Colorado River Board of California

March 27, 2024

NOTICE OF TOUR AND REGULAR MEETING OF THE COLORADO RIVER BOARD OF CALIFORNIA

The Metropolitan Water District of Southern California (MWD) will host a tour of its facilities at Diamond Valley Lake prior to the regular CRB board meeting. To attend the tour, you must submit your request at https://forms.office.com/r/7kF1U3yKaP by 5:00 p.m. on Wednesday, April 3, 2024.

Tour of MWD Facilities

Date:	Wednesday, April 10, 2024
Time:	**8:30 AM**
Place:	Building 3 2325 Searl Parkway Hemet, CA 92545

NOTICE IS HEREBY GIVEN pursuant to the call of the Chairman, J.B. Hamby, by the undersigned Executive Director of the Colorado River Board of California that a regular meeting of the members of the board is to be held as follows:

Board Meeting

Date:	Wednesday, April 10, 2024
Time:	**1:00 PM**
Place:	Building 3 2325 Searl Parkway Hemet, CA 92545

The Colorado River Board of California welcomes any comments from members of the public pertaining to items included on this agenda and related topics. Members of the public may provide comments in the following ways: (1) Oral comments can be provided at the beginning of each board meeting; and (2) Public comments may be submitted by electronic mail, addressed to the board's Chairman, J.B. Hamby, at crb@crb.ca.gov and will be accepted up until 5:00 p.m. on April 8, 2024. Please note, written submissions will be read aloud at the public comment period to the extent they fit within the five-minute time limit.

Colorado River Board of California

If accommodations for individuals with disabilities are required, such persons should provide a request at least 24 hours in advance of the meeting by electronic mail to board staff at crb@crb.ca.gov.

Requests for additional information may be directed to: Mr. Christopher S. Harris, Executive Director, Colorado River Board of California, 770 Fairmont Avenue, Suite 100, Glendale, CA 91203-1068. A copy of this Notice and Agenda may be found on the Colorado River Board's web page at www.crb.ca.gov.

A copy of the meeting agenda, showing the matters to be considered and transacted, is attached.

Colorado River Board of California

TOUR AGENDA
Wednesday, April 10, 2024 — 8:30 AM

The Metropolitan Water District of Southern California will host a tour for its facilities at Dimond Valley Lake, departing from the parking lot at 2325 Searl Parkway, Hemet, CA 92545 at 8:30 a.m.

REGULAR MEETING AGENDA
Wednesday, April 10, 2024 — 1:00 PM

At the discretion of the Board, all items appearing on this agenda, whether or not expressly listed for action, may be deliberated upon and may be subject to action by the board. Items may not necessarily be taken up in the order shown.

CALL TO ORDER

PUBLIC COMMENTS (Limited to 5 minutes.)

ADMINISTRATION

1. Consideration and approval of meeting minutes of the February 14, 2024, Board meeting (**Action**)

2. Discussion of FY 24/25 Priorities and Projects (**Information**)

REPORTS

3. Local and State Water Supply and Operations Reports

4. Colorado River Basin Water Supply and Operations Reports

5. Colorado River Basin Programs Staff Reports

6. Member Agency and Public Member Reports

7. Executive Director's Report

8. Chairman's Report

Colorado River Board of California

EXECUTIVE SESSION[1]

OTHER BUSINESS

FUTURE AGENDA ITEMS & ANNOUNCEMENTS

ADJOURNMENT

Next Scheduled Board Meeting

Next Scheduled Board Meeting	
Date:	Wednesday, May 15, 2024
Time:	10:00 AM
Place:	City Hall – Council Chamber 69-825 Highway 111 Rancho Mirage, CA 92270

[1] An Executive Session may be held by the Board pursuant to provisions of Article 9 (commencing with Section 11120) of Chapter 1 of Part 1 of Division 3 of Title 2 of the Government Code and Sections 12516 and 12519 of the Water Code to discuss matters concerning interstate claims to the use of Colorado River System waters in judicial proceedings, administrative proceedings, and/or negotiations with representatives from the other Basin states or federal government.

Minutes of Meeting
COLORADO RIVER BOARD OF CALIFORNIA
Wednesday, February 14, 2024

A meeting of the Colorado River Board of California (Board) was held on Wednesday, Feburary 14, 2024, at the PVID Board Room, 180 W 14th Ave, Blythe, CA 92225.

Board Members and Alternates Present:

Gloria Cordero (MWD)
Gina Dockstader (IID Alternate)
Dana B. Fisher, Jr. (PVID)
John B. Hamby, Chairman (IID)
Eric Heidemann (SDCWA Alternate)
Jordan Joaquin (Public Member)
Jim Madaffer, Vice Chairman (SDCWA)
Peter Nelson (CVWD)
David R. Pettijohn (LADWP)
Frank Ruiz (Public Member)
David Vigil (DFW Alternate)

Board Members and Alternates Absent:

Castulo Estrada (CVWD Alternate)
Christopher Hayes (DFW Designee)
David De Jesus (MWD Alternate)
Jeanine Jones (DWR Designee)
Delon Kwan (LADWP Alternate)
Jack Seiler (PVID)

Others Present:

Steven Abbott
Nick Bahr
Dee Bradshaw
Dennis Davis
JR Echard
Susan Fisher
Geoff Halbrook
Christpher Harris
Bill Hasencamp
Brian Henry
Ned Hyduke
Laura Lamdin
Victor Lujan
Aaron Mead
Yuanyuan Myint
Jessica Neuwerth
Nisha Noroian
Shana Rapoport
David Rheinheimer
Brad Robinson
Shanti Rosset
Jon Rubin
Eric Ruckdaschel
Alexi Schnell
Carrie Scott
Tina Shields
Lauren Steely
Gary Tavetian
Joseph Vanderhorst
Jerry Zimmerman

CALL TO ORDER

Chairman Hamby announced the presence of a quorum and called the meeting to order at 12:58 p.m.

Member Fisher welcomed everyone on behalf of the Palo Verde Irrigation District (PVID). He stated that it was a privilegae for PVID to host the Lower Colorado River Muti-Species Conservation Program (LCR MSCP) tour and the Colorado River Board meeting.

OPPORTUNITY FOR THE PUBLIC TO ADDRESS THE BOARD

Chairman Hamby invited members of the audience to address the Board on items on the agenda or matters related to the Board. Hearing none, he moved on to the next item on the agenda.

ADMINISTRATION

Chairman Hamby asked for a motion to approve the virtual participation of Member Joaquin. Member Madaffer moved the virtual participation of Member Joaquin, seconded by Member Nelson. By roll-call vote, this item was approved.

Chairman Hamby asked for a motion to approve the December 13, 2023 Board meeting minutes. Member Fisher moved that the minutes be approved, second by Member Madaffer. Member Vigil abstained. By roll-call vote, the minutes were approved.

SPECIAL PRESENTATION – Lower Colorado River Multi-Species Conservation Program

Deputy Executive Director Neuwerth reported that there would be no special presentation on the LCR MSCP because the content had been covered during the morning's tour of the Palo Verde Valley.

LOCAL AND STATE WATER SUPPLY AND OPERATIONS REPORTS

Executive Director Harris presented the water supply report for the California Department of Water Resources (DWR). He reported that the State has had a good start to the water year, although precipitation conditions were initially dry. He stated that current statewide precipitation for the water year to date is 11.27" (89% of average), which is slightly below the historic average of 12.62". Executive Director Harris stated precipitation conditions along the coast of California

and the southern half of Arizona were good. He explained that dry conditions persist in the western half of Colorado, but a series of storms have improved snowpack conditions in the upper Rocky Mountains. He reported that statewide reservoir conditions were good.

Executive Director Harris reported on current and previous natural flow conditions of several of the State's rivers. He displayed a figure showing the two driest years from the last drought and the driest year in the current drought. He stated that the current conditions are close to 100% of normal for the natural flow of the various river systems across the State, although the figure does not reflect the latest series of atmospheric river storms. He stated that the snowpack in the Sierra Mountains is below normal but has improved since January. More storm activity is expected over the next week which should further increase the State's snowpack.

Member Cordero, representing the Metropolitan Water District of Southern California (MWD), reported that as of February 1st, reservoir storage was 92% of capacity. She stated that the Colorado River Aqueduct (CRA) will remain on a 3-pump flow through February and will be shut down for maintenance throughout March. She added that the diversion target is 980,000 acre-feet and as of February 12th, MWD has diverted about 71,000 acre-feet. She reported that deliveries for 2023 were 83% of average and the 2024 delivery target for the Desert Water Agency and the Coachella Valley Water District is 108,000 AF.

Executive Director Harris reported on Eastern Sierra precipitation conditions as of February 6, 2024. He stated that conditions have improved due to recent storm activity, noting that more storm activity is anticipated which will further improve conditions.

COLORADO RIVER BASIN WATER SUPPLY AND OPERATIONS REPORT

Executive Director Harris reported that as of February 5th, the water level at Lake Powell was 3,564.61 feet with 8.12 million-acre feet (MAF) of storage, or 35% of capacity. The water level at Lake Mead was 1,073.45 feet with 9.48 MAF of storage, or 36% of capacity. The total system storage was 24.93 MAF, or 43% of capacity, which is 5.87 MAF more than system storage at this time last year.

Executive Director Harris reported that as of February 5th, the Water Year 2024 forecasted unregulated inflow into Lake Powell is 7.36 MAF, or 77% of normal. He reported that the forecasted April to July inflow into Lake Powell is 4.7 MAF, or 74% of normal. He stated that observed inflow into Lake Powell for January was 84% of normal and the February inflow forecast was 95% of normal. He reported that WY-2024 precipitation to date is 92% of normal and the current Basin snowpack was 92% of normal.

Deputy Executive Director Neuwerth reported on Fall modeled soil moisture conditions from the Colorado Basin River Forecast Center (CBRFC). She reported that soil moisture conditions improved in 2023 compared to 2022. Executive Director Harris reported that precipitation conditions in December were extremely dry except for southern Arizona. He stated precipitation conditions improved in January 2024. Deputy Executive Director Neuwerth reported that, as of the end of January, Water Year 2024 was near to below normal.

Executive Director Harris reported that as of February 11th, the snow water equivalent (SWE) conditions for the Colorado River Basin were close to normal in the Upper Basin with above average conditions in the Lower Basin, particularly central and eastern Arizona.
Executive Director Harris reported that based on the January 24-Month Study, the most probable release from Lake Powell for WY-2024 and WY-2025 is 7.48 MAF.

Executive Director Harris reported that through the end of January, the Brock and Senator Wash regulating reservoirs captured 8,227 AF and 4,832 AF respectively. He also reported that the excess deliveries to Mexico were 9,878 AF, compared to 9,690 AF at this time last year. He stated that saline drainage bypass to the Cienga de Santa Clara is currently about 9,903 AF.

COLORADO RIVER BASIN PROGRAMS STAFF REPORTS

Glen Canyon Dam Adaptive Management Program

Staff Member Rapoport reported that the Bureau of Reclamation released a Draft Supplemental Environmental Impact (Draft SEIS) statement to potentially revise the Long-Term Experimental Management Plan (LTEMP). The purpose of the Draft SEIS is to address nonnative fish issues, in particular to try and prevent smallmouth bass from establishing a population below Glen Canyon Dam.

Staff Member Rapoport stated that scientists at the Grand Canyon Monitoring and Research Center have suggested that one of the best tools available is to attempt to make habitat less hospitable by cooling the water temperatures down and increasing flows during breeding season. The action Reclamation is considering is to adjust dam releases during sensitive periods to try and make the habitat less suitable for smallmouth bass.

Staff Member Rapoport added that, since the LTEMP is being reopened at the moment, consideration is also being given to incorporating new scientific data regarding high flow experiments (HFEs). The proposal would replace the current six-month fall and spring sediment

accounting windows with a single annual sediment accounting window, allowing for more flexibility in HFE timing.

Deputy Executive Director Neuwerth added that Reclamation is aiming to decrease the water temperature, because smallmouth bass are a warm water fish. When Lake Powell is low, water is drawn from closer to the surface of the reservoir, where the water is warmer. The only way to cool down the water is to pull from the bypass tubes rather than through the generators. The proposed action would result in losing power generation, which is a significant issue for the Western Area Power Administration, a lot of the Upper Basin power users, as well as the Upper Basin states.

Deputy Executive Director Neuwerth added that the small mouth bass population is relatively small and localized. Once it spreads, we'll be dealing with them forever. The goal is some short-term pain to hopefully avert a long-term management crisis in that stretch of the river.

Member Nelson inquired as to whether a bunch of fishing poles and some Boy Scouts fishing could resolve the issue. Staff Member Rapoport replied that they are out there every summer trying to fish them out as well as performing chemical treatments. Those methods are not effective enough to get all the fish.

Executive Director Harris asked if they are seeing an increase in the population of smallmouth bass. Staff Member Rapoport replied that the numbers last summer were quite a bit higher than previous monitoring had identified.

Member Nelson asked if the cold water comes in and pushes the fish, would the smallmouth bass be pushed down the river where it warms up and then increases the population? Staff Member Rapoport replied that she had asked that same question, and the scientists think this is unlikely. The theory is that if enough are caught upstream to make it inhospitable, they should not get pushed far downstream. Deputy Executive Director Neuwerth added that the bass would have to go sixty-plus miles downstream before it starts significantly warming up.

Member Nelson asked if the sixty-mile stretch is a barrier right now to contain the fish. Deputy Executive Director Neuwerth replied that a number of different approaches are being considered, including a curtain in Lake Powell at the forebay to prevent fish passage and that would potentially cool down the water passing through the dam. Deputy Executive Director Neuwerth added there is a five-plus year time horizon to potentially install a curtain, by which time the

smallmouth bass would likely be established. Staff Member Rapoport added that simultaneously the National Park Service is considering modifying one of the habitats where the small mouth bass breed by increasing the flow through the area such that it would be less desirable breeding habitat. The idea is that this should be part of a suite of actions, but certainly this is an uphill battle no matter how it is approached.

Deputy Executive Director Neuwerth added that the Draft SEIS is being fast tracked to have these actions available for warmer waters anticipated this summer.

Executive Director Harris asked when the final Record of Decision is expected. Staff Member Rapoport stated that she believed the Record of Decision (ROD) is anticipated around April as Reclamation would like to have the tool available this summer.

Lower Colorado River Muti-Species Conservation Program

Staff Member Rapoport stated that the LCR MSCP has an opportunity to possibly purchase property owned by Gabrych which would provide an opportunity to create backwater and marsh habitat for the program. Staff Member Rapoport stated that she would not go into detail since there was a tour of the site this morning. Staff Member Rapoport stated she was happy to answer any questions.

Staff Member Rapoport added that if the property is purchased for incorporation into the program, the fee title would go to the California Department of Fish and Wildlife, so the State would own the title, and the LCR MSCP would take on the responsibility for the restoration and long-term management of the site.

Staff Member Rapoport reported that the Steering Committee held a meeting during the Colorado River Water User Association (CRWUA) meeting in December in Las Vegas during which three resolutions were passed.

Staff Member Rapoport stated that the first resolution authorized the Bureau of Reclamation to enter into discussions with the U.S. Fish and Wildlife Service regarding potential modifications that might be needed to the program post-2026. Ms. Rapoport added that though we don't know exactly what the post-2026 guidelines are going to look like, this will keep the LCR MSCP moving forward and make sure the program is kept up to date.

Staff Member Rapoport reported that a second resolution was passed to finalize procedures for requesting and transferring funds from the Habitat Maintenance Fund so the

funds can be utilized. The States have been contributing to the fund since the beginning of the program. The program is foreseeing the need to be able to expend some of those funds. This resolution enables those expenditures.

Staff Member Rapoport reported that a third resolution was passed to enable the first membership change to the program for one of the Nevada parties. Basic Water Company has been replaced by Henderson WC LLC.

Staff Member Rapoport reported that the Steering Committee is going to meet virtually tomorrow morning and there will be a Financial Work Group meeting on February 22nd.

MEMBER AGENCY AND PUBLIC MEMBER REPORTS

California Department of Fish and Wildlife (CDFW)

Member Vigil reported that CDFW's Lands South Program has been able to acquire some heavy equipment and implements using recent federal funding for wildfire resiliency, drought, and biodiversity. He showed examples including some water trucks, a tractor, mowing equipment, graders, and backhoe excavators. He further noted that CDFW has wildfire projects in Imperial Wildlife Area, San Jacinto Wildlife Area, and the Palo Verde Ecological Reserve, where they will have work for many years with the new equipment.

Imperial Irrigation District (IID)

Member Dockstader reported that IID does maintenance when water deliveries are low due to more rain. She showed a small pipeline project IID has of about 1,650 feet near the city of Holtville to eliminate some excessive vegetation, perform maintenance, and improve public safety. She noted that these projects are not cheap, despite their small size, and that this pipeline project costs 1.6 million dollars.

Member Dockstader showed other types of projects that IID has been working on, including automatic gate installations to help facilitate some of their discharge prevention programs.

Palo Verde Irrigation District (PVID)

PVID General Manager J.R. Echard showed standing radial gates about four and one quarter mile downstream along the C heading channel, noting that the C channel is the first

channel in PVID's system coming from the Palo Verde Diversion Dam. Mr. Echard highlighted that the south gate was refurbished after their January 2023 outage and reinstalled in January 2024. He noted that PVID has now removed the north gate and they plan to refurbish it and reinstall it in January 2025. Mr. Echard elaborated on the south gate, noting that in 2022 PVID noticed corrosion and cracks on the gate arms for both gates. He indicated that they originally thought they were going to be able to repair the south gate in the same year, but after finding more corrosion, they replaced most of the gate. He noted they will have to do the same for the north gate.

Mr. Echard then reported on a new telemetry station that PVID installed on a small, 4-mile long lateral.

Finally, Mr. Echard noted that in January PVID had a complete outage.

Metropolitan Water District of Southern California (MWD)

Member Cordero reported on a trip by MWD leaders to Washington, D.C., including MWD Board Chair Adan Ortega, Jr., General Manager Adel Hadgekhalil, and Board members Tana McCoy and Dennis Erdman. Member Cordero reported that they met with several members of the congressional delegation and with administrative officials at Reclamation and the Environmental Protection Agency. She reported that they talked about issues related to advocacy and federal funding. She indicated that MWD plans some additional similar trips at the state level.

Member Cordero then reported on a two-day tour for the delegation from the Delta Counties Coalition, and some of the supervisors from that area. She noted that in addition to the San Joaquin Delta, they also visited Diamond Valley Lake and the Pure Water facility in Carson. Member Cordero reported that the State Water Resources Control Board adopted regulations on direct potable reuse, which she noted will help advance the Pure Water facility and that MWD is excited about. She noted that with the new regulations in place, MWD is now able to increase its water supply reliability in the state.

Member Cordero then reflected on the certification for the recently approved Environmental Impact Report for the Delta Conveyance Project. She noted that the EIR allows the permitting and planning work to move forward. She emphasized that the cost estimate will be available toward the end of the year, at which point the MWD Board will make a decision along with the state water contractors.

Member Cordero reported that MWD is currently reviewing and discussing their next biannual budget, and that MWD is facing financial pressures from inflation and reduced revenue due to reduced demand.

Finally, Member Cordero announced that Heather Collins, Assistant Group Manager for Water System Operations for MWD, has been elected as the President Elect of the American Water Works Association. Member Cordero noted that Ms. Collins will serve in that role for this year then transition to President.

San Diego County Water Authority (SDCWA)

Member Madaffer noted that this is the Board's first time together since meeting in Las Vegas and recapped celebrating at the signing ceremony. Member Madaffer stated that SDCWA, IID, and MWD, in cooperation with Reclamation, demonstrated that they could keep 50,000 acre-feet in the river and that this is a step in the right direction.

Member Madaffer reported that SDCWA was recognized globally with an international milestone award from the International Commission on Large Dams for the 2014 San Vicente Dam raise. The dam raise was the biggest roller compact dam raise in the world. Twelve stories in height were added on top of the old dam, increasing the capacity of that reservoir by 152,000 acre-feet. San Vicente Dam is SDCWA's primary reserve storage/reservoir in San Diego. Member Madaffer added that the project is part of continued diversification to be able to store water and have water for emergencies. Efforts include SDCWA's desalination, Pure Water San Diego, and projects by other member agencies.

Member Madaffer reported on grant funding. SDCWA received funds to make 6,000 water efficient toilets available to the region. There are funds available to replace about 4,000 more. Member Madaffer added this is something that the SDCWA has long advocated for, pushing legislation fifteen or twenty years ago to mandate low flow toilets in the State of California.

Coachella Valley Water District (CVWD)

Member Nelson reported that CVWD is working on a regulatory reservoir along the Coachella Canal. Construction is ongoing and should be finished in April. The project will enable CVWD to better regulate canal flows and avoid excess flows to Mexico. Member Nelson added that the project will also reduce operation and maintenance costs on that lined section of the canal, which will assist both San Diego and Coachella.

Member Nelson reported that CVWD is in the testing phase on the Oasis Project distribution of Colorado River water. The project is in the testing phase and deliveries are starting on an intermittent basis and will be up and running soon.

Member Nelson reported that CVWD continues to forego recharging their groundwater basin, in order to create system water instead. This action puts about 3,000 or 4,000 acre-feet a month of water into Lake Mead.

EXECUTIVE DIRECTOR'S REPORT

Basin States Activities

Executive Director Harris reported that operations during the interim period, from 2023 to 2026, would be implemented through the Lower Basin Plan. Activities in the Lower Basin Plan are being financed by Inflation Reduction Act funds, and many of California's short-term conservation contracts have been finalized.

Executive Director Harris noted that the Basin States are now turning their attention to post-2026 operational proposals. Reclamation plans to release a draft Environmental Impact Statement (EIS) for post-2026 operations in December 2024. Reclamation has asked for stakeholders to submit proposed alternatives by spring 2024 for consideration in the draft EIS. Executive Director Harris reported that topics to address in a post-2026 proposal include water use reduction volumes and triggers, water storage and recovery, and parallel activities in Mexico. Executive Director Harris noted that Basin States representatives have had multiple meetings since fall 2023 to discuss potential components of an alternative.

Washington D.C. Updates

Executive Director Harris reported that the Hydropower Delivery Rate-Reduction Offset Act has been introduced in January by Senators Kelly and Sinema. The goal of the bill is to reduce fees if hydropower facilities operated by Reclamation do not generate a minimum amount of electricity due to drought.

Executive Director Harris reported that Mr. John Watts, long-time water staffer for late Senator Dianne Feinstein, has been hired to serve as Senior Advisor to the Commissioner's office at Reclamation, focused on California water-related issues. Executive Director Harris also noted

that Ernest Conant recently retired as the California-Great Basin Regional Director and has been succeeded by Karl Stock.

Lower Colorado River Mainstream Evaporation and Riparian Evapotranspiration Losses Report

Executive Director Harris reported that on February 7th, Reclamation released the Lower Colorado River Mainstream Evaporation and Riparian Evapotranspiration Losses Report, which describes system losses in the Lower Basin. Executive Director Harris noted that the numbers in the report align with internal accounting used by the Board and California agencies in recent years. The report is available on Reclamation's Lower Colorado Region accounting page.

CHAIRMAN'S REPORT

Chairman Hamby reported that he recently attended a Metropolitan Colorado River Aqueduct inspection trip along with Board Members Cordero and Ruiz.

Chairman Hamby also reported that he, Board staff, and member agency staff recently hosted a briefing for the California congressional delegation, providing an update on the latest developments and challenges in Colorado River negotiations.

Chairman Hamby noted that he has worked closely with California Natural Resources Agency Secretary Wade Crowfoot, Reclamation, and others over the past month to coordinate information and logistics on the potential acquisition of the Gabrych property by the LCR MSCP.

Chairman Hamby reported that he had also participated in a presentation by Reclamation on options to capture Lower Colorado River excess flow. Reclamation has preliminarily analyzed nine different potential alternatives to capture excess flow to Mexico. Options include building new storage, repairing or increasing capacity at existing storage sites, and raising or creating wetlands that could provide storage as well as habitat benefits. Reclamation will continue evaluating available options over the next several years.

EXECUTIVE SESSION

The Board entered Executive Session at 1:48 p.m.

Pursuant to provisions of Article 9, commencing with Section 11120, of Chapter 1 of Part 1, Division 3 of Title 2 of the Government Code and Sections 12516 and 12519 of the Water Code,

an Executive Session was held to discuss matters concerning interstate negotiations with representatives from other states or the federal government.

REGULAR SESSION

The Board resumed the regular session at 2:54 p.m. No action was taken.

OTHER BUSINESS

Organizational Assessment for Colorado River Board of California

Chairman Hamby asked the board to consider an information item about an organizational assessment for the Colorado River Board of California to improve organizational effectiveness. He stated that IID has been going through a similar process to engage Board, Board staff, and member agencies to solicit feedback, ideas, and perspectives. He would like to bring this item for the Board for consideration and for discussion.

Vice Chairman Madaffer referred to the memo included in the Board packet. He stated the purpose this item was to colect input from board members, staff, and stakeholders to assess if there were areas needing to be changed and if there were better ways to communicate to the public from California's perspective. He mentioned that some states were more active than others. He pointed out that three agencies: IID, SDCWA, and MWD had split the costs for the signing ceremony on December 13, 2024 prior to the board meeting in Las Vegas, NV. He stated the events like the signing ceremony were important to show the other six states how California was able to keep water on the river. He turned it over to other board members for input and comments.

Member Nelson stated that the Six Agency Committee and the Colorado River Authority were created to fund various events. He stated that he was not favor of bring in a third-party to conduct the organizational assessment for phase one without knowing the scope of the phase two. He suggested having the Executive Director of the Board work with member agencies to come up with suggestions. He stated that it was always good to kow the goals and objectives and believed the agencies have worked together pretty well in the past to identify goals and objectives.

Member Fisher agreed with the approach mentioned by Member Nelson and would like to have Board staff develop options and alternatives for the Board to review. Member Nelson pointed out that the negotiations would be the priority. Member Fisher agreed with Member Nelson that the organizational assessment was not the first priority of the Board because the focus would be negotiations and discussion with Bureau of Reclamation regarding Post-2026 operations.

Chairman Hamby stated that it was important to be able to juggle multiple things per Vice Chairman Madaffer. He stated that have additional help from a third-party would bring additional resources and outside perspectives.

Member Cordero stated that she looking forward to engagement, inclusion, and use of the different skills and qualities of the Board. She added that she thought that getting to know the work of each of the Board members can be a great value. She stated that she was interested to learn more about the perspective from Member Joaquin, the Salton Sea, Mexico, as well as non-governmental organizations related to Colorado River. She stated that understanding the goals and mission of the Board would help raising visibility for California. She mentioned that it was not too early to start thinking how we would like to present in December 2024. She stated that members of the Board have significant expertise and we should work to fully utilize that expertise.

Member Ruiz thought it was important to develop an image of transparency. He stated that we should try our best to convey the best interest of the people in California.

Member Joaquin stated that there was always room for improvement. He acknowledged it was going to be a busy year; however, he believed that we could always do more. He was okay having a third-party conduct an assessement. He stated that he wanted California to be the lead in the negotiations. He stated that there were 107 federally recognized tribes in California and there should be inclusion of all.

Vice Chairman Madaffer agreed with Member Joaquin that there were always room for improvement. He stated that he had been invoved in many effectiveness and organizational assessments. He stated that we should always consider if we being as efficient and as effective as possible. He acknowledged that we were going to be busy this year and should seek outside help for assessment. He stated that there were two things on the memo in the Board packet that capture what everyone was sayingThe first compenent was gathering background information and conducting interviews with Board members, the Executive Director, Board staff, NGOs, Salton Sea representatives, and tribes. Questions during such interviews might include how

much the interviewee knows about the Board, how others see the Board, how the Board communicates, whether it would make sense to have adjunct advisory bodies to the Board, and how the Board be more inclusive. He stated that the second piece would be developing an assessment and work plan findings. The second aspect could be tasked to the Executive Director with potential outside assistance. He believed that the assessment could give the Board greater strength and was a good idea. He suggested that the Executive Director come back to the Board with suggestions and potential consultants. He asked if there is a way to get these interviews done without burdening staff and with the goal of being better than we are today.

Member Ruiz agreed that it was valuable to have an extra set eyes to assess the areas can be improved. He stated that the key was the alignment.

Member Corderto agreed with Member Fisher that this would be a busy year and Board staff might not be able to do the assessment.

Chairman Hamby appreciated all the comments and stated that the intent of this informational item was to initiate conversations. He stated that if it worked as a consensus for the Board, he suggested to put together a representative ad hoc work group composed of Board staff, Board members, Board members' agency staff, and himself to disucss the next step. Vice Chairman Madaffer liked the idea. Chairman Hamby stated that if no further discussion on this item, he would like to see a futue agenda item for a next step regarding organizational assessment.

Chairman Hamby stated the next Board meeting would be in Palm Desert, Califronia.

ADJOURNMENT

With no further items to be brought before the Board, Chairman Hamby adjourned the meeting at 3:19 p.m.

4/1/2024

LOWER COLORADO WATER SUPPLY REPORT

River Operations
Bureau of Reclamation

Questions: BCOOWaterops@usbr.gov
(702)293-8373
http://www.usbr.gov/lc/region/g4000/weekly.pdf

	PERCENT FULL	Content 1000 ac-ft (kaf)	Elev. (Feet above mean sea level)	7-Day Release (CFS)
CURRENT STORAGE				
LAKE POWELL	33%	7,717	3,559.02	11,000
* LAKE MEAD	37%	9,629	1,075.35	12,500
LAKE MOHAVE	93%	1,682	642.41	12,600
LAKE HAVASU	92%	571	447.53	9,600
TOTAL SYSTEM CONTENTS **	42%	24,609		
As of 3/31/2024				
SYSTEM CONTENT LAST YEAR	33%	19,017		

*Percent based on capacity of 26,120 kaf or elevation 1,219.6 feet.
**Total System Contents includes Upper & Lower Colorado River Reservoirs, less Lake Mead exclusive flood control space.

