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Managing WATER SCARCITY

A Framework for Fair and Effective Water Right Curtailment in California

APRIL 2023
Policy Report

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A Framework for Fair and Effective Water Right Curtailment in California

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ABOUT THIS REPORT AND PROJECT

This report is part of a larger project aimed at improving water rights administration in times of water scarcity. The State Water Resources Control Board (SWRCB) funded the project. Input and feedback from SWRCB staff and a range of other stakeholders and experts informed our analysis and recommendations. The project builds on our past research for California's Fourth Climate Change Assessment. In 2018, we published a pair of Assessment reports that analyzed how the SWRCB carried out its water rights responsibilities during past droughts and offered recommendations for improving the agency's future drought response capabilities. We found that the SWRCB developed its drought response strategies on a largely ad hoc basis in the midst of each drought emergency. As a result, its responses were not always timely, effective, or well received. Therefore, we recommended proactively creating a contingency-based framework to support the SWRCB's drought decision making. The goal of this project is to begin to actualize that general recommendation by developing specific recommendations for building a drought decision-support framework and identifying concrete ways to strengthen the SWRCB's ability to respond effectively when water scarcity arises.

This report is available at law.berkeley.edu/curtailments.

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EXECUTIVE SUMMARY

Droughts are becoming more frequent and intense in California. Many California watersheds experience seasonal water scarcity nearly every year. To protect water rights, human health and safety, and the environment from serious harm, California's State Water Resources Control Board (SWRCB) needs to be able to routinely curtail unlawful water uses. But it has struggled to carry out this basic function, running into resource constraints and technical, legal, and political barriers. This report describes the legal context for and history of curtailments in California. It also recommends actions the SWRCB and State Legislature can take to build a framework for fair and effective curtailment in California.

Imagine if a city managed traffic the way California manages water allocation during droughts: Every morning, traffic jams form, snarling streets across the city. Collisions, property damage, and injuries are routine. But the city lacks permanent traffic lights. Instead, it puts up lights in a neighborhood only after the mayor declares a specific traffic emergency, and takes them down as soon as the traffic starts to ease. The city does not empower its traffic regulators to remove reckless drivers from the road. Writing a ticket can take weeks or months, and the penalties for unsafe driving are nominal, even for serious violations that cause severe harm to others. The city's traffic regulators are experienced and sophisticated, and by the end of each day—after irreparable damage has been done—they have figured out systems to reduce the chaos. But the next day, the city starts from scratch again, constructing its traffic regulation systems anew.

No city would want to manage traffic that way, and, fortunately, no city in California does.

However, this metaphor rings uncomfortably true for one of California's most important resources: water. It may be hard to believe, but California's systems for regulating water diversion and use during times of water scarcity closely track the fictional pattern described above.

During droughts and other times of water scarcity, there is not enough water to satisfy all demands. The water that is available must somehow be allocated among competing human and environmental uses. State and federal laws establish legal requirements and policy priorities that govern water diversion and use, and state law designates the State Water Resources Control Board (SWRCB) as California's primary water regulator, with the explicit legal responsibility to administer and protect the state's water resources.

To fulfill this role, the SWRCB needs to be able to routinely curtail (stop) unlawful water uses, including uses that violate water right priority. Implementing water right curtailments is perhaps the most fundamental administrative function of the SWRCB during times of water scarcity. But the SWRCB has not been able to perform this basic function in a simple, straightforward, and predictable manner even a single time during its history. Instead it has implemented curtailments only rarely, in certain watersheds during certain major statewide droughts, using different approaches each time.

The SWRCB is caught between a rock and a hard place. In theory, the SWRCB has sufficient constitutional and statutory authority to require and enforce curtailment of all types of water rights. However, due to legal, institutional, and political realities, additional clarification and support from the Legislature is badly needed to ensure the SWRCB can effectively carry out its obligations under state and federal law. Legally, litigation inevitably follows when the agency relies on its authorities in as-yet untested ways as the basis for curtailment. That litigation—and even the threat of it—generates significant costs and uncertainty for the SWRCB itself and for the broader community of water managers and users. Institutionally, the SWRCB has not been provided with the levels of staff and funding resources it needs to adequately protect the state's water resources and ensure that water users are diverting and using water within the scope of valid water rights. And politically, certain water users and their advocates strongly resist changes to the status quo, limiting the SWRCB's ability to act as a practical matter. All of these realities have stonewalled the SWRCB ability to implement regular, effective curtailments, causing irreparable harm to water users, communities, and ecosystems.

