BAY AREA WATER SUPPLY AND CONSERVATION AGENCY BOARD OF DIRECTORS MEETING

June 9, 2023

Correspondence and media coverage of interest between May 21, 2023 and June 7, 2023

Correspondence

Peter Drekmeier, Policy Director, Tuolumne River Trust	
Chair Larsson and BAWSCA Directors	
June 6, 2023	
TRT Comments – NOP for BDP Amendment	
Nicole Sandkulla, CEO/General Manager, BAWSCA	
Courtney Tyler, Clerk of the Board, Division of Water Rights Mail Room	
May 25, 2023	
NOP Comment Letter - Tuolumne River Voluntary Agreement	

Media Coverage

Bay Delta:

Date:	May 23, 2023
Source:	Maven's Notebook
Feature:	Voluntary Agreements Could Make the Delta a Better Place for Fish – Provided They're Done Properly

Water Supply Conditions:

Date:	June 6, 2023
Source:	Mercury News
Article:	'Pretty dang close to full': Bay Area groundwater back to pre-drought levels after massive winter storms

Date:	June 6, 2023	
Source:	San Francisco Chronicle	
Article:	Two of California's largest reservoirs are near 100% capacity. H	lere's where others stand

Water Policy:

Date: Source: Article:	June 5, 2023 San Francisco Chronicle Rights to California's most important resource are built on injustice. New Legislation seeks to change that.
Date:	June 5, 2023
Source:	LA Times
Article:	Improvised, spotty and belated: Will California reform its oversight of water rights?
Date:	June 2, 2023
Source:	Spectrum 1 News
Article:	Legslation to curb water use for irrigations clears California Assembly

Water Policy, cont'd .:

Date:	May 28, 2023	
Source:	LA Times	
Article:	Supreme Court scales back clean water protections.	What does it mean for California?

Date:	May 27, 2023
Source:	Mercury News
Opinion:	California water proposal has dark, hidden currents

Water Supply Management:

Date:	June 6, 2023	
Source:	San Francisco Chronicle	
Article:	California's once-dead Tulare Lake may be at peak size.	Here's how big it is

Date:	June 5, 2023
Source:	Fresno State News
Article:	Every drop counts: experts encourage continued water conservation

Date:	May 30, 2023
Source:	Courthouse News Service
Article:	Race to move water underground on as California's Central Valley overflows

Water Infrastructure:

Date:	June 5, 2023
Source:	Appeal Democrat
Article:	Sites closer to a reality with state water board decision

Date:	May 21, 2023	
Source:	San Francisco Chronicle	
Article:	Hetch Hetchy Reservoir was a San Francisco miracle.	It was also a curse.

From:	Peter Drekmeier				
То:	glarsson@sunnyvale.ca.gov; bawscaboardofdirectors				
Subject:	TRT Response to BAWSCA Comments				
Date:	Tuesday, June 6, 2023 1:34:44 PM				
Attachments:	TRT Comments - NOP for BDP Amendment.pdf				

Dear Chair Larsson and BAWSCA Directors:

It was disappointing to hear a number of BAWSCA member agency representatives comment at the State Water Board meeting on May 18 in support of the Tuolumne River Voluntary Agreement (TRVA). The speakers read from a crib sheet provided by BAWSCA.

BAWSCA has not done its own analysis of the TRVA, but rather depends on a convenient (but false) narrative provided by the SFPUC. BAWSCA has declined our requests to discuss the issue, suggesting a lack of confidence. We remain available for dialogue.

Attached are TRT's recent comments on the TRVA. The first half focuses on problems with the TRVA, and the second half refutes the position taken by BAWSCA and its member agencies. If BAWSCA has any criticisms of our comments, we'd be happy to discuss.

Thank you.

-Peter

Peter Drekmeier Policy Director Tuolumne River Trust peter@tuolumne.org (415) 882-7252 (This page was intentionally left blank)



May 25, 2023

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Division of Water Rights Mail Room Attn: San Joaquin Unit State Water Resources Control Board P.O. Box 100, Sacramento, CA 95812 LSJR-SD-Comments@waterboards.ca.gov

Re: NOP Comment Letter – Tuolumne River Voluntary Agreement and Possible Amendment to the Bay Delta Plan

Dear Chair Esquivel, Board Members and Staff:

We are disappointed the State Water Board has been pressured into revisiting decades of credible science to consider amending Phase 1 of the Bay Delta Water Quality Control Plan in order to allow consideration of the Tuolumne River Voluntary Agreement (TRVA). The best available science has unequivocally shown that the TRVA would not meet the objectives of the Bay Delta Plan. Politics appears to be getting the better of science.

The 2010 Flow Criteria Report identified 60% of unimpaired flow between February and June as the minimum necessary to protect public trust resources on the Lower San Joaquin River and its tributaries. The 2012 draft SED for Phase 1 recommended a starting point of 35% of unimpaired flow. After being sent back to staff for a more robust analysis, the 2016 draft SED increased the starting point to 40%. Staff would not have raised the starting point had they believed the Plan had a chance of succeeding at a lower level.

By offering considerably less than 30% of unimpaired flow, the TRVA would produce very little badly-needed freshwater inflow to the Delta, would do little to reduce water temperature in the lower Tuolumne River, and would provide minimal inundation of floodplains. In other words, it would fail to address key limiting factors in the Bay-Delta and its watershed.

Following are some specific comments.

I. The State Water Board already analyzed the TRVA, and ruled it out as insufficient.

The Water Board's "Response to Oral Comments Received at the August 21-22, 2018 State Water Resources Control Board Meeting" made it clear that measures included in the TRVA were thoroughly evaluated and ruled out as insufficient. It references a number of responses in the final Bay Delta Plan SED. Following are a couple of quotes.

The proposed TRMP [Tuolumne River Management Plan – predecessor to the TRVA] represents the Districts' assessment of their proposed action using their own models. However, the validity of the Districts' biological models is highly uncertain and remains challenged by outstanding agency comments that were not resolved in the final study reports for the juvenile fish production models (CDFW 2014a; NMFS 2014a; USFWS 2014; TID and MID 2013b, 2017a, 2017b, 2017c). California

Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), and State Water Board documented disagreements with underlying model assumptions in multiple letters and comments in meetings regarding juvenile fish production models and the Districts' predation study and report (CDFW 2013a, 2013b, 2014b; NMFS 2014b; USFWS 2013a, 2013b; State Water Board 2013a, 2013b; Stillwater Sciences 2013; TID and MID 2013a, 2013b, 2016). Agency criticisms of the Districts' biological models include, but are not limited to, concerns that models do not recognize existing rearing and spawning habitat limitations or accurately represent temperature sensitivity, predation, and the effect of flow in establishing rearing and floodplain habitat benefits.¹

And:

Finally, the Districts' use of WUA in isolation from other flow-related benefits does not include important habitat metrics such as food availability, propagation of downstream temperature benefits, migratory corridors, and the value of riparian channel margin and floodplain habitat activation. The TRMP analysis does not recognize the ability of the LSJR plan amendments to shape flows for targeted optimization of in-channel WUA at certain times and overbank floodplain habitats at other times.²

Recommendation: Clarify whether the TRVA has been amended to address any of the concerns previously raised by the Water Board and other agencies. Have the Irrigation Districts' biological models been improved? Have the resource agencies' documented disagreements been resolved?

II. The NMFS-commissioned peer review³ of the Irrigation Districts' fish models identified major problems.

The third-party review of the Irrigation Districts' fish population models, conducted by Anchor QEA in 2020, also called into question the credibility of the Irrigation Districts' fish models used to produce the TRVA. Following are some conclusions from the report:

- The Chinook salmon population model is useful but not usable by all stakeholders; and the *O. mykiss* population model is neither useful nor usable.
- The [Chinook] model is not a full life cycle, which hampers its utility for evaluating potential benefits of management actions to the overall population.
- A shortage of habitat quantity, including spawning habitat and gravel availability, is not a limitation on the population at abundance levels that are of concern. Thus, gravel augmentation would not significantly improve population performance.

¹ Responses to Oral Comment Received at the August 21 and 22, 2018 State Water Resources Control Board Meeting, page 9 –

https://www.waterboards.ca.gov/waterrights/water issues/programs/bay delta/bay delta plan/water quality c ontrol planning/2018 sed/docs/comment responses.pdf

² Ibid, page 10.

³ NOAA's National Marine Fisheries Service Technical Review of Salmonid Population Models, e-filed to the FERC Projects' Dockets Numbers 2299 and 14581 –

https://static1.squarespace.com/static/5eebc0039b04b54b2fb0ce52/t/5ffe1a69cc1c8606a3081719/16104884321 %2068/X-3+NMFS+Peer+Review+of+Fish+Models.pdf

- The Chinook salmon production model cannot identify the number of predators that would need to be removed or how much of a reduction in consumption would be required to achieve a significant increase in smolt-to smolt survival. The response from predator control is assumed, not predicted.
- It bears noting that the model, as developed, found water temperatures to be the major environmental factor driving juvenile *O. mykiss* productivity downstream of the dam. Flows released below La Grange Dam are apparently the major factor affecting water temperatures.
- The model, as configured, indicates that the status of the Chinook salmon population is extremely precarious and bold actions will be needed to prevent extirpation. This need, according to the model, would best be met by very substantial increases in flow releases during spring.

Recommendation: Explain whether the issues raised by the peer review have been addressed. Have the fish population models been improved? Do they address full life cycles? Can the TRVA reasonably predict a response to the proposed predator control measures? How would the limited water temperature improvements in the TRVA effect *O. Mykiss*?

III. The TRVA forces various fish species in different life stages to coexist in the main channel where predation occurs.

A major problem with the TRVA is that it requires various fish species at different life stages to coexist in the main river channel. This is not natural, and exacerbates predation of juvenile fish. In a natural environment, mature fish inhabit the main channel where water is deeper, faster moving and cooler, while juvenile fish inhabit floodplains where the water is slower moving and they have access to more food and refuge from predators.

The TRVA states, "Flow management for the benefit of *O. mykiss* in June consists of striking a balance between providing hydraulic habitat suitability and temperature suitability for fry and adult life stages." It includes a number of examples of the need to make trade-offs between species and life stages. For example:

Adult *O. mykiss* habitat is 78% of maximum WUA at 200 cfs. An alternative flow of 150 cfs was considered, which improves fry habitat to 78% of maximum WUA, but decreases adult habitat to 70% of maximum WUA. At 150 cfs, average daily water temperatures at RM 43 are less than 20 C until maximum daily air temperature exceeds 95 F, which occurs on average three days in June. An alternative flow of 300 cfs increases adult WUA to 90%, but decreases fry to just over 60% of maximum WUA."⁴

The above conclusion references a single species. Elsewhere in the TRVA are examples of trade-offs that would be required to address the needs of different species.

⁴ Voluntary Agreements, Appendix A6: Tuolumne River, page A-171 – <u>https://static1.squarespace.com/static/5eebc0039b04b54b2fb0ce52/t/6006f702a7cd5a36af4a5b67/16110691885</u> <u>01/4+Tuolumne%2BRiver%2BVA.pdf</u> **Recommendation**: Compare the trade-offs that would need to be made between various species at different life stages between the TRVA and the Bay Delta Plan.

IV. The TRVA is based on non-flow measures that have failed in the past due to the lack of sufficient instream flow.

The Irrigation Districts have a poor track record of managing the Tuolumne River. Consider this – In 1944, 130,000 salmon returned to the Tuolumne. This occurred after many decades of in-river mining, the introduction of striped bass in the late 1800s, and La Grange Dam having cut off access to 85% of the historic spawning grounds in 1893. Based on these facts, we can surmise that the Tuolumne historically hosted 100,000 salmon or more. In 2021, CDFW (GrandTab) recorded 186 salmon.

A good example of a non-flow measure failing as a result of inadequate flows is the Special Run Pool (SRP) 9 project. This project was initiated through the 1995 FERC Settlement Agreement, which, like the TRVA, placed a significant focus on reducing predators and predator habitat. SRPs are in-river gravel pits that harbor non-native species, such as black bass. The SRP 9 project filled in that pit, but after the expenditure of approximately \$2.8 million, it simply exchanged one non-native predator (largemouth bass) with another (smallmouth bass).

The Districts' own post-project monitoring report was clear about the importance of flows in reducing predator habitat. It stated:

During extremely wet years, high flows can flush largemouth bass out of a stream, but typically a sufficient number of adults can find shelter in flooded areas to repopulate the stream during lower flow conditions (Moyle 2002)...During the years following the flood, largemouth bass abundance was controlled by spring and summer flow conditions that were unfavorable for reproduction. Largemouth bass require low water velocities and warm water temperatures to reproduce (Moyle 2002, Swingle and Smith 1950, Harlan and Speaker 1956, Mraz 1964, Clugston 1966, Allan and Romero 1975, all as cited in Stuber et al 1982) (p 130).⁵

Recommendation: Consider information from the Special Run Pool 9 post-project report in your consideration of amending the Bay Delta Plan.