Salt/Verde System	88%	2,024		
Painted Rock Dam	0%	0	530.00	0
Alamo Dam	14%	138	1,124.64	20

Forecasted Water Use for Calendar Year 2024 (as of 04/01/2024) (values in kaf)

NEVADA	200	
SOUTHERN NEVADA WATER SYSTEM		189
OTHERS		11
CALIFORNIA	4,288	
METROPOLITAN WATER DISTRICT OF CALIFORNIA		983
IRRIGATION DISTRICTS		3,287
OTHERS		18
ARIZONA	2,025	
CENTRAL ARIZONA PROJECT		908
OTHERS		1,118
TOTAL LOWER BASIN USE		6,513
DELIVERY TO MEXICO - 2024 (Mexico Scheduled Delivery + Preliminary Yearly Excess[1])		1,454

OTHER SIGNIFICANT INFORMATION
UNREGULATED INFLOW INTO LAKE POWELL - MARCH MID-MONTH FORECAST DATED 3/18/2024

	MILLION ACRE-FEET	% of Normal
FORECASTED WATER YEAR 2024	8.076	84%
FORECASTED APRIL-JULY 2024	5.400	85%
FEBRUARY OBSERVED INFLOW	0.345	95%
MARCH INFLOW FORECAST	0.480	80%

	Upper Colorado Basin	Salt/Verde Basin
WATER YEAR 2024 PRECIP TO DATE	106% (17.8")	100% (15.5")
CURRENT BASIN SNOWPACK	113% (16.8")	341% (5.6")

[1]Delivery to Mexico forecasted yearly excess calculated using year-to-date observed and projected excess.

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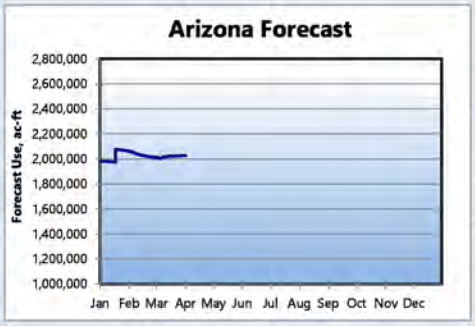
— BUREAU OF —
RECLAMATION

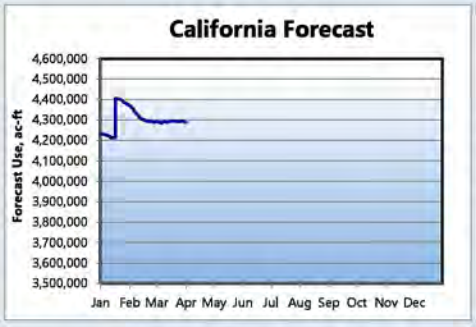
LOWER COLORADO BASIN REGION
CY 2024

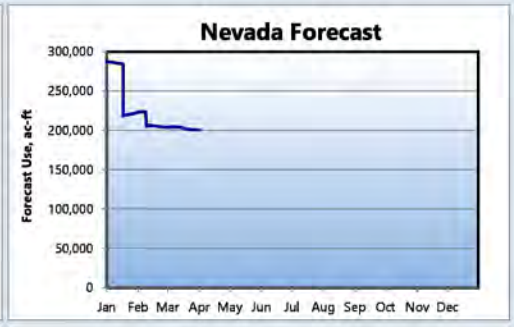
ARIZONA, CALIFORNIA, NEVADA, MEXICO
FORECAST OF END OF YEAR CONSUMPTIVE USE
FORECAST BASED ON USE TO DATE AND ANNUAL WATER ORDERS [1]
(ACRE-FEET)

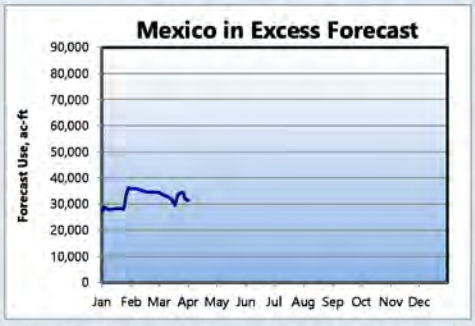
WATER USE SUMMARY	Use To Date CY 2024	Forecast Use CY 2024	Approved Use [2] CY 2024	Excess to Approval CY 2024
Arizona	370,795	2,025,331	1,981,323	**44,008**
California	636,231	4,287,535	4,234,834	**52,701**
Nevada	23,566	200,289	200,289	0
States Total [3]	**1,030,592**	**6,513,155**	**6,416,446**	**96,709**
Total Deliveries to Mexico [4]	336,612	1,422,871	1,422,871	
Creation of Mexico's Recoverable Water Savings [5]	0	30,000	30,000	
Creation of Mexico's Water Reserve [6]	0	0	0	
Delivery of Mexico's Water Reserve [7]	(771)	(2,871)	(2,871)	
Total to Mexico in Satisfaction of Treaty Requirements [8]	335,841	1,450,000	1,450,000	
To Mexico in Excess of Treaty [9]	13,921	31,403	27,417	
Water Bypassed Pursuant to IBWC Minute 242 [10]	37,720	125,218	117,909	
Total Lower Basin & Mexico [11]	**1,418,845**	**8,092,647**	**7,984,643**	

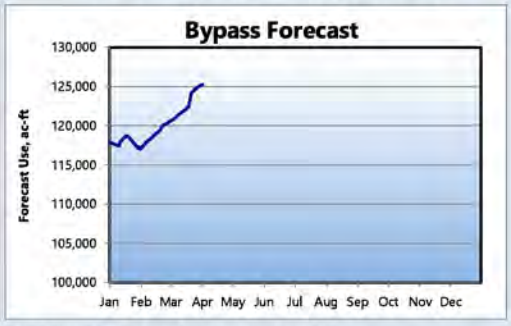
[1] Incorporates 80 daily reporting stations which may be revised after provisional data reports are distributed by the USGS. Use to date is estimated for users reporting monthly and annually.
[2] These values reflect adjusted apportionments. See Adjusted Apportionment calculation on each state page.
[3] Includes unmeasured returns based on estimated consumptive use/diversion ratios by user from studies provided by Arizona Department of Water Resources, Colorado River Board of California, and Reclamation.
[4] Includes deliveries to Mexico at the Northerly International Boundary, Southerly International Boundary, Limitrophe, and Diversion Channel Discharge; and diversions at Parker Dam for Emergency Delivery to Tijuana to meet Mexico's schedule. Does not include Creation of Mexico's Water Reserve or Creation of Mexico's Recoverable Water Savings.
[5] Water deferred by Mexico pursuant to Section IV of IBWC Minute 323 and the *Joint Report of the Principal Engineers with the Implementing Details of the Binational Water Scarcity Contingency Plan in the Colorado River Basin* dated July 11, 2019. (Mexico's required Binational Water Scarcity Contingency Plan Contribution).
[6] Water deferred by Mexico pursuant to Section V of IBWC Minute 323.
[7] Delivery from Mexico's Water Reserve pursuant to Section V.E.13 of IBWC Minute 323.
[8] In accordance with Section XI.G.2.D.1.a of the 2007 Interim Guidelines, a Tier 1 Shortage Condition will govern the operation of Lake Mead and the lower Colorado River in 2024. In accordance with Section III.A of Minute 323, Mexico's scheduled deliveries incorporate the required reduction of 50,000 AF from its 1.5 million AF Colorado River water allotment. "Total to Mexico in Satisfaction of Treaty Requirements" adds in creation of Mexico's Recoverable Water Savings and Mexico's Water Reserve and subtracts out Delivery of Mexico's Water Reserve.
[9] "To Mexico in Excess of Treaty" forecast is based on the 5-year average for the period 2018-2022.
[10] "Water Bypassed Pursuant to IBWC Minute 242" forecast is based on the average for the period 1990-2022.
[11] Includes States Total, Total Deliveries to Mexico, To Mexico in Excess of Treaty, and Water Bypassed Pursuant IBWC Minute 242.











Graph notes: January 1 forecast use is scheduled use in accordance with the Annual Operating Plan's state entitlements, available unused entitlements, and over-run paybacks. A downward sloping line indicates use at a lower rate than scheduled, upward sloping is above schedule, and a flat line indicates a use rate equal to schedule. Lower priority users such as CAP, MWD, and Robt.B.Griffith may adjust use rates to meet state entitlements as higher priority use deviates from schedule. Abrupt changes in the forecast use line may be due to a diversion schedule change or monthly updating of provisional realtime diversions.

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RECLAMATION

LOWER COLORADO BASIN REGION
CY 2024

NOTE:
- Diversions and uses that are pending approval are noted in *red italics*.
- Water users with a consumptive use entitlement - **Excess to Estimated Use** column indicates overrun/underrun of entitlement. Dash in this column indicates water user has a diversion entitlement.
- Water user with a diversion entitlement - **Excess to Approved Diversion** column indicates overrun/underrun of entitlement. Dash in this column indicates water user has a consumptive use entitlement.

ARIZONA WATER USERS
Forecast end of year diversion/consumptive use
Forecast based on use to date and approved annual water orders
Arizona Schedules and Approvals
Historical Use Records (Water Accounting Reports)

WATER USER	Use To Date CY 2024	Forecast Use CY 2024	Estimated Use CY 2024	Excess to Estimated Use CY 2024	Diversion To Date CY 2024	Forecast Diversion CY 2024	Approved Diversion CY 2024	Excess to Approved Diversion CY 2024
TV Marble Canyon, AZ LLC	2	10	10	---	3	15	15	0
Lake Mead NRA, AZ - Diversions from Lake Mead	7	65	65	---	7	65	65	0
Lake Mead NRA, AZ - Diversions from Lake Mohave	51	224	224	---	51	224	224	0
McAlister Family Trust	2	7	7	---	2	10	10	0
Bureau of Reclamation - Davis Dam Project	0	2	2	---	2	9	9	0
Bullhead City	1,629	8,799	8,799	---	2,580	13,730	13,730	0
Mohave Water Conservation District	194	854	854	---	289	1,275	1,275	0
Mohave Valley I.D.D.[1]	2,657	12,267	12,267	---	4,922	22,716	22,716	0
Fort Mojave Indian Reservation, AZ	3,843	40,438	46,167	---	7,116	74,890	85,500	-10,610
Golden Shores Water Conservation District	66	289	289	---	98	433	433	0
Havasu National Wildlife Refuge	431	3,333	3,564	---	3,599	37,664	41,835	-4,171
EPCOR Water Arizona, Inc. - CSA No. 1	135	595	595	---	208	916	916	0
Crystal Beach Water Conservation District	17	73	73	---	25	112	112	0
Lake Havasu City	1,829	9,052	9,052	---	2,950	14,600	14,600	0
Arizona State Parks (Windsor Beach)	2	9	9	---	3	14	14	0
Central Arizona Water Conservation District [2]	242,192	907,534		---	242,192	907,534		--
Springs Del Sol Domestic Water Improvement District	0	2	2	---	1	3	3	0
Hillcrest Water Company	4	18	18	---	6	27	27	0
Frontier Communications West Coast	0	1	1	---	0	1	1	0
Town of Parker	55	388	388	---	163	897	897	0
EPCOR Water Arizona, Inc. - CSA No. 2 (formerly Brooke Water, LLC)	67	318	318	---	100	474	474	0
Colorado River Indian Reservation, AZ	30,273	345,431	360,641	---	75,864	624,495	662,402	-37,907
GM Gabrych Family	0	0	0	---	0	0	0	0
Ehrenberg Improvement District	58	257	257	---	89	391	391	0
B&F Investment	2	7	7	---	2	10	10	0
North Baja Pipeline	47	208	208	---	73	320	320	0
Arizona State Land Department - Domestic	14	57	57	---	20	87	87	0
Cibola Island	165	728	728	---	231	1,018	1,018	0
Cibola Valley I.D.D.	444	2,958	2,958	---	622	4,137	*4,137*	0
Red River Land Co.	18	214	214	---	25	300	300	0
Hopi Tribe	0	0	0	---	0	0	0	0
GSC Farms, LLC	0	0	0	---	0	0	0	0
Arizona Game & Fish	144	2,032	2,032	---	200	2,838	2,838	0
Western Water, LLC	44	379	379	---	62	530	530	0
Bishop Family Trust	68	300	300	---	95	420	420	0
Cathcarts	1	6	6	---	2	8	8	0
Cibola Sportsman's Club	35	154	154	---	49	216	216	0
Cibola National Wildlife Refuge	1,457	15,575	15,575	0	2,350	25,122	25,122	0
Imperial National Wildlife Refuge	996	4,717	4,717	0	1,608	7,610	7,610	0
BLM - Leased by L. Pratt	6	25	25	---	9	39	39	0
BLM Permittees (Parker Dam to Imperial Dam)	295	1,302	1,302	0	454	2,003	2,003	--
Martinez Lake Cabin Sites	2	7	7		2	11	11	
Fisher's Landing Water and Sewer, LLC	2	8	8	---	3	12	12	0
Shepard Water Company	4	16	16	---	6	25	25	0
U.S. Army Yuma Proving Grounds	65	421	421	---	65	421	421	0
JRJ Partners, LLC	140	618	618	---	215	950	950	0
Cha Cha, LLC	231	1,365	1,365	---	355	2,100	2,100	0
Beattie Farms Southwest	153	722	722	---	236	1,110	1,110	0
Gila Monster Farm	765	4,334	4,812	---	1,269	7,556	8,500	-944
Wellton-Mohawk I.D.D.	38,210	264,116	278,000	-13,884	64,179	397,449	424,350	-26,901
BLM Permittees (Below Imperial Dam)	26	114	114	0	40	175	175	--
City of Yuma	1,257	13,108	15,548	-2,440	3,285	24,042	27,500	-3,458
U.S. Marine Corps Air Station Yuma	199	1,193	1,219	---	199	1,193	1,219	-26
Union Pacific Railroad	6	29	29	---	12	48	48	0
University of Arizona	142	839	839	---	142	839	839	0
Yuma Union High School District	21	150	150	---	28	200	200	0
Desert Lawn Memorial	6	28	28	---	9	40	40	0
North Gila Valley Irrigation District	1,369	9,121	9,231	---	6,068	40,468	43,500	-3,032
Yuma Irrigation District	6,703	37,676	38,977	---	11,090	69,090	73,400	-4,310
Yuma Mesa I.D.D.	-1,536	59,185	62,410	---	21,031	183,716	188,219	-4,503
Unit "B" I.D.D.	105	10,353	10,474	---	3,494	27,444	28,300	-856

WATER USER	Use To Date CY 2024	Forecast Use CY 2024	Estimated Use CY 2024	Excess to Estimated Use CY 2024	Diversion To Date CY 2024	Forecast Diversion CY 2024	Approved Diversion CY 2024	Excess to Approved Diversion CY 2024
Arizona State Land Department - Agriculture	927	4,295	4,295		1,425	6,607	6,607	0
Ott Family	56	248	248		87	382	382	0
Ogram Boys' Enterprises	130	574	574		200	883	883	0
Fort Yuma Indian Reservation	708	3,121	3,121	---	1,089	4,801	4,801	0
BLM - Leased by M. Lee	34	148	148		51	227	227	0
Armon Curtis	29	129	129		45	198	198	0
Yuma County Water Users' Association	33,445	252,121	279,319	---	58,073	340,273	367,300	-27,027
R. Griffin	7	32	32		11	49	49	0
Power	23	103	103		36	158	158	0
Cocopah Indian Tribe (PPR No. 7)	58	256	256		89	394	394	0
Griffin Ranches (PPR No. 7)	22	98	98		34	150	150	0
Milton Phillips (PPR No. 7)	12	55	55		19	85	85	0
Griffin Family Ltd. Partnership (PPR No. 7)	5	23	23		8	35	35	0
Cocopah Indian Reservation	188	1,799	1,821	---	217	2,704	2,812	-108
Reclamation - Yuma Area Office	23	100	100	---	23	100	100	0
Arizona Public Service Company	0	0	0		0	0	0	0
Gary Pasquinelli	8	198	198		12	305	305	0
Total Arizona	**370,795**	**2,025,331**	**2,085,700**		**519,219**	**2,859,393**	**2,973,640**	
Central Arizona Project (CAP) [2]	242,192	907,534				907,534		
All Others	128,603	1,117,797	1,187,772			1,951,859	2,075,712	
Yuma Mesa Division, Gila Project	6,536	105,982	110,618	-4,636		293,274		
Total 242 Well Field Pumping [3]	16,805	56,458	56,130					

ARIZONA ADJUSTED APPORTIONMENT CALCULATION

Arizona Basic Apportionment		2,800,000
Reduction for Tier 1 Shortage [4]		(320,000)
Reduction for Arizona DCP Contributions [5]		(192,000)
System Conservation Water - Pilot System Conservation Program [6]		(400)
System Conservation Water – CAP Subcontractors [7,8]		(129,400)
System Conservation Water – Cathcarts [7,9]		(61)
System Conservation Water – CVIDD [7,10]		(2,328)
System Conservation Water – FMYN [7,11]		(13,933)
System Conservation Water – GM Gabrych [7,12]		(3,240)
System Conservation Water – GRIC [7,13]		(125,000)
System Conservation Water – Hopi [7,14]		(3,059)
System Conservation Water - MVIDD [7,15]		(13,441)
System Conservation Water - YMIDD [7,16]		(21,795)
System Conservation Water - Reclamation (Estimated) [7,17]		(25,000)
Delivery of ICS (CAWCD) [18]	up to	30,980
Total State Adjusted Apportionment		1,981,323
Excess to Total State Adjusted Apportionment		44,008
Estimated Allowable Use for CAP		**863,533**

[1] Approved/forecasted values include up to 1,250 AF of diversion for domestic use pursuant to MVIDD's Subcontract No. 09-101 with the Mohave County Water Authority.

[2] Forecast Use incorporates CAWCD's operational schedule. Amount shown includes the diversion of up to 2,033 AF to be delivered via the CAP to the Town of Queen Creek pursuant to Reclamation Wheeling Contract No. 20-XX-30-W0691 and the diversion of 72,000 AF of Arizona third priority Colorado River water to be delivered via the CAP to fulfill water rights settlements pursuant to the Stipulated Judgment and the Stipulation for Judgment entered on November 21, 2007.

[3] In accordance with the Colorado River Water Conservation Letter Agreement 16-XX-30-W0603, Revision No. 1 (Revised Letter Agreement) between Reclamation and the Central Arizona Water Conservation District (CAWCD), pumping above the Historical Average Baseline (31,129 AF), up to 32,000 AF per year, will remain in Lake Mead as Colorado River System water.

[4] In accordance with Section XI.G.2.D.1.a of the 2007 Interim Guidelines, a Tier 1 Shortage Condition will govern the operation of Lake Mead and the lower Colorado River in 2024, resulting in a 320,000 AF reduction to the state of Arizona's Colorado River basic apportionment.

[5] In accordance with Section III.B.1.a of *Lower Basin Drought Contingency Operations* (LBOps), the state of Arizona is required to make DCP Contributions of 192,000 AF in 2024.

[6] The estimated amount of System Conservation Water that will be created by the City of Bullhead City pursuant to System Conservation Implementation Agreement (SCIA) No. 15-XX-30-W0587, as amended. This System Conservation Water will remain in Lake Mead to benefit system storage.

[7] In accordance with the applicable conservation agreements, Section 3.b of the *Lower Basin Drought Contingency Plan Agreement* dated May 20, 2019 (LB DCP Agreement), and Section II.3.e of the *Agreement Regarding Lower Basin Drought Contingency Plan Obligations,* this System Conservation Water will remain in Colorado River reservoirs in the Lower Basin to benefit system storage. The Bureau of Reclamation intends to apply this water towards the Secretary of the Interior's commitment to create or conserve 100,000 AF per annum or more of Colorado River System water to contribute to conservation of water supplies in Lake Mead and other Colorado River reservoirs in the Lower Basin.

[8] The estimated amount of System Conservation Water that will be created by certain CAP Subcontractors pursuant to executed SCIAs.

[9] The estimated amount of System Conservation Water that will be created pursuant to SCIA No. 23-XX-30-W0776.

[10] The estimated amount of System Conservation Water that will be created pursuant to SCIA No. 23-XX-30-W0771.

[11] The estimated amount of System Conservation Water that will be created pursuant to SCIA No. 23-XX-30-W0750.

[12] The estimated amount of System Conservation Water that will be created pursuant to SCIA No. 23-XX-30-W0774.

[13] The estimated amount of System Conservation Water that will be created pursuant to SCIA No. 23-XX-30-W0760.

[14] The estimated amount of System Conservation Water that will be created pursuant to SCIA No. 23-XX-30-W0779

[15] The estimated amount of System Conservation Water that will be created pursuant to SCIA No. 23-XX-30-W0770.

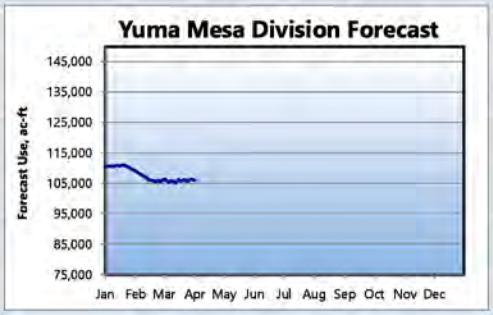
Footnotes continued on next page.

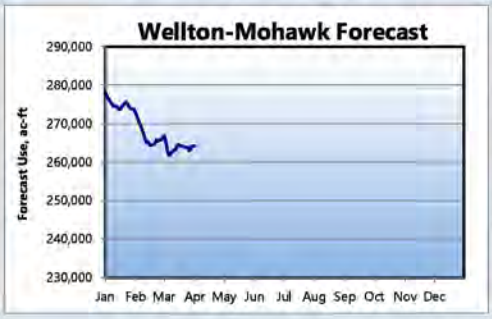
Footnotes continued from previous page.

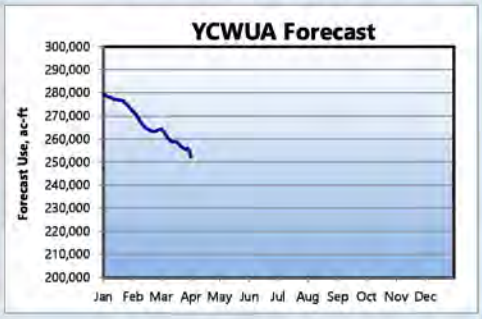
[16] The estimated amount of System Conservation Water that will be created pursuant to SCIA No.23-XX-30-W0769.

[17] The estimated amount of System Conservation Water that will be created by additional pumping from the 242 Well Field Expansion pursuant to Letter Agreement No. 16-XX-30-W0603, Revision No. 1, which will remain in Lake Mead to benefit system storage

[18] The maximum amount of EC ICS delivery per CAWCD's approved water order. Actual amount of EC ICS delivered will be based on final accounting records.







NOTES: Click on Arizona Schedules and Approvals above for incoming diversion schedules and approvals.

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RECLAMATION

LOWER COLORADO BASIN REGION
CY 2024

NOTE:
- Diversions and uses that are pending approval are noted in *red italics*.
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- Water user with a diversion entitlement - **Excess to Approved Diversion** column indicates overrun/underrun of entitlement. Dash in this column indicates water user has a consumptive use entitlement.

CALIFORNIA WATER USERS

Forecast end of year diversion/consumptive use
Forecast based on use to date and approved annual water orders
California Schedules and Approvals
Historical Use Records (Water Accounting Reports)

WATER USER	Use To Date CY 2024	Forecast Use CY 2024	Estimated Use CY 2024	Excess to Estimated Use CY 2024	Diversion To Date CY 2024	Forecast Diversion CY 2024	Approved Diversion CY 2024	Excess to Approved Diversion CY 2024
Fort Mojave Indian Reservation, CA	477	7,857	8,994	—	886	14,606	16,720	-2,114
City of Needles (includes LCWSP use)	312	1,605	1,605	0	440	2,261	2,261	0
PPR No. 30 (Stephenson)	4	16	16	—	7	29	29	0
PPR No. 38 (Andrade)	5	23	23	—	9	41	41	---
PPR No. 40 (Cooper)	1	6	6	—	2	10	10	---
Chemehuevi Indian Reservation	42	184	184	—	2,572	11,340	11,340	0
The Metropolitan Water District of Southern California [1]	105,068	983,201		—	105,818	985,747		---
Colorado River Indian Reservation, CA	993	4,380	4,380	—	1,646	7,258	7,258	0
Palo Verde Irrigation District	30,994	367,838	400,228	—	113,792	786,792	*826,000*	-39,208
PPR No. 31 (Mendivil)	1	3	3	—	1	5	5	0
Yuma Project Reservation Division	3,414	40,385	46,515	—	12,589	88,218	95,734	-7,516
Yuma Project Reservation Division - Bard Unit	—	—	—	—	6,570	45,770	49,800	-4,030
Yuma Project Reservation Division - Indian Unit	—	—	—	—	6,019	42,448	45,934	-3,486
Fort Yuma Indian Reservation - Ranch 5 (Surface Delivery)	198	1,194	1,194	—	358	2,160	2,160	0
Fort Yuma Indian Reservation - Other Ranches (Pumpers)	442	1,948	1,948	—	799	3,522	3,522	0
Yuma Island Pumpers	453	1,997	1,997	—	819	3,613	3,613	0
Imperial Irrigation District [2]	447,757	2,530,404	2,612,800	-82,396	461,831	2,680,068	2,782,987	---
Coachella Valley Water District	45,945	345,945	359,000	-13,055	47,458	368,161	383,674	---
Other LCWSP Contractors	113	497	497	—	173	761	761	0
City of Winterhaven	12	52	52	—	17	75	75	0
Total California	**636,231**	**4,287,535**	**4,418,776**		**749,217**	**4,954,667**	**5,117,948**	

CALIFORNIA ADJUSTED APPORTIONMENT CALCULATION

California Basic Apportionment	4,400,000
System Conservation Water - Pilot System Conservation Program [3]	(145)
System Conservation Water - CVWD [4,5]	(35,000)
System Conservation Water - MWD/PVID Fallowing Program [4,6]	(117,021)
System Conservation Water -Quechan Indian Tribe [4,7]	(13,000)
Creation of Extraordinary Conservation ICS [8]	0
Total State Adjusted Apportionment	4,234,834
Excess to Total State Adjusted Apportionment	52,701

Estimated Allowable Use for MWD **930,500**

[1] Forecast Use is based on MWD's operational projected diversion of 0.982 MAF as modeled in the January 24-Month Study.

[2] IID's total approved consumptive use is 2,622,800 AF, of which up to 10,000 AF is anticipated to be supplied from the LCWSP.

[3] The estimated amount of System Conservation Water that will be created by the City of Needles pursuant to System Conservation Implementation Agreement (SCIA) No. 15-XX-30-W0596, which will remain in Lake Mead to benefit system storage.

[4] In accordance with the applicable system conservation agreements and Section 3.b of the *Lower Basin Drought Contingency Plan Agreement* dated May 20, 2019, the Bureau of Reclamation intends to apply all or a portion of this water towards the Secretary of the Interior's commitment to create or conserve 100,000 AF per annum or more of Colorado River System water to contribute to conservation of water supplies in Lake Mead and other Colorado River reservoirs in the Lower Basin. This System Conservation Water will remain in Lake Mead to benefit system storage.

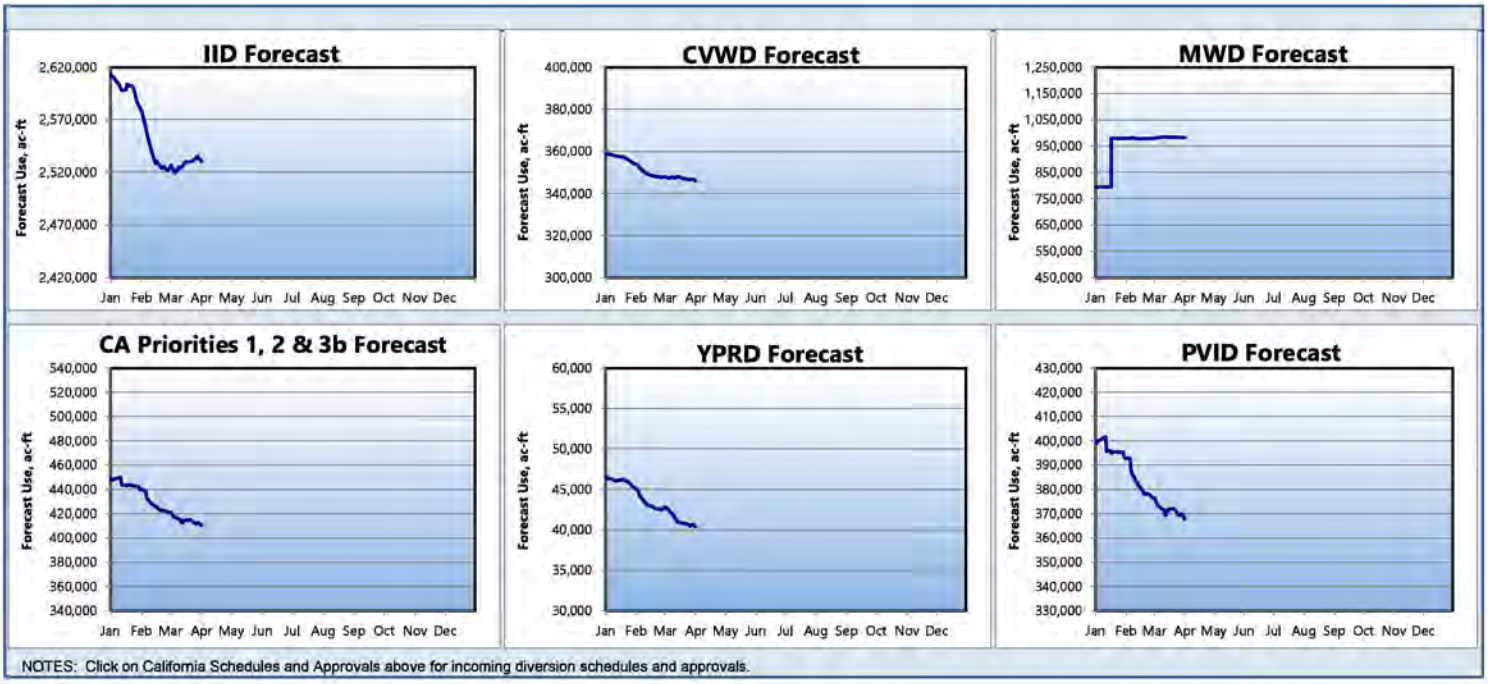
[5] The estimated amount of System Conservation Water that will be created pursuant to SCIA No. 23-XX-30-W0764.