Like the traffic regulators in the fictional city, the SWRCB is an experienced agency with skilled and dedicated staff, and the measures it adopts can be sophisticated and creative. But it is working within a reactive and anemic support structure, and it lacks the resources and specific tools it needs to respond quickly, effectively, and transparently to water scarcity.

WHAT IS CURTAILMENT?

In this report, we use the term "curtailment" to describe water users reducing or stopping their water diversions, whether voluntarily or under order, during times when there is not enough water available to fully support all uses. Curtailment is usually based on water right priority, with more-junior diverters curtailing before more-senior diverters, but other legal requirements and policy priorities also affect the availability of water and, therefore, the need to curtail.

To implement curtailments, the State Water Resources Control Board (SWRCB) takes actions to ensure that curtailments occur when necessary. One of the key ways the SWRCB implements curtailments is by informing water right holders and claimants in critically dry watersheds when they are required to curtail their diversions because water is not available under their priority of water right. Implementing curtailments also involves other actions, such as administering curtailment exceptions and alternative compliance mechanisms.

As this report will explain, the SWRCB is currently using emergency regulations as its primary tool for implementing curtailments. But this tool is not always available when curtailments are needed. Drought emergency rulemaking authority under Water Code section 1058.5 is only available under two narrow sets of circumstances: (1) when a critically dry year follows at least two consecutive below-normal or drier years or (2) when the Governor proclaims a state of emergency due to drought. Because 2021 was only the second consecutive dry year, the SWRCB had to wait for the Governor to declare county-based drought emergencies before embarking on months-long processes to lay the groundwork for curtailments with emergency regulations. As a result, curtailments would have been warranted in each of the critically dry watersheds for which the SWRCB eventually developed emergency regulations months before the SWRCB could issue curtailment orders. **Figure ES** demonstrates this gap in the Shasta River watershed. It shows that, not only were curtailments warranted at least four months before they were implemented in 2021, curtailments were also needed in 2020.

The SWRCB's primary tool for implementing curtailments, emergency regulations, is not always available when curtailments are needed.

