management in its geographic scope (RDSEIS, p. 2-24). While we recognize that Reclamation excludes Mexico from the RDSEIS geographically as well as the impacts of water management actions in the United States on Mexico for legal-political reasons, failing to include impacts of the two alternatives on the whole of the Colorado River Basin makes the RDSEIS much less useful to reviewers. Our understanding is that Executive Order 12114 ("Environmental effects abroad of major Federal actions,") may apply, in particular, Section 2.3(d):

major Federal actions outside the United States, its territories and possessions which significantly affect natural or ecological resources of global importance designated for protection under this subsection by the President, or, in the case of such a resource protected by international agreement binding on the United States, by the Secretary of State. Recommendations to the President under this subsection shall be accompanied by the views of the Council on Environmental Quality and the Secretary of State.

The Upper Gulf of California and Delta of the Colorado River Biosphere Reserve is a UNESCO World Heritage Site and also a protected wetland area designated under the Ramsar agreement



(González Barajas 2021, Ramsar n.d.). This area includes the Ciénega de Santa Clara (Santa Clara Slough), which is fed water by a canal that originates in the Wellton-Mohawk Irrigation and Drainage District in the United States, so any effects on Colorado River flows to Wellton-Mohawk could well have an effect on water flows to the Ciénega de Santa Clara, and operation of the desalination plant in Yuma County would have a very direct and adverse effect on the Ciénega de Santa Clara. However, these possible effects of the proposed and cumulative actions are not analyzed in the RDSEIS.

### **Paleontological Resources**

In Section 3.12, Paleontological Resources, there are several problems. 3.12.1 Affected Environment states: "Paleontological resources include (with some exceptions) any fossilized remains, traces, or imprints of organisms preserved in or on the earth's crust." Paleontological specimens may be above ground, embedded in the rocks, or below the waterline and may be anywhere within the Colorado River basin (e.g., between Lake Powell and Lake Mead). The RDSEIS description of paleontological resources leaves out microfossils which are not traces. Microfossils are important in establishing the environment in which animals, plants, insects, and other organisms lived. These fossils establish flora, fauna, and sometimes the temperature of the environment. Microfossils are a common feature in marine environments, brackish water, freshwater, and terrestrial sedimentary deposits. Every kingdom of life is represented in the microfossil record.

It is important to differentiate between archeology – the study of the human past, which encompasses a small part of life on this planet – and paleontology, which goes back many millions of years. These two are not the same, but in this document, they are lumped together repeatedly. In both the No Action Alternative and Proposed Action, there is no way to know what the river levels will be at any given time. Paleontological resources cannot be reestablished once they are gone. We urge ongoing study to minimize the impacts on paleontological resources all along the Colorado River, including the Salton Sea, to minimize damage from weather, visitors, construction, and vandalism to these vital fossils, including tracks, traces, imprints, plants, insects, and microfossils.

### **Grand Canyon—an Area of Special Significance**

Because of its natural beauty and its demonstration of the power and wonder of nature, the Grand Canyon is a national treasure and a World Heritage Site, and Reclamation has a special responsibility to care for the Grand Canyon. The RDSEIS cannot sacrifice the health of the Grand Canyon in determining how and when to send water downstream. The Grand Canyon Protection Act (GCPA) (1992) 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.<sup>3</sup>

*Reclamation must operate Glen Canyon Dam for the health of the Grand Canyon.*

As Reclamation determines how much water it will annually release through Glen Canyon Dam, the agency should release water in a way that mimics a historically-timed hydrograph. On other rivers where dams have been operated to mimic the historic hydrograph, benefits extended to a multitude of aquatic and riparian resources (Richter et al. 2003, Rood et al. 2003). Evidence is accruing that the same would be true for Grand Canyon (Healy et al. 2020, Healy et al. 2022). Beneficial flows are required under the Grand Canyon Protection Act and flows for ecological improvement such as High Flow Experiments (HFEs) have been successfully implemented without affecting the total amount of water released to the Lower Basin.

Reclamation acknowledges that, to comply with the National Environmental Policy Act of 1969 (NEPA), “As stored water is released from the reservoir, it must be released consistent with the specific physical and operational characteristics of the release structures and the river below, which can include maximum and minimum flow rates; ...[or] considerations to meet ecological conditions, such as the time of year or temperature when water is released...” (RDSEIS p.1-9). However, flow timing is not considered in the RDSEIS. It must be analyzed in order to meet the requirements of NEPA, the Endangered Species Act, and the Grand Canyon Protection Act.