[6] The estimated amount of System Conservation Water that will be created pursuant to SCIA No. 23-XX-30-W0772.

[7] The estimated amount of System Conservation Water that will be created pursuant to SCIA No. 23-XX-30-W0783.

[8] MWD has an approved ICS Plan for the creation of up to 450,000 AF of Extraordinary Conservation (EC) ICS in 2024. The actual amount of EC ICS created by MWD in 2024 will be based on final accounting and verification. In accordance with Section XI.G.3.B.4 of the 2007 Interim Guidelines and Section IV.B of *Lower Basin Drought Contingency Operations* (LBOps), the total amount of EC ICS that may be created by the states of Arizona, California, and Nevada in 2024 will be limited to 625,000 AF. Additionally, the total amount of EC ICS, Binational ICS and DCP ICS accumulated in Arizona, California and Nevada's ICS Accounts will be limited in accordance with Section IV.C. of LBOps.

Continued on next page.



NOTES: Click on California Schedules and Approvals above for incoming diversion schedules and approvals.

Apr 01, 2024 10:04:41 AM

— BUREAU OF — RECLAMATION

LOWER COLORADO BASIN REGION
CY 2024

NOTE:
- Diversions and uses that are pending approval are noted in *red italics*.
- Water users with a consumptive use entitlement - **Excess to Estimated Use** column indicates overrun/underrun of entitlement. Dash in this column indicates water user has a diversion entitlement.
- Water user with a diversion entitlement - **Excess to Approved Diversion** column indicates overrun/underrun of entitlement. Dash in this column indicates water user has a consumptive use entitlement.

NEVADA WATER USERS

Forecast end of year diversion/consumptive use
Forecast based on use to date and approved annual water orders
Nevada Schedules and Approvals
Historical Use Records (Water Accounting Reports)

WATER USER	Use To Date CY 2024	Forecast Use CY 2024	Estimated Use CY 2024	Excess to Estimated Use CY 2024	Diversion To Date CY 2024	Forecast Diversion CY 2024	Approved Diversion CY 2024	Excess to Approved Diversion CY 2024
Robert B. Griffith Water Project (SNWS)	86,953	428,824		---	86,953	428,824		---
Lake Mead NRA, NV - Diversions from Lake Mead	330	1,500	1,500	---	330	1,500	1,500	0
Lake Mead NRA, NV - Diversions from Lake Mohave	133	500	500	---	133	500	500	0
Basic Management, Inc.	0	0	0	---	0	0	0	0
City of Henderson (BMI Delivery)	0	0	0	---	0	0	0	0
Nevada Department of Wildlife	0	0	0	0	0	0	0	---
Pacific Coast Building Products, Inc.	183	928	928	---	183	928	928	0
Boulder Canyon Project	41	180	180	---	68	300	300	0
Big Bend Water District	883	4,823	4,823	---	2,096	10,000	10,000	0
Fort Mojave Indian Tribe	189	3,352	3,683	---	281	5,005	5,500	-495
Las Vegas Wash Return Flows	-65,146	-239,818	-232,886	---				
Total Nevada [1]	**23,566**	**200,289**	**212,000**	**0**	**90,044**	**447,057**	**452,000**	**-495**
Southern Nevada Water System (SNWS)	21,807	189,006				428,824		
All Others	1,759	11,283				18,233		
Nevada Uses Above Hoover	22,361	191,614				431,552		
Nevada Uses Below Hoover	1,205	8,675				15,505		

Tributary Conservation (TC) Intentionally Created Surplus (ICS)

Southern Nevada Water Authority (SNWA) Creation of TC ICS (Approved) [2]	44,000

NEVADA ADJUSTED APPORTIONMENT CALCULATION

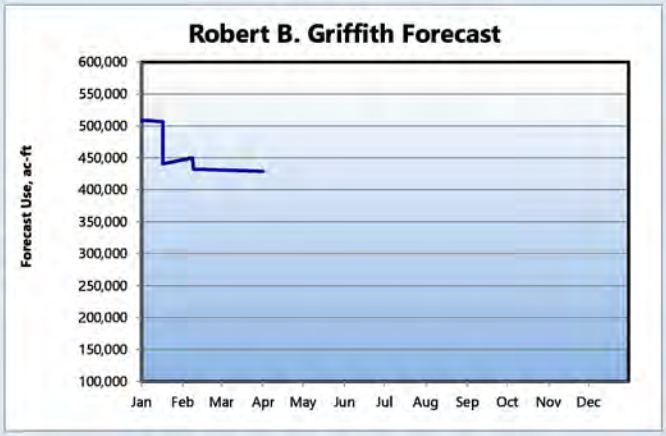
Nevada Basic Apportionment	300,000
Reduction for Tier 1 Shortage [3]	(13,000)
Creation of Extraordinary Conservation ICS - SNWA (Estimated) [4]	(86,711)
Total State Adjusted Apportionment	200,289
Excess to Total State Adjusted Apportionment	0

[1] The State of Nevada has been approved to consumptively use up to 287,000 AF in CY 2024. Forecast Use shown here is based on Nevada's operational projected consumptive use of 212,000 AF.

[2] SNWA has an approved ICS Plan for the creation of up to 44,000 AF of TC ICS in 2024. The actual amount of TC ICS created by SNWA in 2024 will be based on final accounting and verification.

[3] In accordance with Section XI.G.2.D.1.a of the 2007 Interim Guidelines, a Tier 1 Shortage Condition will govern the operation of Lake Mead and the lower Colorado River in 2024, resulting in a 13,000 AF reduction to the state of Nevada's Colorado River basic apportionment.

[4] SNWA has an approved ICS Plan for the creation of up to 100,000 AF of Extraordinary Conservation (EC) ICS in 2024. The actual amount of EC ICS created by SNWA in 2024 will be based on final accounting and verification. In accordance with Section XI.G.3.B.4 of the 2007 Interim Guidelines and Section IV.B of *Lower Basin Drought Contingency Operations* (LBOps), the total amount of EC ICS that may be created by the states of Arizona, California, and Nevada in 2024 will be limited to 625,000 AF. Additionally, the total amount of EC ICS, Binational ICS, and DCP ICS accumulated in Arizona, California, and Nevada's ICS Accounts will be limited in accordance with Section IV.C of LBOps.



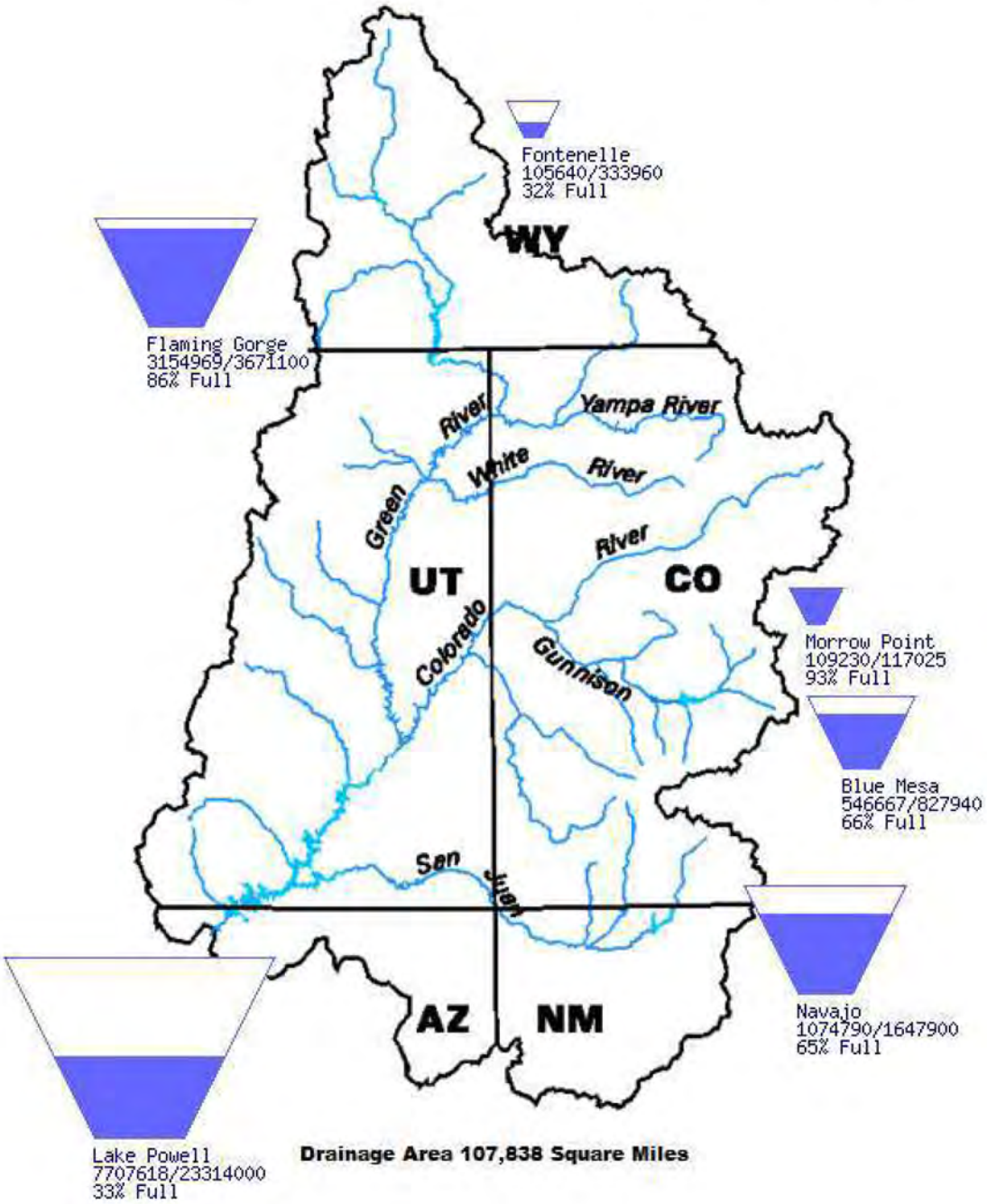
NOTES: Click on Nevada Schedules and Approvals above for incoming diversion schedules and approvals.

Upper Colorado Region Water Resources Group

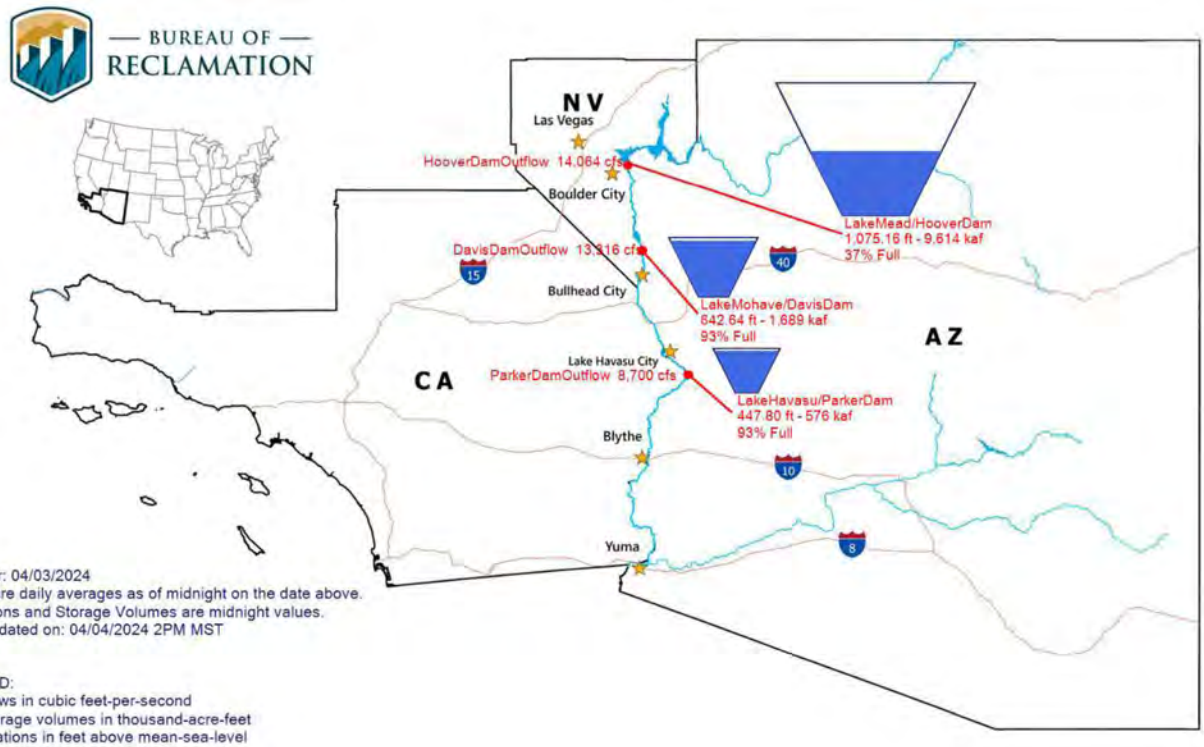
River Basin Tea-Cup Diagrams

Data Current as of:
04/03/2024

Upper Colorado River Drainage Basin



Lower Colorado River Teacup Diagram



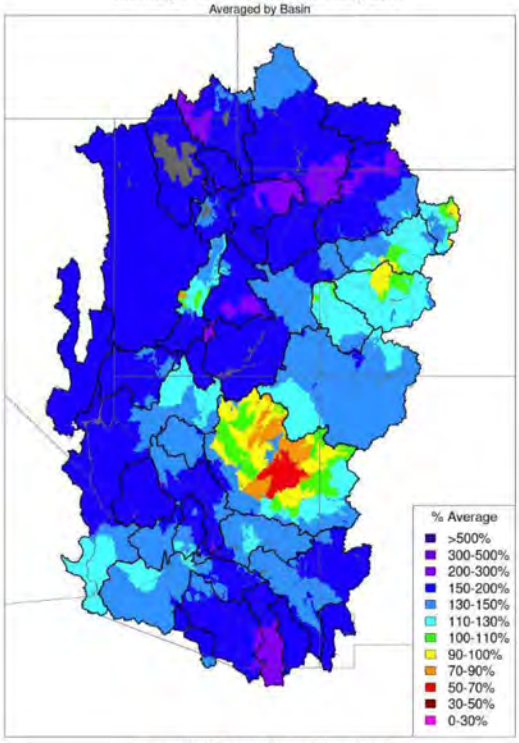
Data for: 04/03/2024
Flows are daily averages as of midnight on the date above.
Elevations and Storage Volumes are midnight values.
Last updated on: 04/04/2024 2PM MST

LEGEND:
cfs: Flows in cubic feet-per-second
kaf: Storage volumes in thousand-acre-feet
ft: Elevations in feet above mean-sea-level

NOAA National Weather Service Monthly Precipitation Map March and April 2024

Monthly Precipitation - February 2024

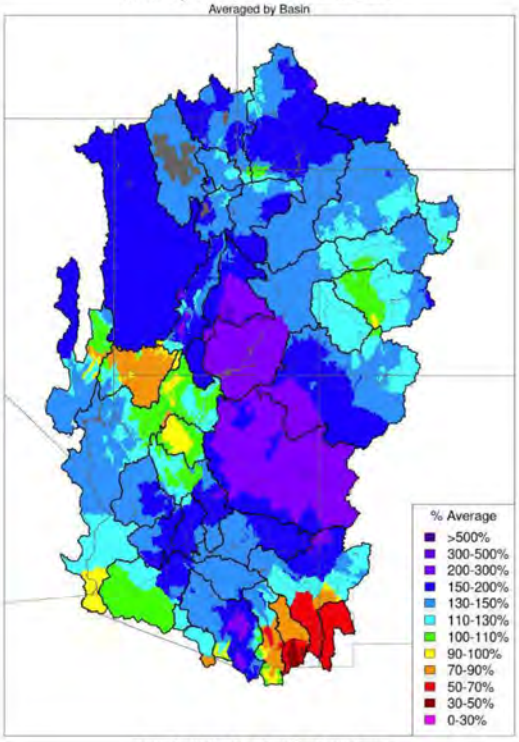
Averaged by Basin



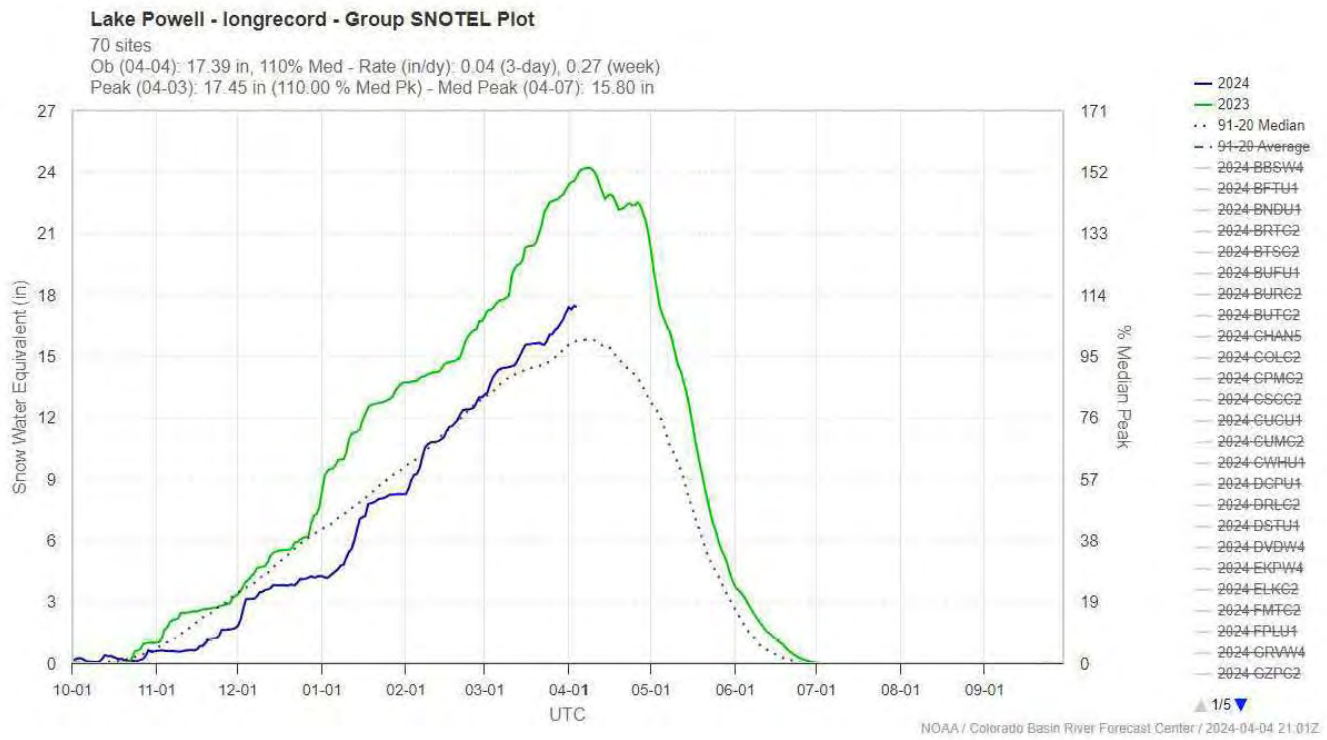
Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov

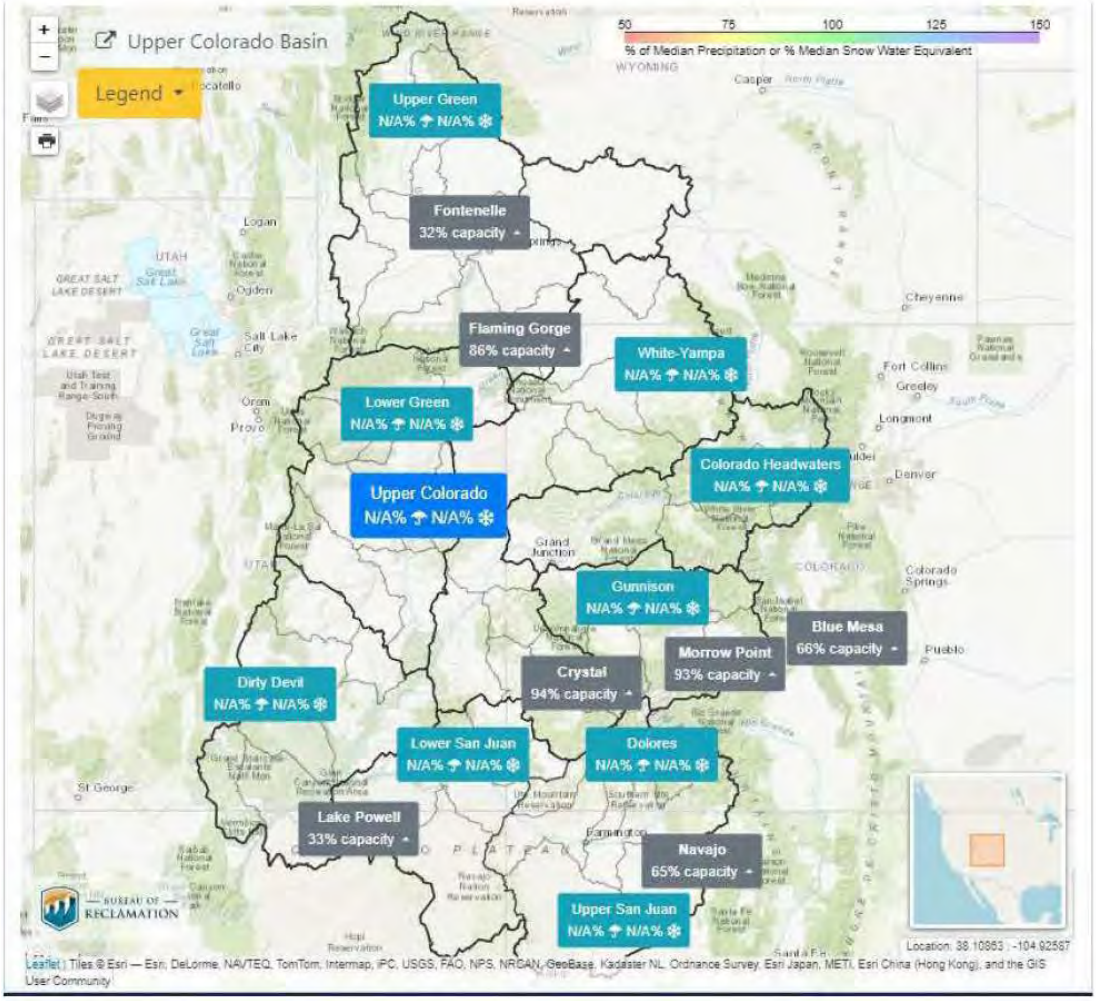
Monthly Precipitation - March 2024

Averaged by Basin



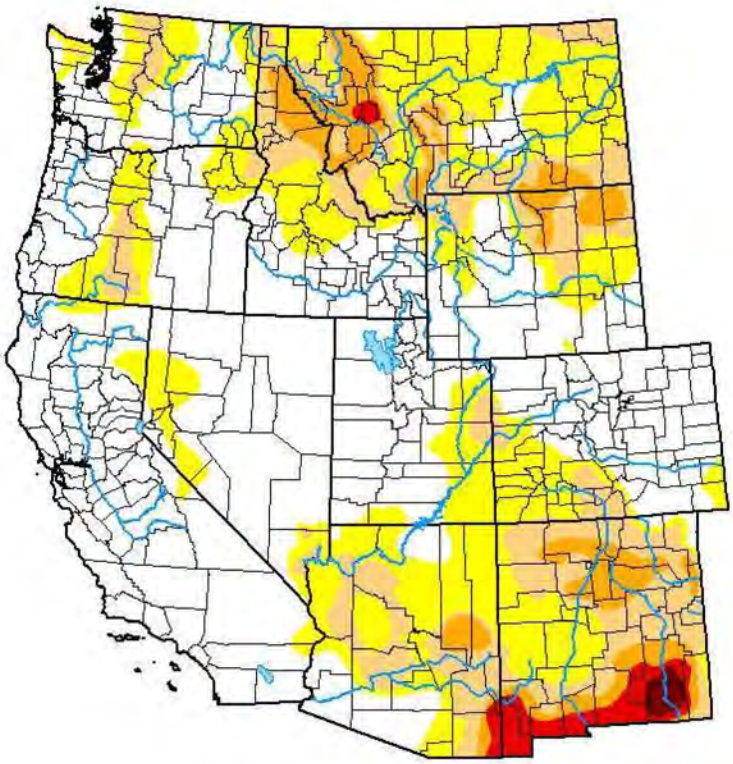
Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov


Lake Powell - longrecord - Group SNOTEL Plot
70 sites
Ob (04-04): 17.39 in, 110% Med - Rate (in/dy): 0.04 (3-day), 0.27 (week)
Peak (04-03): 17.45 in (110.00 % Med Pk) - Med Peak (04-07): 15.80 in
Snow Water Equivalent (in)
% Median Peak
UTC
10-01
11-01
12-01
01-01
02-01
03-01
04-01
05-01
06-01
07-01
08-01
09-01
2024
2023
91-20 Median
91-20 Average
1/5
NOAA / Colorado Basin River Forecast Center / 2024-04-04 21:01Z


Upper Colorado Basin
Legend
% of Median Precipitation or % Median Snow Water Equivalent
Upper Green
N/A% N/A%
Fontenelle
32% capacity
Flaming Gorge
86% capacity
White-Yampa
N/A% N/A%
Lower Green
N/A% N/A%
Colorado Headwaters
N/A% N/A%
Upper Colorado
N/A% N/A%
Gunnison
N/A% N/A%
Blue Mesa
66% capacity
Morrow Point
93% capacity
Crystal
94% capacity
Dirty Devil
N/A% N/A%
Lower San Juan
N/A% N/A%
Dolores
N/A% N/A%
Lake Powell
33% capacity
Navajo
65% capacity
Upper San Juan
N/A% N/A%
BUREAU OF RECLAMATION
Location: 38.10863, -104.92587
Leaflet | Tiles © Esri — Esri, DeLorme, NAVTEQ, TomTom, Intermap, iPC, USGS, FAO, NPS, NRCAN, GeoBase, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community

USDA United States Drought Monitor Map

U.S. Drought Monitor
West



April 2, 2024
(Released Thursday, Apr. 4, 2024)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	52.27	47.73	22.35	7.89	2.01	0.36
Last Week 03-26-2024	50.96	49.04	23.21	8.50	2.01	0.36
3 Months Ago 01-02-2024	51.19	48.81	25.08	13.17	4.67	0.66
Start of Calendar Year 01-02-2024	51.19	48.81	25.08	13.17	4.67	0.66
Start of Water Year 09-26-2023	55.99	44.01	31.24	17.70	6.09	0.70
One Year Ago 04-04-2023	38.53	61.47	30.91	7.78	1.24	0.06

Intensity:

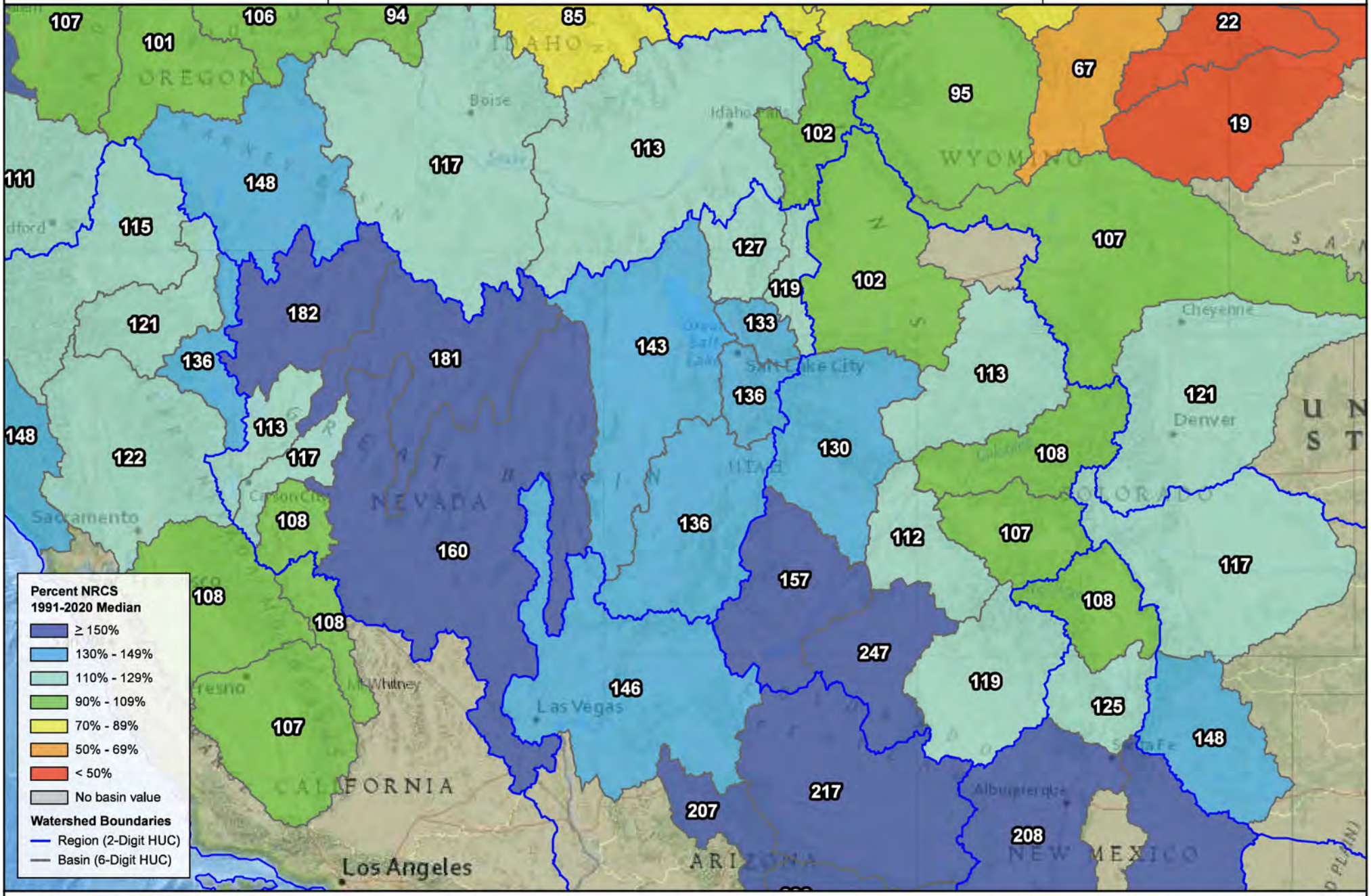
- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author:
Brad Pugh
CPC/NOAA

droughtmonitor.unl.edu

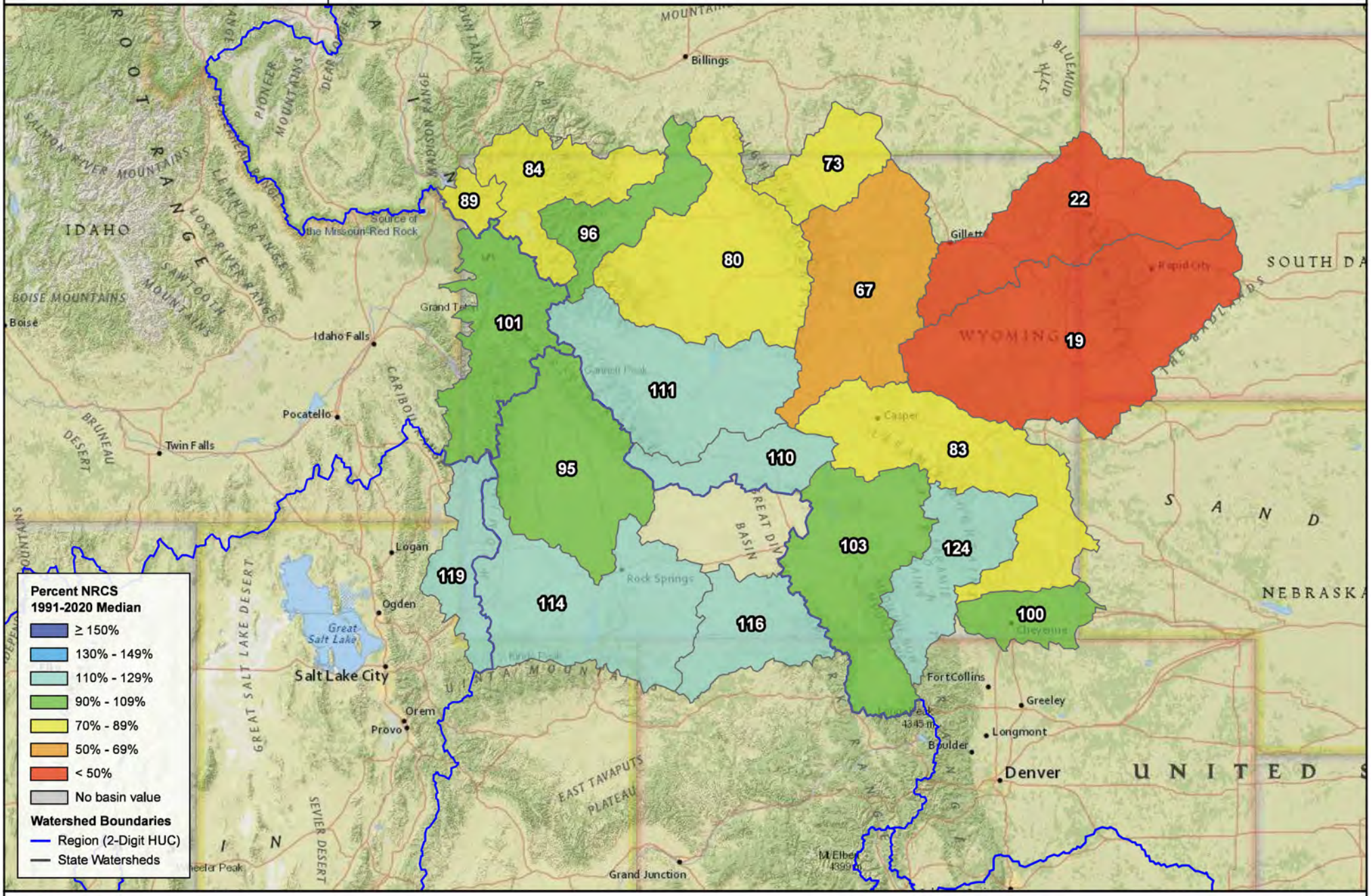
Snow Water Equivalent	Percent NRCS 1991-2020 Median	April 1st, 2024



USDA Natural Resources Conservation Service
United States Department of Agriculture

Created 4-04-2024

Snow Water Equivalent	Percent NRCS 1991-2020 Median	April 1st, 2024



USDA Natural Resources Conservation Service
United States Department of Agriculture

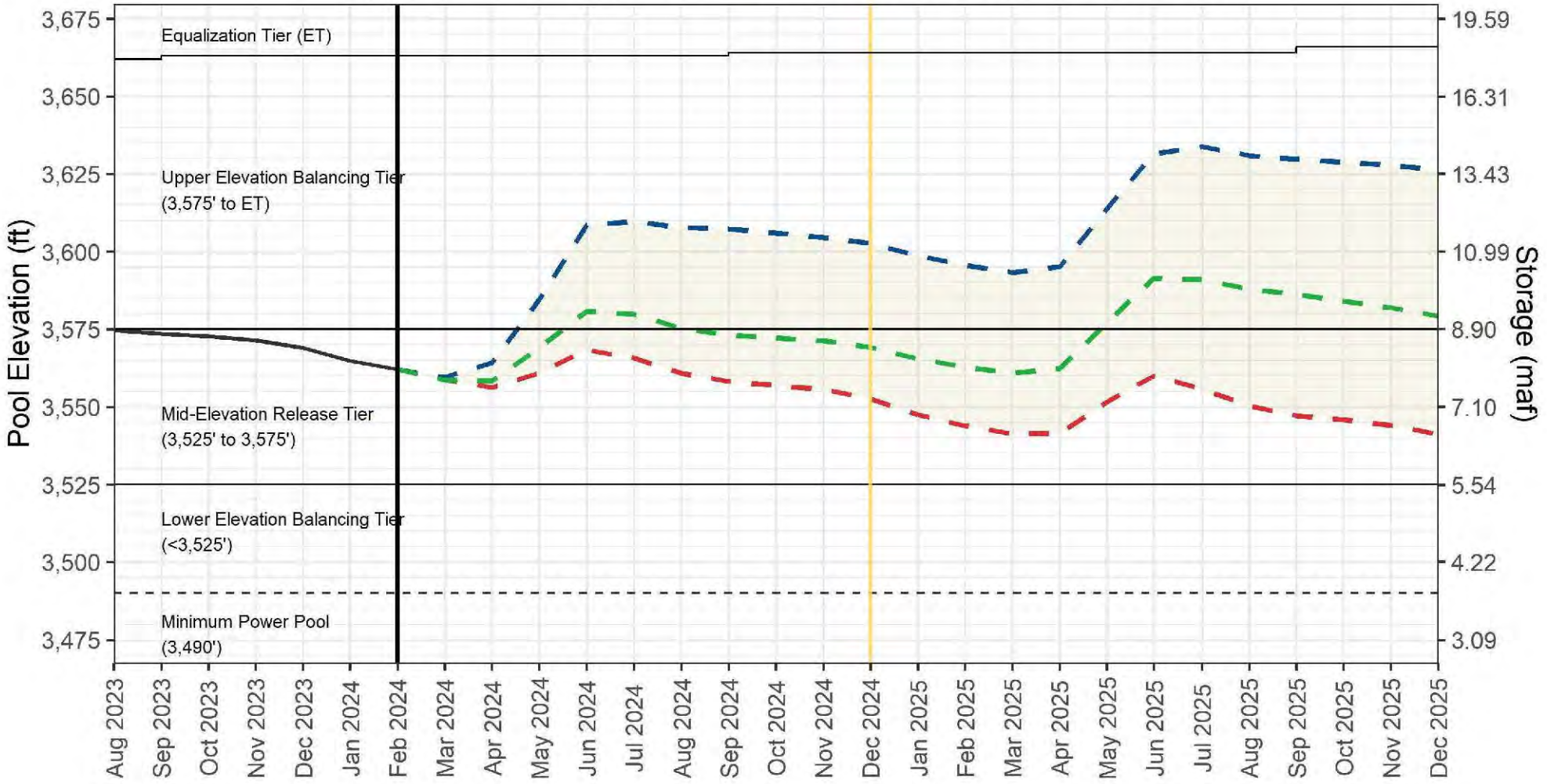
N

0 20 40 80 120 160 200 Miles

Created 4-04-2024

Lake Powell End-of-Month Elevations

Projections from January and March 2024 24-Month Study Inflow Scenarios



Historical Elevations

January 2024 Probable Maximum Inflow with a Lake Powell release of 7.48 maf in WY 2024 and 9.00 maf in WY 2025

March 2024 Most Probable Inflow with a Lake Powell release of 7.48 maf in WY 2024 and WY 2025

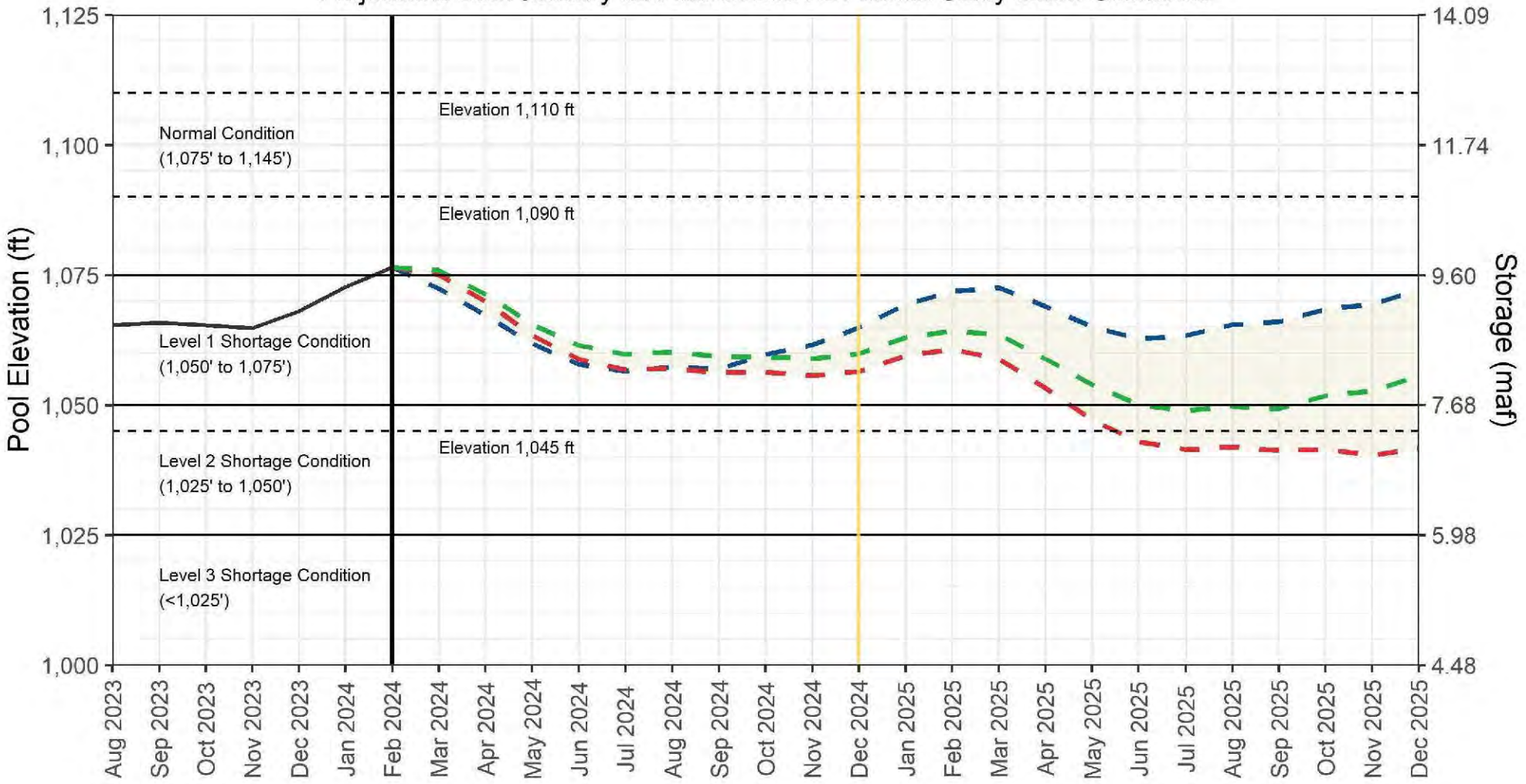
March 2024 DROA Probable Minimum Inflow with a Lake Powell release of 7.48 maf in WY 2024 and WY 2025

The Drought Response Operations Agreement (DROA) is available online at https://www.usbr.gov/dcp/finaldocs.html.

BUREAU OF RECLAMATION

Lake Mead End-of-Month Elevations

Projections from January and March 2024 24-Month Study Inflow Scenarios



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The Drought Response Operations Agreement (DROA) is available online at https://www.usbr.gov/dcp/finaldocs.html.

BUREAU OF RECLAMATION

Precipitation Statistics (period of record: 1981-current)

Statewide as of 04/01/2024

Water Year to Date: **21.25"**

% of Average: **107%**

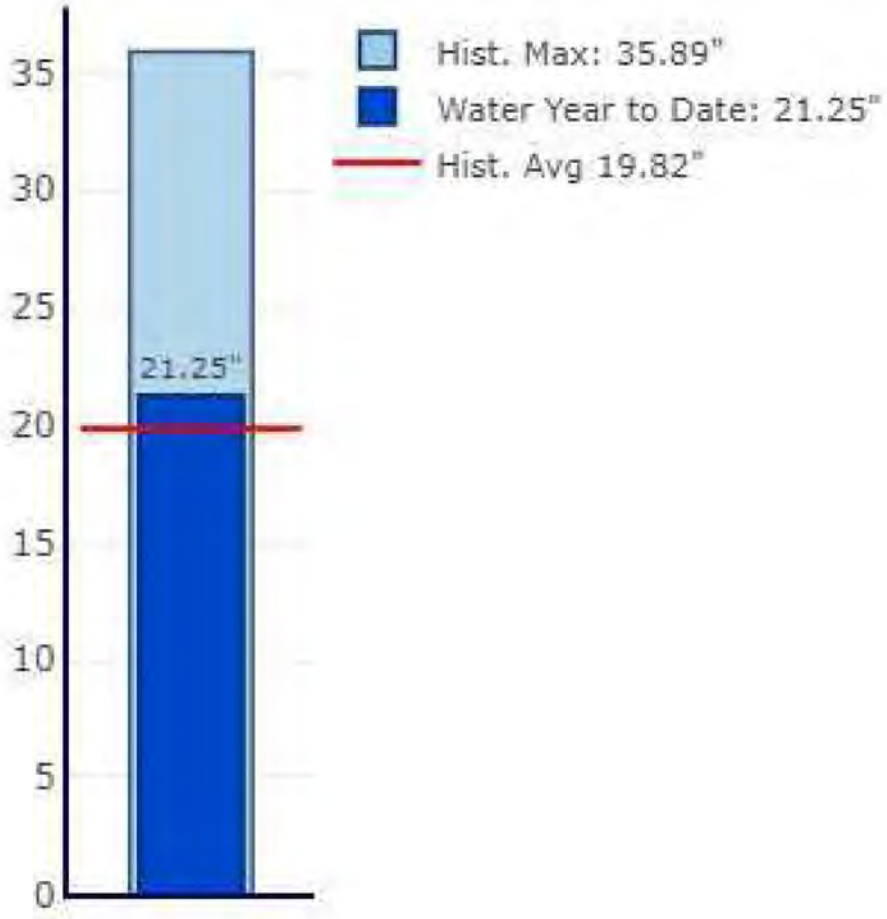
Precipitation % of average for full water year through September 30th: **89%**

Historical Record to Date:

Max: **35.89"**

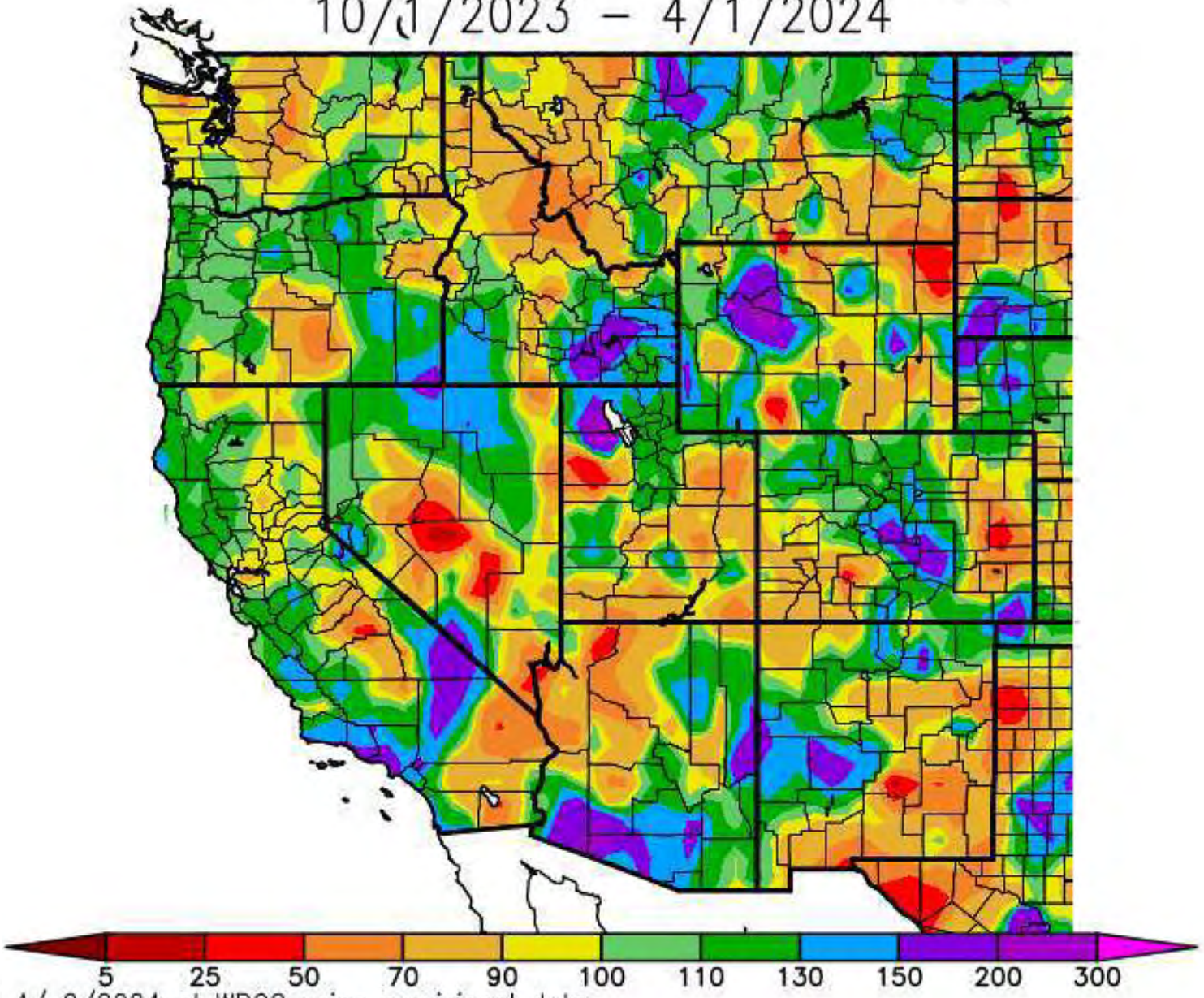
Mean: **19.82"**

Min: **10.4"**



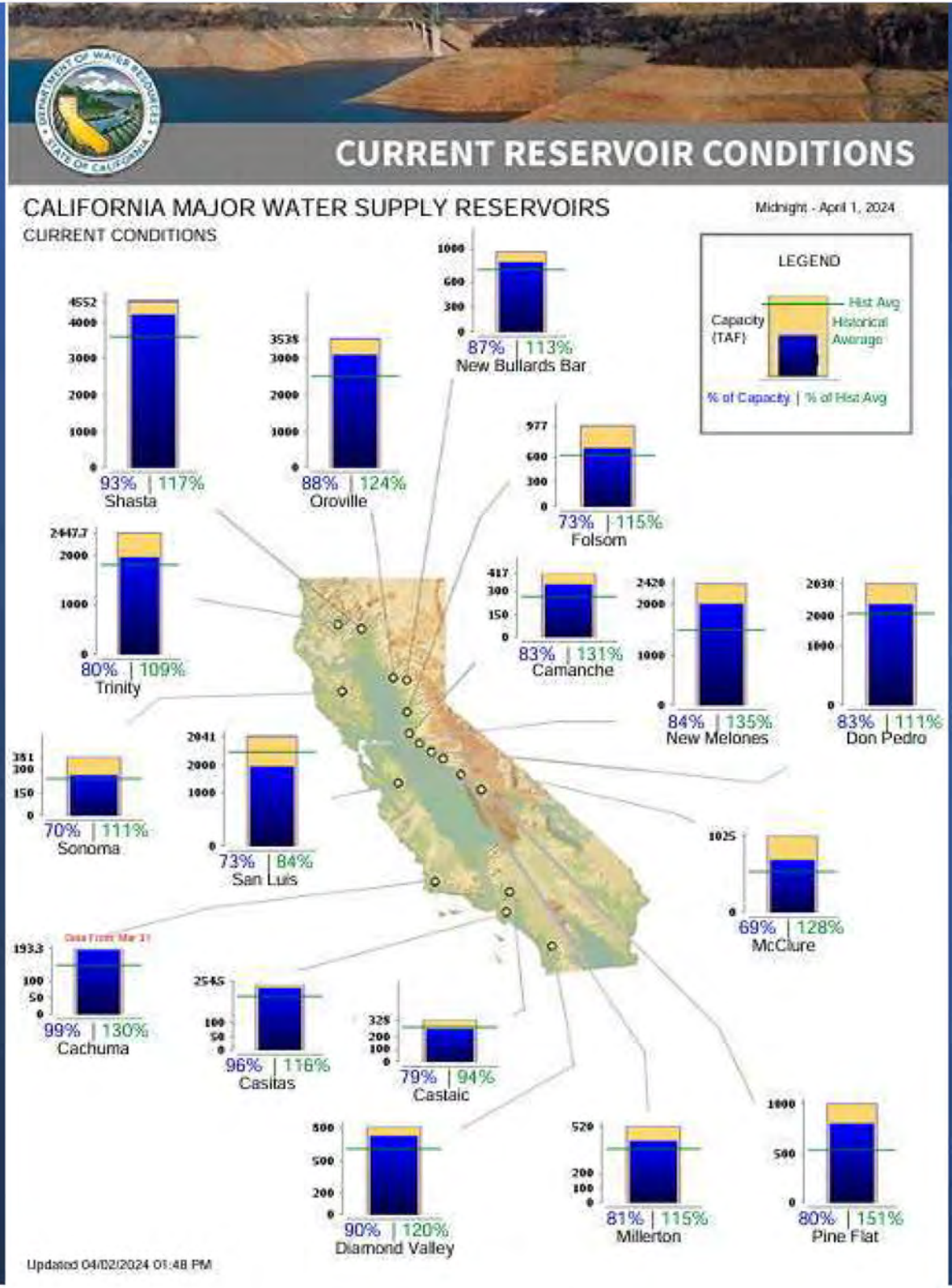
Precipitation for water year to date is 107% of historical average

Percent of Average Precipitation (%)
10/1/2023 – 4/1/2024



Generated 4/ 2/2024 at WRCC using provisional data.
NOAA Regional Climate Centers

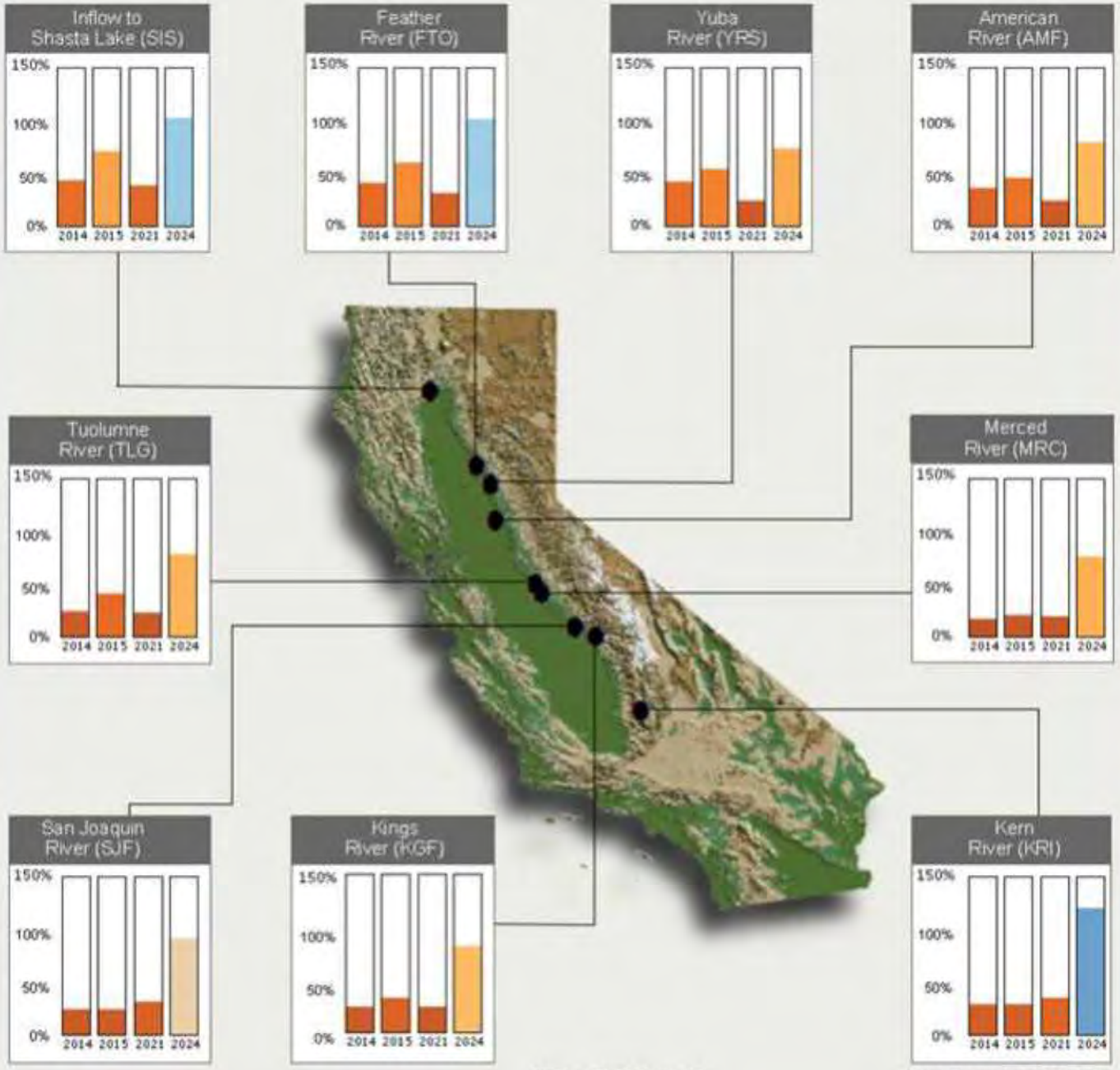
The State Water Project increased its forecasted allocation of water supplies for the year to 30 percent.