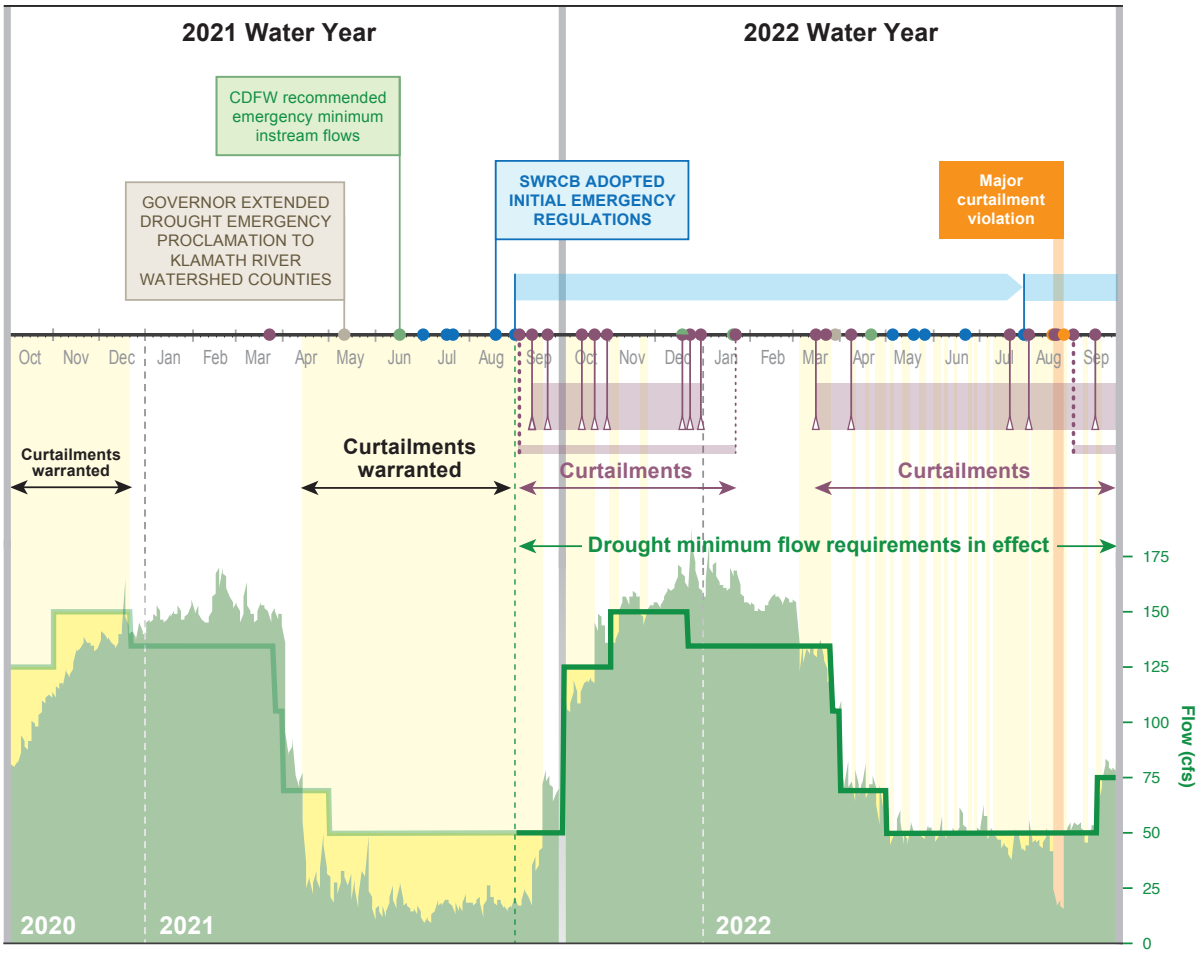


Figure ES. *Timeline of curtailment-related actions and flow for the Shasta River watershed from October 2020 through September 2022. In 2021, curtailments would have been warranted beginning in April, but the SWRCB did not adopt emergency regulations requiring maintenance of drought minimum flows until mid-August 2021, finally issuing curtailment orders in early September. Shasta River flows dropped below drought minimum levels at times shown in yellow. A major curtailment violation in August 2022 caused flow to drop by more than half for about a week.*

Emergency regulations are also temporary, lasting up to one year. The SWRCB can readopt them if drought conditions continue. It can also reuse and build on past emergency regulation text during a later drought. However, if water shortage develops quickly after a wetter period, the SWRCB will not be able to adopt timely emergency regulations to support curtailments unless the Governor immediately proclaims a drought emergency as soon as a watershed warrants it.

Another challenge is that the SWRCB's current options for enforcing curtailments are limited and cumbersome, making robust, timely enforcement difficult when it is most needed. Most enforcement mechanisms take weeks, or longer, to implement, and the magnitude of available penalties can be insufficient to deter violations.

Limited and cumbersome options for enforcing curtailments allow bad actors to cause irreparable harm while risking only modest financial repercussions.

These inadequacies allow bad actors to intentionally violate curtailment orders, causing irreparable harm to public trust resources and other water users, while risking only modest financial repercussions. A stark illustration: In 2022, a group of approximately 80 water users under a single 1912 water right diverted more than half of the Shasta River's flow—in direct violation of a curtailment order—for more than a week, as shown in **Figure ES**. The SWRCB could not stop this unlawful diversion, despite dispatching staff to the site to witness the ongoing violation and speak face-to-face with diverters, because the SWRCB lacks the authority to physically shut a diversion down. When SWRCB staff instructed the diverters to immediately turn off their pumps, they refused. Instead, the diverters continued to pump unlawfully for another week, until they decided they had taken enough water to serve their purposes. The SWRCB imposed the maximum penalty for this violation: $4000, equivalent to about $50 per water user within the violating group. This tiny penalty was much less than the value of the water illegally diverted, and it did nothing to redress the irreparable harm the violation inflicted on sensitive fisheries and more-senior water users in the watershed.

Curtailments are needed on a regular basis, not only in times of crisis.

This system might be acceptable if times of water shortage were rare, each meriting a unique response. But recurring drought has been a central water management challenge throughout California's history, and climate change is increasing the frequency and intensity of drought across the state. Furthermore, curtailments are not just needed in a few watersheds or only during major statewide droughts. Essentially every year, water demand exceeds supply in some watersheds in California, creating short-term water shortages and contributing to long-term imbalances between water supply, water demand, and environmental water needs. Which watersheds experience water scarcity can change significantly from year to year, and even within a single year. Additionally, some watersheds routinely experience seasonal water scarcity.