V. Instream flow plays a major role in juvenile fish survival.

The following graph shows that juvenile Chinook mortality on the Tuolumne River between the Waterford and Grayson rotary screw traps averaged 95.6% in the five non-wet years from 2007-2012. In the one wet year (2011), mortality decreased to 74%.

⁵ 2006 Tuolumne River Annual Report, page 130.

KS	15 during 2007-2012.			
Year	Waterford	Grayson	Loss	% Loss
2007	50,573	952	49,621	98%
2008	49,527	3,020	46,507	94%
2009	54,517	4,072	50,444	93%
2010	74,520	2,056	72,464	97%
2011	364,627	95,156	269,471	74%
2012	62,076	2,268	59,808	96%

 Table 6.3-7.
 Estimated abundance of juvenile Chinook salmon at the Waterford and Grayson RSTs during 2007-2012.

High flows in 2011 improved water temperature, floodplain activation and outmigration flows. The following graph (produced by Greg Reis at The Bay Institute), shows percentage of unimpaired flow remaining in the Tuolumne River. In 2011, unimpaired flow was 68% of what was higher than median unimpaired flow.



The draft "Limiting Factor Analyses and Recommended Studies for Fall-run Chinook Salmon and Rainbow Trout in the Tuolumne River"⁷ was not finalized due to political pressure, but it includes a lot of valuable information. The study concludes:

The limiting factor analyses suggest that Chinook salmon recruitment, which is the total number of adults in the escapement and harvested in the sport and commercial fisheries in the ocean, is highly correlated with the production of smolt outmigrants in the Tuolumne River and that winter and spring flows are highly correlated with the number of smolts produced. Other

 ⁶ Predation Study Report, Don Pedro Project FERC No. 2299, Prepared by FISHBIO for MID/TID, December 2013.
 ⁷ Limiting Factor Analyses and Recommended Studies for Fall-run Chinook Salmon and Rainbow Trout in the

Tuolumne River, Mesick et al., 2007 –

https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/exhibits/nmfs/sp prt_docs/nmfs_exh4_mesick_etal_2007.pdf

evidence from rotary screw trap studies indicate that many more fry are produced in the Tuolumne River than can be supported with the existing minimum instream flow schedules, and so, producing more fry by restoring spawning habitat is unlikely to increase adult recruitment.

Recommendation: Review the Limiting Factor Analyses and answer the management questions beginning on page 44. Compare the potential benefits of the TRVA with the Bay Delta Plan on juvenile fish survival in the lower Tuolumne.

VI. Response to BAWSCA member agency comments.

At the May 18, 2023 scoping meeting, a number of spokespeople for BAWSCA member agencies read talking points provided by BAWSCA. The comments were virtually the same. They cited arbitrary numbers based on the SFPUC's manufactured Design Drought.

The Water Board should be commended for conducting its own analysis of potential impacts on SFPUC water supply in the Bay Delta Plan SED (Appendix L). You should do the same in this case. Following is some information to help out.

The SFPUC has manufactured a water crisis to support their narrative that the Bay Delta Plan would lead to excessive rationing. In November 2021, when the SFPUC declared a Water Shortage Emergency, they had enough water in storage to last 4.5 years. Throughout the recent three-year drought, they never had less than four years-worth of water in storage, and yet they imposed a drought surcharge on San Francisco ratepayers. As of May 15, 2023, the SFPUC had entitlements to enough water from the Tuolumne River (1,384 thousand acre feet)⁸ to last more than six years, and there's still a tremendous amount of snow remaining in the Hetch Hetchy watershed.

The SFPUC's Design Drought combines the drought of record (1987-92) with the driest two-year period on record (1976/77) to create an arbitrary 8.5-year drought. It assumes water demand of 265 million gallons per day (mgd) in the SFPUC service area.

Much has changed since the Design Drought was developed following the 1987-92 drought:

- Water demand has declined from 293 mgd in 1987 to less than 200 mgd for the past nine years.
- The SFPUC adopted a Water First Policy, prioritizing water supply over hydropower generation.
- The SFPUC completed a Long-Term Vulnerability Assessment that found climate change will have a minimal impact on water supply, and potentially a positive impact.

SFPUC Water Demand

The graph below shows historic water demand in the SFPUC service area. Demand in FY 2022/23 will likely be below 190 mgd, making it the ninth year in row that demand is under 200 mgd.

⁸ SFPUC Water Supply Conditions Update ---

https://sfpuc.sharefile.com/share/view/s23e46b5fc55c477bbdcc8b61d849abfb



In early 2021, TRT caught the SFPUC using contractual obligations to represent current and future water demand for use in Urban Water Management Plans. This inflated the severity of potential rationing considerably. A number of BAWSCA agency representatives cited the inflated figures at public meetings (much like they did last week). When the SFPUC was eventually shamed into using actual demand projections, this reduced potential rationing under the Bay Delta Plan by 15 percentage points.

The demand projections included in the final UWMPs will prove to be inflated themselves. An SFPUC report⁹ comparing UWMP projections with SFPUC Finance Bureau sales projections informed that:

The [UWMP] projections represent an outside bound of whatever demand will occur in the next 25 years...These demands will likely always be greater than actual demands because not all developments materialize, or they materialize slower than projected.

And:

By contrast, for the purpose of financial planning and for short term water system management, we estimate the demand that we are likely to experience. For budgeting and rate setting we use demand projections that are as close to actual as we can make them.

The SFPUC Finance Bureau projects water sales will remain flat for at least the next decade.

⁹ SFPUC Water Enterprise and Finance Bureau Water Demand Projections, July 5, 2022 – <u>https://sfpuc.sharefile.com/share/view/sa628ebe9c31e4326b84ffa2976f9f9a3</u>

SFPUC Water First Policy

The SFPUC's Water First Policy has had a big positive impact on water supply, and yet the Commission refuses to even discuss potential changes to the Design Drought, such as removing one year.

The following slides were presented by staff at a water demand and management workshop on July 13, 2021.



How Dry Has It Been?

- Comparison between 2020 & 2021 and 1976 & 1977
- Two-year Hetch Hetchy precipitation totals:
 - 1976 & 1977: 39.14 inches
 - 2020 & 2021: 39.28 inches



- March 21, 1977
 - Hetch Hetchy: 24,500 AF (dead pool)
- March 21, 2021
 - Hetch Hetchy: 179,700 AF (Water First!)
- June 10, 1977
 - Hetch Hetchy: 128,900 AF
 - Total Hetchy System: 563,298 AF
- June 10, 2021
 - Hetch Hetchy: 321,302 AF
 - Total Hetchy System: 917,455 AF

You see that while Hetch Hetchy precipitation was comparable in 1976/77 and 2020/21, Total System Storage was 354 TAF greater on June 10, 2021 than on the same day in 1977. This was a direct result of the Water First Policy and a decrease in water demand.

Long-Term Vulnerability Assessment

The SFPUC spent \$743,000 on a Long-Term Vulnerability Assessment (climate change study), yet they have never cited from it, because it does not support their narrative that they cannot afford to leave more water in the Tuolumne River without risking severe water shortages.

The study states, "According to climate projections and expert elicitations, there is a central tendency of warming of + 2°C and + 4°C by 2040 and 2070 (Representative Concentration Pathway [RCP] 8.5),

respectively, with no clear direction of change in mean annual precipitation over the planning horizon."¹⁰

In other words, we might expect greater swings in precipitation, but on average it won't change much.

The report includes return periods for the known droughts, but not for the Design Drought. Through a Public Records Act request, TRT uncovered a document showing that the authors had looked at the return period for a drought as severe as the Design Drought, and at 240 mgd demand (much greater than it has been for the past 14 years), we might expect such a drought to occur every 25,000 years.

The report included the following graph. Based on 100 years of recorded data, 1,100 years of tree ring data, and 25,000 simulated model runs, the worst drought the study produced required less than 1,200 TAF of water from storage. The Design Drought, at 240 mgd demand, would require 1,309 TAF of water from storage (we added the red line).



TRT requested that the study explore how earlier runoff might impact SFPUC water entitlements. Our prediction was that a shift in runoff from the mid-April to mid-June time period (when the Irrigation Districts have the right to the first 4,000 cfs) to pre-April 15 (when the Districts are entitled to the first 2,400 cfs) would benefit the SFPUC. Our request was ignored.

We did our own analysis, and found that a three-week shift in runoff (as predicted by 2070 in the Long-Term Vulnerability Assessment) would result in the SFPUC picking up an additional 237 TAF of water over the course of the Design Drought. With 200 mgd demand equaling 224 TAF/y, this would amount to a year's-worth of water shifting to the SFPUC.

¹⁰ SFPUC Long-Term Vulnerability Assessment, page xxii – <u>https://sfpuc.org/about-us/reports/long-term-</u> vulnerability-assessment

TRT's Assessment of SFPUC Water Supply

Using our water supply calculator, TRT found that at current demand, with the Bay Delta Plan's unimpaired flow requirement in place (with the SFPUC responsible for 51.7%, per the 4th Agreement), the SFPUC could manage a repeat of the drought of record (1987-92) without requiring any rationing or developing any new alternative water supplies. Our results are shown in the graph below.

Year	Demand (MGD)	Rationing (%)	Storage Reduction (TAF)	Water in Storage (TAF)
=1986				1,517
=1987	198	0	450	1,067
=1988	198	0	319	748
=1989	198	0	42	706
=1990	198	0	289	417
=1991	198	0	97	320
=1992	198	0	242	78

With modest rationing, the SFPUC could manage a seven-year drought, and with a modest investment in alternative water supplies, they could manage an eighth year.

The following slide was produced by SFPUC staff at our request for use at a water demand workshop in 2021. It shows that even using inflated UWMP demand projections (236 mgd in 2045), if the SFPUC were to reduce the Design Drought by one year, they could manage a 7.5-year drought by developing 35 mgd of alternative water supplies. Perhaps the rationing level included in this scenario is too aggressive, but the benefit of earlier runoff would more than compensate for an adjustment in the rationing level.



VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought

- Base Conditions
- Includes SFPUC contribution to the Bay-Delta Plan displayed in the graph as a reduction in Firm Yield, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.
- · Includes a total of 35 MGD of new water supply projects, as described on slide 12 for scenario V
- · Yield values are estimated using a 7.5-year design drought
- Includes 6.5 years of rationing at 20% in the 7.5-year design drought sequence.

SFPUC Water Supply and Demand Worksheet Results All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	299	192	196	196	238	238
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	101	101	101	101	101
Surplus or Deficit:	100	-21	-19	-24	12	2

In conclusion, the SFPUC could manage the Bay Delta Plan flow requirement if they were to reduce the length of the Design Drought by one year (still more conservative than any other water agency) and use reasonable demand projections. In a worst case scenario, they might need to develop up to 35 mgd of alternative water supplies, but that's a far cry from the 90 mgd cited by the BAWSCA agencies at the scoping meeting.

Recommendation: Disregard the BAWSCA member agencies' comments at the scoping meeting. Their figures came from a BAWSCA crib sheet, which was based on unreasonable assumptions and inflated figures developed by the SFPUC for political purposes. As you did with Appendix L of the Bay Delta Plan SED, conduct your own analysis.

Thank you for the opportunity to provide our comments.

Sincerely,

Patrick ka

Patrick Koepele Executive Director

Peter Dachmein

Peter Drekmeier Policy Director

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May 25, 2023

Courtney Tyler, Clerk to the Board Division of Water Rights Mail Room Attn: San Joaquin Unit State Water Resources Control Board 1001 I Street, 2nd Floor, Sacramento, CA 95814 Transmitted via e-mail to: LSJR-SD-Comments@waterboards.ca.gov

Re: NOP Comment Letter – Tuolumne River Voluntary Agreement

Dear Ms. Tyler:

The Bay Area Water Supply and Conservation Agency (BAWSCA) submits the following scoping comments regarding the Notice of Prepreraiton (NOP) for the *Possible Amendment of the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquina Delta Estuary (Bay-Delta Plan or Plan) to Incorporate Tuolumne River Voluntary Agreement.* BAWSCA supports the State Board's evaluation of the proposed Tuolumne River Voluntary Agreement, as described in the November 2022 Revised Memorandum of Understanding presented to the State Board as a possible amendment to the Bay-Delta Plan. The proposed Tuolumne River Voluntary Agreement could be a big step forward in providing more flows and increased habitat for fish in the Tuolumne River and ensuring a continuing reliable supply of high-quality water at a fair price for the health, safety, and economic well-being of BAWSCA's water users. As with every important water supply project in California, a thorough, robust and defensible environmental analysis of the proposal, along with a true comparison to the alternatives, is critically necessary to bring all parties together and in moving forward with a solution that meets our shared objectives.