***Recommendation 1:** The Near-Term Colorado River Operations (2024-2026) should require flows to be released from Glen Canyon Dam in a way that minimizes daily fluctuations, creates flood pulses in the spring when sediment levels are adequate (similar to pre-dam flood pulse timing), optimizes sediment retention downstream, and keeps water temperatures in the Colorado River through Grand Canyon at temperatures that scientists say are best to preserve native fish and wildlife.*

*Equalization and Upper Elevation Balancing Tier flows must occur only when sediment conditions are adequate to prevent beach and sandbar erosion in the Grand Canyon.*

Equalization and Upper Elevation Balancing Tier flows are common to both alternatives despite the fact that research reveals that they have significantly eroded Grand Canyon’s beaches and sandbars in the past (RDSEIS section 2.7.2, p. 2-10, Ashley et al. 2020, Fig. 8; Grams et al. 2018, Fig. 2; Jacobs, McCoy, and Martin 2019, 25). Previous implementation of the 2007 Interim Guidelines via equalization flows between the reservoirs in 2011 caused irreparable damage to the Grand Canyon by scouring sediment from beaches and sandbars that will never be fully replaced.

The RDSEIS must analyze the impacts of all flows authorized in all actions in the RDSEIS on sediment retention in the Grand Canyon. By only analyzing the impacts of HFEs as authorized under the Long-Term Experimental and Management Plan (LTEMP) (RDSEIS section 3.5.1, p.

3-11), Reclamation is ignoring a known and demonstrated harm that it will cause to the Grand Canyon with this RDSEIS. HFE implementation is only one component of the Grand Canyon's sediment balance. Reclamation must time Equalization and Upper Elevation Balancing Tier flows to occur when sediment conditions are adequate and should use existing science to determine the proper timing and best flow pattern to release these elevated flow levels while also conserving the Grand Canyon's sediment balance.

We are glad to see that Reclamation intends to meet the distributions and experimental flow patterns of LTEMP, but Reclamation must modify the Equalization and Upper Elevation Balancing Tier flows to protect sediment, temperature, water quality, and other ecological requirements of the Colorado River ecosystem in the Grand Canyon. It is not enough to conduct an HFE for a short amount of time and then allow an Equalization or Upper Elevation Balancing Tier flow to erode beaches and sandbars for weeks or months at a time. Reclamation must structure Glen Canyon Dam's annual, monthly, and daily flow patterns to protect the Grand Canyon.

***Recommendation 2:** The model predictions for river operation should be based on realistic future flow estimates. As the residence time of water behind the dam is of the order of 2-3 years, basing predictions and impacts based on 30-year average flow (or 80%-90% of the 30-year average flow) is unrealistic and can lead to further worsening of water levels, especially as climate change is expected to continue to strengthen in the future.*

The worst-case scenario for drought is defined by the RDSEIS as 80% or 90% of the 30-year average (Sections 2.8.7 and 3.3.3). The assumption does not reflect the reality of the Colorado River flow. The 10-year running mean is most recently 12 Maf or approximately 80% of the running mean (a proxy for the 30-year average that is used; see fig 3-1) or 75% of the most recent 10 year running mean. With the residence time of water in this reservoir system being on the order of 2-3 years, the 10-year running mean is a more appropriate starting point and is yet still biased towards higher flow regimes.

Furthermore, the flow of the river during drought has most recently been on the order of 8-10 Maf (60% of the 30-year mean flow or 75% of the 10-year running average flow. Thus, we find that the "worst-case scenario" (section 2.8.7) does not reflect a true and possible worst-case scenario. A more appropriate "worst-case scenario" would be 8-10 Maf, 60% of mean flow or 75% of the current 10-year running average. We are dealing with the probabilities of future precipitation and runoff which might best be evaluated from mid-year assessment of snowpack.

It is concluded, therefore, that the "worst-case scenario" analysis is flawed (section 2.8.7), and the river operating system should most definitely be reconsidered with a mid-term review with defined contingencies should 2024 end as a typical drought year for the Basin rather than an average year.

***Recommendation 3:*** *The Near-term Colorado River Operations (2024-2026) must require flows to be released from Glen Canyon Dam only when sediment levels are adequate, optimizing sediment retention in the Grand Canyon.*

*The Purpose and Need for the proposed action must include ecosystem protection.*

At least thirteen, and up to twenty-two animal species have been extirpated from the Colorado River ecosystem since Glen Canyon Dam closed in 1963 (Glen Canyon Dam Adaptive Management Program 2020, Stevens n.d.), and non-native plant species are now prevalent in riparian habitats. Three of eight native mainstem fish (Colorado pikeminnow, bonytail chub, roundtail chub) have been extirpated from Grand Canyon, and four more (humpback chub, razorback sucker, flannelmouth sucker, and bluehead sucker) require intensive management to avoid serious decline. (United States National Park Service Grand Canyon National Park 2023). At one time, the razorback sucker was thought to be extirpated, but it has since been found in newly exposed river segments above Lake Mead. Changes in all aspects of the natural flood regime threaten the survival of riparian and aquatic species: flow magnitude, frequency, duration, timing, and rate of change across hourly to century scales (Poff et al. 1997, Schmidt and Grams 2011).