Routine curtailments happen in other western states.

To effectively manage California's surface water resources, the state needs to implement curtailments on a regular basis, not only in times of extreme crisis. Routine curtailments already happen in other western states. California cannot afford to remain an outlier. It needs routine curtailments supported by predictable and expeditious curtailment procedures and effective enforcement tools. This need will only intensify in the years to come.

This report lays out a framework that would enable the SWRCB to implement more regular and nimble water right curtailments to help our state to adapt to the contemporary realities of a growing population, ongoing environmental crises, and the increasingly frequent and intense droughts (and floods) that are California's new normal. The framework includes the following core elements, some of which the SWRCB can implement on its own, and some of which require, or would benefit from, swift and decisive legislative action.

1. ACTIONS THE SWRCB CAN TAKE ON ITS OWN TO ESTABLISH A BASIC FRAMEWORK FOR ROUTINE CURTAILMENTS

Preparation:

- Adopt standard regulations to lay the groundwork for routine curtailments. These regulations would include both generally applicable provisions and any watershed-specific provisions that are needed (e.g., drought minimum flows, methodologies for analyzing water unavailability) and would address the basis for curtailments, exceptions to curtailment, alternative compliance mechanisms (like voluntary water sharing agreements), reporting obligations, notice requirements, options for seeking changes or review, and enforcement. This basic curtailment framework would be designed to make many key decisions in advance, streamlining in-drought decision-making processes and minimizing the need for emergency rulemaking by specifying contingency measures that allow for situation-specific adjustments.

- Include a due process analysis in the rulemaking record to explain how the regulations, and actions the SWRCB subsequently takes under them, meet state and federal due process requirements.

- Develop best practices for using emergency regulations to support curtailments. Standard regulations have the advantage, once adopted, of being ready to implement immediately when needed. But because they are enacted in advance, they will sometimes be an uneven fit for specific watersheds and times. Therefore, emergency regulations would continue to play an important, but subsidiary role, by enabling rapid in-drought adjustments not possible via regular rulemaking (such as when changed circumstances or new information reveal the need for near-term adjustments to watershed-specific methodologies for analyzing water unavailability or to drought minimum flows). We recommend that the SWRCB develop best practices for efficient and effective use of emergency regulations. These would include preferred timelines and potential triggers to address different contingencies, for example, for coordinating with the Governor's office when a drought proclamation is needed to give the SWRCB timely access to emergency rulemaking authority under the Water Code.

Implementation:

- Implement curtailments when needed, as prescribed under the basic curtailment framework, for example, by: analyzing water unavailability; issuing curtailment orders; providing curtailment status updates; administering exceptions to curtailment; addressing proposals for and administering water sharing agreements and other alternative compliance mechanisms; addressing requests for corrections, petitions for reconsideration of curtailment or information orders, and objections related to alternative compliance mechanisms; monitoring compliance; and taking appropriate enforcement action when necessary.

- Employ emergency regulations to make temporary adjustments to the curtailment framework when needed, following the above best practices.

2. ACTIONS THE LEGISLATURE CAN TAKE TO UPDATE THE SWRCB'S STATUTORY TOOLSET FOR IMPLEMENTING CURTAILMENTS

Enable more effective curtailment regulations:

- Clarify that the SWRCB has broad authority to implement priority-based curtailments for *all* diverters, regardless of their basis of right, including diverters with pre-1914 appropriative rights.

- Extend the SWRCB's emergency rulemaking authority under Water Code section 1058.5 to *all* critically dry years.

- Direct the SWRCB to adopt certain watershed-specific provisions of the curtailment framework by emergency regulation, such as watershed-specific unavailability assessment methodologies and minimum flows.

Enhance curtailment enforcement options:

- Clarify that the SWRCB has the authority to bring enforcement action against *any* diverter who violates a curtailment regulation or order.

- Provide stronger penalty options for violation of curtailment regulations and orders issued under them to ensure that penalty structures actually encourage compliance with the water right priority system and the SWRCB's regulations and orders.

- Give the SWRCB the authority to issue interim relief orders to prevent irreparable harm pending completion of enforcement proceedings.

- Give the SWRCB the express authority to physically stop unlawful diversions, as is common in other western states.