BAWSCA represents the 26 water agencies that purchase two-thirds of the water delivered by the San Francisco Regional Water System (Regional Water System) and pay for two-thirds of its costs. The Regional Water System relies on the Tuolumne River for 85 percent of its water supply. The BAWSCA member agencies, in turn, provide water to 1.8 million residents, 40,000 businesses, and hundreds of communities in Alameda, San Mateo, and Santa Clara counties. It is important to understand that BAWSCA was created 22 years ago by the California legislature (AB 2058) to protect and assure a reliable water supply for its constituents. (Water Code, § 81300 *et seq.*)

BAWSCA has been engaged in the process to update the Bay-Delta Plan and continues to support its objective. However, BAWSCA cannot support the Plan adopted by the State Board in December 2018 due to the resulting significant negative impacts to the water customers BAWSCA represents. The current Plan would result in a very serious loss of up to 90 million gallons of water every day during times of drought from the Regional Water System. BAWSCA member agencies have adopted State-required Urban Water Management Plans (UWMP) that show they would suffer up to a 50-percent loss of water supply from the Regional Water System during multi-year droughts, like the most recent drought that ended this Winter, if the adopted Bay-Delta Plan was in force. BAWSCA member agencies already have some of the lowest residential per capita water users in the State. For some, a 50% reduction equates to an average per person water use of 25 gallons per day or less. Such water losses would

Ms. Tyler Clerk of the Board Page 2 of 6

result in unacceptable negative impacts on job growth, a slowdown in the economy, and health, safety and economic risks for people, businesses and our communities. Importantly, the adopted Plan could limit the abilities for cities to approve State-mandated construction of new affordable-housing for residents and employees of vital businesses. These are the same unacceptable impacts that BAWSCA described to the State Board in detailed written and oral comments when it adopted the Bay-Delta Plan update and Substitute Environmental Document (SED) in 2018.

While BAWSCA opposed the 2018 adopted Plan, it has consistently supported voluntary agreements. Fortunately, the adopted Bay-Delta Plan provides a policy and legal pathway for a voluntary agreement to implement the Lower San Joaquin River flow portions of the Bay-Delta Plan.

Water Supply Impacts to the Regional Water System and BAWSCA Member Agencies Must be Considered

The project location map for the NOP shows the watershed boundary ending just West of Modesto at the confluence of the Tuolumne and San Joaquin Rivers, but explains that the project area also covers areas that receive water exported from the Tuolumne River that could be impacted by implementation of the Tuolumne River Voluntary Agreement. The staff report and environmental document must consider the changes to water supply reliability and resulting environmental and other impacts to the Regional Water System and on BAWSCA member agencies.

The NOP explains that the Voluntary Agreement flows are additive to the average January-June minimum instream flows requirements on the Lower Tuolumne River, as set forth in the current Federal Energy Regulatory Commission (FERC) license for the Don Pedro project. These increased flow requirements will have impacts on the water supply for the Regional Water System. Specifically, an increased flow requirement and resulting water supply reliability impacts will have potential environmental effects in the following areas that must be fully analyzed in the project environmental document to ensure it is robust and meets the requirements of CEQA:

- Land Use/Planning
- Population/Housing
- Public Services
- Utilities/Service Systems

BAWSCA and its member agencies must be consulted through this process. (Public Resources Code, § 21104(a); CEQA Guidelines, §15083.)

The Drought Response Actions in BAWSCA Member Agencies' Urban Water Management Plans Must be Considered

BAWSCA member agencies' UWMPs and Water Shortage Contingency Plans must be reviewed for any resulting impacts from reduced water supplies -- including drought response actions and rationing -- and for potential impacts from securing additional water supplies to make up for shortfalls. Under the Urban Water Management Planning Act (Act), most BAWSCA member agencies must prepare an UWMP and submit it to the Department of Water Resources

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every five years. (Wat. Code, § 10610 *et seq*.) Figure 1 illustrates the BAWSCA service area and agencies.

Figure 1: BAWSCA Member Agency Service Area

Legend

- 1 Alameda County Water
- 2 City of Brisbane
- 3 City of Burlingame
- 4a CWS Bear Gulch
- 4b CWS Mid-Peninsula
- 4c CWS-SSF
- 5 Coastside County Water
- 6 City of Daly City
- 7 City of East Palo Alto
- 8 Estero Municipal

- 9 Guadalupe Valley
- 10 City of Hayward
- 11 Town of Hillsborough
- 12 City of Menlo Park
- 13 Mid-Peninsula Water
- 14 City of Millbrae
- 15 City of Milpitas
- 16 City of Mountain
- 17 North Coast County
- 18 City of Palo Alto

Source: BAWSCA FY 2021-22 Annual Survey

- 19 Purissima Hills Water
- 20 City of Redwood City
- 21 City of San Bruno
- 22 San Jose Municipal Water
- 23 City of Santa Clara
- 24 Stanford University
- 25 City of Sunnyvale
- 26 Westborough Water

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The UWMPs provide the long-term resource planning of each agency and ensure that adequate water supplies are available to meet existing and future needs. (Wat. Code, §§ 10610.2, 10610.4.) The Act's purpose is to ensure that water suppliers' plans for long-term reliability, conservation, and efficient use of California's water supplies will meet existing and future demands. (*Id.* §§ 10610.2, 10610.4.) The Act requires that planning projections extend at least 20 years beyond the year of the UWMP, *e.g.*, through 2040 for the 2020 UWMP cycle. (*Id.* at § 10635.) In analyzing the impacts of any water shortages identified in the SED, the State Board must consider those reasonably foreseeable actions of the BAWSCA member agencies as presented in their UWMPs.

The UWMPs can be found on BAWSCA's web site at <u>https://bawsca.org/members/urban_water_management</u>.

BAWSCA member agencies' foreseeable responses to a water shortage derived from the UWMPs include, but are not limited to:

- Increased reliance on local groundwater, increasing the probability for groundwater basin overdraft, saltwater intrusion, and land subsidence.
- Expanded use of local surface water supplies, which could be greatly depleted or completely unavailable during times of drought.
- Seeking to acquire new water supplies though transfer or alternative supplies.
- Implementing a development (e.g., "no new hook up") moratorium which would cause environmental and economic impacts and impacts from displaced growth and urban sprawl.

These drought response actions would in turn create foreseeable environmental impacts. For example, based on the history of BAWSCA member agencies' actions during past droughts, it can be reasonably assumed that agencies would require increasing levels of rationing and they may need to impose moratoria on new development if the flow requirements reduce water supplies. Moratoria on new development will exacerbate the existing Bay Area housing crisis and cause affordability issues that will cripple Bay Area communities (discussed below).

The environmental document must also consider the environmental impacts of displaced growth from reduced flows resulting in insufficient water supplies. Due to the high cost of housing in the region, for decades, an ever-increasing number of people who work in the Bay Area have been compelled to look for more affordable housing in the Central Valley or other surrounding regions resulting in urban sprawl. Urban sprawl has two primary impacts: 1) it increases per capita land consumption, and 2) it disperses development, which increases the distances between common destinations, increasing the costs of providing public infrastructure and services, and the transportation costs required to access services and activities. Potentially significant project effects on energy consumption, human health, water quality, air quality, and greenhouse gas emissions, should be analyzed.

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Special Attention Must be Given to the Bay Area's Housing Crisis

The Bay Area has an affordable housing crisis¹. This must be considered in the staff report and environmental document. (CEQA Guidelines, § 15125(d) ["The EIR shall discuss any inconsistencies between the proposed project and applicable general plans, specific plans, and regional plans [including] regional transportation plans [and] regional housing allocation plans."]) The California Sustainable Communities and Climate Protection Act of 2008 (California Senate Bill 375, Steinberg) requires the Bay Area to plan for housing that can accommodate all projected growth, by income level, so as to reduce the pressures that lead to in-commuting from outside the nine-county region. (Plan Bay-Area 2040: Regional Transportation Plan and Sustainable Communities Strategy for the San Francisco Bay Area 2017–2040, Adopted July 26, 2017, Association of Bay Area Governments, Metropolitan Transportation Commission (Plan Bay Area 2040)². Plan Bay Area 2040 encompasses the entire Bay Area, including the nine counties and the 101 cities and towns that make up the region. Plan Bay Area 2040 provides a roadmap for accommodating projected household and employment growth in the nine-county Bay Area by 2040 as well as a transportation investment strategy for the region. Plan Bay Area 2040 details how the Bay Area can make progress toward the region's long-range transportation and land use goals. Under Plan Bay Area 2040, the region must accommodate 820,000 new projected households and 1.3 million new jobs between now and 2040³. The staff report and environmental document must analyze the impacts of the project flow requirements and ensure that BAWSCA member agencies have the water supply needed to accommodate the pattern of growth called for in Plan Bay Area.

The consideration of the Plan Bay Area housing requirements is not optional. The Regional Housing Needs Allocation program, or RHNA. (Gov. Code. § 65584 et seg.) addresses the housing crisis by assigning each local jurisdiction a number of housing units that represents its share of the state's housing needs for an eight-year period. (Gov. Code, § 65588.) The California Department of Housing and Community Development allocates the state's anticipated housing needs on a regional basis at different levels of affordability based on data involving household demographics. (Gov. Code, §§ 65584(a)(1); 65584.01; 65588.) The housing needs are distributed to individual localities by a regional council of governments. (Gov. Code, § 65584.05.) Once the housing needs allocations are final, each locality must update its general plan's housing element to provide an inventory of sites available for residential development, and identify any constraints to development. (Gov. Code, §§ 65583; 65583.2; 65585.) Any locality that does not adopt a compliant updated housing element is subject to accelerated rezoning and penalties. (Gov. Code, §§ 65583(c)(1)(A); 65583.2(c); 65588(e)(4)(C); 65755(a)(1),(4).) Accordingly, cities and counties *must* comply with the RHNA numbers; participation is not optional. The staff report and environmental document must consider how reduced water supplies may impact the ability to meet the required RHNA housing mandates.

Reduced Impacts from the 2018 Adopted Bay-Delta Plan Should be Considered

It is unclear if the baseline for the project will be the existing FERC flows or 2018 Plan flow requirements. (See CEQA Guidelines, 15125(a)(1) [allowing the use of a future

³ *Id*. at p. 33

¹ <u>https://www.sfchronicle.com/bayareahousingcrisis/</u>

² http://2040.planbayarea.org/files/2020-02/Final Plan Bay Area 2040.pdf

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baseline.]) In any event, the environmental document should provide an evaluation and comparison of potential water supply and environmental impacts to the Regional Water System from the 2018 adopted Plan and the Tuolumne River Voluntary Agreement. As discussed above, BAWSCA supports the objectives of the Bay-Delta Plan, but cannot support the Plan adopted by the State Board in December 2018 due to the resulting significant negative impacts to the water customers BAWSCA represents. A comparison of the impacts will help show the potential environmental and other benefits anticipated by the proposed Tuolumne River Voluntary Agreement.

BAWSCA looks forward to the proposed Voluntary Agreement for the Tuolumne River being carefully analyzed, as a possible amendment to the Bay-Delta Plan, and implemented. Such a thorough, robust and defensible environmental analysis of the proposed Tuolumne River Voluntary Agreement, along with a true comparison to the alternatives, is critically necessary to bring all parties together and in moving forward with a solution that meets our shared objectives.

Sincerely, Kulla

Nicole Sandkulla Chief Executive Officer/General Manager

cc: San Francisco City Attorney's Office Mr. Steve Richie, SFPUC

FEATURE: Voluntary Agreements Could Make the Delta a Better Place for Fish—Provided They're Done Properly

Maven's Notebook | May 23, 2023 | Robin Meadows

The State Water Resources Control Board, which both allocates surface water rights and protects water quality for people and wildlife, is proposing a new approach to setting flow standards in the Sacramento-San Joaquin River Delta.

The Delta drains about 40 percent of California, including much of the Sierra Nevada, and supplies fresh water to two-thirds of the state's population and millions of acres of farmland. This water hub is also home to hundreds of native species as well as a migratory corridor for salmon and birds.

Under the existing approach, the State Water Board establishes the Delta inflow and outflow standards designed to protect fish and wildlife. Under the new approach—called voluntary agreements—these Delta flows would be determined collaboratively by



The San Francisco Bay-Delta, which drains much of California, is the hub of the state's water supply. Image by GAO.

government agencies as well

as by the local water agencies that supply users.

Voluntary agreements would also require restoring habitats that fish depend on, including spawning grounds and floodplain nurseries, as well as improving fish passage. The thought is that a combination of flows and high-quality habitat can do more for fish than flows alone. "The agreements aim to improve conditions and help change the trajectory of declining native fish species in the Delta and the rivers that flow into it," according to the California Natural Resources Agency.

The hope is that voluntary agreements will allow the State Water Board to finally update the Bay-Delta Water Quality Control Plan, a federally required effort that began in 2009 but has been hampered by a barrage of lawsuits from, for example, Central Valley irrigation districts, the City of San Francisco, and the U.S. Department of Justice and U.S. Department of the Interior.