Full Natural Flow at DWR Forecast Points on Selected California Rivers

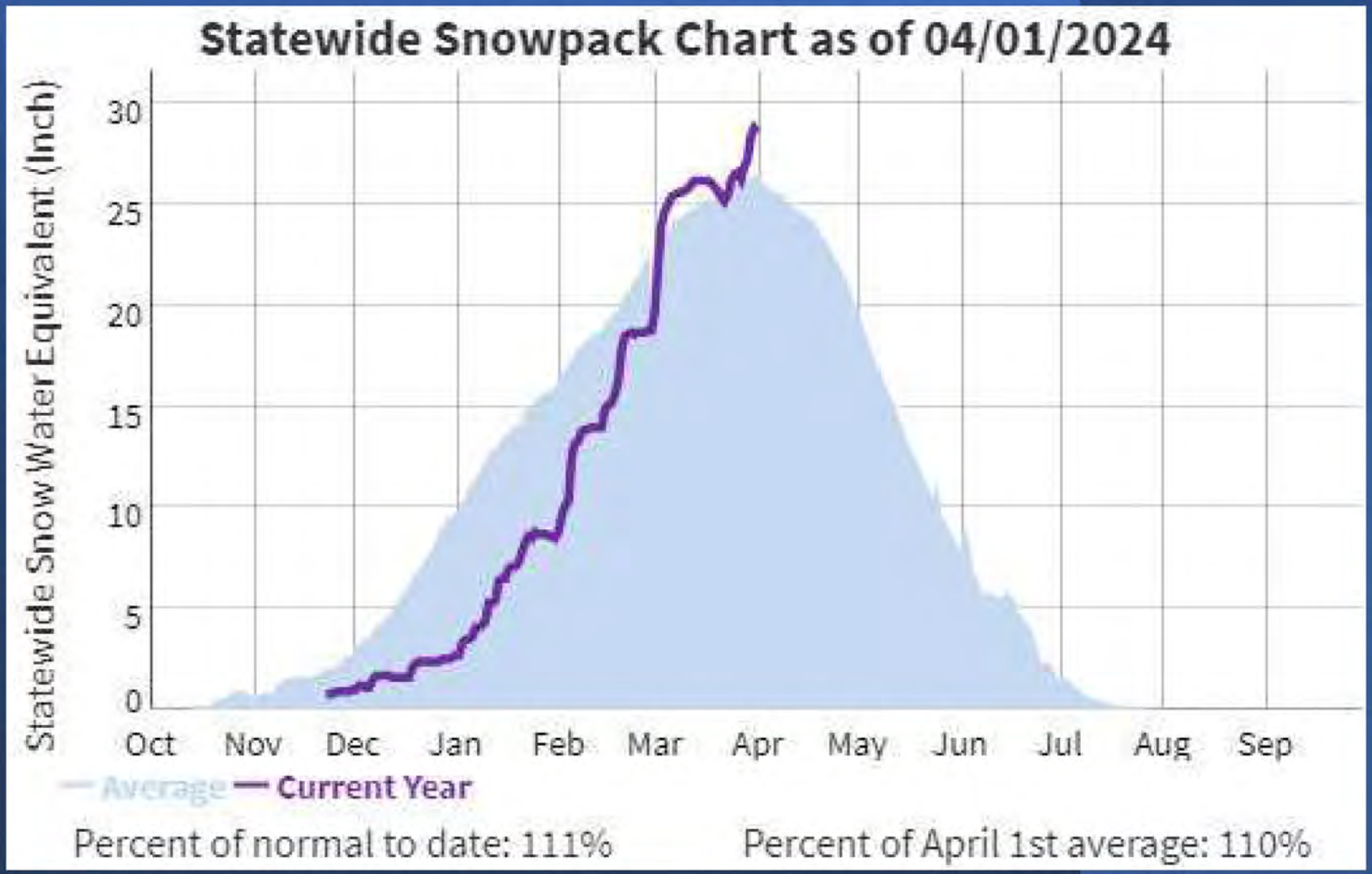
Shown as a Percent of Average to Date

Data as of Midnight: 01-Apr-2024



(XYZ) = CDEC Station ID

Date Created: 04/02/2024

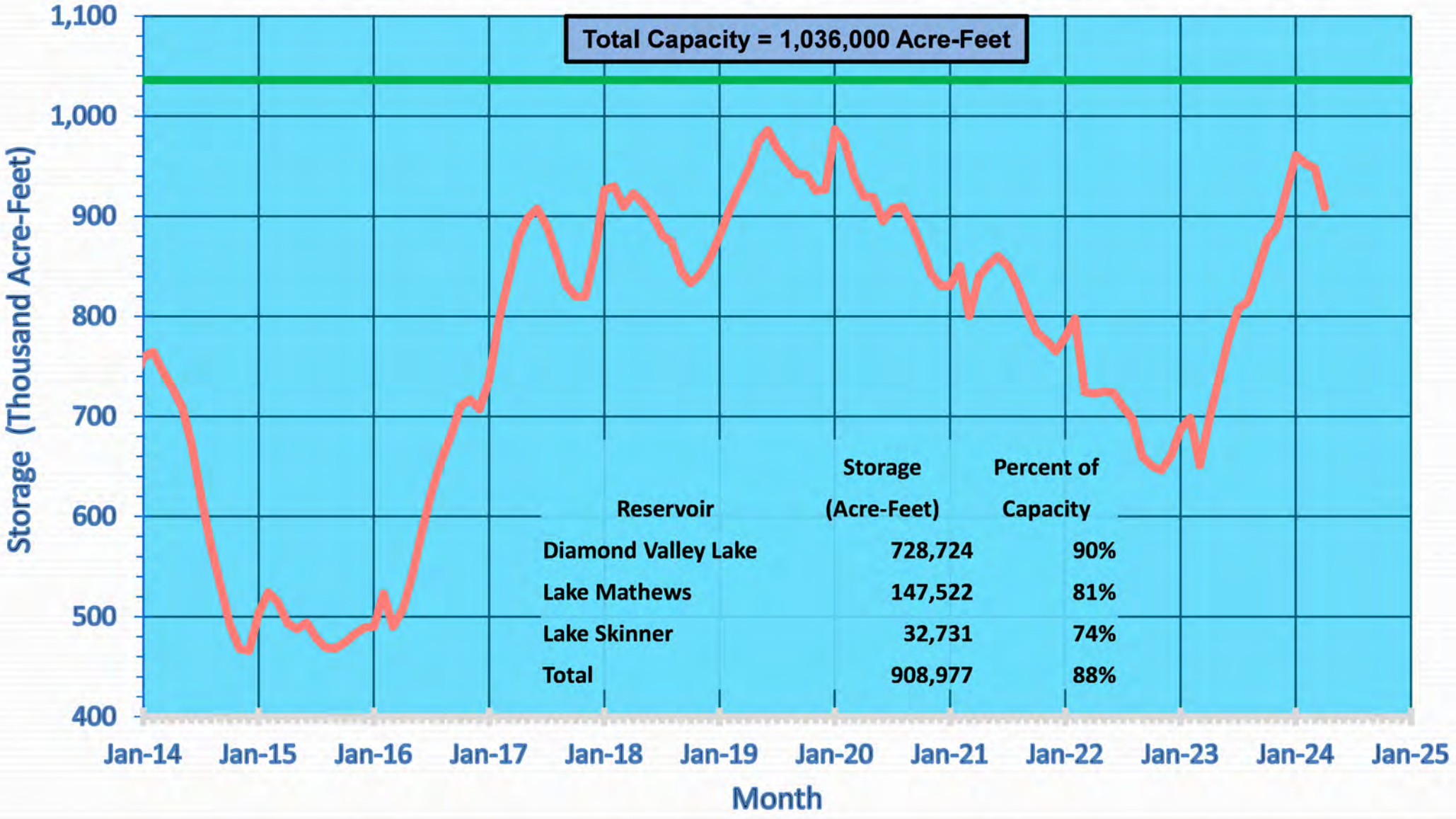


Snowpack as of 4/2/2024

	Statewide	Northern Region	Central Region	Southern Region
Percent of normal to date	111.0%	124.0%	107.0%	101.0%
Percent of April 1st average	110.0%	124.0%	107.0%	100.0%

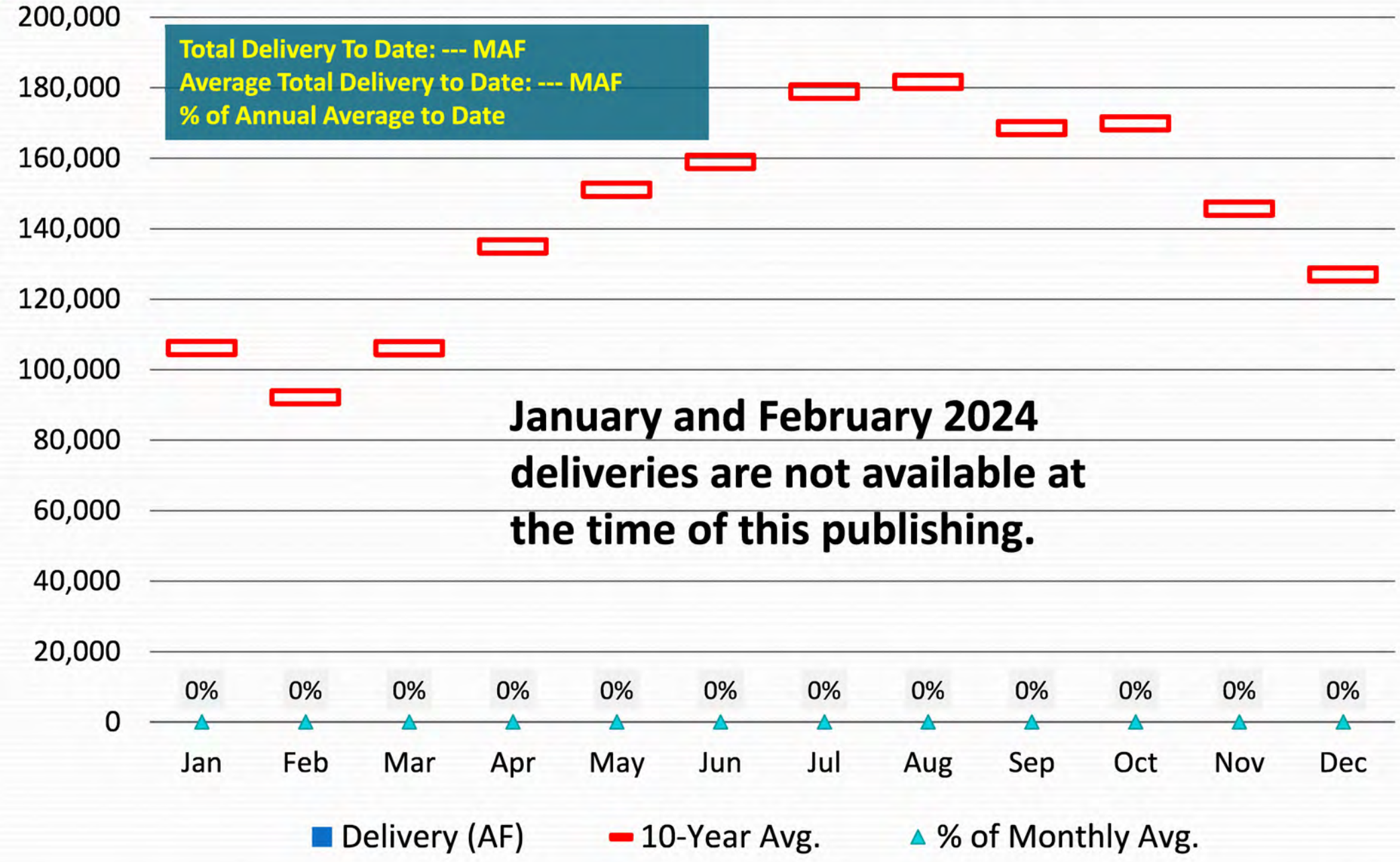
MWD's Combined Reservoir Storage as of April 1, 2024

Lake Skinner, Lake Mathews, and Diamond Valley Lake

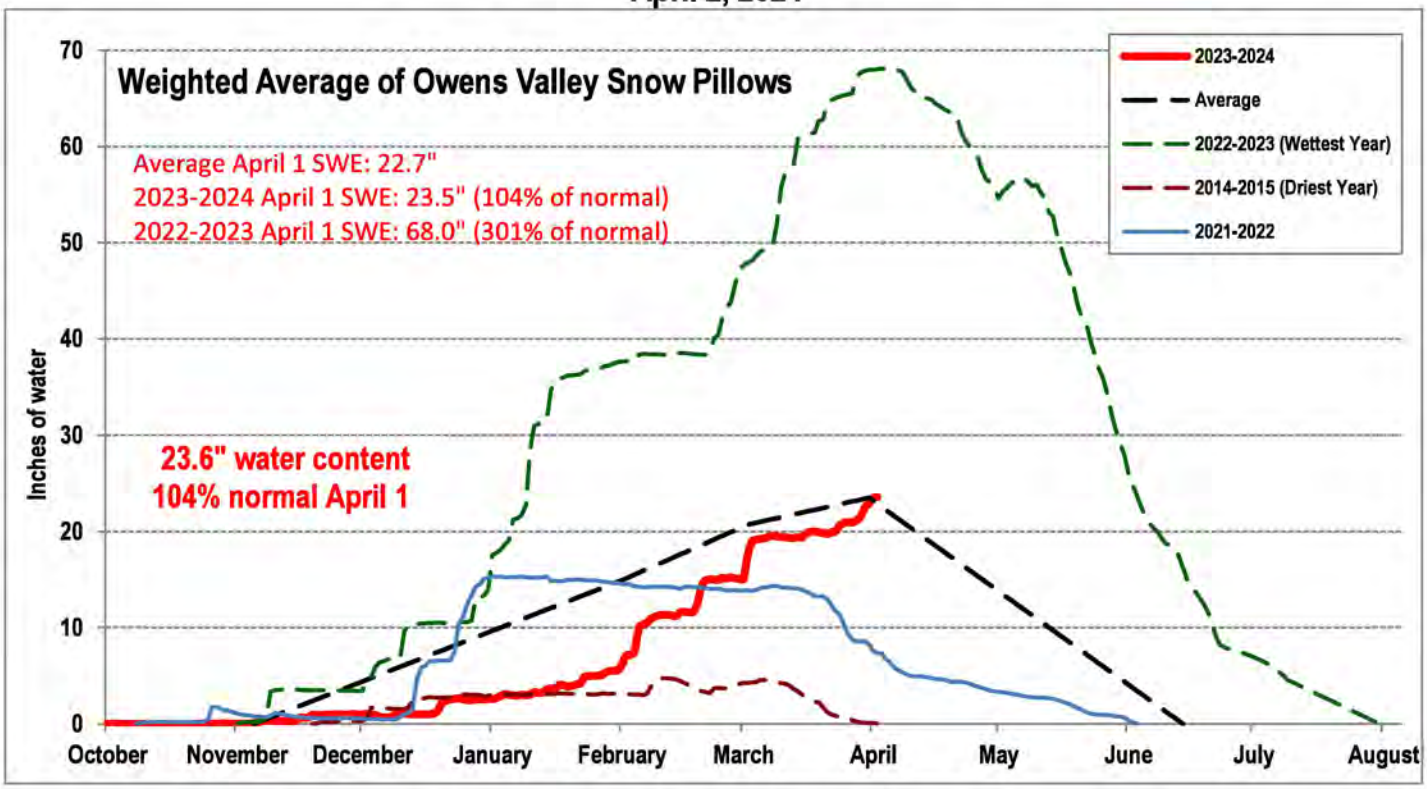


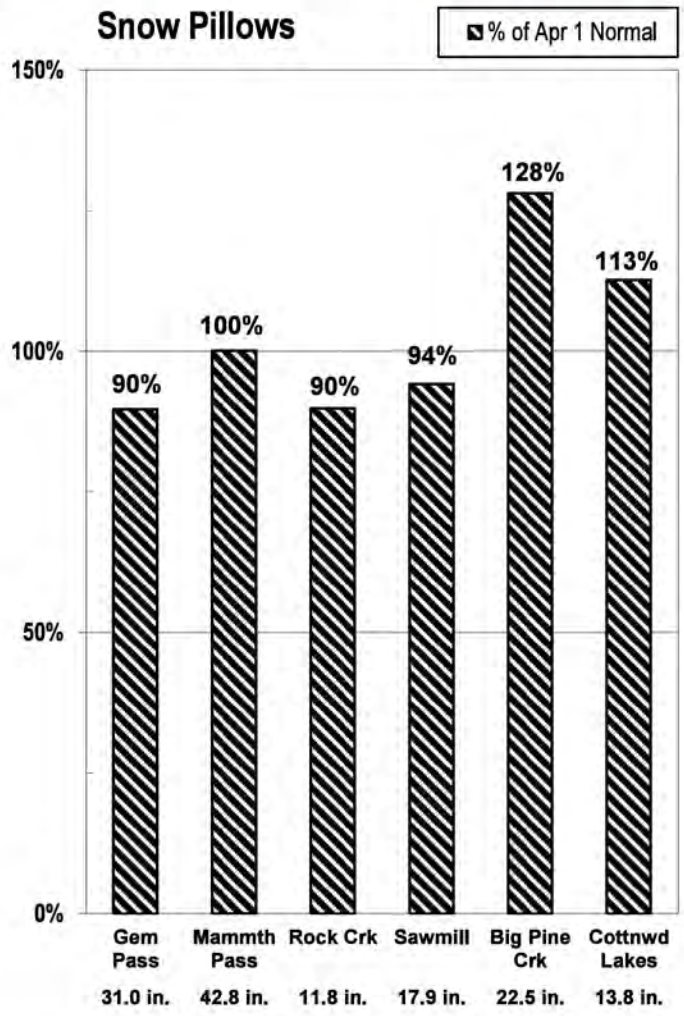
Reservoir	Storage (Acre-Feet)	Percent of Capacity
Diamond Valley Lake	728,724	90%
Lake Mathews	147,522	81%
Lake Skinner	32,731	74%
Total	908,977	88%

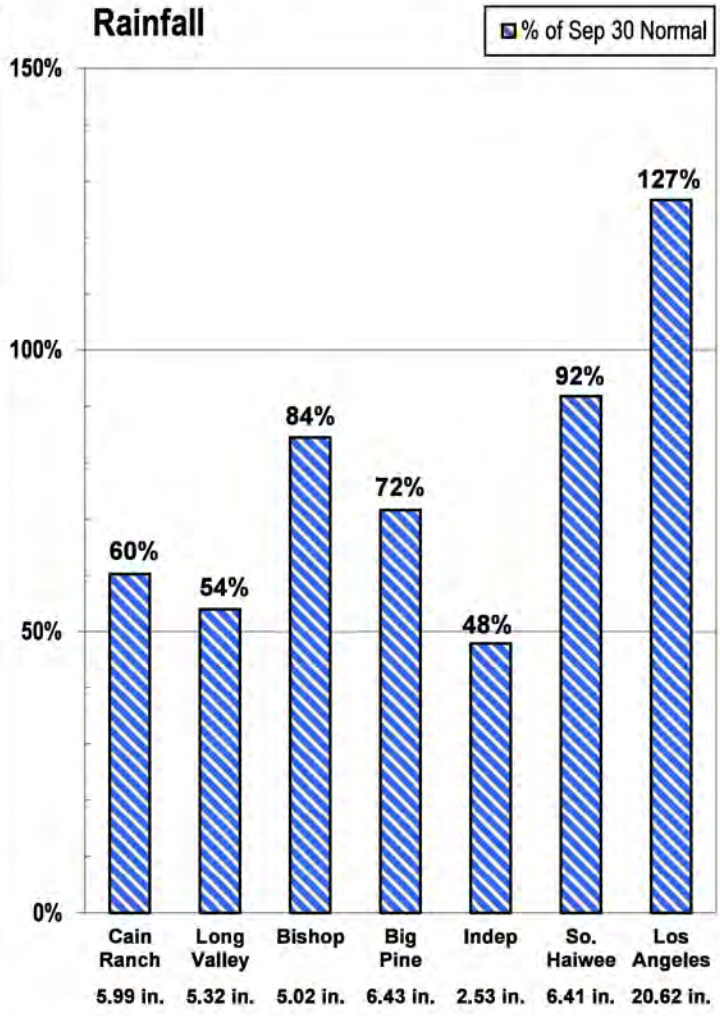
2024 Water Deliveries to Agencies (AF)



EASTERN SIERRA
CURRENT PRECIPITATION CONDITIONS
April 2, 2024







Measurement as Inches Water Content; Precipitation totals are cumulative for water year beginning Oct 1

March 29, 2024

To: Glen Canyon Dam Planning and Implementation Team

From: William Stewart, Bureau of Reclamation, Glen Canyon Dam Adaptive Management Program Manager

Re: Insufficient Sediment to Trigger Implementation of a Spring 2024 High Flow Experiment at Glen Canyon Dam

The purpose of this memorandum is to transmit technical information regarding a potential 2024 Spring High Flow Experiment (HFE) at Glen Canyon Dam to the Glen Canyon Leadership Team and to the Department of the Interior (Department) in accordance with the Long Term Experimental and Management Plan (LTEMP) Record of Decision (ROD). The Glen Canyon Dam Technical Implementation / Planning Team (Technical Team) includes technical representatives from the National Park Service (NPS), the U.S. Fish and Wildlife Service (FWS), the Bureau of Indian Affairs (BIA), the U.S. Geological Survey (USGS) Grand Canyon Monitoring and Research Center (GCMRC), the Bureau of Reclamation (Reclamation), Western Area Power Administration (WAPA), the Arizona Game and Fish Department (AGFD), the seven Colorado River Basin States (States), and the Upper Colorado River Commission (UCRC).

On March 25, 2024, Reclamation and Grand Canyon Monitoring and Research Center (GCMRC) determined that there is not sufficient sediment to support implementing an HFE at Glen Canyon Dam during the Spring 2024 planning window; therefore, an HFE will not be tested this Spring. This determination is based on the best available sediment and streamflow data and sand budget modeling to date. The determination that no HFE has been triggered this Spring is made in accordance with the process for sediment related experiments described in the Glen Canyon Dam LTEMP ROD.

LTEMP Process for Implementing Experiments

Under the LTEMP, the Department may conduct flow-based experiments (HFEs, Bug Flows, Trout Management Flows, and Low Summer Flows) at Glen Canyon Dam when resource conditions warrant and if it is determined that there will not be unacceptable adverse impacts on other resources. This process entails outreach to Glen Canyon Dam Adaptive Management Program (GCDAMP) partners through regular meetings and additional notification to Tribes inviting consultation. The process also entails coordination with the Technical Team to plan for the possible experiment, evaluate the status of resources, and make a technical recommendation regarding whether to conduct an experiment. The Technical Team presents its recommendation to the Glen Canyon Leadership Team, which makes a recommendation to the Department. In the Spring 2024 HFE planning window, the sediment trigger was not met; therefore, no technical recommendation or decision-making process was initiated.

LTEMP HFE Protocol

As described in the LTEMP ROD, HFEs are experimental in nature and are designed to achieve a better understanding of whether, how, and when to incorporate high releases into future dam operations in a manner that maintains or improves beaches, sandbars, and associated habitat. The

LTEMP HFE Protocol establishes a decision-making framework consisting of three components: (1) planning and budgeting, (2) modeling, and (3) decision and implementation. It also provides the framework and process for implementing high flow releases from Glen Canyon Dam when sediment and other resource conditions warrant.

The purpose of HFEs is to learn, through adaptive management, how to better conserve the limited sand supply to the Colorado River below Glen Canyon Dam for ecological, recreational, and cultural purposes; and to better meet DOI obligations under the Grand Canyon Protection Act (1992). Under the LTEMP HFE Protocol, for the Water Year 2024 sediment triggered HFEs may be conducted in the Fall (October to November, beginning in 2023) and Spring (March to April, beginning in 2024). Cumulative sand input from the side canyons during the Fall and Spring windows is evaluated in a sand budget model to determine whether the sediment trigger has been met. HFEs are only considered when they will not result in net erosion to the riverbed and sandbars in Marble Canyon as measured over the sediment accounting period.

HFE Sand Budget Results

The LTEMP HFE Protocol uses modeled sand inflow from the Paria River (USGS Gaging Station 09382000) and cumulative sand load at the Colorado River above Little Colorado River gage (USGS Gaging Station 09383100) verified by direct sediment-transport measurements combined with forecasted hydrologic data to determine whether suitable sediment and hydrology conditions exist in the Marble Canyon for a high-flow experimental release. On March 25, 2024, the measured post-December 1 Paria Cumulative Sand Load was approximately 37,625 metric tons and on March 2, 2024, the measured post-December 1 Colorado River above Little Colorado River Cumulative Sand Load was approximately 50,099 metric tons. Given the uncertainties associated with these measured loads and after accounting for the sand inputs from the lesser tributaries, the December 1–March 2 Marble Canyon sand mass balance was -12,474-±30,000 metric tons. A large sand input is therefore needed from the Paria River to result in a positive mass balance in Marble Canyon and trigger an HFE. Current long-term forecasts for the region do not indicate that any large sand inputs into the Paria River are likely, therefore reaching a trigger for a Spring HFE is highly unlikely. HFE implementation requires several weeks of advance planning and coordination. On March 25, 2024, GCMRC scientists and Reclamation determined there is insufficient sediment to meet the trigger in time to plan and coordinate an HFE in the March to April 2024 implementation window."

Consultation

On February 12, 2024, the required 30-day advance notification and offer for consultation was emailed to the Tribes and Parties to the LTEMP cultural Programmatic Agreement of the potential for a HFE beginning April 18, 2024. As of March 25, 2024, Reclamation has not received any requests for consultation on the potential experiment.

March 25, 2024

via e-mail only

LTEMP SEIS Program Manager
Bureau of Reclamation
125 South State Street, Room 800
Salt Lake City, Utah 84138
LTEMPSEIS@usbr.gov

Re: Comments on the Draft Supplemental Environmental Impact Statement for the December 2016 Record of Decision Entitled Glen Canyon Dam Long-Term Experimental and Management Plan

Dear LTEMP SEIS Project Manager:

The Colorado River Basin States' Representatives (Basin States' Representatives) submit the following comments regarding the Bureau of Reclamation's (Reclamation) release of the Draft Supplemental Environmental Impact Statement (DSEIS) for the December 2016 Record of Decision (ROD) titled "Glen Canyon Dam Long-Term Experimental and Management Plan" (89 Fed. Reg. 9147) (LTEMP) published in the Federal Register on February 9, 2024.

Glen Canyon Dam Operations and Critical Infrastructure:
Reclamation has made public statements regarding significant infrastructure concerns associated with LTEMP ROD experimental operations at Glen Canyon Dam and releases through the River Outlet Works (ROW). The most recent such statement was provided by the Secretary of the Interior's Acting Designee during the February 28-29, 2024 meeting of the Adaptive Management Work Group. While the Basin States' Representatives support Reclamation's efforts to address the threat of warmwater nonnative species, we oppose proposed experimental operations that use the ROW if such operations may negatively affect the rights afforded to the Colorado River Basin States through the Law of the River.

While the DSEIS indicates that the ROW flow releases could be reduced to half tube increments, it is not clear what potential impacts may occur if the ROW are used at a reduced rate at any given reservoir elevation and for an extended duration. The operation of the ROW for experimental environmental flows should be an opportunity to further our understanding of their integrity and vulnerabilities. Therefore, thorough inspections and observations should occur before and after potential implementation of the flow options, maintenance should be consistent and preventative, and experimental flows should not occur if there is a risk that they will cause irreparable damage to the ROW.

Support for Addressing Warmwater Nonnative Species Threats:
The Basin States' Representatives support Reclamation's efforts to address the threat of smallmouth bass and other high-risk warmwater nonnative species and see this as an immediate concern. The Basin States' Representatives understand that the flow options discussed in the DSEIS are potential actions to assist in the prevention of warmwater nonnative fish species establishment to protect the humpback chub, a federally listed species under the Endangered Species Act.

While the actions in the DSEIS are experimental in nature and of a limited duration, the long-term management of an invasive species is often far more costly than short-term prevention efforts. The Basin States' Representatives would like to see actions taken to address the threat of warmwater nonnative fish in the Colorado River ecosystem and maintain that a multi-faceted approach, such as potential installation of a fish exclusion device and modification of the -12-mile slough, are necessary.

The need for actions to prevent the establishment of warmwater nonnative fish species has been acknowledged by the Glen Canyon Dam Adaptive Management Program (GCDAMP). A consensus-based document titled "Invasive Fish Species Below Glen Canyon Dam: A Strategic Plan to Prevent, Detect, and Respond" (Strategic Plan) was recommended for adoption by the Secretary of the Interior by the GCDAMP's Adaptive Management Work Group in February of 2023. The Strategic Plan as well as the "Proposal to Amend the High-Flow Experiment Protocol and other Considerations" (HFE Amendment Proposal), are guiding documents from the GCDAMP. The Basin States' Representatives support continued reliance on these reference documents in the DSEIS.

Flow Option Alternatives:
It is recommended that Reclamation include in the preferred alternative the full array of flow option alternatives analyzed in the DSEIS. As the actions are experimental in nature, the use of a range of potential flows will allow adaptive management to address changing conditions on the river. The implementation of the various flow options would be subject to warmwater nonnative fish population size and distribution, hydrology, reservoir elevations, water temperature, and potential impacts to infrastructure.

While the DSEIS acknowledges the choice in temperature target of 15.5℃ (Chapter 3, page 3-70) for the flow options was based on observations of smallmouth bass in the Upper Colorado River Basin, the Basin States' Representatives want to acknowledge the potential for smallmouth bass to spawn at temperatures as low as 12.5℃ in other systems as indicated in Figure 3-23, page 3-55. While many factors play into a species spawning success, it is imperative that Reclamation consider this range in temperature while evaluating the effectiveness of the proposed actions. If smallmouth bass are found to be spawning in the Colorado River at temperatures below the 15.5℃ target, flow options should be reevaluated and potentially discontinued.

HFE Sediment Accounting Period and Implementation Window Adjustments:
The GCDAMP's HFE Amendment Proposal highlights additional considerations that were not included in the DSEIS, including specific language changes to the HFE protocol and additional research questions to analyze during the implementation of Spring HFEs. The Basin States' Representatives would like to see the HFE protocol amended to include the proposed changes from the HFE Amendment Proposal and the complete updated protocol included in the Final SEIS for clarity regarding the proposed action.

The interactions between the various flow alternatives designed to disrupt smallmouth bass spawning and the proposed adjustment to the HFE sediment accounting period and implementation window are not clearly documented in the DSEIS, making it difficult to comment on the cumulative impacts if the actions were to occur within the same year. Further analysis should be provided to better inform the communication and consultation process as specified in Sections 1.3 and 1.4 in Attachment B of the ROD (Communication and Consultation Process) that is further discussed below. This was also a recommendation in the GCDAMP's HFE Amendment Proposal.

Since an HFE only alternative was not analyzed, it is difficult to differentiate between potentially short-term impacts stemming from the combined proposed actions (HFEs and smallmouth bass flows through 2027) and longer-term impacts (HFEs only from 2027 to 2036). Additional information should be provided to differentiate these impacts.

Implementation of Operational Alternatives:
Meaningful consultation with the States must continue before Reclamation considers implementation of any of the alternatives described in the DSEIS. The Basin States' Representatives request that the current Communication and Consultation Process described in the LTEMP ROD continue to be utilized to analyze the various flow options, including discussion of their impacts on Glen Canyon Dam operations and critical infrastructure, in order to recommend flow experiments to the Secretary of the Interior. The Communication and Consultation Process must also consider circumstances when an experiment may warrant discontinuation and evaluate the flow options throughout the potential periods of implementation.

Adequate notice of the timing of a planned flow experiment will be necessary to facilitate consideration of potential resource impacts, to coordinate monitoring prior to, during, and following the implementation of the flow options, and to address impacts to the Basin Fund and market grid reliability. Successful implementation will necessitate reliable temperature models and meetings to occur in a timely manner before a potential trigger is hit.

Monitoring and Offramps:
Potential conditions for discontinuing the experimental flow options should be informed by the monitoring of warmwater nonnative fish species and consideration of the effectiveness of actions. To ensure decisions are well-informed, adequate analysis and data collection should occur before, during, and following a flow experiment. Several factors to consider when evaluating the potential discontinuation of warmwater nonnative fish management actions are included in the Strategic Plan (see Section 3.4, page 11, titled "Offramps"). This information should be used to inform the Communication and Consultation Process.

While minimization of predation on humpback chub is the intent behind the experimental flow options, it is imperative that potential impacts to humpback chub from the flow options themselves are closely monitored. If the experimental flows are found to negatively impact the humpback chub population below the current triggers identified in the 2016 Biological Opinion, Reclamation should immediately discontinue the use of the flow actions and consider alternative measures.