3. ACTIONS THE SWRCB CAN TAKE, WITH LEGISLATIVE SUPPORT, TO IMPROVE ENGAGEMENT AND INFORMATION FOR FAIR AND EFFECTIVE CURTAILMENTS

- Strengthen the SWRCB's connections with watersheds through regional liaisons and SWRCB-linked "watermasters," modeled after the Delta Watermaster.

- Improve the data that inform curtailments, including by requiring more frequent reporting of water diversion and use and requiring diverters to provide additional information needed to inform fair and effective curtailments.

- Accelerate development and implementation of instream flow requirements to ensure that curtailments protect water quality and public trust uses.

Together, these actions will help the SWRCB meet one of its most important responsibilities: implementing water right curtailments during times of water shortage.

Beyond improving California's drought response, regular and nimble implementation of water right curtailments is a crucial means of adapting California water management—and administration of California's water rights system—to climate change. The actions we recommend here will begin to close the unsustainable gaps between legal requirements and on-the-ground practice, enabling the SWRCB to better protect the water rights of more-senior diverters, to better maintain flows needed to support water quality and environmental water uses, and to more reliably ensure that water is available to meet the basic human health and safety needs of California communities.

1. INTRODUCTION

California needs an effective framework for water right curtailment. Recurring drought is a central water management challenge, and climate change is increasing the frequency and intensity of drought across the state. When surface water supply is insufficient to meet all demands, California law generally requires water users with more-junior water rights to curtail (reduce or stop) their water use to protect supply for more-senior water users and critical uses. While curtailments are fundamental to effective drought response, they are rarely implemented because technical, legal, and political barriers stand in the way. Overcoming these barriers will take both administrative and legislative action.

1.1. NEED

1.1.1. Drought is a core water management challenge.

Dry years and multi-year droughts are already common occurrences in California, and they are likely to become more frequent and intense with ongoing climate change.[1]

The times and places precipitation is abundant in California are not the times and places water is most in demand, making water resource management a constant challenge. Precipitation varies, sometimes dramatically, from year to year.[2] Additionally, in any particular year, rain and snow fall mainly during the cooler months and are focused in the northern part of the state and the Sierra Nevada range.[3] However, the times and places water is most in demand—during the warmer months, along the central and southern coast, and in the Central Valley[4]—are not those in which water is naturally the most abundant.

To address the mismatch between supply and demand, extensive networks of storage and conveyance infrastructure operated by federal, state, and local entities redistribute water in time and space.[5] But these systems have important limits and vulnerabilities. For example, they depend on snowpack and groundwater storage continuing to serve as large additional water supply reservoirs.

As California's climate warms, the amount of precipitation that falls as snow is decreasing, and the snow that does fall is melting earlier in the water year, significantly reducing the storage potential of snowpack and altering the timing of runoff and streamflow.[6] Higher temperatures are also increasing losses to evaporation and transpiration, so that more water is needed to accomplish the same tasks.[7]

California could face a future "in which essentially every seasonal, annual, and multiannual precipitation deficit co-occurs with historically warm conditions[,] . . increas[ing] the risk of severe impacts on human and natural systems."[8] As shown in **Figure 1**, this trend is already developing. Major statewide droughts between the 1970s and 2016 were each successively warmer. Research suggests anthropogenic warming has contributed to the co-occurring hot and dry conditions of recent droughts.[9] The 2020–2022 drought has also been very warm. All but 3 water years in the last decade had below average precipitation, and all were warmer than the 1970–2022 average.