Voluntary agreements for the Delta would entail integrating flow with habitat restoration to benefit imperiled fish. The estimated \$2.6 billion cost of implementing these agreements would be shared by water users and the state and federal governments. Implementation includes governance and habitat monitoring to analyze outcomes and manage adaptively for eight years, at which point the parties would decide whether or not to continue the program.



The Delta has more than half a million acres of agricultural land. Photo by DWR.

In January 2023, the State Water Board released a new draft report on the scientific basis for voluntary agreements in the Delta to supplement their 2017 report.

In March 2023, the Delta Independent Science Board (ISB) submitted comments on the scientific basis for voluntary agreements in the Delta. The Delta ISB—which includes 10 scientists from across the United States

with expertise ranging from fish ecology to river ecosystems to environmental decisionmaking—is charged with evaluating scientific programs that support adaptive management of the Delta.

Adaptive management is a science-based approach to making environmental decisions in the face of uncertainty. This strategy for managing natural resources is inherently experimental, relying on monitoring and evaluation of outcomes to learn the best ways of refining future management decisions.

The State Water Board's 2023 draft scientific basis report acknowledges the uncertainty in the science of voluntary agreements in the Delta, and outlines an accompanying adaptive management plan.

To learn more about the Delta ISB's assessment of the scientific underpinnings of voluntary agreements in the Delta, Robin Meadows spoke with Lisa Wainger, a University of Maryland environmental economist who chairs the Delta ISB.

What would the Delta ISB most like to see in voluntary agreements going forward?

First and foremost, we want to see the adaptive management experiment done well because we know this is going to be extremely hard. There's so much natural variability in the system, from weather extremes to changes in the crops grown on land to conditions in the ocean, which affect adult salmon.

It'll be key to have proper monitoring and to track whether things are moving in the right direction. Monitoring tends to get short shrift and this is a case where it will be critical—fish respond to almost everything in the water and on the landscape.



The adaptive management cycle as described in the Delta Stewardship Council's Delta Plan.

Another need is the right mix of expertise on the adaptive management team, and to have them be dedicated to the project. They need to have enough time for it and to be there consistently instead of going through a revolving door. It will be important to keep institutional knowledge about prior system responses to management when interpreting the data and adapting to changes.

What are other key ways the scientific underpinnings of voluntary agreements could be strengthened?

Both flow and non-flow changes need to be assessed to ensure that they are performing as anticipated to improve habitat and fish outcomes. The habitat restoration plans and assessments should address whether adjustments are needed for climate change, especially higher water temperatures that could be detrimental to salmon and smelt.



Understanding multiple sources of stress, and how they may combine, improves the ability to design restoration that leads to successful outcomes for fish, particularly since changes and restoration will impact different species to different degrees. Success means not only increasing abundances of the targeted fish but also in

Nearly 1,200 acres of freshwater tidal marsh are being restored at Dutch Slough in the Delta. Photo by DWR.

providing ecological conditions that support a resilient aquatic system.

Ultimately, achieving the benefits from restoration will require substantial and diverse restoration efforts. In the current plan, not all habitat goals are met in all tributaries. It's important to keep the scale of restoration big to see big effects. This has the added benefit of creating spatial redundancy, so that you're literally not putting all your eggs in one basket.

Finally, there are only two check-in points, one at four years and another starting in the sixth year, after which they'll decide whether to continue the voluntary agreements. These assessments need more specifics—they need to set performance measures and thresholds of concern for multiple environmental indicators such as fish abundances, growth rates and condition as well as habitat variables including temperature and water quality.

Some environmentalists say that voluntary agreements trade flows for habitat restoration, and that this is flawed because the former have proven benefits to fish but fish benefits from the latter are anticipated but as yet unproven. What is the Delta ISB's "big picture" take on the science side of voluntary agreements in the Delta?

The science of combining flows with habitat restoration is uncertain and some would say we should stick with what works, which is flows. But just focusing on flows is also uncertain. This is because this approach entails mimicking historic flows in a system with a host of new stressors such as rising water temperatures, disconnected flood plains, and invasive species that may have changed food availability or fish interactions such as predation of native species. Flows are just one of the many factors that can affect fish productivity.

Flows are one of the main environmental variables that affect fishes, and this is one of the drivers that we have some ability to control. Habitat restoration is also a management tool that can support fish populations, if done properly. Scientifically, considering both of these in the same equation is more robust than single driver approaches.



Central Valley Chinook salmon migrate through the Delta on their way to spawn. Photo by DWR.

Doing voluntary

agreements as an adaptive management experiment will be a test of whether a combination of improvements in flow and non-flow habitat—such as marshes and accessible floodplains—can increase native fish populations. The difficult challenge is that to have healthy fish populations, you have to address all the bottlenecks at every life stage: spawning, hatching, young and adults, which require different habitats at different times.

Flows are important for some life stages, including migration and rearing, and can improve water quality, but other parts of the system could be limiting for other life stages. The voluntary agreements propose to create habitat for different life stages. For example, floodplains provide rearing habitat, and marshes support young fish by providing more food.

The voluntary agreements are a complex undertaking, with significant opportunities for learning how to effectively improve the Delta's aquatic habitat, but only if they are implemented well and the adaptive management is thorough.

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'Pretty dang close to full': Bay Area groundwater back to pre-drought levels after massive winter storms

Water tables rose significantly due to soaking rains and recharge projects, boosting supplies for future dry years

Mercury News | June 6, 2023 | Paul Rogers



The Page Groundwater Recharge Pond in Campbell, Calif., on Wednesday, May 31, 2023. (Nhat V. Meyer/Bay Area News Group)

Anyone driving around the Bay Area can see how the drenching storms that soaked California this winter filled local reservoirs after three brutal years of drought.

But the wet winter also refilled an equally — if not more important — source of water: underground aquifers. Across the Bay Area, communities that rely on groundwater, from Silicon Valley to the East Bay suburbs, have measured big increases in recent months in their subterranean supplies to some of the highest levels on record.

The unseen bounty is dramatic, and rebuts a common misperception among many Californians that groundwater always takes years to recover, or is all so hopelessly overdrawn it can never be restored. While that is true in some heavily pumped farm areas in the Central Valley, experts say, water agencies in the Bay Area that have carefully managed groundwater supplies for decades saw the payoff this winter.

Groundwater provides 40% of the water supply for 2 million people in Santa Clara County. Following more than a dozen major atmospheric river storms this winter, the main water table in the county has risen 35 feet since last June — and is up 51 feet since the most extreme part of the drought in September 2021 — returning to pre-drought levels. The county's main groundwater basin is now about 90% full.



Groundwater Recharge Ponds, looking eastward, in Campbell, Calif., on Wednesday, May 31, 2023. (Nhat V. Meyer/Bay Area News Group)

"All the rain certainly helped," said Vanessa de la Piedra, groundwater unit manager at the Santa Clara Valley Water District. "We definitely saw big increases throughout the county."

Readings taken two weeks ago show that groundwater is just 64 feet below the surface at the district's main monitoring well in San Jose near the corner of Hamilton and Leigh avenues. That's the highest level ever recorded since readings began there in 1936.

Similar rebounds have occurred in wells in Sunnyvale, Milpitas and Morgan Hill, where the main index well came up 50 feet since September of 2021 and is now at its highest level in five years.

A similar trend has unfolded at the Alameda County Water District, which provides water to 345,000 people in Fremont, Newark and Union City.

There, the water table has risen 13 feet since Dec. 31 at the Niles Cone Groundwater Basin, which provides 40% of the district's supplies.

"It's pretty dang close to full now," said Ed Stevenson, general manager for the district.

"We consider groundwater to be our most important supply because it is under local control," he said. "It's good the state's reservoirs are brimming full right now. That's fantastic. But the local groundwater is key to us."

The district diverts water from Alameda Creek into old gravel pits at Quarry Lakes park in Fremont. The dozen or so pits, where gravel was

GROUNDWATER REFILLS IN SANTA CLARA COUNTY

During the recent 3-year drought, groundwater levels in San Jose fell 31 feet from February 2020 to September 2021. But since then, they have come up 51 feet to the highest level recorded since readings began in 1936.



A chart showing the historical groundwater levels in San Jose. The chart shows that the groundwater level in San Jose fell 31 feet between February 2020 and September 2021. However, since then, the level has risen 51 feet to its highest point since records began in 1936.

taken to help build the transcontinental railroad, act as natural percolation ponds, allowing water to gradually seep back into the ground.

In Livermore and Pleasanton, the water table has risen between 30 and 80 feet, and groundwater basins are full, said Sal Seguro, a civil engineer with the Zone 7 Water Agency, which supplies water to 265,000 people in the area.

The agency is taking water it purchases from the State Water Project and using it to recharge aquifers that were drawn down during the drought, he said.

"Districts are trying to sock away as much as they can while they have it," he said. "Especially after the drought."

In Santa Clara County, there is three times as much water storage underground as the county's 10 reservoirs can hold when full. That underground water isn't sitting in giant open caverns, however. It is filling the spaces between millions of tons of sand and gravel. Groundwater projects are often cheaper than constructing new reservoirs and have less controversy than building new dams on rivers.

But because of geology or historical practice, some large Bay Area water providers don't have much groundwater, including the San Francisco Public Utilities Commission's Hetch Hetchy project and the East Bay Municipal Utility District.



Park goers enjoy fishing and paddling at Horseshoe Lake in Quarry Lakes Regional Recreation Area in Fremont, Calif., on June 5, 2023. (Dai Sugano/Bay Area News Group)

It will be a while, experts say, before the full impact of this year's historically wet winter is known on groundwater supplies across the state. Many well operators only report water levels to the state twice a year.

But some clues are emerging. Of 3,400 wells monitored by the State Department of Water Resources where measurements were taken this spring, 35% showed groundwater increases of at least 5 feet — however, 59% showed no change and 6% showed a decrease when compared with levels a year ago.

Many of the places showing the most improvement are along the coast, in the Bay Area or in the Sacramento Valley. The San Joaquin Valley has many of the wells showing continued decreases.

Geology can make a big difference. Places with groundwater only 25 feet to 100 feet below the surface recharge more quickly in wet years from rain, and water seeping from below creeks and rivers, experts say. Some areas in the Central Valley have groundwater 500 feet or deeper. They also have thick clay layers that make it more difficult to recharge over short time periods.

"If you break the state up into areas where you have shallower aquifers, like in the Coast Range, you are going to see quicker response," said Tim Parker, a veteran hydrologist and president of Parker Groundwater in Sacramento. "But in the southern part of the Central Valley, the San Joaquin Valley, the water levels are still quite low. A lot of them are at historic lows."

Decades of relentless overpumping by farmers have created a crisis in some parts of the San Joaquin Valley.

A study in December from scientists at NASA and Arizona State University found that during the most recent drought, the rate of groundwater depletion in the Central Valley was 31% greater than during the two previous droughts.

They also found that groundwater losses in the Central Valley since 2003 totaled about 36 million acre-feet, or about eight times the capacity of Shasta Lake, California's largest reservoir, near Redding.

Santa Clara County has a long history of groundwater struggles. The water table fell nearly 200 feet from 1915 to 1960 as farmers and residents of growing suburbs increased their water use. That overpumping caused the ground to fall as much as 13 feet around San Jose. But the water table began to slowly recover when the Santa Clara Valley Water District began to construct local reservoirs, import water from the Delta and impose what's commonly known as "the pump tax" to fund groundwater recharge programs. The district now has 102 percolation ponds where it moves water to recharge underground supplies.

The main underground supply, called the Santa Clara Sub Basin, is currently back up to the same level it was 100 years ago, despite the fact that the county's population has grown from 83,000 in 1910 to 2 million today.

In 2014, concerned about massive overdraft in some parts of the state, Gov. Jerry Brown signed a sweeping law aimed at better-regulating groundwater in California. It requires local government agencies in places where groundwater is most at risk to draw up plans to recover it.

Critics, including some environmental groups, say the law will take too long to make an impact. As part of a compromise with farmers, it gives areas until 2040 to bring their groundwater pumping back to sustainable levels. Nevertheless, the law could take 500,000 acres out of farm production in the San Joaquin Valley, according to some estimates by the Public Policy Institute of California.

Although Bay Area agencies have had percolation ponds and other recharge programs in place since the 1960s and before, some Central Valley communities are just getting started on major recharge efforts.

"Very few people know about these groundwater basins," Stevenson said. "Groundwater isn't as exciting as a reservoir you drive past, or the snow-capped mountains you can see. But it's just as important a water supply."

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Two of California's largest reservoirs are near 100% capacity. Here's where others stand San Francisco Chronicle | June 6, 2023 | Danielle Echeverria



Water rushes out of the Oroville Spillway at Lake Oroville on March 26 in Butte County. The California Department of Water Resources was releasing water to create room at the reservoir for anticipated snowpack melt. At the time of this photo, the reservoir stood at 82% of capacity and 118% of its historical average. Noah Berger/Associated Press

As California's record snowpack this winter continues to melt, reservoirs across the state are filling up, and two of the state's largest are nearly at capacity.