The effects of this problem were recognized decades ago, leading to an important mandate from Congress to mend the river ecosystem:

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 of 1992, Pub. L. 102-575, title XVIII, Oct. 30, 1992, 106 Stat. 4669, Section 1802(a)).

Although Reclamation acknowledges that water releases “can include maximum and minimum flow rates; safety restrictions to protect downstream facilities or water uses; considerations to meet ecological conditions, such as the time of year or temperature when water is released; or physical limits where water can no longer be released,” RDSEIS, p. 1-9), Reclamation is dodging the fact that these considerations *must* be included to meet the requirements of the law.

Rather than avoiding ecological considerations, Reclamation must change the Purpose and Need to reflect its legal requirement to “protect, mitigate adverse impacts to, and improve” the Grand Canyon.

***Recommendation 4:*** *Include within the Purpose and Need of the Near-term Colorado River Operations the protection and restoration of the Colorado River ecosystem in the Grand Canyon*

*as required by the Grand Canyon Protection Act, the Endangered Species Act, and the purpose and significance of Grand Canyon National Park.*

*Reclamation must act now to protect the health of the Grand Canyon while also protecting the interests of those who rely on the Colorado River.*

Implementation of the RDSEIS's Proposed Action will not eliminate the risk of reaching dead pool in Lake Mead nor of falling below the minimum power pool at Glen Canyon Dam (RDSEIS p. 1-7). The Bureau should consider at what point river management — specifically, water and power needs — would be better served by maximizing water storage in Lake Mead rather than dividing storage between Mead and Powell reservoirs. The Bureau should assess the comparative loss of water (1) to infiltration and (2) from evaporation between maintaining both reservoirs, maintaining only Lake Mead, and an alternative where Lake Powell is kept low to reduce losses to infiltration and evaporation. Hydropower needs may be more secure if water is concentrated above Hoover Dam, where it will have a higher hydraulic head.

In any reasonably foreseeable future, the likelihood of hitting power pool elevations and even lower will only increase. Reclamation needs to be making plans for replacing both the hydropower and important revenues generated at the Glen Canyon Dam. The revenues generated are important sources of funding for several significant environmental programs, such as the Endangered Species Recovery Programs in the Upper Basin. Plans must be in place for the financial maintenance and continuation of these programs should the day come when hydropower generation no longer proves a reliable source of funds.

Reclamation needs to immediately begin studies to develop new ways to pass water around Glen Canyon Dam under low reservoir conditions. Examining the potential to construct river outlets with low intakes on Glen Canyon Dam would enable Reclamation to keep the Lake Powell reservoir low without risking dead pool above Glen Canyon Dam.

Because Lake Powell is likely to fluctuate around its current level into the future, continuing the risk of allowing more warm water non-native fish in the Grand Canyon, Reclamation should also examine the potential for other dam modifications that will limit fish passage through the dam. One possibility is upstream screening. Because it will take some time to analyze the feasibility of this action, Reclamation should begin to study it now.

During Reclamation's webinar on its future Glen Canyon Dam Low-Head Hydropower Modifications project, Reclamation acknowledged that implementation of major dam modifications will not occur for at least a decade. Analysis and planning must begin immediately to avoid severe damage to the Colorado River ecosystem in the Grand Canyon, should dead pool occur above Glen Canyon Dam. Glen Canyon Dam modifications will also increase flexibility to

control water temperature in the Grand Canyon, as proposed in the Glen Canyon Dam/Smallmouth Bass Flow Options Draft Environmental Assessment.

***Recommendation 5:*** *As part of or simultaneously with this process, Reclamation needs immediately to begin to plan a way to move water around the dam at the base of Glen Canyon Dam. This will: 1) maintain flow through the Grand Canyon and enable reliable water deliveries by eliminating the possibility of reaching dead pool, 2) enable water to be concentrated above Hoover Dam while maintaining the flexibility to move water downstream from a low Powell reservoir, and 3) allow cold water to be released from the deepest part of the reservoir, even when reservoir levels are low.*

***Recommendation 6:*** *Assess the comparative loss of water from bank storage and evaporation between maintaining both reservoirs, maintaining only Lake Mead, and an alternative where Lake Powell is kept low to reduce losses to infiltration and evaporation.*