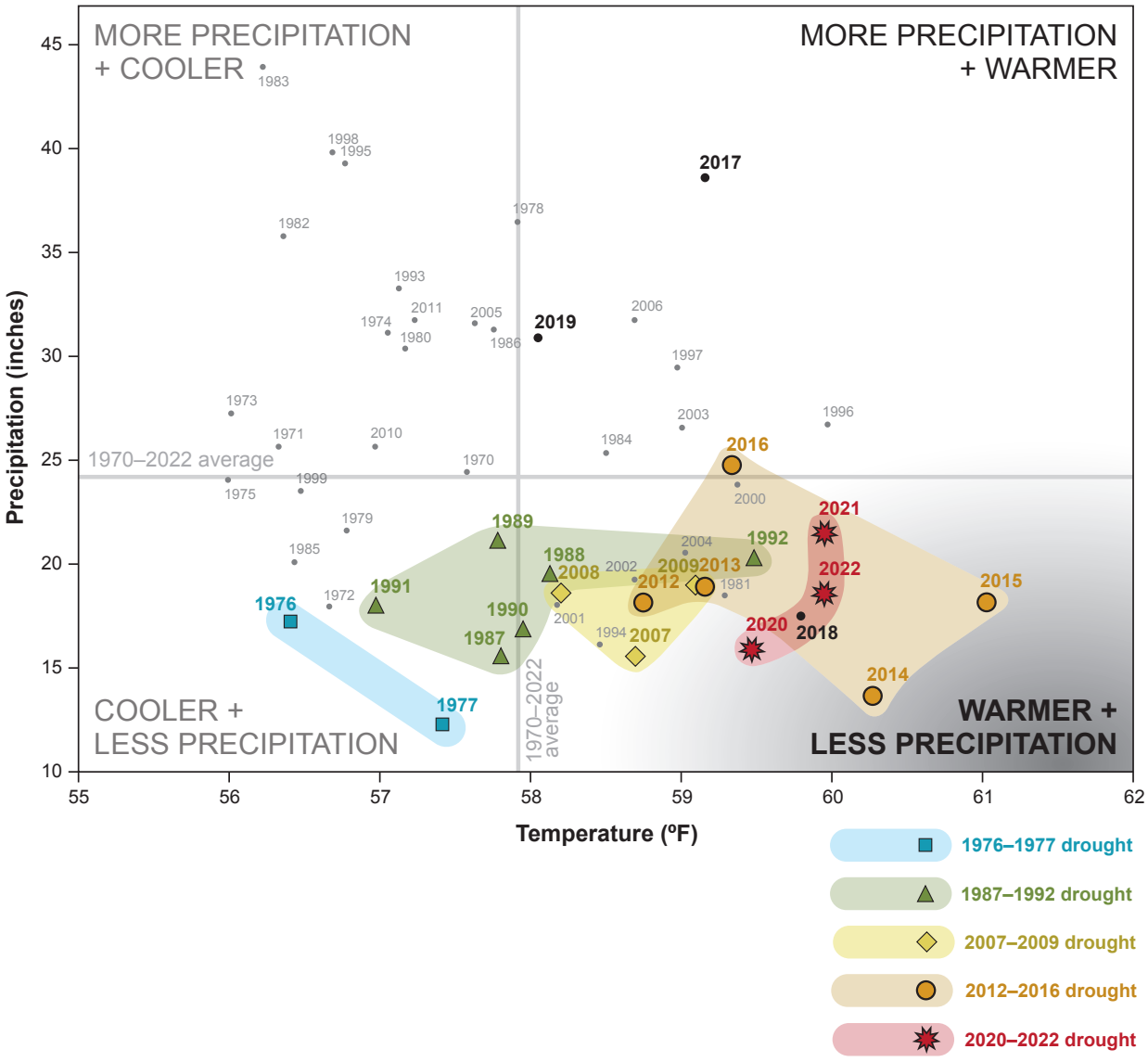


Figure 1. *Estimated statewide average temperature and precipitation for each water year from 1970 to 2022. Over this period, droughts have become warmer and more frequent.*[10]

1.1.2. Curtailments are fundamental to effective drought response but have rarely been implemented.

When water supply is insufficient to meet all demands, California law generally requires water users with more-junior water rights to reduce or stop diverting water. This reduction or cessation of diversions is known as curtailment.

One of the most important responsibilities the State Water Resources Control Board (SWRCB) has during a drought is providing the information and oversight needed to ensure that water users exercise their water rights and claims appropriately—and implement curtailments when necessary. Effective water rights administration includes helping water users understand when water is, or is not, available to them and ensuring that water is diverted and used in accordance with state and federal law. History demonstrates that water users do not adequately police themselves, and courts are not institutionally structured to affirmatively enforce priorities through curtailment.

While water right priority rules are intended to help water users determine who may divert water in a particular watershed during a time of water shortage, following these rules and other legal requirements is not always straightforward in practice. Instead, understanding whether water is *legally available* to a particular diverter at a particular time may require a complex analysis of water supply, water demand, water right priority, and other legal requirements. For example, water may be unavailable when water users with more-senior rights need water downstream, when streamflow includes previously stored water that was released to meet water quality requirements or for other diverters who are entitled to the stored water, or when some of the natural flow is needed to meet instream requirements.