Shasta Lake in Shasta County and Lake Oroville in Butte County, where much of Northern California's water is stored, are at 98% and 99% of their total capacity, respectively, for the first time in five years, according to data from the state Department of Water Resources.

Lake Oroville, which supports 27 million Californians, has experienced water storage whiplash over the last five years — a sign of how volatile the state's hydrology has been. The last time water storage levels neared capacity was in July 2019. By August 2021, it had hit historic lows.

As with other reservoirs, the Department of Water Resources, working with the U.S. Army Corps of Engineers and local water operators, makes releases to the Feather River using the spillway at the Oroville Dam to ensure the lake does not overflow.

Water storage levels at California's reservoirs

Daily percentage of storage capacity from June 7, 2022 to June 7, 2023 Average storage is based on data from 1991 to 2020.



California reservoir levels: Charts show water supply across the state

"DWR continues to closely monitor lake levels and will adjust releases accordingly to optimize operations for water storage and environmental protection while allowing for carryover storage into next year," the department wrote in a June 2 blog post.

Shasta Lake also came close to full capacity in summer 2019 before dropping significantly in 2021.

The San Luis Reservoir by Highway 152 in Merced County is also at 99% capacity, as well as New Bullards Bar in Yuba County. Cachuma Lake in Santa Barbara County is at 101% of total capacity.

Major reservoirs serving the Bay Area



Also close to full capacity are Folsom Lake in the Sierra Nevada foothills, now at 93% of its total capacity, and Castaic Lake in Los Angeles County, at 96%.

While other reservoirs around the state are not quite nearing total capacity, most are still at or above their historic average storage levels for this time of year — a far cry from a year ago, when nearly all reservoirs were below their average levels. Statewide, water storage is at 110% of its average level for this time of year.
Water storage level across California's major reservoirs

Daily percentage of storage capacity across 48 of the state's major water supply reservoirs



from June 7, 2022 to June 7, 2023

But the high water levels aren't all good news — state officials have warned that, with rivers overflowing, some people have been swept away in the currents, leading to several reports of drownings this year.

The dangers prompted California State Parks to launch a public safety campaign last month: "This year is different."

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Reservoir data is from the <u>California Data Exchange Center</u>. One acre-foot is equivalent to 325,851 gallons. Chart: Nami Sumida and Ying Zhao

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Rights to California's most important resource are built on injustice. New legislation seeks to change that

San Francisco Chronicle | June 5, 2023 | Kurtis Alexander



The steel drum gate spillway at the Hetch Hetchy Reservoir is seen in February. San Francisco holds pre-1914 rights on the Tuolumne River, which set the stage for construction of the reservoir. Carlos Avila Gonzalez/The Chronicle

Who gets California's water, and how much, is a high-stakes affair, and it's based on a system of water rights born long ago, when the West was wild — and often unfair.

The first-come, first-served pecking order established during European settlement gave the new and dominant landowners first dibs on pumping rivers and creeks. The beneficiaries, which include the likes of San Francisco and its pristine supplies in Yosemite, continue to enjoy tremendous advantage, consuming water with little constraint while others sometimes go without.

Amid growing water shortages and focus on equity, the system has begun drawing increased scrutiny. Last week the state Legislature weighed in with the unusual step of advancing measures that would help regulators rein in the most privileged and profligate water users.

"The Legislature is finally considering water rights in California," said Gary Mulcahy, government liaison for the Winnemem Wintu Tribe, a Native American group in the state's far north that, like other tribes, didn't get water rights for ancestral lands. "How water is allocated in California has got to change, for the benefit of Californians, not for the benefit of a few."

The three bills before lawmakers, each of which passed in its house of origin last week, do not mark a major undoing of the state's water hierarchy. However, they're enough of an adjustment that they're drawing pushback from cities and agricultural communities concerned about losing their standing, and most fundamentally their water, in the face of greater regulation.

Critics of the bills say that tinkering with a system that's been around so long, even if it's imperfect, will create uncertainty with water supplies and could destabilize everything from housing development to farming to manufacturing. Billions have been invested in capturing and moving water in California based on existing rights.

"We're a cornerstone of the Bay Area economy," said Steve Ritchie, assistant general manager of the water enterprise for the San Francisco Public Utilities Commission. "We constantly are having to plan not just for this year and 10 years from now but for 50 years out. Once we get users in our system, we can't just cut them off one day and say, 'Sorry, we're out of water.'"

California's most senior water rights holders gained their status by making claims on rivers and creeks before 1914, when the state didn't regulate draws. San Francisco holds pre-1914 rights on the Tuolumne River, which set the stage for construction of the city's invaluable Hetch Hetchy Reservoir in Yosemite National Park years later.

Questions have long lingered about what jurisdiction the state has over senior water rights. During the drought of 2012-2016, the State Water Resources Control Board tried to limit, or "curtail," the draws of pre-1914 rights holders amid widespread water shortages. The action, however, was challenged in court, only to undergo years of litigation that ended in September when an appellate district court ruled against the state.

Assembly Bill 1337, one of the three pieces of advancing legislation, would reaffirm the state water board's ability to curtail the most senior water rights holders. It was introduced by Assembly Member Buffy Wicks, D-Oakland.

"Legislative proposals like this that shore up the board's authority and embolden the board to be more aggressive go some distance," said Stephanie Safdi, clinical supervising attorney and lecturer at Stanford Law School.

Safdi was among those who supported the state in its legal fight with water users, filing an amicus brief last year on behalf of a handful of tribes and an environmental justice group. The filing described the water rights system as "discriminatory" and "racist" because of those who were — and weren't — able to get historical water rights and for perpetuating these injustices today.

Critics of AB1337 fear the proposal would lead to new and unwarranted curtailments by the state water board.

A second piece of legislation, AB460, would streamline the state water board's ability to crack down on water rights holders who illegally take water and boost fines to as much as \$10,000 a day. It was authored by Assembly Member Rebecca Bauer-Kahan, D-Orinda.

The bill follows a highly publicized incident last year along the Shasta River where farmers and ranchers flouted state curtailment orders. The group calculated that going without water was more costly than paying the penalties.

Because state law affords time for water users to request a hearing and time before cease-anddesist orders become final, the water board didn't act quickly enough to stop the draws. The pumping was blamed for reducing river flows and killing salmon.

Opponents of the legislation say one egregious incident shouldn't lead to throwing out due process.

"None of us condone diverting water illegally," said Brian Poulsen, general counsel at the El Dorado Irrigation District, a water agency serving about 125,000 people east of Sacramento. "We just think the bill goes way beyond."

A third bill, SB389, would give the state water board greater authority to investigate the authenticity of senior water rights and strip the rights of those deemed illegitimate.

The legislation, authored by Ben Allen, D-Santa Monica, flips the burden of proof from the state to the water rights holder, which concerns critics. Water rights dating to 1914 and earlier can be tough to document, and some fear the state water board may be overzealous in its demands for evidence.

While SB389 is advancing to the state Assembly, the other two water bills are headed to the Senate. If the legislation passes in these chambers, they proceed to Gov. Gavin Newsom for final approval.

Stockton-based Restore the Delta, an advocacy group that for years has been fighting for more equitable water allocation in California, supports the trio of bills, calling them a first step to making bigger changes to the water rights system.

"They're an excellent start in terms of gaining accountability of these legacy water right holders," said Tim Stroshane, the organization's policy analyst.

Cannon Michael, an influential grower and president and CEO of Bowles Farming Company, agrees that some improvements to water rights policy are necessary, just not as many.

"I think the state board needs to have more power," Michael said. But "as soon as you start saying you're going to take something away or blow up a system, that's when you start putting people in their corners."

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Improvised, spotty and belated: Will California reform its oversight of water rights? LA Times | June 5, 2023 | Ian James



An irrigation canal that feeds a rice field in Knights Landing. California legislators are considering proposals to strengthen oversight of water rights. (Max Whittaker/For The Times)

California's complex system of water rights took shape starting in the mid-1800s, when settlers saw the state's water as abundant and free for the taking — a time when a Gold Rush prospector could stake claim to river flows simply by nailing a notice to a tree.

Today, California's oldest and most senior water rights — called riparian and pre-1914 rights — have been passed along to thousands of agricultural landowners, irrigation districts and urban water suppliers that claim control of roughly one-third of the water that is diverted from the state's rivers and streams.

But increasingly, California water regulators are struggling to manage supplies for 39 million residents, agriculture and the environment as climate change warps the hydrologic cycle and brings longer-lasting and more severe droughts. Legal experts say the way the state manages this antiquated system is in dire need of reform. Among other problems, they say, current law prevents officials from verifying whether claims of senior water rights are valid, ordering those water users to reduce usage, or imposing fines that are large enough to penalize those who flout the rules.

Three bills gaining momentum in the Legislature are seeking to change that, even as they draw heated opposition from water agencies and agricultural groups.

"These bills show that the Legislature is taking a serious look at bringing more comprehensive and consistent regulation to water rights — and empowering the State Water Resources Control Board to do the job California needs it to do," said Nell Green Nylen, a senior research fellow at the UC Berkeley School of Law's Wheeler Water Institute.

Green Nylen is part of a group of legal experts who recently published a state-funded report outlining recommendations for legislative and policy changes to improve oversight and management of the water rights system. She said the bills in the Legislature would partially address some of their recommendations, while still leaving some "concerning gaps in the state's ability to manage water scarcity."

One bill — AB 1337, introduced by Assemblymember Buffy Wicks (D-Oakland) — would clarify that the State Water Board has authority to issue a curtailment order for all diverters, including senior rights holders. The legislation was drafted in response to a recent decision by an appeals court, which sided with water agencies in the Sacramento-San Joaquin River Delta that had challenged the state's authority to order cuts. In its decision, the court suggested it's up to the Legislature to determine whether it's time to update the law.

Another measure approved by the Senate, SB 389, would give the State Water Board the authority to investigate and verify whether the claims of senior rights holders are valid and accurate.

"They've got to have more tools at their disposal to better understand the rights system as it exists," said Sen. Ben Allen (D-Santa Monica), who introduced the proposal.

California's existing water rights allocate far more water than is available in an average year, Allen noted, and state water regulators are tasked with making the system work through increasingly intense droughts.

The change would help the water rights system function the way it's supposed to, "before we run out of time to fix it," Allen said.

Another bill, AB 460, would strengthen the State Water Board's enforcement powers to stop illegal water diversions and would sharply increase fines for violators.

The bill is intended to prevent the sort of violations that occurred in August in the Shasta River watershed, when farmers and ranchers who belong to the Shasta River Water Assn. defied a curtailment order for eight days and diverted more than half the river's flow, flouting requirements aimed at protecting salmon. The State Water Board fined the association the

maximum amount for the violation: \$4,000, which worked out to about \$50 for each of its members.

The case led to widespread calls for larger fines and stronger enforcement powers.

"If we have scofflaws out there taking water that is not theirs, then it really messes up the entire system," said Assemblymember Rebecca Bauer-Kahan (D-Orinda), who introduced the bill.

The bill would give the State Water Board the authority to issue temporary orders to stop the illegal taking of water, and would increase fines for violations to up to \$10,000 per day, plus \$2,500 per acre-foot of water diverted. (An acre-foot is 325,851 gallons, or enough to cover one acre a foot deep.)

Some environmental groups and tribes have called for a major overhaul of the state's water rights, arguing that the current system was built on a foundation of violence against Native people, the taking of land from tribes, and systemic racism that long prevented people of color from securing water rights.

Supporters of the reform proposals in the Legislature say the bills aren't meant to radically change the existing system, but rather to make a dysfunctional system work.

"These modest changes are a first step in retrofitting the water rights system for the 21st century challenges ahead," said Amanda Fencl, a senior climate scientist for the Union of Concerned Scientists. She said the measures offer critical updates to enable the State Water Board "to make informed and timely water management decisions and build climate resilience for the future."

The proposals are facing opposition from many water agencies and groups representing the agriculture industry.

The three bills "all create increased uncertainty in the water supply, which would make it harder for growers to plan — and could result in fewer planned acres of food grown," said Gail Delihant, senior director of California government affairs for Western Growers, which represents more than 1,500 crop growers, packers and shippers.

Delihant said the measures represent "attempts to destabilize the water rights system in California."

Also opposing the bills is the Assn. of California Water Agencies, or ACWA, which represents about 460 public agencies that deliver water to cities and farms. Kristopher Anderson, a legislative advocate for ACWA, said the bills "present a foundational change in the way California's water rights system is implemented, managed, and enforced."

"They would authorize the State Water Board to impose punitive penalties on even law-abiding water right holders, curtail water rights in any year, and strip entities of their water rights," Anderson said. "This package of legislation would create significant uncertainty, and lead to unintended consequences, for not just water right holders themselves, but communities and businesses across the state that depend on a reliable water supply."