Reservation of Rights:
Failure of the Basin States' Representatives to provide specific comments regarding details of the SEIS shall not be construed as an admission with respect to any factual or legal issue or a waiver of rights for the purposes of any future legal, administrative, or other proceeding. Moreover, the comments herein are specific to this SEIS process and should not be interpreted to apply to any other ongoing NEPA processes. Finally, the Basin States' Representatives reserve the right to comment further on SEIS documentation as Reclamation proceeds with subsequent phases of the SEIS process.

Conclusion:
The Basin States' Representatives appreciate the opportunity to provide comments on the DSEIS to the 2016 LTEMP ROD and appreciate Reclamation's efforts. The Basin States' Representatives are supportive of short-term, mid-term, and long-term actions to address warmwater nonnative fish species establishment in the Colorado River in an effort to avoid the potential for long-term management of an established warmwater nonnative species. These actions, however, must not be taken at the expense of compromising the integrity of dam infrastructure. Should there be any questions, please contact us at your earliest convenience.

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March 29, 2024

The Honorable Camille Calimlim Touton
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Re: Conservation Groups' Cooperative Conservation Alternative for Post-2026 Colorado River Guidelines Operations and Strategies

Dear Commissioner Touton,

On behalf of our respective organizations, we are grateful for the opportunity to contribute to the ongoing dialogue shaping the future of the Colorado River through the post-2026 NEPA process for developing Colorado River Guidelines and Strategies. The Cooperative Conservation Alternative (Cooperative Conservation) that we submit today emerges from a synthesis of lessons learned from operation under the 2007 Interim Guidelines, a deep understanding of the Basin's environmental dynamics, and a commitment to collaborative, equitable water management. It endeavors to introduce innovative strategies that balance the needs of human and natural systems under the shadow of climate change and increasing water scarcity.

Cooperative Conservation describes what we view as critical elements of forward-looking, comprehensive operations and strategies aimed at addressing the pressing and evolving challenges facing the Colorado River Basin, its ecosystems, and the diverse community of sovereigns and stakeholders reliant upon its resources. This Alternative is also designed to

inform and enhance one or more alternatives for consideration in developing the post-2026 Colorado River Environmental Impact Statement (EIS).

The significance of our Alternative lies not only in its aim to expand consideration of how to address immediate challenges, but also in its vision for a resilient and adaptive strategy that honors the interdependence of all who share this vital river. By embracing a holistic perspective that integrates scientific insight, stakeholder inclusivity, and environmental stewardship, we contribute to a framework that ensures the Colorado River remains a life-sustaining resource for future generations.

Our Alternative emphasizes the need for innovative strategies to stabilize system storage, integrate environmental stewardship and necessary mitigation measures, allow for binational solutions, and provide for flexible management tools that incentivize water conservation and maximize the community and ecological benefit of every drop of water saved. We introduce "Dual Indicator" operations for determining annual releases from Lakes Powell and Mead, aiming to avoid crisis management and stabilize storage. Additionally, we propose a stewardship targets and mitigation goals to maintain the integrity of priority Basin ecosystems, and introduce the “Conservation Reserve” as a flexible tool for water conservation and management.

We urge Reclamation to incorporate this Alternative into the NEPA process, evaluating its impact and feasibility alongside other alternatives. Furthermore, we advocate for an examination of the individual tools and strategies presented within our alternative, evaluating their potential to enhance the effectiveness and resilience of the proposed management strategies when possibly combined with components from other operational alternatives.

We are eager to engage in constructive dialogue with Reclamation, Basin States, Tribes, and stakeholders. This collaborative effort is essential for navigating the challenges ahead, united by our commitment to the Colorado River.

Sincerely,

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Cooperative Conservation
NEPA Alternative

Post-2026 Colorado River Operations and Strategies

Audubon

AMERICAN RIVERS

Environmental Defense Fund

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The Nature Conservancy

TROUT UNLIMITED

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Cover Photo 1. *(Top) Aerial view of Reflection Canyon, Glen Canyon, Lake Powell, Arizona. Credit: Justin Reznick*

Cover Photo 2. *(Bottom) Lake Mead at critically low elevations with "bathtub" rings. Credit: Colleen Miniuk-Sperry*

A. Introduction

On behalf of our respective organizations, the undersigned conservation groups (Conservation Groups or Groups) submit the Cooperative Conservation Alternative (Cooperative Conservation) to contribute to the ongoing dialogue shaping the future of the Colorado River through the post-2026 NEPA process for developing Colorado River Guidelines and Strategies.

The Groups request the Bureau of Reclamation include Cooperative Conservation in its analysis of post-2026 Colorado River Guideline Operations and Strategies as a forward-looking, comprehensive approach for addressing the pressing and evolving challenges facing the Colorado River Basin, its ecosystems, and the diverse community of sovereigns and stakeholders who rely upon its resources.

Cooperative Conservation is designed to inform and enhance one or more alternatives for consideration in developing the post-2026 Colorado River Operations and Strategies Environmental Impact Statement (EIS). It emerges from a synthesis of lessons learned, a deep understanding of the Basin's environmental dynamics, and a commitment to collaborative, equitable water management, and endeavors to introduce innovative strategies that balance the needs of human and natural systems under the shadow of climate change and increasing water scarcity.

The urgency to redefine the framework for Colorado River operations cannot be overstated. The Bureau of Reclamation's (Reclamation) notice of intent to prepare an EIS for the post-2026 Colorado River marks a critical step toward addressing the Basin's future needs ("Notice of Intent To Prepare an Environmental Impact Statement for Post-2026 Colorado River Operational Guidelines and Strategies for Lake Powell and Lake Mead," 88 Fed. Reg. 12345 (June 16, 2023)). The existing guidelines, while pioneering at the time of their inception, are now recognized as insufficient to navigate the complexities of prolonged drought, escalating impacts of climate change, and pressing needs of a diverse array of sovereigns and stakeholders. Cooperative Conservation is rooted in the recognition that the Colorado River Basin has entered an era of uncertainty, where traditional management approaches must be reevaluated in light of scientific advancements, changing hydrological patterns, and the imperative of sustainability.

The significance of this Alternative lies not only in its aim to expand consideration of ways to address the immediate challenges, but also in its vision for a resilient and adaptive future that honors the interdependence of all who share this vital river. By embracing a holistic perspective that integrates scientific insight, stakeholder inclusivity, and environmental stewardship, our alternative is a framework for optimizing every drop of the Colorado River to better ensure it can remain a life-sustaining resource for future generations.

As the Conservation Groups submit this Alternative, we are mindful of the collective effort required to steward the Colorado River through the challenges ahead. We look forward to engaging in a constructive dialogue with Reclamation, the Basin States and Tribes, and all interested stakeholders involved in this essential process, united by our shared commitment to the River that sustains us all.

B. Background/Context

The binational Colorado River Basin confronts an unparalleled challenge: reconciling the water demands of over 35 million people and millions of acres of agricultural land with the ecological needs of the natural river system under siege by climate change and over-allocation. Reclamation's acknowledgment of the need to prepare an EIS for post-2026 operations and strategies sets the stage for a comprehensive evaluation of the river's future management. A confluence of factors necessitates this consideration, including:

- **Crisis of Hydrological Imbalance:** The Basin is experiencing a dire mismatch between the growing water demands of agricultural, urban, and ecological needs and the decreasing supplies due to over-allocation and reduced inflows. This imbalance has put the Basin in a state of decreasing reservoir levels, emergency operations, environmental damage, and less reliability in water supply from year to year, compelling a reevaluation of water management strategies to ensure sustainability.
- **Reliance on Depleting Storage:** Historically, the Colorado River Basin has relied on its vast storage capacity, epitomized by reservoirs such as Lake Powell and Lake Mead, to buffer against variability in annual water supply. Despite implementation of the 2007 Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead (2007 Guidelines) and 2019 Drought Contingency Plans (DCPs), these storage reserves have been depleted to critically low levels, signaling the unsustainability of current operational paradigms.
- **Climate Change Impacts:** The experience of the past two decades, augmented by scientific studies, projects a likelihood of a hotter and drier climate for the Colorado River Basin. This emerging reality is characterized by a long-term decline in hydrology, compounded by highly variable and uncertain precipitation patterns from year to year. The evolving climate scenario necessitates a proactive and adaptive operational approach that anticipates rather than reacts to future challenges.
- **Integrated Basin Management:** The complexities of the Colorado River Basin's hydrology and the interdependencies of its water users (including the environment) demand a holistic management perspective. Lessons learned from the implementation of the 2007 Guidelines and DCPs highlight the need for a basin-wide approach that transcends political and geographical boundaries to foster resilience and sustainability.

Our pre-scoping comment letter underscores these challenges, emphasizing the urgent need for new operational strategies that reflect a realistic appraisal of the river's hydrology, the imperative of system-wide management, and the protection of critical environmental resources (Joint Pre-Scoping Comments Letter for Post-2026 Colorado River Operations, June 24, 2023).

Amidst these challenges, there are emerging positive factors that also lay a foundation for the innovative strategies proposed through Cooperative Conservation, including but not limited to:

- **Increasing Recognition of the Need to Adapt**: There is a growing consensus among sovereigns and stakeholders, including federal, state, tribal, and local entities, on the urgent need for flexible and adaptable management strategies that can accommodate the dynamic nature of climate variability and water demand pressures.
- **Advances in Water Conservation Policy/Technology and Forecasting**: Policy and technological advancements in water conservation and efficiency, along with

improved hydrologic and climate forecasting models, are enhancing our ability to use water more judiciously and to plan for variability and change with greater precision.

- **Increased Understanding of the Relationship Between Watershed Health and River Flows**: Recent research underscores the critical link between watershed health and resilience of river flows. This knowledge supports integrated water management practices that benefit both human and ecological communities.
- **Federal Recognition of the Need for Additional Funding**: The federal government has acknowledged the necessity for increased investment in water infrastructure, conservation, and river health initiatives that support the long-term resilience of the system as a whole. This recognition is paving the way for greater financial support for sustainable water management efforts across the Colorado River Basin.[1]

These positive factors contribute to a promising context for our proposed solutions, suggesting that, despite significant challenges ahead, there are reasons to be optimistic about our collective capacity to forge a sustainable path forward for the Colorado River Basin.

C. Cooperative Conservation

Cooperative Conservation is an operating alternative that synthesizes lessons learned from past management experiences and current scientific understandings. Most alternatives proposed for the post-2026 Colorado River NEPA process center on potential changes in reservoir releases and water uses based on different legal and negotiating positions held by the Upper and Lower Division States. Our proposal broadens these alternatives to consider additional proactive responses, targeted reservoir management strategies, and innovative and flexible tools in the face of uncertain and changing future water supply conditions. Specifically, Cooperative Conservation emphasizes approaches (summarized below) to help:

- Stabilize system storage and avoid crisis management;
- Target reservoir management to integrate stewardship and mitigation in storage and release operations;
- Maintain opportunities for Colorado River Delta flows; and
- Incentivize flexible tools and water management.

1. Stabilize Storage and Avoid Crisis Management - Dual Indicator Operations

Cooperative Conservation proposes "**Dual Indicator Operations**" for determining annual releases from Lakes Powell and Mead to better stabilize storage and avoid crisis to crisis management. This approach predicates annual reservoir operations at Lakes Powell and Mead first on combined storage at relevant system reservoirs and second on climate trends affecting Basin water supplies.

> ***Rationale:*** *The 2007 Guidelines inform operation of Lakes Powell and Mead to withstand a normal drought cycle. They are based on an overly optimistic estimate of future hydrology, limited forecasts/modeling that do not account for climate trends, and a primary goal of limiting shortages and avoiding curtailment of water users. This has resulted in reduced reservoir releases only after significant storage declines when reservoirs risk reaching critically low levels. This has led to effectively "mining" storage and increasing risks of catastrophic shortages by allowing reservoirs to dangerously approach the point where they cannot reliably release water. The Dual*

[1] See e.g., Colorado River Resilience at https://resilientcoriver.org/

Indicator Operations advance operations that provide a proactive yet relatively predictable strategy to setting annual water release determinations to avoid crisis management and stabilize storage to reduce the threat to Colorado River Basin ecosystems and allow water users to assess the amount of water likely to be available with a greater degree of confidence over the life of the new guidelines.

i. Indicator 1 - Combined Storage

Although Lakes Powell and Mead are the powerhouse reservoirs driving the Colorado River system, their operations can still be influenced by conditions and operations at other system reservoirs (Flaming Gorge, Blue Mesa, Navajo Reservoirs, Lake Mohave and Lake Havasu). For the first reservoir release indicator (combined storage), Cooperative Conservation proposes introducing continuous rule curves for baseline releases from Lake Powell based on the available live storage at Lake Powell, Flaming Gorge, Blue Mesa, Navajo Reservoir (Colorado River Storage Project (CRSP) Initial Unit storage) and for deliveries from Lake Mead based on available live storage from Lake Mead, Lake Mohave and Lake Havasu in addition to the CRSP Initial Units (whole system storage). The Lake Powell curve would be based on available CRSP Initial Unit storage in recognition of the upstream facilities' potential influence on Lake Powell, while acknowledging the need to delink the influence of Lower Basin conditions on Upper Basin actions/operations.[2] Similarly, the Lake Mead rule curve would be based on available whole system storage in recognition that such storage will inform current and future water availability for downstream water users.

Assessing the health of the Colorado River's relevant system storage to inform operations at Lakes Powell and Mead allows the Colorado River community to move away from unreliable forecasting and reservoir elevation triggers that have challenged relationships and operations. It also avoids concern over where water is stored in the system or the appearance of "hiding" storage outside of Lakes Powell and Mead that leads to conflict and debates. It further removes incentives for acting just enough to hover slightly above or below the specific reservoir elevation triggers, and opens the door for the possibility of greater flexibility and adaptability in reservoir management (see Flexible and Innovative Tools - Conservation Reserve, Section C.4).

ii. Indicator 2 - Climate Response

Storage by itself, however, is not enough to prepare the Colorado River community for the water supply challenges that may come as a result of climate trends in the Basin. Adding a near-term climate response trend introduces a much needed proactive measure to anticipate the impacts of known conditions on future system storage.

Cooperative Conservation proposes applying near-term, observed trends over the baseline storage/release curves for the second release determination indicator. This "Climate Response" indicator would be used to anticipate any potential loss in net storage of CRSP

[2] By proposing Powell and Mead operations to consider relevant system storage conditions, the Dual Indicator Operations do NOT aim to make storage above Powell or below Mead readily available for release outside the normal course of operations under existing Records of Decisions and Biological Opinions for those respective facilities. Nonetheless, such storage is still an important indicator of system health to inform what to expect from operations at Powell and Mead both in the current year and in years to come. For example, if hydrology has been so impacted by climate change during the course of the post-2026 Guidelines that CRSP Initial Units do not fill to normal/typical volumes in a given year, that would inform expectations of how much water would be released to Powell through the normal course of operations which in turn would inform expectations of subsequent conditions at Powell and Mead, respectively.

Initial Units (for Lake Powell) and whole system storage (for Lake Mead) based on recent hydrology trends in the Basin. It would help the Basin adjust to expected conditions (i.e., lower runoff because of dry soils that results in less storage in the upcoming year) by avoiding making larger releases than the system can support. This Climate Response indicator is not a forecast, and should be distinguished from predictions of seasonal precipitation and flow that have been used to inform current reservoir operations and have led to less confidence in the functionality of operational triggers.

For the post-2026 NEPA process, Cooperative Conservation applies the 3-year hydrologic adjustment that is embedded in Reclamation's Colorado River Basin Post-2026 Operations Exploration Webtool, which factors temperature, precipitation, snow, etc. into the natural flow calculation at Lee Ferry. We recognize, however, that any trends used to inform annual reservoir operations must be reliable and would ideally be agreed to by consensus. We are interested in discussing with Reclamation, the Basin States and Tribes as well as the rest of the Colorado River community the appropriate trends to rely on, including the possibility of recent temperature-related indicators that have a demonstrated correlation to water supply availability.[3] Other trends to possibly consider may relate to other drivers of positive or negative change, such as shifts in recent hydrology or uses, soil moisture trends, dust on snow, groundwater storage levels and trends, or evolving patterns of regional precipitation. Modeling assumptions for the Dual Indicator Operations are outlined as reservoir regimes in Section D below.

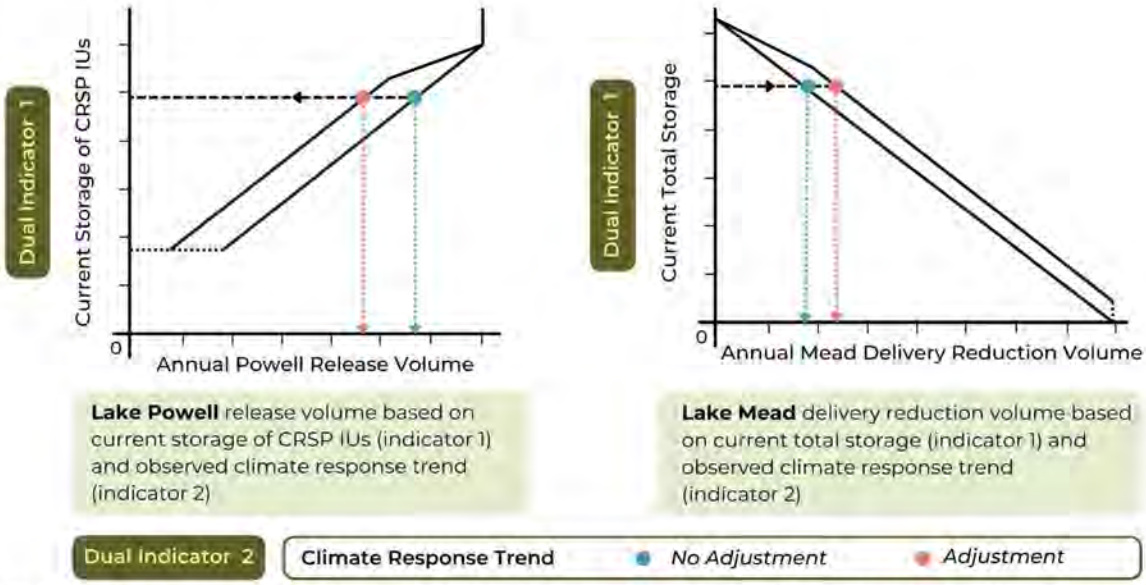

Figure 1. *Dual Indicator Operations - conceptual illustration. In Dual Indicators Operations, annual release volumes are based on Colorado River Storage Project Units (CRSP) and a climate response trend and annual delivery reduction volumes are based on CRSP units plus Lakes Mead, Mojave and Havasu (Total System Storage) and a climate response trend. The black lines show the relationship between storage, release volume, and adjustments based on indicators.*

[3] Recent investigations of the "hot drought" phenomenon have shown that higher temperatures do correlate closely with the reduced runoff efficiency that has been observed in the Basin due to higher EvapoTranspiration values changes in vegetation, and longer growing seasons (e.g. estimated by one study as ~9.5% at present, potentially increasing to ~20% by 2050). Udall, B., & Overpeck, J. (2017). The twenty-first century Colorado River hot drought and implications for the future. Water Resources Research, 53(3), 2404-2418. https://doi.org/10.1002/2016WR019638.

2. *Targeted Management of Operations to Include Stewardship and Mitigation*

Cooperative Conservation proposes targeting reservoir management to take a multi-benefit approach by incorporating stewardship and mitigation principles into reservoir operations that help maintain the integrity of the Colorado River Basin's ecosystems.

Rationale: *Climate change and reservoir management decisions are indisputably impacting natural resources and systems throughout the Basin. Yet, environmental considerations have oftentimes had to be separated from Colorado River decision making from year to year. For example:*

- ***Recovery Programs in the Upper Colorado River, San Juan River Basin, and on the Virgin River*** *that provide for ongoing water uses in conjunction with recovery of threatened and endangered species under the Endangered Species Act are separated by independent records of decisions or biological opinions, which in some cases, have not been updated to reflect current Basin conditions.*
- *Management of the* ***Grand Canyon and its resources*** *frequently fall under the framework of the Grand Canyon Protection Act, which does not account for flow effects based on annual operational considerations at Glen Canyon Dam.*
- *The* ***Lower Colorado River Multi-Species Conservation Program (LCR MSCP)*** *has been successful in achieving restoration goals identified as of 2006. Conditions over the past 20 years reveal a need for similar actions in response to changing conditions or the potential need for increased reductions in deliveries from Lake Mead along the Lower Colorado River corridor in years to come.*
- *The environmental and health effects of the* ***Salton Sea's*** *declining inflow are directly connected to delivery reductions in the Lower Basin but sometimes considered beyond the geographic scope of annual reservoir operations.*
- ***Impacts from climate change*** *are being felt in the Basin but are not yet fully incorporated into some federal reservoir operations as they work to implement the Law of the River.*
- *Effects of annual operations at Lake Mead on flows to the* ***Cienega de Santa Clara*** *and* ***Colorado River Delta*** *are sometimes determined to be beyond the purview of NEPA for reservoir operations.*

As a result, the historic processes to establish rules governing annual operation of the two largest Colorado River reservoirs have not always been able to fully contemplate storage and release measures that could help forestall the degradation of the Basin's natural systems. Cooperative Conservation proposes to rectify this outcome in part by targeting reservoir management, where possible and consistent with the Law of the River, to integrate stewardship and mitigation considerations into the annual operations at Lakes Powell and Mead under the post-2026 Guidelines.

i. Stewardship Target[4] - Grand Canyon Example

[4] Stewardship refers to responsible use of natural systems through conservation and sustainable practices.Chapin, F. S., Stephen R. Carpenter, Gary P. Kofinas, et al. 2010. Ecosystem Stewardship: Sustainability Strategies for a Rapidly Changing Planet," Trends in Ecology & Evolution. 25 (4):241-249.

Nowhere in the Colorado River Basin is the need for environmental stewardship better exemplified than the Grand Canyon. As the natural conduit between Lakes Powell and Mead along the Colorado River mainstem, the health of the Grand Canyon ecosystem is tied to management decisions for coordinating operations between the two reservoirs. At the same time, the Grand Canyon National Park is an essential Colorado River resource that supports biologically diverse communities, including many rare, endangered, and endemic species as well as several ecosystems, ranging from the lower canyon's Sonoran Desert to the North Rim's coniferous forest. The park also contains important cultural resources, and more than ten Tribes ascribe substantial cultural significance to the Grand Canyon, the Colorado River, and various sites and resources through the park's boundaries. Not to be overlooked, the Grand Canyon also provides opportunities for a range of recreational experiences that attract millions of visitors annually as one of the crown jewels of the National Park system and one of the seven natural wonders of the world.

The post-2026 Guidelines provide both a need and opportunity to consider Grand Canyon flow needs as part of the rules for Lake Powell's annual storage and release operations.[5] Specifically, annual storage considerations at Lake Powell that influence water temperature, invasive species, high flow experiments, and minimum flow priorities can help create the conditions for Powell releases to ensure ongoing compliance with the Endangered Species Act and continued operation of the Long-Term Experimental Management Plan (even if adjusted at a later date) under the Grand Canyon Protection Act, and the sustainability of Grand Canyon's resources through changes in climate and annual reservoir operations during the life of the post-2026 Guidelines.

In light of these resource considerations, which are further summarized in Table 1, Cooperative Conservation identifies Grand Canyon flow targets to inform the rule curve for annual storage and release of water at Lake Powell. These targets inform when would be beneficial to increase or decrease releases from Powell but do NOT serve as hard floors or ceilings to protect Powell storage (See Section D). Moreover, Cooperative Conservation recognizes that such storage targets may have implications for water supply, hydropower production and other resources which will be important to analyze and assess to determine viable tradeoffs and mitigation responses as part of Reclamation's NEPA process.

[5] Currently, hourly, daily, and monthly operational decisions at Glen Canyon Dam fit squarely within the management framework set forth in the Grand Canyon Protection Act, but annual operations do not. Because annual operations still have the potential to impact Grand Canyon resources, the post-2026 Guidelines present the chance to consider impacts to Grand Canyon resources through the full cycle of reservoir operations (Annual ops - post-2026 Guidelines and hourly, daily, monthly ops - GCPA authorities). See Grand Canyon Protection Act of 1992, Pub. L. No. 102-575, Title XVIII, 106 Stat. 4669.

Table 1. *Resource considerations and targets related to Lake Powell storage and release operations.*

Resource	Annual Operations Influence	General Objective	Storage/Release Target
System Integrity/ Continuity	Releases from Powell influence the minimum flows achievable to avoid the devastation of Grand Canyon resources under significantly dry hydrologies.	Prevent Powell releases that are so low they compromise the integrity of the Grand Canyon corridor.	Preferred min Grand Canyon flow: **6,000 cfs (~4.34 maf/year)** Ensures integrity of natural resources and considers the Grand Canyon recreation economy. Critical min Grand Canyon flow: **5,000 cfs (~3.23 maf/year)** Ensures annual connectivity of River system; Avoids flat flow/provides variation of flows to mimic a more natural Grand Canyon hydrograph.
Water Temperature	Powell storage and release volumes and the volume of inflow to Lake Powell have the potential to influence water temps below Glen Canyon Dam.[i]	Strive to support Glen Canyon Dam releases that are warm enough (> 12°C) to allow for Humpback Chub reproduction and growth but cool enough (< 20°C) to preserve Trout and deter reproduction, growth of invasive species.	Target 1: Powell Elevation above 3,600 ft - release temps become too cold for Grand Canyon flows (< 12°C) Target 2: Powell Elevation within 3,570-3,575 ft - release temps fit the 12-20°C window that helps avoid invasives bypassing infrastructure and preserves opportunity for HFE (if sediment is present) Target 3: Powell Elevation below 3,525 ft - release temps become too warm (> 17-20°C) and potential for HFE significantly diminished
Invasive Species	At low Powell elevations, invasive fish species have greater opportunity to pass through the Glen Canyon Dam's facilities and establish populations that impact Blue Ribbon Trout Fisheries and Native Fish at/below Lee Ferry.[ii]	Strive to maintain Powell storage elevations that prevent invasive species from entering the Colorado River below Glen Canyon Dam/Lee's Ferry.	
High Flow Experiments	Experience over the last few years reveals that when Powell storage is low, the opportunity and flexibility to accomplish HFEs (for optics or operational reasons) is significantly diminished.	Strive to maintain Powell elevations that support HFEs (over 24 hours) occurring once every 3 years (if sediment is present in the system), allow for interannual release adjustments (when sediment is present) to support mimicry of natural hydrograph and preserve HFE benefit in upcoming season.	

[i] Mihalevich, B. A., Neilson, B., Buahin, C. A., Yackulic, C., & Schmidt, J. C. (2020). Water temperature controls for regulated canyon-bound rivers. Water Resources Research, 56(10), e2020WR027566. https://doi.org/10.1029/2020WR027566.

[ii] Melis, T. S., ed., 2011, Effects of three high-flow experiments on the Colorado River ecosystem downstream from Glen Canyon Dam, Arizona: U.S. Geological Survey Circular 1366, 147 p. http://pubs.usgs.gov/circ/1366/c1366.pdf

ii. Stewardship Target – Upper Colorado River Endangered Fish Recovery and San Juan River Basin Recovery Implementation Programs Example

If any Alternative analyzed by Reclamation for the post-2026 NEPA process contemplates operations upstream of Powell, then it would be important to include additional stewardship targets for the Upper Basin. For example, The Upper Colorado River Endangered Fish Recovery Program and San Juan River Basin Recovery Implementation Program (Programs) are critical to the river system's integrity as it continues to experience changes due to climate conditions. The recovery of listed species has been a long-term effort that provides streamlined ESA compliance for thousands of Upper Basin water users by providing benefits to four species of warm-water fish found nowhere else in the world. Climate change has impacted these endangered fish as hotter and drier conditions have lowered river flows in many of the Colorado River's major tributaries. Management strategies can benefit listed fish through both improving management of reservoirs and focusing conservation efforts above critical habitat reaches.

Specifically, water releases from reservoirs can and should be timed to maximize ecological benefits, including meeting recommended flows for endangered fish and wildlife and providing appropriate water temperatures. This is especially true when operations are changed to address drought or unanticipated circumstances. For example, when the 2019 Drought Response Operations Agreement was implemented, it included timing releases to improve flows in priority reaches.

Similarly, any updates to the DROA or future conservation programs that enable water conservation that are contemplated with or alongside the post-2026 Guidelines could include criteria to prioritize projects that will benefit river reaches with specific environmental needs. This might include a new DROA, additional System Conservation Pilot Program projects or other Upper Basin water conservation programs developed in the future. Such water could be provided at times and in volumes that materially benefit river health while that same water provides greater security for basin-wide management: a classic win-win.

iii. Mitigation[6] Goals

The post-2026 Guidelines will inevitably result in resource impacts throughout the Basin. The NEPA process is intended to inform decision makers of what those impacts may be and consider whether and how new guidelines can be implemented in a manner that mitigates significant effects to the environment.[7] Cooperative Conservation proposes Reclamation define, where possible in the NEPA process, affirmative mitigation measures to be included as part of the post-2026 Guidelines to address impacts identified in Draft EIS. Presumed areas for mitigation consideration (which may evolve based on the EIS analyses) include:

Lower Colorado River Multi-Species Conservation Program - The success of the LCR MSCP in creating Colorado River habitats over the past 20+ years is a testament to the collaborative efforts taken to address habitat risks to valuable species of birds and wildlife and cultural heritage while providing greater water security for thousands of water users. As the post-2026 Guidelines consider ways to manage the potential for reduced water deliveries from Lake

[6] Mitigation refers to "[a]ctions taken to avoid, reduce the severity of, or eliminate an adverse impact." It can include implementing measures to avoid or minimize the degree or magnitude of identified impacts, or rectifying those impacts by restoration, rehabilitation, repair or offsets to the affected environment. U.S. Bureau of Reclamation. 2022. *Reclamation Library: Glossary*. https://www.usbr.gov/library/glossary/.
[7] National Environmental Policy Act of 1969, 42 U.S.C. § 4321 et seq. (1970).

Mead, possibly resulting in reduced flows and availability of water in the Lower Colorado River, Cooperative Conservation calls for increased restoration actions in line with anticipated impacts to address increased risks to habitat and cultural heritage along the Lower Colorado River corridor, including those established by LCR MSCP.

ESA Compliance/Recovery Programs - Recovery programs throughout the Basin remain important to the river system's integrity. It will, therefore, be important to identify if and how the post-2026 Guidelines will implicate any recovery program and provide opportunity to apply innovative solutions that accommodate continued protection, mitigation, and recovery of species and habitats at a broad scale within the Colorado River Basin.