***Recommendation 7:*** *As part of or simultaneously with this process, Reclamation should implement screening upstream of Glen Canyon Dam to prevent future non-native species passage through the dam.*

### **Errors in the RDSEIS**

The statement “Major tributaries to the Colorado River include the Green, San Juan, Yampa, Gunnison, and Gila Rivers.” (RDSEIS, p. 1-2) is partially incorrect. The Gila River is no longer a major tributary of the Colorado River and has not been for decades. At most, a trickle of local field runoff flows from the Gila into the Colorado. Until this year, the last significant flow into the Colorado from the Gila occurred in 1993. When there is a significant flow in the Gila, as there is right now, it results from releases from dams on the Verde and Salt Rivers, which the Salt River Project manages. Please correct the statement to reflect this information.

### **Conclusion**

Reclamation seems to have taken the narrowest possible view of effects analysis and alternatives in the RDSEIS at precisely the time when new ideas that expand outside the box are needed. If Reclamation doesn't analyze new ways of protecting the water supply of the Colorado River now, who is going to do that job?

Reclamation needs to take adequate action now to buffer the Colorado River's water supply to keep the option open so that in 2026 a comprehensive operating plan can be adopted that can protect not only hydropower but also all the River's resources and environment.

Reclamation needs to model and operate their responsibilities in the Colorado River not only for day-to-day operations but the impact of those operations into the future (on the order of 30 years). Section 3-5 (RDSEIS, pp. 2-10 to 2-11) only considers the cumulative impacts of two other projects, LTEMP and the Salton Sea. What about other current projects, some of which are dismissed? What about the cumulative impact of this project considered in context with all the actions Reclamation has taken on the Colorado River since 1902, including dam building, water management, diversion of water away from the river and out of the Basin, invasion of exotic vegetation, introduction of exotic animal species (e.g., fish), modification of the river's channel, and existing impacts on Native American culture and livelihood? Most of these cumulative impacts have gone unmitigated and date back to well before the passage of NEPA and in fact to the beginning of the twentieth century, and for Native American peoples, to the time of European entry into their homelands.

Thank you again for the opportunity to comment on these formidable issues regarding the Colorado River: Ecosystem Protection, Conservation and Stabilization, Evaporation and Fallowing, The Natural Environment and Lack of Mitigation, Water Quality, Environmental Justice, Modeling, Alternatives Analyzed and Identified Weaknesses of Alternatives, Paleontological Resources, and the Grand Canyon—an Area of Special Significance. We ask that Reclamation continue to do everything it can by keeping in mind the forty million people and myriads of plant and animal species in the Colorado River Basin, some of which are already threatened and endangered, whose futures are at stake.

Sincerely,



Cary W. Meister, Ph.D.  
Chair  
Colorado River Task Force  
Western Water Subteam  
Water Sentinels Grassroots Network Team  
Sierra Club

## NOTES

1. How did this critical situation arise in such a seemingly sudden manner? The effective residence time of water in Lake Mead is on the order of 2.9 years (Lake Mead volume, 26 million acre-feet (Maf) (RDSEIS Fig. 1-1) divided by Hoover Dam release flux, 9 Maf (RDSEIS p. 3-16), or  $26 \text{ Maf} / 9 \text{ Maf per year} = 2.9 \text{ years}$ ) when the reservoir is “full”. Any lowering of the surface results in nonlinear shortening of the residence time (volume is nonlinear with water depth), not counting the loss of reservoir volume attributed to sedimentation over the approximately ninety years of Boulder Dam operation. Residence times of water behind each dam can thus easily be reduced to a range of 0.5-1.5 years (using 2022 lake storage of Mead = 9 Maf and Powell = 5 Maf; RDSEIS, Fig. 1-1).

2. The Bureau of Reclamation, in this RDSEIS, has overlooked some important areas. One is having each state account for evaporation during transportation. The open canals that carry water from the reservoir to states lose an enormous amount of water by evaporation. This amount for the Lower Basin alone is 1.5 million acre-feet annually (Mafy). Each state needs to account for water lost by evaporation, using the same method, in their allotted amount. For example, the largest user of Colorado River water, California, receives 57% of the Lower Basin water allotment of 7.5 Maf. Their allotment is 4.4 maf annually and should include, all other things equal, a deduction of 57% of the 1.5 Maf attributed to evaporation and other losses in the Lower Basin, for a total of 0.88 Maf. Going forward, the open canals need to be enclosed. A win-win solution would be to cover the open canals with solar panels. The last part of making the transportation of water over hundreds of miles would be to use technology to determine any leakage so no water is not wasted in transportation to its final destination.

3. “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)).



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