Anderson said water agencies that belong to the association agree that higher fines are necessary to deter violations, such as those that occurred on the Shasta River last year. But he and other opponents argued the proposal is overly broad and goes beyond what is necessary.

In a letter opposing Wicks' bill, representatives of dozens of water districts and agriculture industry groups said they support proposals to "modernize administration" of the water rights system by improving how the state collects and manages data, and by deploying more stream gages, among other steps. They argued that as it stands, the proposal "threatens to remake the way water rights are managed in California by employing a top-down approach that would override decades of successful collaborative water management practices."

State officials are working on a project to modernize California's water rights information system by digitizing about 7 million pages of paper records. But officials have said that even those extensive records in many cases don't include original documents that show proof of pre-1914 water rights, which were grandfathered in under the 1913 Water Commission Act. That act established a permit process for rights from then on.

In a February meeting, state officials said there are currently about 2,600 riparian and pre-1914 water rights claims in the San Joaquin River watershed, and more than 3,900 rights claims in the Sacramento River watershed. The rights are held by various entities and individuals, among them agencies that supply cities and agricultural irrigation districts supplying farms that produce nuts, cotton, rice and other crops.

In their recent report, Green Nylen and other water law researchers recommended various changes to establish what they say would be a fair and effective framework for curtailing water rights. They said that the Legislature should clarify, among other things, that the State Water Board has broad authority to order curtailments for all diverters, including those with the oldest rights.

The researchers said the State Water Board "needs to implement curtailments on a regular basis, not only in times of extreme crisis or only in certain watersheds." They noted that other Western states routinely curtail water rights in this way.

"Drought response has been improvised, spotty and belated," said Dave Owen, a professor at UC College of the Law in San Francisco.

"If you talk to people at the board, they will bluntly tell you they're incredibly frustrated with their inability to gather information that they think they need. And then there are anemic enforcement

mechanisms," Owen said. "We just have this huge mismatch between major problems, big expectations for the agency and a fairly weak set of implementation tools. And it just means that we sort of default to the status quo. We default to improvisation or we default to letting people just kind of do what they want with water — unless it is so egregiously obvious that there is a problem that we have to step in."

Michael Kiparsky, director of the Wheeler Water Institute at the UC Berkeley School of Law, said it's vital that state officials look ahead now to improve how the system functions to respond to the next drought.

"Our system for water administration in California just doesn't work," Kiparsky said. "It doesn't work because the state doesn't have the tools it needs to do the basics. Those basics include figuring out who should have the right to divert water from rivers and streams at any particular time, and telling those who should not be diverting water that they can't. It's a very basic function."

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Ian James is a reporter who focuses on water in California and the West. Before joining the Los Angeles Times in 2021, he was an environment reporter at the Arizona Republic and the Desert Sun. He previously worked for the Associated Press as a correspondent in the Caribbean and as bureau chief in Venezuela. He is originally from California. (This page was intentionally left blank)

Legislation to curb water use for irrigation clears California Assembly

Spectrum 1 News | June 2, 2023 | Susan Carpenter



(AP Photo/Rich Pedroncelli)

SACRAMENTO, Calif. — A pair of California bills aimed at curbing water use for landscaping has cleared the California State Assembly.

On Wednesday, AB 1573, which requires the use of California native plants, and AB 1572, banning the use of potable water for irrigation on non-functional turf, passed onto the Senate.

What You Need To Know

- AB 1573 requires the use of native plants in new and renovated commercial and industrial areas, including parking lots
- AB 1572 prohibits the use of potable water to irrigate any turf that isn't used for recreation or community space
- The bills passed the California State Assembly Wednesday
- If passed, AB 1573 would be phased in starting Jan. 1, 2026, and AB 1572 would phase in starting Jan. 1, 2027

"Landscaping has so much potential to support California's important goals to conserve water, support biodiversity and connect more people to nature," Assembly member Laura Friedman, D-Burbank, said in a statement.

Friedman is the author of both bills.

AB 1573 is the first bill of its kind that seeks to replace the use of decorative grasses in new and renovated commercial and industrial areas, including parking lots.

If signed into law, it would require that such areas use 25% local native plants beginning Jan. 1, 2026, and increase to at least 75% beginning Jan. 1, 2035.

Friedman said the bill addresses the interdependence of native plants, insects and birds in maintaining biodiversity. Friedman cited a recent report from the nonprofit NatureServe that found 34% of plants and 40% of animal species in the U.S. are at risk of extinction.

California, it found, has the highest percentage of at-risk species.

"We understand that our industry partners — growers, nurseries and landscapes — need time to prepare and adapt," Friedman said of the bill that focuses only on commercial and public works projects, not home landscapes, edible gardens or lawns used for recreation and civic gatherings.

AB 1572 takes a similar phased-in approach to AB 1573. If passed, starting on Jan. 1, 2027, AB 1572 would prohibit the use of drinkable water to irrigate any turf that isn't used for recreation or community space on all properties owned or leased by the Department of General Services.

One year later, it would expand to properties owned by local agencies and public water systems. By Jan. 1, 2030, it would apply to common areas of all multifamily residential properties, and by Jan. 1, 2031, to all common areas of multifamily residential affordable housing properties.

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Supreme Court scales back clean water protections. What does it mean for California? The sun sets over a river.

LA Times | May 28, 2023 | Ian Jamesstaff



The San Joaquin River in Isleton.(Gary Coronado / Los Angeles Times)

The Supreme Court's landmark decision scaling back federal protections for many wetlands and streams has drawn criticism from scientists and environmental advocates, who say the gutting of safeguards will jeopardize water quality throughout the arid West.

California's water regulators say the ruling will be harmful for protections nationwide, but the more stringent state protections of wetlands won't be affected.

To examine the implications of the ruling, The Times spoke with Joaquin Esquivel, chair of the State Water Resources Control Board, about the potential effects of limiting federal protections under the Clean Water Act and how the board will continue to regulate wetlands and streams under the state's Porter-Cologne Water Quality Control Act.

Esquivel stressed that because more than 90% of California's wetlands have already been drained and destroyed, strong protections for those that remain are vital. He said California's stringent protections will continue to safeguard wetlands and streams, even as the court's

decision narrows the authority of the federal Environmental Protection Agency and the U.S. Army Corps of Engineers.

One of the biggest areas of concern is the Colorado River, he said. The ruling will put at risk water quality in intermittent streams and wetlands that feed the river. That could affect quality — and treatment costs — for one of Southern California's major water sources.

What does this decision change in terms of protections for streams and wetlands?

It's pretty devastating nationally. You look at the reality of what we know to be the science and the facts of the way our watersheds work, and the real importance of the Clean Water Act. When it comes to the streams and wetlands that are no longer protected, there's no longer a permit or requirement to abide by rules and standards that ensure that you protect the water and the quality of water downstream from those wetlands and streams. And so, we're not going to wake up and see this damage, but as additional development is undertaken, as activities happen, there won't be protections or won't be permits for activities that pull up wetlands, that degrade the quality of downstream waters.

Aren't there protections overseen by the State Water Resources Control Board that accomplish the same thing or better?

Yes, that is correct. Porter-Cologne is a little over 50 years old. It was the model for the Clean Water Act. And so here in the state, we're fortunate because the board did update its wetlands definition in 2019 to ensure that, because if you really think of it as a circle, the protections in the state waters and the protections that Porter-Cologne affords are larger than what the federal Clean Water Act and purview are. The caveat, and an important one there, is that it will impact interstate waters — so, most important, the Colorado River and the protections that really Southern California depends on.

Does the Supreme Court decision affect areas like the Sacramento-San Joaquin River Delta and San Francisco Bay?

No. When it comes to the legal protections within the law, within the state here, they are maintained. The difference is the reliance on federal resources and or permits, or state resources and permits to accomplish the protections. But the legal protections, the fundamental protections, are there.

Does it mean that the federal EPA will be doing less oversight of surface water bodies in California, and the state water board will basically be doing the same work it's already doing?

Yes, that is the case. And the Army Corps of Engineers is another permitting entity within the Clean Water Act. It does a lot of important work within the state. Those wetland delineations and

work the feds would cover would be shifting to the state. So it's both the EPA and Army Corps that are probably most impacted on what their purview and work would then be covering.

Are there negatives to losing that federal oversight and regulation in California, even though the state has relatively stringent regulations?

Yes. There are resources the federal government would otherwise contribute to the state and [to] interstate waters like the Colorado River. There is real material impact to us there. It's also just regrettable loss of protections across the nation that the Clean Water Act was providing us. It is unfortunate to see a discontinuity of those federal protections continue to emerge. We're seeing this kind of reversion to [where] you either have a state that's being more protective or not, because of a rollback of fundamental federal protections.

How many streams or wetlands in California no longer fall under federal protections as "waters of the United States" with this decision?

I think we may have some sense of that. The problem is, we've never had a real good, federal tool that delineates all this. It's often a permit-by-permit, case-by-case delineation by the Army Corps. The work by the permitting agencies is what actually determines oftentimes if it is a wetland that's covered and protected, either from the federal or state purview. So it's hard to easily come up with ... what percentage of wetlands or what percentage of our features might lose that sort of protection.

(The State Water Board staff said the agency is unable to provide an estimate of the acreage of wetlands in California that have lost federal protection under the ruling.)

One of the criticisms of the ruling is that it ignores the connection of groundwater to surface water. What do you think about that?

By saying that a wetland needs to have a significant surface connection to streams, and or a connection to the federal bodies for the purposes of the Clean Water Act, it ignores what we know is subsurface flow, oftentimes from either wetlands or creeks. And just because you don't see a significant surface flow between the features doesn't mean that they aren't actually connected. The federal Clean Water Act isn't supposed to apply to groundwater. But we know there is connectivity oftentimes. So it's problematic that we see the court has taken this idea that the wetland must have a significant surface flow. Really problematic. It doesn't conform with the way we know our watersheds work.

What's the best way to summarize what California's Porter-Cologne Water Quality Control Act does independently of what the federal government is doing?

Ultimately, the federal Clean Water Act was modeled off Porter-Cologne. Here in the state of California, we have the irrigated lands regulatory program. It regulates nitrates. And we do so under Porter-Cologne, not under the Clean Water Act, because the Clean Water Act is limited.

So it's always been the case that Porter-Cologne, the state's water quality laws, are more encompassing than the federal law, although there is significant overlap, certainly. And because we adopted definitions around what a wetland is already, we better conformed and standardized that regulatory program so that it can be ready to absorb any contraction from the federal government around their definition and their work.

How does the decision affect the streams that feed into the Colorado River, and how could that affect water quality?

It's ultimately the impact to the quality of water that flows down and through the Colorado mainstem. These wetlands, ephemeral streams and other features that aren't protected may be developed over, or are no longer able to function as they are, [and] have impacts ultimately on the quality of water being served to Southern California. ... We know for every 100 milligram per liter increase in total dissolved solids that makes its way to Southern California, it's like \$200 million a year in economic impacts. That's impacts in the need to additionally treat, impacts in the ability to reuse that water, at a time when we know we're investing in water recycling in Southern California.

Do you think it will affect Colorado River water quality?

I think that will really depend upon the various states and the protections within them. Once you fill in a wetland, once you develop and once we find ourselves continuing to remove these features — as we see now in the state, with 90% of them having been developed over — it's hard to get them back. The real concern is what we'll find ourselves with after a decade of a lack of protections and ... moving back from the real progress that's been made by the Clean Water Act. You look at the last 50 years, and I think it's really easy for many of us to take for granted. I know it is for me, who was born in 1982 and have largely known a time when these protections were in place, and we were moving here — and are moving continuously — toward actually remedying what was a lot of damage that was done to a watersheds. It's easy to forget.

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Opinion: California water proposal has dark, hidden currents

Bill will upend due process for water rights holders, creating massive supply uncertainties Mercury News | May 27, 2023 | Jerry Hill



Former state Sen. Jerry Hill writes that three bills currently moving through the California Legislature – SB 389, AB 1337, and AB 460 – aim to provide the State Water Resources Control Board with new authorities to regulate water. (Josie Lepe/Bay Area News Group)

When's the last time you thought about where your water comes from? If you aren't steeped in water policy, it's fair to assume you may not appreciate the complexities of managing our water systems. But what's vital to know is that water is the essential building block to ensure prosperous, healthy communities.

This resource ensures housing gets built, people can afford groceries and local businesses can offer good jobs. Legislation introduced in Sacramento creates uncertainty that threatens these underpinnings of our economy.

As a former legislator, I trust that my former colleagues had the best intentions in putting these policies forward, but residents should be aware that these bills are far reaching and will create dramatic changes that increase costs.

Three bills currently moving through the California Legislature - SB 389, AB 1337, and AB 460 - aim to provide the State Water Resources Control Board with new authorities to regulate water. On the surface, this may seem like a good idea, but still water runs deep.