Tribal Water Rights and Trust Assets - Colorado River Basin Tribes have recognized rights to use approximately twenty-five percent of the Colorado River water supply , and many of these Tribal Nations are in the process of quantifying additional rights to Colorado River water. Given this volume of Tribal water, it is imperative to identify relevant "adverse impacts, whether direct, indirect, or cumulative, to Tribal Water Rights [and Tribal trust assets], whether such water is being presently put to use or is as yet unused, when analyzing alternatives considered for incorporation into the post-2026 Guidelines."[8]

Reduced Supply Impacts - Having to reduce releases/deliveries from Colorado River reservoirs under different conditions will have inevitable impacts on both the human environment (communities, economies, cultural values, livelihoods) and natural resources (soils, surface and groundwater sources, air, vegetation, wildlife, habitats, etc.). Cooperative Conservation expects the post-2026 EIS to acknowledge the impacts that are the consequence of reduced supplies and demand reductions and outline the possible mechanisms or programs that can work to minimize effects to water users, communities and resources going forward.

Salton Sea - The Imperial Valley's participation in innovative Colorado River strategies is key to the successful development of workable solutions to a dwindling water supply in the Basin. Such participation, however, will only be secured by identifying a workable path for addressing the impacts to public health and wildlife associated with reduced flows to the Salton Sea. Cooperative Conservation expects Reclamation to anticipate the impacts of post-2026 Colorado River operations to the Salton Sea (including biological resources and air quality changes expected from changes to shoreline dust emissions) and identify the mitigation measures that will be contemplated going forward.

Salinity changes on Lake Mead storage or water deliveries to Mexico - Post-2026 operations may affect salinity in the Lower Colorado River, and deliveries to Mexico or storage conditions at Lake Mead may be influenced as a result. Cooperative Conservation expects the post-2026 NEPA analysis to include mitigation measures as needed to ensure: (a) the United States' ongoing compliance with Minute 242; (b) Reclamation's ability to use Yuma-area pumped return flows as a component of delivery to Mexico; (c) Reclamation's ability to deliver the volume of water to Mexico at the rates and times requested (a key area of binational cooperation identified in Minute 323). Reclamation will need to identify, analyze, and describe these impacts to ensure the United States and Mexico can continue to work collaboratively, with shared information, to maintain the benefits achieved under the terms of recent binational Colorado River agreements.

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[8] Colorado River Basin Tribes. (2024, March 11). *Letter to Commissioner Touton, Bureau of Reclamation, regarding common views and expectations regarding alternative(s) that will be analyzed and considered for the Post-2026 Guidelines.*

Changes in water deliveries or management that impact water quantity in the MODE canal - The post-2026 Guidelines may affect water deliveries in the Yuma area that drain into the Main Outlet Drain Extension (MODE)[9] canal and are delivered in Mexico to the Cienega de Santa Clara. This Cienega is a large, important wetland that supports rare and endangered species. It is a nesting and feeding site for shorebirds and marsh birds on the Pacific Flyway, and provides habitat for 75% of the remaining population of the Yuma Ridgway's Rail, an endangered marsh bird. Reclamation's NEPA analyses will need to consider impacts of Colorado River operations in the United States on the Cienega de Santa Clara to allow the US and Mexico to identify suitable mitigation opportunities.

Interconnected systems - The Colorado River system cannot effectively operate to stabilize conditions at the expense of other watersheds or groundwater resources. Additionally, understanding the demands and constraints of adjacent watersheds/systems could directly or indirectly impact supplies (i.e., transbasin diversions, groundwater supplies) and inform the stability of the Colorado River Basin going forward. As Basin stakeholders work to implement river policies and management decisions to sustain the Colorado River system over the long-term, it will be important to consider ways to minimize harm to systems that are interconnected and/or dependent on, but separate from, the consideration of the annual water supplies within the Colorado River Basin. Such interconnected systems include: (a) groundwater supplies; and (b) transbasin connections like the San Juan Chama/Rio Grande; Colorado River/South Platte/Arkansas to name a few.

3. *Maintaining Opportunities for Colorado River Delta Flows*

Cooperative Conservation includes releases from Colorado River reservoirs that will aid in accomplishing environmentally beneficial flows through the Colorado River Delta. The purpose of this approach is to: (a) ensure that a full range of options are available to consider when engaging in binational solutions through a separate US - Mexico negotiation process; (b) understand the benefits and impacts of potential Delta flows on reservoir operations in the US; and (c) inform the mitigation strategies that will be needed to effectively minimize effects going forward.

> ***Rationale:*** *Although Mexico's participation is essential to effective Colorado River management, the process for developing the post-2026 Guidelines is separate from binational collaboration through Treaty Minute negotiations. To avoid precluding opportunities to achieve useful binational agreement, Cooperative Conservation incorporates Delta Flow releases for EIS modeling considerations consistent with existing Colorado River binational frameworks between the U.S. and Mexico.*

Cooperative Conservation proposes a possible 45 thousand acre feet (kaf) Delta flow release each year. Recognizing that such flow would not likely occur each year, the approach also proposes a maximum possible release of 135 kaf in any given year. Actual availability of water for environmental flows, however, would be determined based on agreements between the U.S. and Mexico that have yet to be negotiated.

[9] The MODE canal is a concrete structure that removes drainage water from farms in Arizona.

Flexible and Innovative Tools - Conservation Reserve

Cooperative Conservation includes a "**Conservation Reserve**" tool to replace the existing Lower Basin Intentionally Created Surplus (ICS) program as an innovative mechanism for incentivizing meaningful water conservation and enabling much needed flexibility in annual water use.

> ***Rationale:*** *ICS under the 2007 Guidelines has been successful in encouraging water users to conserve water and boost storage elevations in Lake Mead. However, because ICS "counts" as part of the Lake Mead elevations, the timing of ICS creation and withdrawal has risked influencing Powell releases under coordinated reservoir operations and the extent of shortages applied to Lower Basin water users. At the same time, allowing stored ICS to be used to offset shortages potentially increases the amount of water withdrawn in times of shortage, reducing the effectiveness of shortages in arresting reservoir declines.*

Cooperative Conservation proposes the ICS program transition after 2026 into a Conservation Reserve that authorizes storage and movement of conserved water *on top of the normal system operating pools in an operationally neutral manner*. This program would maintain benefits of the ICS program, including incentivizing conservation to allow participating water users to offset shortages in particular years. It would also allow the actions to occur without increasing risks to others. Because the reservoirs' system water would be unaffected by water in a Conservation Reserve pool, the program would also provide flexible opportunities for moving conserved water where it can provide the most operational and environmental benefits without affecting available water supplies to Upper or Lower Basin water users. In this way, the program can offer an incentive structure for conserving Colorado River water that can also help protect critical infrastructure, meet important environmental targets, improve hydropower generation, and/or provide other resilience benefits.

****** Because the Conservation Reserve tool has the potential to provide flexibilities and mitigation benefits beyond environmental priorities identified in this proposal, the Conservation Groups requests that Reclamation treat the Conservation Reserve as a standalone tool to be analyzed for impacts and mitigation benefits as part of other alternatives and/or as the sensitivity analyses for each of the alternatives in the post-2026 EIS. ******

i. Conservation Reserve Framework

To be effective, the Conservation Reserve tool must encourage water users to conserve water that can be stored and delivered as needed without affecting regular reservoir operations. A Conservation Reserve framework must allow for the reserved water to be:

(1) **Invisible to available system storage**. Colorado River reservoir release determinations would not be influenced by storage or movement of water reserved under the Conservation Reserve. Instead, the water conserved in the program would be reserved as "top storage" that would be invisible when assessing the available storage within the system.

(2) **Operationally neutral, but still beneficial**. Because water reserved under the Conservation Reserve would not be counted in setting reservoir release volumes, supplemental deliveries would not impact the amount of storage available to other users – it would be "operationally neutral" as if it was never stored or withdrawn.

However, stored water under the program would still be allowed to keep reservoir levels higher than they would otherwise have been (consistent with #6 below). To manage this effectively, Reclamation would need to maintain and publish clear records that account for system storage as the basis for annual operations as well as for reserve bank storage as the basis for flexible management on top of system storage within the reservoirs.

(3) **Typically created via reduced use/increased supply.** Reserved conservation water would continue to be created by measurably reducing consumptive uses or augmenting the Colorado River system in a particular year. Once created, reserved water would be retained in the Conservation Reserve pool until delivered at the request of the water user who created it. **NOTE:** Upon future negotiation and agreement, the Conservation Reserve may also work to accommodate the unique characteristics of Tribal water rights and empower Tribes to use their water in more flexible ways.

(4) **Available for delivery on top of normal entitlements**. Water users with water in the Conservation Reserve could choose to deliver their reserved conservation water "on top" of their normal entitlements, including to supplement deliveries in shortage years or to meet compact obligations.

(5) **Subject to an evaporation/system assessment and spill**. All water reserved in a Conservation Reserve would be subject to an evaporation/system assessment. In the event the reservoir fills (ie. there is no longer enough remaining empty active storage space to retain Conservation Reserve water), the water reserved in the program would be spilled on a 1:1 basis.

(6) **Stored and moved where needed for operational and environmental benefits.** Because water reserved under the Conservation Reserve would be invisible and operationally neutral to calculations of storage available for release from Lake Powell and delivery from Lake Mead (See Dual Indicator Operations, above), there can be greater flexibility to provide operational and environmental benefits as needed.

ii. Benefits of the Conservation Reserve Tool

Reclamation's ability to flexibly manage the reserve water to provide greater resiliencies within the Basin is essential to long-term stability of the Basin. By making the creation ("puts") and withdrawals ("takes") of water reserved in a Conservation Reserve "operationally neutral," the top storage approach of the Conservation Reserve tool could allow the amount in a reserve to be increased substantially without increasing interbasin or water user risks. Similarly, greater flexibility could potentially be allowed in the volume of "puts" and "takes" permitted from the reserve pool in any particular year.

While rules would need to be adopted to protect water user interests and prevent undesirable impacts, Reclamation could also gain useful management flexibility by enabling the water reserved under a Conservation Reserve to either be stored or moved without affecting water users in either the Upper or Lower Basins. For example, Reclamation could move conservation reserved water as needed to assist in:

- Ensuring river connectivity through the Grand Canyon;
- Striving to maintaining temperature condition windows that aid native fish and deter invasive species; and
- Accomplishing HFEs that would otherwise not be achievable due to Basin conditions

Reclamation also could move water in the Conservation Reserved water between reservoirs for operational benefits such as:

- Protecting human health and safety under extreme dry conditions;
- Holding additional water in Powell to protect critical infrastructure;
- Holding additional water in Mead to protect intake levels and critical elevations; or
- Boosting hydropower production during particular periods.

If Reclamation temporarily moves Conservation Reserve water from upstream (i.e. Powell) for operational and environmental benefits, it could be recaptured at the next reservoir (i.e. Mead), and moved back upstream by reducing flows in subsequent water years. When the Conservation Reserve water is finally ordered for delivery by the water user who created it, Reclamation could adjust the relative deliveries accordingly (within the limits of permitted operations). Because all water reserved in the Conservation Reserve would be invisible to the determination of system water available for release under normal reservoir operations, adjusting reservoir releases to deliver the Conservation Reserve water does not change water availability or create risk for any upstream or downstream water user.

Initial rules and priorities to guide modeling of the Conservation Reserve for the post-2026 NEPA process are listed in Section D.3. We would like to explore these and other variables with the Colorado River community to evaluate the benefits and impacts of the Conservation Reserve tool as applied to various alternatives evaluated through the post-2026 NEPA process.

iii. Additional Conservation Reserve Opportunities

The Conservation Reserve does not have to be limited to Lower Division water users. An Upper Basin Conservation Reserve pool could similarly be treated as operationally neutral, without affecting the releases of water from the Upper to the Lower Basin. It could work to help provide compact compliance benefits if it was deemed necessary during low-flow sequences by the appropriate decision makers. Even if compact compliance is not at issue, an Upper Basin Conservation Reserve pool could be used to promote temporary and voluntary conservation that helps increase the flexibility of water uses within the Upper Basin from year-to-year water.

Similar Conservation Reserve rules could also be applied to water stored in the Mexican Water Reserve, which could allow for expanded international use of voluntary storage on the same terms. Such rules could also extend to aid in providing flows through the Colorado River Delta (if agreed to in US - Mexico agreements).

As alluded to above, if future negotiations result in relevant agreements, the Conservation Reserve may also be structured to include the range of Tribal water rights in the Colorado River Basin, providing a mechanism to "[e]nsure that the eligibility and participation requirements of any conservation programs included in the post-2026 Guidelines are established and operated in a manner that maximizes Basin Tribes' ability to participate in them without triggering onerous financial burdens."[10]

[10] Colorado River Basin Tribes. (2024, March 11). *Letter to Commissioner Touton, Bureau of Reclamation, regarding common views and expectations regarding alternative(s) that will be analyzed and considered for the Post-2026 Guidelines.*

D. Cooperative Conservation Modeling Considerations

Taking all the elements and priorities outlined above, Cooperative Conservation proposes the following continuous curve management approach for Lakes Powell and Mead under different storage conditions, to which we apply the flexible Conservation Reserve as a tool. Importantly, this Cooperative Conservation management approach is intentionally distinct and different from those presented in the current Upper Division and Lower Division State proposals. We have taken this approach primarily to propose operations that achieve greater reliability for water supplies AND improved outcomes for river-related ecosystems. We have also taken this approach to aid Reclamation's efforts to build out a reasonable range of management options to evaluate, and thereby provide greater confidence and credibility to this important NEPA process.

To be clear, our use of the following "continuous-response curve" management approach does not reflect any shared position among the Conservation Groups as to the reasonableness of other proposals submitted to Reclamation or how changes in available water supplies should be absorbed within the Basin. We understand and respect that changes to reservoir release regimes at Lakes Powell and Mead implicate the rights and authorities of federal, state and Tribal entities as well as stakeholders throughout the Basin, and that ongoing negotiation and discussions with a goal of reaching workable solutions for sustaining the Basin will continue to be important during each phase of the NEPA process.

1. *Lake Powell Reservoir Regime for EIS Modeling Purposes*

Cooperative Conservation proposes modeling a Lake Powell reservoir management regime that involves a "continuous-response" storage and release curve based on observed conditions of available live CRSP Initial Unit Storage on October 1 of each year. This curve gradually alters annual releases from Lake Powell in response to system storage,[11] applying the Dual Indicator Operations and incorporating the stewardship considerations for Lake Powell storage as described above and based on the steps outlined below. Table 2 summarizes the Lake Powell Reservoir Regime and Figure 2 provides a conceptual illustration.

Step 1. Develop a baseline continuous release curve relating Lake Powell releases to the observed storage conditions at the CRSP Initial Units on October 1, providing larger releases when the CRSP storage is above 60% (Powell storage is likely to be above 3,600 feet.) Calculated baseline releases are continuously and smoothly reduced until the CRSP storage reaches 40% (and Powell storage is likely to be near 3,525 feet). When combined storage is less than 40%, follow run-of-river operations.

Step 2. Apply a known, reliable, agreed-to Climate Response Indicator adjustment to account for anticipated loss in net storage that may occur in out years (see Dual Indicator Operations, Section C.1).

Step 3. Adjust the potential release volume to proactively account for the likely future condition of storage at the CRSP Initial Units as dictated by the Dual Indicator Operations. The adjusted point on the curve would establish the water available for release for the Water Year.

[11] Combined storage refers to Lake Powell and the CRSP Initial Units, as well as Lake Mead, Lake Mohave, and Lake Havasu.

Table 2. *Lake Powell Reservoir Regime*

Observed Pool Elevation at Powell on Oct. 1 (As approx. CRSP % full)	**Lake Powell Water Year Release**	**3-year Average Hydrologic Adjustment**[1]
100% (Assumes Upper CRSP IU Storage mostly full and Powell at elevation 3,700 feet)	Flood Control / Dam Safety Releases	Begin making reductions in Powell releases when CRSP storage is ≤ 70% with full adjustments when CRSP storage ≤ 50%: If trend < 10 maf, then adjust Powell releases down 0.5 maf If trend < 8 maf, then adjust Powell releases down 1.0 maf
70%-100% (Assumes Upper CRSP IU Storage mostly full and Powell at or above ~3,600 feet)	8-10 maf	
50% - 70% (Assumes Upper CRSP IU Storage mostly full and Powell below elevation 3,600 and at or above ~3,525 feet)	7-8 maf	
37%-50% (Assumes Upper CRSP IU Storage mostly full and Powell below elevation 3,525 and at or above 3,510 feet.	6-7 maf	
< 37% (Assumes Upper CRSP IU Storage mostly full and Powell at or below elevation 3,510 feet)	Run of River up to 6 maf (adj. for trend)	

[1]Through preliminary modeling, Cooperative Conservation relied on the 3-year hydrology inflow metric in Reclamation's webtool as a stand-in/proxy for the appropriate, agreed to Climate Response Indicator to apply going forward.

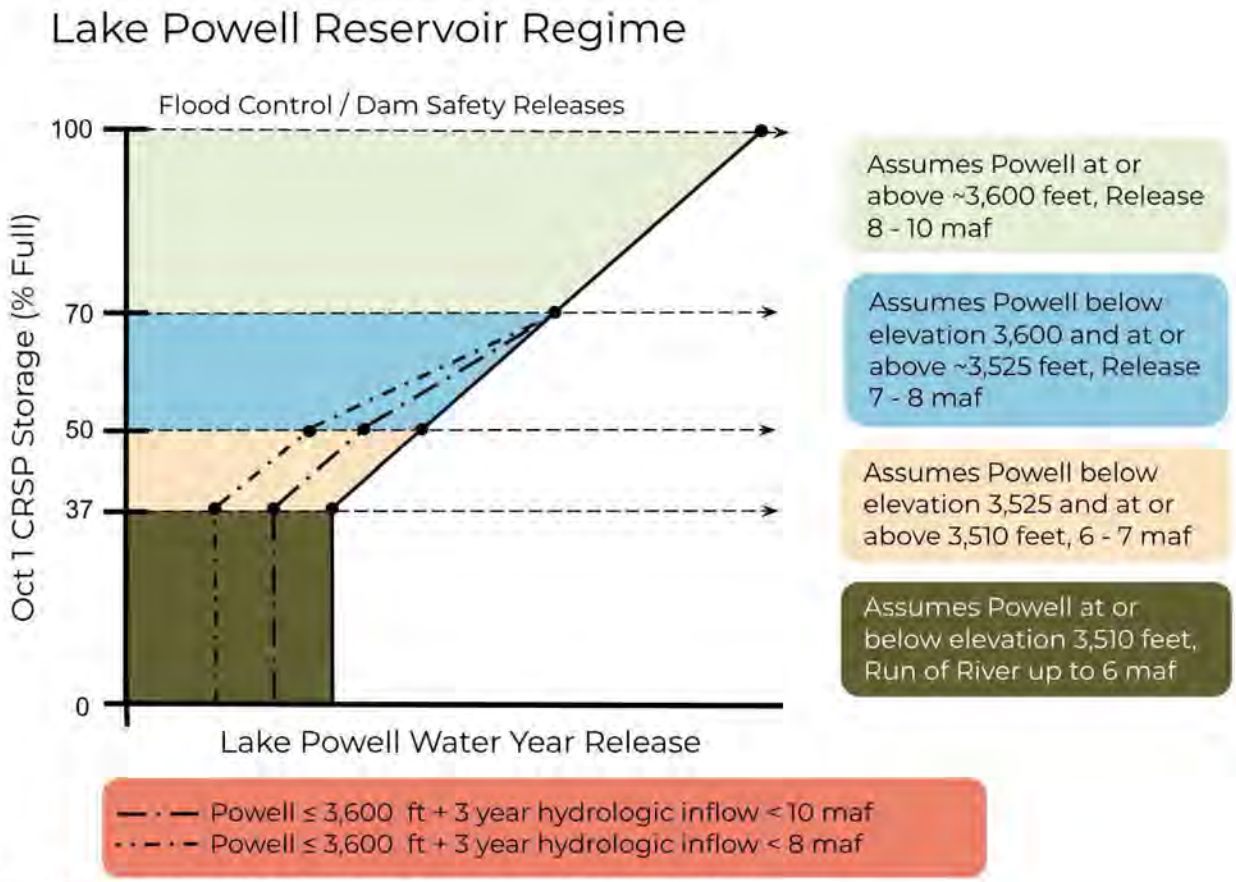


Figure 2. *Conceptual illustration of Lake Powell Release Regime*

2. Lake Mead Reservoir Regime for EIS Modeling Purposes

To continue with the exploration of a "continuous-response" methodology, the Lake Mead reservoir management regime similarly includes a baseline Lake Mead storage and release curve based on observed conditions of available live whole system storage on October 1 of each year.[12] This curve also applies the Dual Indicator Operations and incorporates the stewardship and Delta flow considerations for Lake Mead storage as described above. Table 3 summarizes the Lake Mead Reservoir Regime and Figure 3 provides a conceptual illustration.

Step. 1 - Develop a baseline continuous delivery reduction curve relating Lake Mead deliveries to observed (and available) live storage from CRSP Initial Units, Lake Mead, Lake Mohave and Lake Havasu on October 1, allowing larger Mead deliveries when the whole system storage is closer to full (e.g. >80%), and reduced releases down to a minimum level when the system is low (e.g. <10%). In contemplating Lake Mead storage and deliveries, factor in the potential for creating up to 45 kaf of binational water annually and for a 135 kaf release of that water every three years to keep the possibility of a Delta Flow release open during US/Mexico negotiations.

[12] The October 1 observation date is proposed for simplicity and with the understanding that the difference between system storage on observed conditions earlier in the year (August 1) will not be that much different from those on October 1. The actual date of observed conditions to apply to the Lake Mead reservoir regime can be modified if agreed to by appropriate authorities going forward.

Step 2. Apply a known, reliable, agreed to Climate Response Indicator adjustment to account for anticipated loss in net storage that may occur in out years (see Dual Indicator Operations, Section C.1).

Step 3 - Adjust the potential delivery volume to proactively account for the likely future condition of whole system storage given those trends. The adjusted point on the curve would establish the water available for delivery for the upcoming Calendar Year.

Table 3. *Lake Mead Reservoir Regime*

Observed Whole System Storage (Oct. 1)	**Release Reductions**	**3-year Average Hydrologic Adjustment**[i]	**Potential for Delta Release Accommodation**[ii]
Above 80% full	No release reductions	Begin making additional reductions when system storage is at 80%, with full reduction adjustments occurring when system storage is below 75%: If trend ≤ 14 maf, increase reductions by 0.25 maf If trend ≤ 11 maf, increase reductions by 0.75 maf If trend ≤ 8 maf, increase reductions by 1.5 maf Maximum reductions cannot exceed 5 maf	Allow for release of Delta Flows of up to 45 kaf/ year (based on water provided by Mexico, NGOs and the US) with a maximum flow of 135 kaf if accumulated on a three year average.
80% - 0% full	Baseline reductions continuously increase from 0 to 5 maf[iii]		

[i] Through preliminary modeling, Cooperative Conservation relied on the 3-year hydrology inflow metric in Reclamation's webtool as a stand-in/proxy for the appropriate, agreed Climate Response Indicator to apply going forward. We would like to explore several approaches to establishing potentially-useful Climate Response Indicators as part of the further development of our alternative.

[ii] To keep options for binational negotiations open, the Conservation Groups recommend the post-2026 NEPA process consider the possibility of Delta Flow releases as part of the post-2026 NEPA process, recognizing that such flows would only be authorized if the US and Mexico negotiate for such flows under an agreement separate from the post-2026 Guidelines.

[iii] Delivery reductions or contributions to storage (whatever the case may be) must be determined after discussion and agreement among federal, state, and Tribal governments and stakeholders in the Basin. In the absence of other solutions proposed by Basin sovereigns, Cooperative Conservation assumes for modeling purposes that the first 1.5 maf of reductions would be applied to the Lower Basin (in line with both the Upper and Lower Division State Alternatives). The remaining delivery reductions or contributions to storage could be applied under various scenarios, after carefully considering the rights and interests of Tribes, states, and water users throughout the Basin. The Conservation Groups look forward to working with Reclamation and others to identify what scenario(s) would be most useful to fully inform the post-2026 NEPA analysis going forward. Regardless of the scenario(s) that are ultimately adopted, this Alternative is only intended to provide Reclamation additional options for broadening the range of the post-2026 EIS analysis and is NOT an expression of opinion as to the reasonableness of any proposed alternatives that have been submitted at this time.

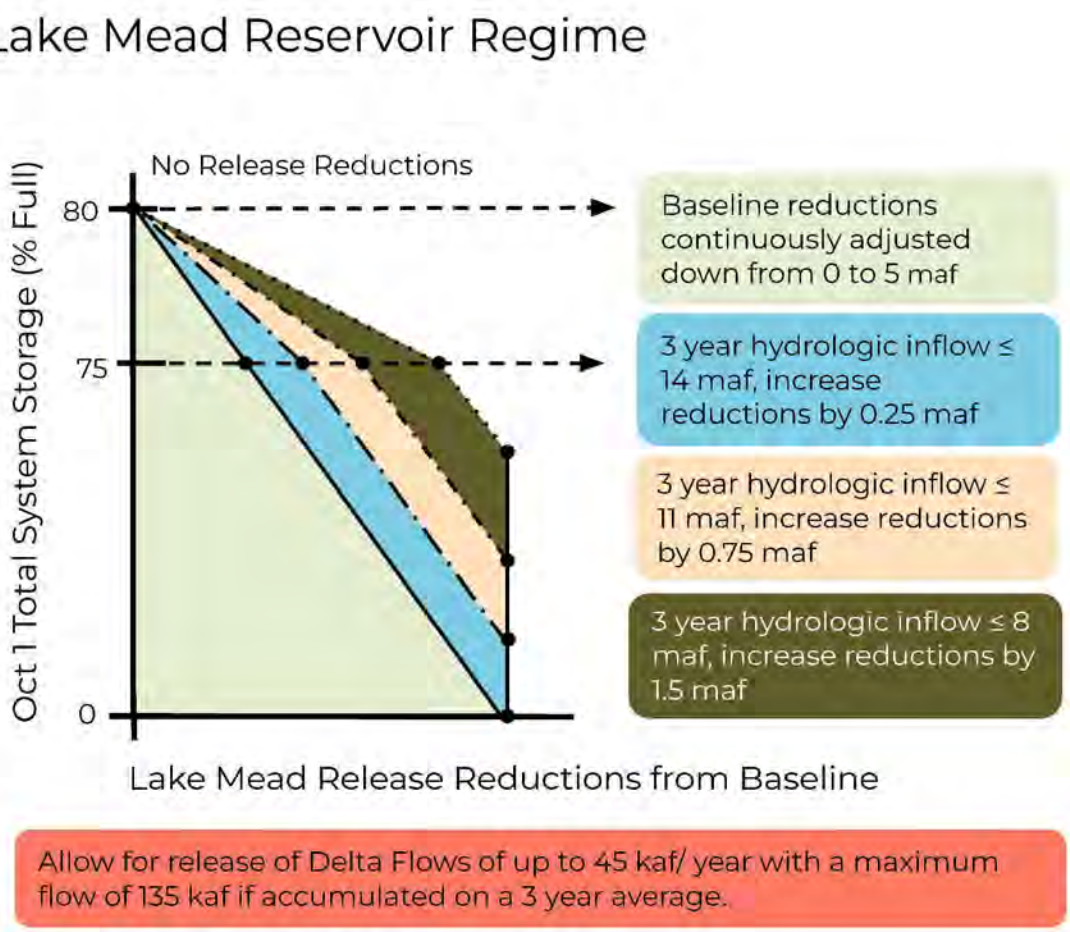


Figure 3. *Lake Mead Delivery Regime - conceptual illustration*

3. Conservation Reserve Goals and Priorities for EIS Modeling Purposes

As mentioned above, the Conservation Groups would like to work with Reclamation, the Basin States, Tribes, and Colorado River stakeholders to analyze different approaches to addressing the variables involved in operationalizing an innovative tool like the Conservation Reserve. For preliminary modeling purposes, Cooperative Conservation assumes the following basic rules and priorities:

i. Basic Conservation Reserve Operating Rules

1. Assume a combined total reserve bank in Lakes Powell and Mead of up to 8 maf of conserved or non-system water created by Lower Division States water users with the potential for other participants to utilize the reserve if agreed to at a future time.
2. Apply the parameters of a Conservation Reserve tool as described in Section C.4 above:
    a. Do not count Reserve water as part of available system storage.
    b. Keep Reserve water operationally neutral, but still beneficial.
    c. Allow Reserve water to be created via reduced use/increased supply, with the potential for accommodations made for developed and undeveloped Tribal rights.
    d. Allow Reserve water to be delivered on top of normal entitlements.

e. Subject Reserve water to an evaporation/system charge and spill.
f. Allow Reserve water to be stored and moved where needed to provide benefits to the system. (See priority listing below).

3. For creation of Reserve water, allow for "pre-conservation" to account for reductions in system deliveries so that water stored in a previous year could be delivered to offset reduction volumes and/or to avoid inadvertent overruns.
4. For delivery of Reserve water, allow those who reserved water in the Conservation Reserve to receive delivery "on top" of their normal entitlements, including to supplement deliveries in shortage years provided that such delivery does not allow any state to exceed its basic apportionment when reductions apply in the Lower Basin.

ii. Basic Conservation Reserve Water Storage/Movement Priorities

1. Protect human health and safety within the Basin.
2. Protect critical infrastructure - Mead elevation 1,000 feet and Powell elevation 3,500 feet.
3. Allow for delivery of Reserve water to the water user who created it.
4. Promote favorable storage/release conditions at Lakes Powell and Mead that:
    a. Protect minimum flows through the Grand Canyon of at least 5,000 cfs, and ideally 6,000 cfs with the potential for flow variability throughout the year (not flat flow).
    b. Assist in accomplishing a regular 45 kaf/year flow or 135 kaf flow every 3 years to the Colorado River Delta if negotiated and agreed to as part of a separate agreement with Mexico.
    c. Support conditions to help mitigate native and invasive fish impacts by maintaining, to the extent practicable, Powell storage between elevation 3,530 and 3,600 feet, with priority for elevation 3,570-3,575 feet at critical times of year.
    d. Improve opportunities for High Flow Experiments and natural hydrographs through the Grand Canyon, when sediment is in the system by supporting conditions to maintain, to the extent practicable, storage at Powell above 3,525 feet.
    e. Enable maintenance and enhancement of conservation areas as part of or in addition to the LCR MSCP.
    f. Protect hydropower heads at Glen Canyon Dam or Hoover Dam.