However, to date, the SWRCB has been able to meet only a fraction of the existing need for curtailment. During some major statewide droughts, the SWRCB has taken actions to implement curtailments in certain watersheds by temporarily diverting staff attention and resources away from non-drought activities.[11] But curtailments are not just needed in a few watersheds or only during major statewide droughts. Historically, almost every year some watersheds in California have experienced dry conditions that can create short-term water shortages and contribute to long-term imbalances between water supply, water demand, and environmental water needs. The particular watersheds experiencing dry conditions can change significantly from year to year (as **Figure 2** suggests), and even within a single year. Additionally, some watersheds experience water scarcity on a regular basis, such as seasonally, during all or most years.

Curtailments also need to happen more quickly than they have in the past to better protect water users, environmental flows, and public health and safety from harm. Flows in California waterways can decline quickly, particularly when hot, dry weather accelerates both natural evapotranspiration and human water use, with immediate, and potentially long-lasting, impacts. In those circumstances, a curtailment process that takes weeks or even months to create restrictions will mean that some water users' rights are infringed, potentially at the times when they need water most, and that aquatic ecosystems remain under extended stress.

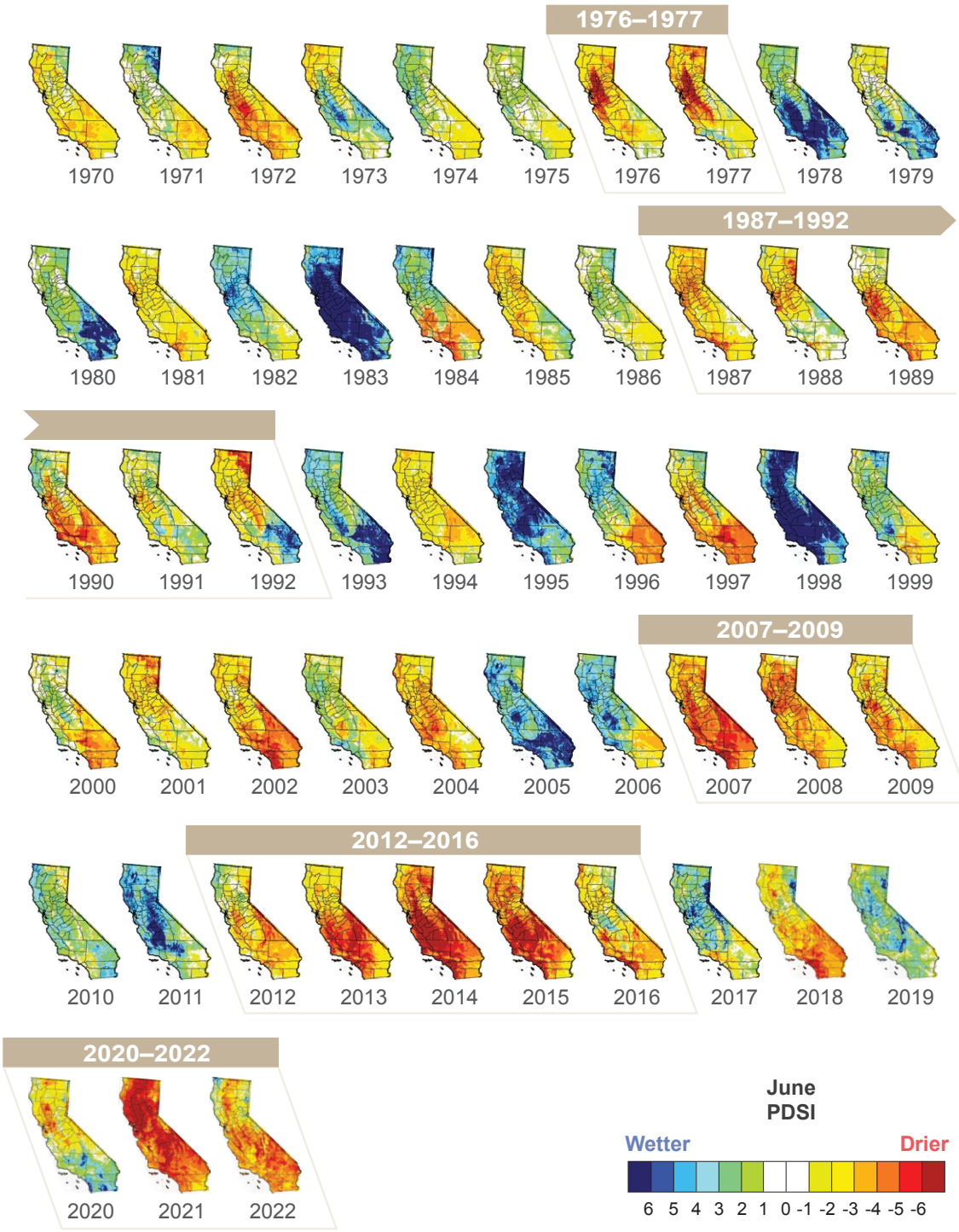


Figure 2. *Spatial distribution of one drought indicator, the Palmer Drought Severity Index (PDSI), for June of each year from 1970 to 2022, noting years of past major statewide droughts.*[12] *Monthly PDSI estimates accumulated surface water excess or deficit based on monthly precipitation and temperature data and soil characteristics, as well as the prior month's PDSI.*[13]

Yet, as we will explain in more detail in **Section 3.4**, deficiencies in California's current processes for implementing curtailments mean that they often start late or do not happen at all.

For related reasons, more regular implementation of curtailments will provide needed certainty for California water managers. If the SWRCB implements curtailments on a regular basis, and not only in times of extreme crisis, they will be more finely tuned and predictable. Water users will be able to plan for shortage periods more effectively than they can under the status quo. If water users know that curtailments are recurring events, and they also know the conditions that will trigger those curtailments, they can plan accordingly. Curtailments can be designed to protect more-senior water rights from encroachment by juniors and to protect storage supplies for the benefit of those who are entitled to them giving both groups greater assurance that water will be available to them, even in dry periods. Water users with more-junior water rights will be less likely to take water they are not entitled to, and they also will have a clearer basis for contingency planning. The state will better positioned to ensure that water remains available to meet minimum health and safety needs and minimum instream flows needed to protect critical ecosystem functions and water quality for all water uses. Finally, communities or other groups that wish to come up with creative alternative compliance mechanisms, such as voluntary water sharing agreements and local cooperative solutions to manage flows, will have a clearer understanding of the legal regime that will govern in the absence of those solutions—and defines what they must achieve. In the long run, the entire state benefits from a properly functioning, properly managed water rights system that includes regular curtailments.