These bills will effectively upend due process for water rights holders in California and empower Water Board members to supersede California's state court process. This will create massive uncertainty of water supplies that serve as the lifeblood for us and to numerous industries.

I understand the challenge of crafting complex water policies that support diverse needs. During my time in the Legislature representing San Mateo and Santa Clara counties, I worked with colleagues, the State Water Board, regional water suppliers and constituents on policies that improved water management statewide. I made progress by streamlining compliance standards for urban water suppliers, curbing excessive water use in residential areas and allowing the San Francisco Public Utilities Commission to complete work on construction projects integral to water capture and storage throughout the Bay Area.

Our region needs to build 441,176 units of housing over the next eight years, with over 180,000 units available to low-income residents. Housing developers must prove they have access to sufficient water supply in order to build new housing. Instead of eliminating the constraints to new development, these bills will contribute to the problem by creating water supply uncertainty.

According to agricultural experts in the state, transforming the water management system will also hike up the price of food. More than 1 in 10 people in the Bay Area are food-insecure. Upending water rights law will inevitably increase costs to the agricultural industry. This will hit consumers at the grocery store, with those most affected being the ones who can least afford it.

Jobs would also be in jeopardy. The construction and agriculture industries account for over 100,000 jobs in San Francisco, Oakland and Richmond alone. Each of these professions rely on the certainty of water rights, allowing them to ensure adequate supply of the resource. Without this certainty, businesses facing increased costs for water and uncertainty of water supply may be forced to halt operations or cancel projects, leaving workers without jobs and development delayed or unfinished.

I shared what we could be facing, but the reality is that we don't know the extent to which these bills could harm us. Lawmakers haven't seriously considered this. I know there are tradeoffs in any legislative process – but the Legislature should aim to fully understand these tradeoffs before acting.

I appreciate the difficult task legislators have in front of them to balance competing priorities. But when it comes to water, we simply can't afford leaks throughout our entire state's economy.

Jerry Hill is a former state senator and assemblyman 19th District who represented San Mateo and Santa Clara County residents in the California Legislature.

California's once-dead Tulare Lake may be at peak size. Here's how big it is

Revived lake is sprawling across roads, farms and homes, but avoiding worst-case scenarios. San Francisco Chronicle | June 6, 2023 | Kurtis Alexander



Tulare Lake, the historical body of freshwater that unexpectedly re-emerged in the San Joaquin Valley with the winter deluge, may have reached its peak size this week: about 178 square miles or nearly the size of Lake Tahoe, according to new state estimates.

The revived lake came to life in March, flooding roads, farms and even homes, and has continued to grow as record snow from the nearby Sierra Nevada has melted into rivers that feed the basin.

Models released Tuesday by the state Department of Water Resources, based on last month's runoff forecasts, show the lake's floodwaters likely topping out last Friday, with inflow reduced to just one river, the Kings. Measurements this week show the lake larger than Friday's projected peak, but the difference is slight – all of which suggests the waters have crested or soon will.

"It's not projected to go much higher than what we've seen," said Boone Lek, a senior engineer at the Department of Water Resources, who is working as part of a state team mobilized to provide information for flood response. As damaging as the flooding has been, the new state projections mirror a forecast late last month that suggested the lake does not pose a worst-case scenario, in which local communities become submerged.

State officials credit the rosier picture to a gradual melting of snow, as opposed to a rapid thaw prompted by a heat wave, combined with the ability of water managers in the region to capture the runoff and keep it out of the lake bed. Dam managers, for example, have limited the water sent from upstream reservoirs.

"The weather has really cooperated with us, with the cooler temperatures, but the Army Corps (of Engineers) has done a good job of managing releases," said Mehdi Mizani, deputy state floodplain manager for the Department of Water Resources.

The decline of the lake is expected to be very slow, with the most likely scenario being a 13% decrease by the end of July, according to the state models. Some water experts say it could take two years for all of the floodwater to fully recede.

The lake, between Fresno and Bakersfield, was reborn when storm-swollen rivers and creeks in the southern Sierra Nevada became too much for the area's dams and levees.

The runoff that is typically captured by the region's water infrastructure, then diverted to the vast farming industry there, instead poured into the former lake bed, which now contains mostly row crops and orchards and a few small towns.

The Kings County city of Corcoran, the biggest community in the basin, has remained concerned about water overtopping its levee and drowning neighborhoods and a state prison complex. The local flood district has launched a massive effort to raise the city's 15-mile levee.

The new state projections suggest that the lake's elevation is most likely to peak at 180.8 feet above sea level, shy of Corcoran's levee, which rises to 188 feet above sea level. Even the most extreme scenarios produced by the models show the water level cresting well below the top of the levee.

Growth of Tulare Lake since March

Tulare Lake, before it began to go dry in the late 1800s, was the largest freshwater body west of the Mississippi River. It was shallow, no more than 50 feet deep, but during wet years stretched 800 square miles or more.

Lake Tahoe, by contrast, is about 191 square miles, though it's much deeper.

Comparing California's largest lakes



Chart: John Blanchard / The Chronicle · Source: Sentinel Hub, May 28. Comparing the rejuvenated 2023 Tulare Lake with Lake Tahoe

The native Yokuts lived, fished and hunted along the shores of Tulare Lake, where elk and antelope, countless migratory birds and terrapins, frogs and fish teemed amid tule reeds and cattails. The 19th century communities ran boats across the water.

This lake's appearance this year is much different than what it once was, looking more like a misplaced body of water in the heart of farm country than a sprawling natural wetland.

Tulare Lake has returned a handful of times since it dried up, 1983 marking the last reemergence to the current extent. Then, it took nearly two years for the floodwaters to evaporate. The basin essentially has no outflow.

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Every drop counts: experts encourage continued water conservation

Fresno State News | June 5, 2023 | Eddie Hughes



Regions and communities across California are still grappling with water supply shortages, despite the relief brought by this past winter's storms. While the precipitation offers some hope, it provides little consolation to communities reliant on depleted groundwater sources.

"It could be raining and flooding outside but when they turn on the faucet, nothing comes out," said Laura Ramos, interim director of the California Water Institute's Research and Education Division at Fresno State.

There are still thousands of Californians living in rural and disadvantaged areas who face the distressing reality of dry wells.

On average, about 40% of the water used by California residents comes from groundwater. It can take anywhere from months to several years for water to percolate into the water table, depending on the soil above. Sandy soil allows for faster percolation of water, while clay, which is less permeable, takes much longer.

Areas in the Central Valley have both sandy soil and layers of clay, which cause varied groundwater recharge rates. In some places the water table has risen by several feet already since the seasonal storms, Ramos said, while other areas remain unchanged as the water slowly makes its way down.

"Water goes where it's easiest," she said. "It will still make its way down through clay, but not as fast as through the sandy layers."

Cordie Qualle, a lecturer in the Lyles College of Engineering at Fresno State, said more water is used than is replenished during a drought. While this may not pose a significant problem after a year or two of drought, he said it becomes increasingly problematic when it persists for three to five years. Such situations lead to drought declarations, water usage restrictions and limited allocations through the State Water Project and the Central Valley Project.

"That's what happened to the water levels in all the reservoirs in California, essentially — they dropped because we took out more than was added by precipitation," Qualle said.

While Qualle said future planned reservoirs would help manage the state's water more efficiently over time, they wouldn't necessarily change drought conditions. Due to finite reservoir storage, once those reservoirs are full, all the excess water gets spilled.

Water management is not an issue that can be addressed on a year-to-year basis, Qualle said. Current reservoir storage systems are based on a quasi-static model with minor fluctuations, he said, but climate scientists are predicting that the state will continue to experience drier dry years and wetter wet years.

"They seem to be right," Qualle said. "We will have four to five years of really dry and then a wet year or two of insane runoff, and then back to the dry."

The recent winter exemplified this, with one of the wettest years on record following three of the driest consecutive years.

What's needed moving forward, Qualle said, is to restructure our understanding of hydrology and of how our water infrastructure works. He said we need to think about how to maximize our infrastructure to increase groundwater and surface storage so we can capture and store more excess runoff events for the next drought period, which is coming.

"It's not a matter of whether we're in a drought or in an excess water year – we're just in a situation where every drop of water counts," Qualle said.

Although California Governor Gavin Newsom rolled back some of the state's most stringent drought restrictions in March, including a voluntary 15% reduction in water use that had been in place since July 2021, Ramos urged Californians to continue their water conservation efforts, even during wet years like this one.

"If we continue to conserve, water managers will have more surface water available to put into groundwater recharge systems to bank water in the aquifer for future years."

Race to move water underground on as California's Central Valley overflows

One of California's most susceptible regions to disastrous flooding faces dangerous conditions as the historic new snowpack melts. But there may be a silver lining in the floodwaters. Courthouse News Service | May 30, 2023 | Natalie Hanson



A recharge basin fills with water in California's San Joaquin Valley, as snow from recent storms melts. (Natalie Hanson / Courthouse News)

BAKERSFIELD, Calif. (CN) — After an unexpected wet winter, California's drought-addled Central Valley now faces dangerous floods as a historic snowpack melts — even as the state moves to store the liquid gold as quickly as possible.

Once the largest freshwater lake west of the Mississippi River at about 650 square miles, it hosted a diverse ecosystem and many Indigenous people. When the lake dried as rivers were diverted for cities and farming, agricultural communities appeared thanks to the rich soil.

Today, the basin spans several counties and produces more than half of the state's agricultural output, according to the Public Policy Institute. Those crops account for 97% of regional water use, often relying groundwater pumping in dry years.

Without an outlet to the ocean, water normally leaves the basin through evaporation and agriculture. The lake occasionally reappears in particularly wet years. Snowpack from recent storms melts into about 4 million acre-feet of additional runoff, leaving 103,000 acres underwater. Communities within the Tulare Lake Basin will be on flood alert well into July.

UC Davis professor Thomas Harter, Hydrologic Sciences Graduate Group chair, said whiplash from drought to floods makes water management very challenging. Local agencies must negotiate with farmers about capturing water, and finding land where it can soak into the ground — called recharge basins.

"The looming question with the snowpack sitting up there is, is there a way we can store this water for a drier year?" he said. "The basin's shortfall is not going to go away."

Tricia Stever Blattler of Tulare County Farm Bureau said the agricultural community is too focused on keeping their heads above the water to rejoice about drought relief.

In March, many miles of farmland and roads were covered in water. Months later, landowners face financial losses — at least \$160 million in reportable losses in Tulare County alone, Blattler said. And their fields remain flooded.

Some landowners are already diverting flood water to help it soak underground, off to aquifers to recharge depleted groundwater storage, Blattler said. They are using Governor Gavin Newsom's executive order allowing people without water rights to divert floodwater away from communities, off to basins or fallowed land.

"We are totally at the mercy of needing to comply with the Sustainable Groundwater Management Act as part of any recovery effort," she said, referring to the law that requires local groundwater sustainability agencies to develop and implement plans to bring groundwater basins into balance by 2040.

On May 17, Newsom signed an order to send Kern River overflows into the California Aqueduct, which eventually flows to Southern California. Daniel Wisheropp of the State Water Project said this is the first time the diversion point, called the Kern River Intertie located west of Bakersfield, has been used since 2006.

Mehdi Mizani, manager of Tulare Lake Basin's planning unit, said the areas most likely to flood will reach peak inundation levels by May 31. The most at-risk areas could see about 117,000 more acres under water.



An aerial view of the Kern River Intertie and a section of the State Water Project California Aqueduct, in Kern County, Calif. on May 15, 2023. (California Department of Water Resources via Courthouse News)

Meanwhile, California plans to boost the number of facilities and acres where floodwater can be diverted to seep into the ground, recharging aquifers.

State Water Project deputy director Paul Gosselin said California has enough land to recharge about 2 million acre-feet of water, and could add nearly 300,000 acre-feet through new recharge projects. The average U.S. household uses about an acre-foot of water a year.

The state has \$2 million for "rip and chip" projects — fallowing cropland into permanent recharge lands — and restoring flood plains. Flood plains take water from overflowing rivers, relieving pressure on levees and helping water move underground. Nearly 3,000 recharge basins are active in the valley, with more than 100 operated by Kern River Water Authority in Bakersfield to divert water from Kern River and the California Aqueduct and put it back into the ground.

But residents worry agencies are not moving fast enough to prioritize the replenishment of domestic wells and that private agricultural interests may use the lion's share on crops.

This year, Melynda Metheney's community in West Goshen finished connecting all residents to Cal Water after more than a decade of demanding clean water. Metheney said residents worry that authorities allocating the runoff will prioritize farms.

"They really should be allocating it to residents and to private wells, to at least to get them through for a little while until we can figure out what's going to happen," she said. "But I don't think that's going to happen. At the end of the day, money talks."



About 100 recharge basins reside within a land conservation habitat area in California's Central Valley, operated by Kern River Water Authority. (Natalie Hanson / Courthouse News)

Jeffrey Mount, founding director of the Center for Watershed Sciences and Public Policy Institute fellow, said if water permitholders want to save land for crops, the state may pressure them not to pump groundwater this year.