E. Parallel Programs, Processes, and Actions

While new guidelines are pivotal to successful management of the Colorado River in the post-2026 era, they will not be enough to surmount the Basin's long-term challenges alone. Additional programs, processes, and actions from all economic/water use sectors, located throughout the Basin, will still be required and must be taken in conjunction with new guidelines to adapt and build the Basin's resilience to an increasingly dry and variable system. This includes: (1) protecting and restoring forests, headwater streams and water-dependent habitats to help build the Basin's overall resilience to climate change impacts; (2) empowering Basin Tribes to have access to and be able to use their water rights in flexible ways; (3) adapting agriculture to a hotter and drier future by improving water use practices, updating infrastructure, and identifying opportunities for water-saving crops; (4) adopting greater water conservation and efficiency practices for urban and industrial sectors throughout the Basin; (5) promoting effective, flexible, and innovative water management

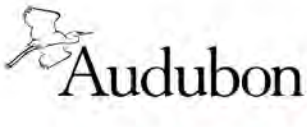
and conservation opportunities in all parts of the Basin, and (6) other improvements. Achieving these improvements to help provide the stability the Colorado River community needs will require targeted programming with durable funding in parallel with new guidelines to mitigate natural hazards, improve resilience, and combat the urgent, broad, and diverse challenges facing the Basin.

F. Reservation of Rights

Operations and strategies proposed by Cooperative Conservation do not represent a waiver of rights, claims or defenses that may accrue under federal or state law, administrative rule, regulation or guideline. Requests by the Conservation Groups for Reclamation to analyze Cooperative Conservation does not serve as an endorsement or an admission with respect to any factual or legal issue for the purposes of any future legal, administrative, or other proceeding. Moreover, each of the Conservation Groups reserve the right to provide further comments and engage with Reclamation through ongoing phases of the post-2026 NEPA process.

G. Conclusion

The Conservation Groups appreciate Reclamation's consideration of Cooperative Conservation as an Alternative. We ask that Reclamation advance this proposal through its NEPA process and model and evaluate its impacts on the Basin's natural, socio-economic, and cultural resources in the Draft EIS for Post-2026 Colorado River Guideline Operations and Strategies. We are available to discuss the details with you, Basin States, Tribes, Mexico and other stakeholders as appropriate. We remain committed and look forward to collaborating with Reclamation and the Colorado River community to work through the next NEPA phases to arrive at workable, consensus based solutions for the benefit of the Basin as a whole



March 29, 2024

The Honorable Camille Touton
Commissioner
U.S. Bureau of Reclamation
1849 C Street NW
Washington, DC 20240

VIA ELECTRONIC MAIL
mtouton@usbr.gov
crbpost2026@usbr.gov

Dear Commissioner Touton:

Please find attached our proposal for consideration in the development of the U.S. Bureau of Reclamation's Colorado River Reservoir Operations and Post-2026 Operational Guidelines and Strategies for Lake Powell and Lake Mead.

Our proposal suggests an opportunity for flexibility in meeting environmental, cultural, and recreational goals in the management of the Lake Powell/Grand Canyon/Lake Mead ecosystem by decoupling decisions about annual releases through the Grand Canyon from the annual water accounting needs of the Law of the River.

We propose creating an accounting system for Upper Basin and Lower Basin debits and credits in the two reservoirs. This would allow the actual annual wet water releases to be adjusted to meet the suite of environmental, cultural, and recreational needs that now must be subservient to annual water release rules driven by inter-basin accounting.

Our proposal offers a flexible management approach that offers the potential to significantly improve the environmental, cultural, and recreational benefits to the Grand Canyon, without harming the overall basin-scale water management goals you are pursuing. Our plan would work in conjunction with either of the two basin state proposals or a compromise between the two. In the absence of a compromise between the two state proposals, our approach would also be compatible with a solution that Interior chooses, taking elements from each.

We request that you consider our proposal in the preparation of the post-2026 Draft Environmental Impact Statement as way to implement one or more of the alternatives.

We would be happy to discuss our proposal with you and/or your staff in more detail.

Jack Schmidt, Center for Colorado River Studies

Eric Kuhn, Glenwood Springs, CO

John Fleck, Utton Center, University of New Mexico School of Law

CC:

Russ Callejo, Deputy Regional Director, Mid-Pacific Region

Carly Jerla, Senior Water Resources Program Manager

Jim Prairie, Hydrologic Engineer

Managing the Powell/Grand Canyon/Mead ecosystem after 2026

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29 March 2024

1.0 Introduction

The most important question that must be addressed by the post-2026 Colorado River Basin Guidelines is how to allocate shortages during a multi-year period of low runoff so that basin-wide reservoir storage does not precariously dwindle. The Upper Basin and the Lower Basin have offered competing proposals of how to share the pain of a declining water supply.

A second-tier question concerning future management of the Colorado River concerns how water storage should be allocated between Lake Mead and Lake Powell and what should be the rules concerning the transfer of water from Lake Powell to Lake Mead. These two reservoirs hold between 60 and 80% of the entire reservoir storage of the watershed. Between Lake Powell and Lake Mead is the Grand Canyon, and the 255-mile Colorado River corridor is primarily managed by the National Park Service and partly by the Hualapai Tribe.

The present policy concerning distribution of reservoir storage is to equally divide the contents between the two reservoirs under a policy that attempts to balance the active storage in each reservoir, and to manage the year-to-year "Law of the River" accounting based on annual releases from Lake Powell. This management strategy can have unintended, but sometimes significant, negative consequences, as in 2011 when large releases caused significant erosion of the Grand Canyon sand resource. In that case, the requirement to meet a Law of the River delivery rule from Powell to Mead required delivery of water, regardless of the environmental consequences and with long-lasting implications.

Because Lake Powell is in the Upper Basin and Lake Mead is in the Lower Basin, releases from Powell represent the delivery of water to the Lower Basin, and the competing proposals of the Upper and Lower Basins are focused on how those deliveries should be defined. The competing proposals differ slightly on how much water should be annually released from Lake Powell and are based on different calculations of the status of basin-wide reservoir storage and whether consideration should also be given to current and past inflows. The competing proposals agree on the need to define the annual release from Lake Powell, and they agree that the basis for defining annual releases should be considerations of water-supply management.

We suggest an alternative: a system that preserves the Upper Basin-Lower Basin accounting that will be required by whatever interpretation of the Law of the River emerges from the on-going negotiation of the post-2026 Guidelines but creates more flexibility in year-to-year decisions about actual Lake Powell releases. We think that increased flexibility in annual releases would allow those releases to be optimized to meet environmental, recreational, and cultural goals while retaining an interstate accounting system that still meets water-supply objectives. Flexibility in establishing the annual releases from Lake Powell would result in more adaptable management of the environmental resources of Lake Powell, the Grand Canyon, and Lake Mead.

This strategy would also allow the distribution of storage between Mead and Powell to be treated in an adaptive framework that is less constrained by the needs of Law of the River accounting. Modeling of future runoff (i.e, water supply) and future consumptive water use indicates that the average volume of stored water in Lake Powell and Lake Mead is unlikely to exceed 50% of the capacity of those two reservoirs (Wheeler et al, 2022), although storage is likely to be larger in rare wet years. If storage will rarely exceed 50% of capacity, then it is logical to ask whether storage in one reservoir ought to be emphasized, potentially reducing evaporation. The competing proposals of the Upper and Lower Basin states assume that the balancing policy remains in place.

Flexibility in annual releases and adaptive allocation of water storage in Powell and Mead allows consideration of environmental, recreational, cultural, and hydropower issues, and can better address tribal concerns and objectives. Consideration of environmental and recreation issues can be accomplished by directing the Glen Canyon Dam (GCD) Adaptive Management Program to make recommendations to the Secretary of the Interior about annual Lake Powell releases. All relevant stakeholders – federal agencies, the seven basin states, five tribes, and NGOs – participate in the GCD Adaptive Management Program, and the program already makes recommendations to the Secretary of the Interior about how Lake Powell releases should be managed on an hourly, daily, weekly, and monthly basis, and we suggest that the charge to the GCD Adaptive Management Program be expanded to also make recommendations concerning annual releases.

2.0 Recommendation

We suggest that the post-2026 Guidelines should focus on rules for reducing consumptive use during years when runoff and reservoir storage is unusually low but should not include rules concerning how annual releases from Lake Powell will be determined on a year-to-year basis. Clearly, the post-2026 Guidelines must include guidance concerning the long-term average delivery of water from the Upper Basin to the Lower Basin, but there should not be prescriptive rules that determine the annual Lake Powell release in each year.

Instead, we recommend that reservoir and river operations in the Lake Powell/Grand Canyon/Lake Mead system be adaptively managed. Decisions about each year's annual release from Lake Powell should be made by the Secretary of the Interior, based on environmental and recreational considerations as well as considerations of water supply and hydropower. We

suggest that the decision about annual releases be made by the Secretary after consultation with the states, other interests, and consideration of environmental, recreation, and tribal interests.

Pursuit of this strategy will probably require that the GCD Adaptive Management Program charter be amended. We suggest that this federal advisory committee make formal recommendations to the Secretary regarding the annual release from Lake Powell in addition to recommendations already made concerning shorter duration releases. We also suggest that the geographic scope of the GCD Adaptive Management Program be expanded to include all of Lake Powell and all of Lake Mead, as well as the Grand Canyon ecosystem. The focus of recommendations about annual releases should consider how these releases might best achieve desired future conditions for Lake Powell, the Grand Canyon ecosystem, and Lake Mead.

Contrary to common misunderstanding, the 1922 Colorado River Compact and the 1944 Water Treaty with Mexico do not require a "fixed" annual delivery of water from the Upper Basin to the Lower Basin, as discussed below. The Bureau of Reclamation has the authority to implement a flexible delivery system wherein an accounting system can be established that credits the Lower Basin for water stored in Lake Powell but not delivered in a specific year.

Our suggestion maintains the principle of adaptive management – of learning by doing – that has been pursued in the Grand Canyon since the mid-1990s and is the guiding principle of the Grand Canyon Protection Act. Expansion of the geographic scope of the GCD Adaptive Management Program ensures that the competing issues in the management of recreation and the environment in Lake Powell and Lake Mead are considered along with the competing perspectives on how the Grand Canyon ecosystem is managed.

3.0 Background

3.1 Designer flows and annual releases

To date, the strategy for mitigating the adverse effects to the Grand Canyon ecosystem of the existence and operations of Glen Canyon Dam and Lake Powell is to implement short-duration releases, such as controlled floods (administratively known as High Flow Experiments), Macro-invertebrate Enhancement Flows (informally known as bug flows), Low Summer Steady Flows (LSSF), and Trout Management Flows (proposed but not implemented). These types of releases are referred to as Designer Flows, because they do not disrupt long-term water-supply agreements. Designer flows do, however, have the potential to affect hydropower generation.

It has long been hoped that designer flows might offset the adverse effects of large-scale water-supply management, including sediment trapping in Lake Powell, transformations of temperature, and changes in the annual flow regime. Designer flows have been successful in maintaining the size of sand bars and in revitalizing the food base of invertebrates on which fish depend for food. Nevertheless, some underlying attributes of the ecosystem are strongly affected by annual flows.

3.2 The role of annual flows in downstream ecological conditions

One of those attributes is the total mass of sand stored on the channel banks and along the channel margin. This is the sand resource that gets mobilized during controlled floods, and progressive depletion of the sand resource ultimately undermines the success of controlled floods. Sand is primarily supplied to the Grand Canyon ecosystem from the Paria River and the Little Colorado River (LCR), the two large tributaries whose delivery of sand is not blocked by Glen Canyon Dam. Sand is primarily delivered during monsoon season floods, and the mass of sand evacuated from Grand Canyon primarily depends on the amount of water released from Lake Powell. Thus, the long-term mass balance of sand that is the supply needed to guarantee the success of controlled floods depends on the number of years when large monsoon-season floods deliver sand to the Colorado River and on the magnitude of releases from Lake Powell.

Topping et al (2021) summarized nearly 20 years of sediment transport data collected in Grand Canyon, and they developed simple relations between the amount of sand accumulated or evacuated by different annual Lake Powell releases when there are large or small inputs from the Paria River and the LCR. Although there is variability in these relations due to other factors that control suspended sediment transport, these relations highlight the dominant role of annual reservoir releases in determining the sand mass balance of Grand Canyon. For example, in years when sand delivery from the Paria River is less than 1.1 million tons, annual releases from Lake Powell must be less than 8.0 million af/yr (acre feet per year) for sand to accumulate in Marble Canyon (Fig. 1). In contrast, in a year when annual delivery of sand exceeds this threshold, reservoir releases can be as large as 9.8 million af/yr without eroding sand from Marble Canyon. Years of small sand supply occur more frequently than do years of large supply, and releases from Lake Powell would have to be less than 8.0 million af/yr to ensure sand accumulation in those years of low supply. Large equalization releases in 2011 that exceeded 11 million af/yr greatly increased sand erosion, and many sand bars never recovered from that wave of erosion. Grams et al (2019) concluded that almost all of the sand erosion between 2009 and 2012 occurred during the 7 months of equalization in 2011. In such years, when releases are made that are greater or less than might be made under accounting rules agreed on among the states or established by the federal government under the Post-2026 guidelines, the accounting system would track the differences to retain Law of the River compliance.

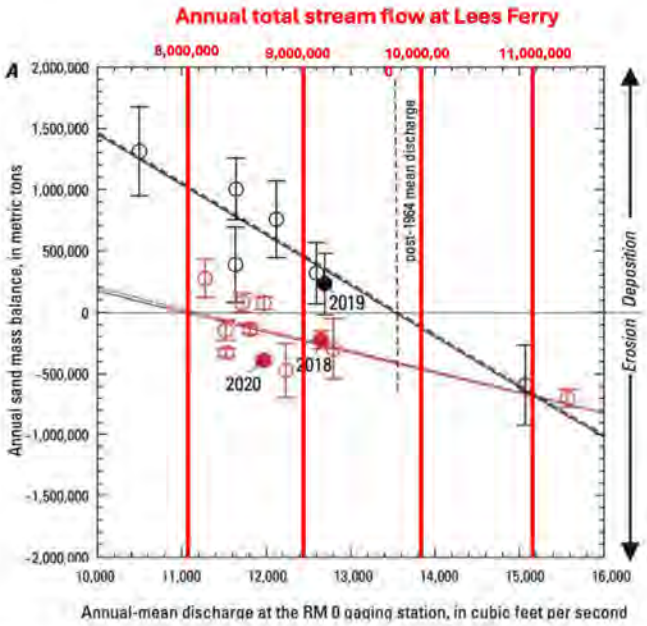

Figure 1. Graph showing annual sand mass balance as a function of annual-mean discharge (in black, bottom X-axis) and annual total stream flow (in red, top X-axis) at Lees Ferry gage for Marble Canyon. Data are separated into relatively large (black) and relatively small annual tributary sand supply delivered from the Paria River. Error bars indicate the magnitude of the uncertainties in annual sand mass balance. The regression line for small sand supply indicates that erosion of sand in Marble Canyon occurs when annual Lake Powell releases exceed approximately 8.0 million af/yr. Note that sand was eroded from Marble Canyon in 2020 when annual releases were 8.71 million af/yr. In this study, year is defined as the period between July 1 and the following June 30, termed a "sediment year." Adapted from Griffiths et al (2024, fig. 2A).

Annual releases also play important roles in the aquatic ecosystem, because storage in Lake Powell is determined by the difference between the volume of inflows and of outflows. Warmer water is released from Lake Powell when Lake Powell is low (Dibble et al., 2021), and these releases also entrain undesirable non-native species. Today, those species include smallmouth bass that threaten the integrity of the existing fish community in Grand Canyon. Decisions about annual releases that in turn determine the amount of water in Lake Powell will have a strong effect on the aquatic ecosystem when reservoir elevation drops below 3600 ft asl and reservoir contents are less than 50% of capacity. These conditions are highly likely in the future, and decisions will have to be made annually about whether the volume of releases should be adjusted to affect the elevation of Lake Powell and the likelihood of entrainment of non-native fish from Lake Powell into the Grand Canyon.

3.3 Uncertainty in scientific predictions and uncertainty in management goals

Another principle that should be considered in managing environmental and recreational resources of the Lake Powell/Grand Canyon/Lake Mead ecosystem is the inherent uncertainty in applying scientific insights to management actions. There are often unforeseen physical or biological processes or unintended consequences of management actions that require

adaptation and revision of management paradigms. In the past, revision of codified rules has been necessary because of new scientific findings, such as numerous revisions of the rules concerning implementation of controlled floods. Those rules were initially addressed in 1996, were significantly changed in the 2012 HFE Protocol because of new scientific insights (Rubin et al., 2002), were revised again in the Record of Decision of the Long-Term Experimental and Management Plan (LTEMP) EIS, and other changes are now proposed in the supplemental EIS that proposes revisions to the LTEMP. Acceptance of the inevitability of scientific uncertainty and the need to revise guiding paradigms in river management suggests that the Lake Powell/Grand Canyon/Lake Mead ecosystem would be better served by providing greater flexibility in the determining annual releases. Flexibility is the basic premise of the GCD Adaptive Management Program that mandates that environmentally-oriented reservoir operations should be pursued in an adaptive framework wherein management actions are treated as experiments and actions can be changed.

Additionally, the values and goals of ecosystem management change over time. Schmidt et al. (1998) argued that the most significant uncertainty in planning environmental river management in Grand Canyon was that the goals of rehabilitation are poorly defined. Conflicting goals will have to be resolved in the future. For example, is the goal of maintaining the existing novel fish community in Grand Canyon that that is dependent on maintaining a higher elevation of Lake Powell a more important management goal than maintaining the emergence of valued cultural landscapes and returning rapids in Glen Canyon that require a lower reservoir elevation? Societal values in 2024 might emphasize one desired future condition over the other, but those values may change in subsequent decades. An adaptive recommendation of annual releases would allow resource management goals expressed by the GCD Adaptive Management Program to change with time without the need to formally amend the post-2026 Guidelines.

Thus, we suggest seeking a strategy that allows adaptive and flexible management of annual releases from Lake Powell. Combining needed certainty in water-supply management with needed flexibility and adaptability in management of the Lake Powell/Grand Canyon/Lake Mead ecosystem will be a significant but necessary challenge. The central question for the future is, “How can the certainty required of water-supply agreements negotiated among the Basin states mesh with the inherent uncertainty of ecosystem management?”

4.0 A proposal – accept uncertainty and adopt adaptive management for the Lake Powell/Grand Canyon/Lake Mead ecosystem

We advocate embracing adaptation and uncertainty in managing the Lake Powell/Grand Canyon/Lake Mead ecosystem. An alternative to embracing flexibility might be to adopt prescriptive rules for target elevations for Lake Powell or desired releases that might focus on a specific environmental management goal: such as fish management or recreational boating. We discourage this approach, because locking in rules based on current scientific understanding runs the risk that rules will need to change as scientific understanding evolves. Additionally, the condition of the Grand Canyon ecosystem may change due to unintended interactions among the native and non-native species, and the values ascribed to the emerging resources of Glen Canyon

may change. Additionally, while the preponderance of the current science points to a drier future, there is considerable uncertainty in how dry that future will be. Thus, we do not know how much managers will struggle to achieve any target elevation for Lake Powell.

Rather than codifying rules based on scientific projections that have unavoidable uncertainty and are based on changing values concerning environmental and recreational resources, we advocate that the post-2026 Guidelines should narrowly focus on balancing water supply and consumptive use. The post-2026 Guidelines should consider the Powell/Grand Canyon/Mead ecosystem as a black box where the management issues associated with passing water through that black box are addressed by yearly decisions by the Secretary of the Interior. The post-2026 Guidelines would establish accounting goals of how much water should be released from Lake Powell based on agreed upon criteria for reductions in consumptive use during dry times, but decisions about the amount of wet water released in any year should be made by the Secretary each year. Additionally, the post-2026 Guidelines need not address the proportion of the water stored in Mead or in Powell. In the next section, we describe an accounting scheme wherein deficits and surpluses in the delivery of wet water from the Upper Basin to the Lower Basin could be tracked.

We suggest the following process by which the Secretary would make decisions about the release of wet water from Lake Powell.

- Annually, the Secretary will decide the annual release from Powell to Mead. That decision will be based on:
    - Recommendations from each of the basin states, assumed to be primarily focused on water supply, reservoir storage, and hydropower production;
    - Recommendations of the relevant federal agencies of the Department of the Interior and the Department of Energy;
    - Recommendations of the GCD Adaptive Management Program stakeholders, presumably based on modeling and monitoring data about sand bar resources, the sand mass balance related to recent inflows of sand, the fish community, and other resources of the Grand Canyon ecosystem, the emerging natural resources of Glen Canyon, and the recreational resources of Lake Powell and Lake Mead; and,
    - Recommendations of the five tribes that participate in the GCD Adaptive Management Program;

The recommendations of the GCD Adaptive Management Program would inevitably result from debate among stakeholders who have different perspectives about the relative the value of different pre-dam relict and post-dam artifact resources (*sensu* Schmidt et al., 1998). We acknowledge that expansion of the geographic scope of the GCD Adaptive Management Program may result in changes in the stakeholders who participate in the program. It is recognized that the five tribes providing direct input to the Secretary are members of the GCD Adaptive Management Program, but the Secretary would nevertheless seek direct input from these tribes distinct from the opinions of the GCD Adaptive Management Program.

The buck must stop with the Secretary of the Interior, and the Secretary would make the final decision about annual releases based on consideration of all the input described above. Establishing a flexible approach to defining actual reservoir releases from Lake Powell would ensure that management of environmental resources of Lake Powell, the Grand Canyon, and Lake Mead are considered in a transparent way. This flexible approach preserves the principle of adaptive management and recognizes that annual releases have significant ecosystem effects that cannot be mitigated by designer flow releases. A flexible approach also recognizes the uncertainty in predicting future ecosystem conditions or assigning values to different ecological and recreational values while recognizing that there are likely to be future unintended consequences to some management actions.

The future is deeply uncertain – not merely concerning the amount of future runoff and the ability of water users to limit their consumption of water – but also how the river's ecosystem will evolve and respond to management actions. Adaptive management of annual reservoir releases will allow ecosystem science and ecosystem management to evolve along with a changing climate and changing water use.

5.0 How might a flexible accounting of Upper Basin deliveries to the Lower Basin work?

The goal of this accounting system would be to set up a transparent accounting system that recognizes a prescribed, but theoretical, annual release from Lake Powell based on water supply considerations as negotiated in the post-2026 Guidelines. We suggest that the new Guidelines allow the Secretary of the Interior to make adjustments to the actual release of wet water from Lake Powell, taking into account other factors such as environmental, recreational, hydropower, and tribal considerations. The difference between the prescribed annual release and the actual release would be credited or debited to the appropriate basin.

5.1 Background to the consideration of a flexible accounting system

For Colorado River Compact purposes, measuring and accounting for flows at Lee Ferry is important. There is no gage at Lee Ferry, and the flow at Lee Ferry is the sum of the flow at the Lees Ferry (USGS gage 90380000) and Paria River (USGS gage 09382000) gages a short distance upstream.

Article III of the Colorado River Compact includes certain disputed flow-related provisions. Article III(d) requires that the four States of the Upper Division not cause the flow at Lee Ferry to be depleted to less than 75 million af every consecutive ten years. Further Article III(c) requires that if there is not sufficient "surplus" water available to meet the annual delivery obligation to Mexico under the 1944 Treaty (normally 1.5 million af/yr), the States of the Upper Division shall deliver at Lee Ferry 50% of the deficiency (the difference between the available surplus and 1.5 million af/yr) in addition to their III(d) obligation. If there is no surplus (and the Upper Division States are not required to cover transit losses), the required delivery is 0.75 million af/yr.

The States of the Upper Division and the States of Lower Division have never agreed on how to interpret and implement Article III(c). In 1970, the Secretary promulgated the Long-Range Coordinated Operating Criteria (LROC) setting a "minimum objective release" from Glen Canyon Dam at 8.23 million af/year. The 8.23 million af/yr happens to be 7.5 million af/yr plus 0.75 million af/yr minus 0.02 million af/yr that is the long-term mean flow of the Paria River. The ~0.15 million af/yr of flow that accrues between the dam and the Lee's Ferry gage was not considered when setting the minimum objective release or the prescribed annual releases under the 2007 Interim Guidelines. The Upper Division States strongly objected to setting the annual release at 8.23 million af/yr. In response the Secretary made it clear that the release was an objective, not a requirement. and that the Secretary has the legal authority to modify the annual release from the dam. In a 2 June 2005 letter, Secretary Gail Norton reiterated the authority and flexibility provided to the Secretary under the LROC. The 2007 Interim Guidelines do not include a minimum objective release *per se*, but the 8.23 million af/yr release is used as common release amount in the tiering.

5.2 A conceptual proposal for flexible accounting

The rules under which annual releases after 2026 will be determined are being negotiated. There are many possible outcomes of these negotiations. One possibility is that agreement between the two basins is not reached, and annual releases in the future are determined under the 1970 LROC as anticipated by the termination provision of the 2007 Interim Guidelines. Another possibility is that the two basins (divisions) reach a compromise on a set of rules that would set an annual release amount under different triggering conditions such as the amount of reservoir storage in the watershed. If agreement is ultimately achieved, it is likely that a "prescribed release" will be defined. If a compromise set of release objectives is adopted, the Secretary would still retain the flexibility to adjust annual releases for purposes other than water supply. In doing so the Secretary could adopt a set of accounting rules that would retain on paper an agreement between the Upper and Lower Basin states, but also retain flexibility to consider environment, recreation, hydropower, and tribal considerations.

If the Secretary determines that the annual release from Glen Canyon Dam should be different than the prescribed release for purposes other than water supply, as described above, then Reclamation would make the adjusted annual release as directed by the Secretary. If the revised annual release is less than the prescribed release, then the difference would be credited to an account referred to as "Lower Basin Water Stored above Lee Ferry" and for Lee Ferry accounting purposes, necessary under the Compact, the water would be considered as having flowed by Lee Ferry in the year the water is credited to the account. If the revised annual release is more than the prescribed release, then the difference would be credited to an account referred to as "Upper Basin Water Stored Below Lee Ferry." For accounting purposes, the year the water is delivered to the river and credited to the account would not be considered a Lee Ferry (i.e., Compact) delivery. It would be considered a Lee Ferry (Compact) delivery in the year the water is made available for use in the Lower Basin.

Once there is water in the “Lower Basin Water stored above Lee Ferry” account, it would be discharged or credited by either releasing the water from Lake Powell or trading it for a like amount of water in the “Upper Basin Water Stored Below Lee Ferry” account. In the year either option occurs, it would not be considered a Lee Ferry delivery, because, forCompact purposes, it has already been delivered. Water in the “Upper Basin Water Stored Below Lee Ferry” account would be credited as a Lee Ferry delivery when it is made available for use in the Lower Basin. If the water is traded for a like amount of water in the “Lower Basin Water Stored above Lee Ferry” account, it is not considered a Compact delivery the year it is traded. An example of the operation of this accounting scheme is described in Appendix 1.

We note that while this kind of accounting system may be a novel idea for Lake Mead and Lake Powell, similar multi-reservoir accounting systems are used by Reclamation. An example is the accounting system used for the operations of Taylor Park and Blue Mesa Reservoirs under the 1975 Exchange Agreement.

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Appendix 1: Example Accounting Sequence:

YEAR	Prescribed Release	Actual Release	LBWSALF	UBWSBLF	COMPACT
2030	8.0 maf	7.0 maf	+1.0 maf		8.0 maf

Notes – in this year, the goal was to increase the storage in Powell, so a smaller release 7.0 maf is made. The LBWSALF account was credited with 1.0 maf, but for compact accounting the delivery is considered 8.0 maf.

2031	8.0 maf	8.5 maf		+.5 maf	8.0 maf

Notes – in this year the goal is to deliver an additional .5 maf for environmental purposes, so an 8.5 maf is made and the UBWSBLF account is credited with .5 maf and for compact purposes the delivery is 8.0 maf. At this point, since there is water in both accounts, the basins could make a trade. However, let's assume that UD States decide to keep the water in the account.

2032	10.0 maf	9.0 maf	1.0 +1.0 =2.0 maf	+.5 maf	10.0 maf

Notes-this is a wet year, but goal is to not put 10 maf down the canyon for sediment management, so 9.0 maf is released and an additional 1.0 maf is credited to the UBWSBLF account making its total 2.0 maf. For accounting purposes, the delivery is 10 maf.

2033	8.5 maf	8.5 maf	2.0 maf	+.5 maf	8.5 maf

This is a "no change" year. The prescribed flow an the desired flow are the same and neither basin wants to utilize the water stored in its account,

2034	7.0 maf	8.5 maf	2.0 maf	1.5+.5= 2.0 maf	7.0

In this year the goals are to equalize the power head between Mead and Powell and generate more power at Powell, so the desired release is 8.5 maf. An additional 1.5 maf is credited to the LBWSALF account giving it a total of 2.0 maf. Both accounts have 2.0 so they can cancel each other out. When this happens, both accounts are zero and the UB is not credited with an additional 2.0 maf compact delivery in the year 2034. If the UBWSALF had 1.0 maf and the LBWSBLF had 2.0 maf the 1.0 maf would cancel and the UB could either keep it or make it available to the LB – it then gets credit for a compact delivery)

In this example, the 5-year prescribed total flow is 41.5 maf. The actual flow is 41.5 maf. For Compact purposes, the UB delivery is 41.5 maf.

Several issues arise from this example that would need to be addressed:

- The above example assumes that the two basins and Interior agree on a compromise set of release rules (the "prescribed" delivery). If there is no agreement, the proposed accounting would work for a minimum objective releasee of 8.23 million af/year (or 8.1 million af/yr if the flows between the dam and gage are considered).
- When the reservoirs are full, the accounts would spill.
- There may need to be limits on how much water can accrue in each account.
- ICS accounts in either reservoir would be on top of the Compact account, (but could be integrated.