The institute posited that although San Joaquin Valley authorities don't want state oversight, recent floods show that counties need local cooperation agreements on what to do when rivers overlapping county borders overflow.

Mount said he thinks this year is a test run — for California to establish more effective water management strategies, and for water rightsholders to adapt and avoid losing precious new water.

"What we haven't grappled with is that it takes extraordinary discipline not to use all of the available water," Mount said. "We're still figuring this out."

Harter said it is not impossible for agencies to establish successful partnerships with landowners and secure land for capturing water. He pointed to the example set by McMullin Area's groundwater agency in Fresno County, partnering with landowners to make the region a water bank.

But Helen Dahlke, an integrated hydrologic sciences professor at UC Davis, is more pessimistic. Most senior water rightsholders want to see water captured in reservoirs and are hesitant to continue making cuts.

"They do whatever is in their economic interest," Dahlke said. "It is not in line with protecting, for example, the impoverished communities."

Dahlke said although the state has some oversight, it is not clear how practices in regions whose groundwater management plans were rejected will change. But court battles appear likely.

"The losers, of course, are going to be people that are relying on shallow domestic wells and groundwater for their water supply," Dahlke said.

"I'm not sure how we're going to solve the politics of this. People have to come together and want to do this."



The Kern River in California's southern San Joaquin Valley rages with new melting snowpack and requires a major local and state effort to manage. (Natalie Hanson / Courthouse News)

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Sites closer to a reality with state water board decision

Appeal Democrat | June 5, 2023 | Appeal Staff

Sites Reservoir, which could provide 1.5 million acre-feet of additional water storage capacity, received a significant boost late last week when the Sites Project Authority was notified by the State Water Resources Control Board (SWRCB) that the reservoir's water right application was deemed complete.

Because of this action, the Sites Reservoir project is now able to move forward to the next step in the process of getting a new water right permit for the project.

The project, which has been in the works for more than 60 years, hopes to turn the Sites Valley, located 10 miles west of Maxwell where Colusa and Glenn counties meet, into a state-of-the-art off-stream water storage facility that captures and stores stormwater flows in the Sacramento River – after all other water rights and regulatory requirements are met – for release in dry and critical years for environmental use and for communities, farms and businesses statewide to utilize when needed, the Appeal previously reported.

Once the Sites Project Authority receives a water right permit, it will give the Authority "legal authorization to divert water within certain conditions, for a specific purpose, and for use within a specified area," Sites Project Authority officials said. As a result, the Sites Project Authority will be considered the state-designated steward of the water right for the Sites Reservoir project.

"We are excited to move into this next phase of the permitting process, which builds on the momentum we've had this past year," Jerry Brown, executive director of the Sites Project Authority, said in a statement. "We welcome the public review of our work, and we are confident in our analysis that the Sites Reservoir Project can safely and reliably serve as a key component of new infrastructure to manage California's water in light of our changing climate."

In order to move forward with the water right application, officials with the Sites Project Authority said an extensive water availability analysis was done and considered it "more comprehensive than any other in California history." The analysis, officials said. looked at six other water supply scenarios – ranging from historical conditions to climate change projections as far out as 2070 – to determine how much water would be available to store in Sites Reservoir under a variety of hydrologic conditions.

Officials said that the findings "clearly demonstrate that there is water available to store in Sites Reservoir under a variety of conditions." Officials believe that Sites Reservoir will benefit the public while all other water uses, including those serving environmental resources, will continue to be met.

"We have closely examined a number of scenarios and every analysis showed that there is water available that could be stored in Sites," Alicia Forsythe, Environmental Planning and Permitting manager of the Authority, said in a statement. "This year is a great example. In 2023 alone – after multiple atmospheric rivers – roughly 700,000 acre-feet of water could have been stored in Sites Reservoir and saved for later use."

Officials said that as part of the permit process, the SWRCB is required by law to publish public notice of a water right application once it has been accepted and deemed complete.

"This notice begins a 60-day period whereby the public can protest the issuance of a water right permit for the Project on specific grounds, including alleged injury to prior rights, adverse impact on the environment, or failure to best conserve the public interest or public trust resources," officials said. "The 60-day public notice for the Authority application is the next step in the SWRCB's process for issuing a water right permit for the Project. Through this process, a number of factors are considered, including potential injury to senior water right holders, potential environmental impacts, and potential adverse impacts to public trust resources. Finally, the SWRCB must find that unappropriated water is available to supply the Project and that the use of water is in the public interest; the State Water Board will issue a water right permit if they determine the Project meets these criteria."

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Hetch Hetchy Reservoir was a San Francisco miracle. It was also a curse

One hundred years after Hetch Hetchy Reservoir was filled, it remains a miracle and a controversy, connected to two men — John Muir and Michael O'Shaughnessy — who never saw it finished. San Francisco Chronicle | May 21, 2023 | Peter Hartlaub



O'Shaughnessy Dam and the Hetch Hetchy Reservoir in Yosemite National Park shortly after the dam was finished in 1923.

It was 1908 in California, and naturalist and author John Muir was full of rage.

The prospect of damming the Hetch Hetchy Valley was a long shot — still 15 years away from completion — but he wrote an essay for the Sierra Club Bulletin as if the construction crews were already on the valley floor.

"These temple destroyers, devotees of ravaging commercialism, seem to have a perfect contempt for Nature," Muir wrote. "Instead of lifting their eyes to the God of the mountains, (they) lift them to the Almighty Dollar."

Today, we take for granted the creation of the O'Shaughnessy Dam and Hetch Hetchy Reservoir, which began filling with water meant for San Francisco taps on May 24, 1923. Since the greater 160mile waterway project was finished in 1934, crystal clear water from the Sierra has arrived in city faucets as if by magic.

Hetch Hetchy Valley in Yosemite National Park

Pictured before and after the construction of the O'Shaughnessy Dam, which was completed in 1923.



In fact, the journey to Hetch Hetchy's transformation was both an engineering marvel and a bureaucratic nightmare, and Muir and the dam's namesake, Michael O'Shaughnessy, were both dead by the time water finally arrived in 1934 at the Pulgas Water Temple in Redwood City — a domed monument that marks the "finish line" for the project. (The Golden Gate Bridge, which had its own struggles and detractors, was arguably a breeze by comparison.)

Before Hetch Hetchy Reservoir, San Franciscans contracted poorer-quality water from the Spring Valley Water Company, which sourced its water from Alameda Creek and watershed in San Mateo County. But city leaders wanted out, and in 1903 began pressing U.S. officials for water rights in the Sierra. After the 1906 earthquake and fire, when Spring Valley's supply failed completely, the mission reached a new sense of urgency.

The pro-Sierra forces had the perfect mayor in "Sunny Jim" Rolph, who served San Francisco for 19 years from 1912 until 1931 (when he became governor of California). After decades of corruption — including one mayor who was jailed — Rolph put a priority on infrastructure, building the current City Hall, half the city's police stations and miles of municipal railway in San Francisco.

His chief engineer O'Shaughnessy was the ideal collaborator. While Rolph was loquacious, it's hard to find a quote from O'Shaughnessy in the Chronicle archive that doesn't read like an engineering report. The Irish immigrant was prone to lecturing politicians and making enemies, but he was loved by his crews and worked incredibly efficiently — bringing complicated projects together quickly and under budget.

One of his first big tasks seemed impossible: building a streetcar line from scratch for the 1915 Panama Pacific International Exhibition. Funds became available Jan. 1, 1914, O'Shaughnessy assembled crews the next day and less than 14 months later delivered several operational lines that ferried San Francisco's distant working-class neighborhoods to the fair.


Michael O'Shaughnessy is seen in 1923, when a railroad was built to carry in the materials to build the Hetch Hetchy Reservoir. San Francisco Water Department



A map of the Hetch Hetchy Reservoir and water system bringing water from Yosemite National Park to San Francisco. Chronicle archives

Hetch Hetchy, which had been eyed by San Francisco city leaders as a water source since the 1870s, was by far the pair's most ambitious build. Rolph let O'Shaughnessy run wild with few restrictions on the project, backing him in every fight, including against federal forces.

O'Shaughnessy alternately dismissed and belittled Muir's growing environmental movement against the damming of Hetch Hetchy Valley in Yosemite National Park, which at the time had the backing of an eclectic group of writers and educators including poet Harriet Monroe and Harvard University president John Thornton Kirkland.



Left: John Muir in Yosemite National Park in 1907. Right: Anti-dam graffiti marks the O'Shaughnessy Dam in 1987. Photos by Associated Press and David Cross

Muir described the valley, and all that would be lost, in beautiful prose, paying tribute to the sunshine bouncing off Tueeulala Falls and the shadowy gorge of Wapama Falls, where the water echoed like thunder.

"Dam Hetch Hetchy!" Muir ended his 1908 essay. "As well dam for water tanks the people's cathedrals and churches, for no holier temple has ever been consecrated by the heart of man."

O'Shaughnessy was a far-below-average wordsmith, but he had the benefit of support from Rolph and the mainstream media, including The Chronicle, which published attack pieces against reservoir detractors like Spring Valley Water Company and the newcomer power providers at Pacific Gas & Electric.

In one 1912 Chronicle front-page story headlined "HETCH-HETCHY WILL HELP NATURE — WILL BANISH MOSQUITOS," O'Shaughnessy argued nonsensically that damming the valley was a public health issue.



A spillway downriver from the Hetch Hetchy Reservoir is constructed in 1923. Chronicle file photo

"The nature lovers ought to assist in expediting the work to be done by this city, O'Shaughnessy thinks, as it will make a decided improvement in the scenic beauty of the valley," The Chronicle reported. "The present conditions keep Hetch-Hetchy from being a resort for tourists, he points out, as, not only is travel difficult, but the mosquitos are a nuisance."

Behind the scenes, Rolph was building a national coalition. Congressman John Raker in 1913 sponsored the Raker Act, which authorized damming of the Tuolumne River and flooding of Hetch Hetchy Valley. President Woodrow Wilson signed the bill into law on Dec. 18, 1913, making The Chronicle's front page.

"I have signed this bill because it seemed to serve the pressing public needs of the region better than they could be served in any other way, and yet did not impair the usefulness or materially detract from the beauty of the public domain," Wilson said.

O'Shaughnessy and his crews wasted no time, and began clearing trees from Hetch Hetchy Valley in 1914. Photos in The Chronicle archive show lush wilderness was quickly converted to a naked dirt floor. Meanwhile, the battles continued. O'Shaughnessy made front-page news in 1917 when he denied a routine inspection request from W.B. Holton, the director of the San Francisco's Bureau of Governmental Research — and released a letter berating the bureaucrat.



A citizen expedition drinks mountain water near Hetch Hetchy Reservoir in Yosemite National Park on Oct. 27, 1961.Chronicle file photo

"There's something rotten at Hetch Hetchy," Holton said, accusing O'Shaughnessy of "political paranoia."

There were other signs the project might be cursed. Weeks after water began filling the valley, a delegation of supervisors who traveled to check on the progress were met with twin disasters — a derailed train in a tunnel on the way to Hetch Hetchy, then a reservoir tugboat that came to a halt in a hailstorm.

The Chronicle story described drenched politicians fighting to get to shore in a smaller boat that burst into flames.

"The oarsman became exhausted by the battle against rain, hail and wind, and the seats of the boat were broken up and a fire built in the bottom to thaw them out," The Chronicle reported. "The fire developed into a menace when it threatened to burn a hole through the hull."

Beyond the 341-foot-tall dam, which was 150 feet wide at the base, workers spent 11 more years building 160 miles of tunnels, pipes and aqueducts, with two power stations to convert the water to electricity along the way and four pipelines underneath the San Francisco Bay — more than four

decades before BART installed its Transbay Tubes. The total cost to the city was \$100 million, almost \$2.6 billion in 2023 dollars.

But the finished product was a stunning feat, bringing 300 million gallons of water per day to the Bay Area, entirely by gravity without a single pump. Each drop takes five days to make the journey.



An observation deck at the Hetch Hetchy Reservoir, which provides the majority of water for most of San Francisco, near Yosemite National Park on Feb. 7.Carlos Avila Gonzalez/The Chronicle

A century later, the damming of the valley is still a controversy, with environmentalists advocating for a restoration of the valley floor. Meanwhile, residents of San Francisco continue to enjoy some of the best water in the world.

But they were the only winners. John Muir died in 1914, living just long enough to see those construction crews clear his beloved Hetch Hetchy Valley. O'Shaughnessy, who burned almost every bridge in City Hall, lost his protector when Rolph left for Sacramento. While the O'Shaughnessy Dam retained his name, the chief engineer was demoted to "consulting engineer" in 1932.

O'Shaughnessy died of a heart attack on Oct. 12, 1934, just missing the opportunity to drink from the faucet of his life's work. Two weeks after his death, the first Hetch Hetchy water arrived in the Bay Area.

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