The changes in California's hydrology wrought by a warming climate ensure that curtailments will be needed on a much more regular basis in the future. The necessity of adapting California's water rights systems to climate change as a complement to climate mitigation measures has been clearly established for years in concept[14] and is articulated in current state policy.[15] More effective water right curtailments will be central to such adaptation, and the risks of failing to develop this capacity are clear and significant.

1.1.3. Technical, legal, and political barriers currently impede curtailments.

The SWRCB is caught between a rock and a hard place. It has clear legal responsibility to implement curtailments when they are needed, using the information and tools available to it, regardless of the challenges. At the same time, it is critical to acknowledge the technical, legal, and political barriers that impede the SWRCB's ability to routinely implement curtailments in order to identify and take affirmative steps to address them.

Inadequate information can make it difficult for the SWRCB to know when curtailments are needed and which water users should be curtailed. Understanding how much water is available and for whom requires timely analysis of water unavailability, comparing water supply with water demand in the context of water right priority and other legal requirements. This type of analysis is challenging because key classes of data have significant limitations and are badly in need of improvement.[16]

In particular:

- Water rights and use data are necessary for understanding the relative water right priorities of water users within a given watershed. With more than 45,000 individual water rights in the state, the current system of paper records, an incompletely populated electronic database, and infrequently updated (and often inaccurate) diversion and use data makes it hard to respond effectively to developing drought.[17] The state is currently working to address this gap, in part, by developing a new water rights information system for California, and while it will take years to complete, this new system represents essential progress.[18]

- In addition, California does not have a reliable picture of the flows of water through its natural and managed systems. Information on snowpack, runoff, stream flows, water diversion and use, and other essential indicators of water availability are all inadequate.[19] The result is that, in spite of some state-level attention and progress,[20] basic understanding of how much water is being used, when, where, and by whom is limited, hampering both long range planning and real-time analysis of water unavailability to inform curtailments.[21]

Additionally, a key regulatory gap is a dearth of clear, quantitative water quality and environmental flow standards[22] that balance the demands of water users and ecosystem needs. The California Department of Fish and Wildlife (CDFG) has developed flow recommendations for some stream systems and is working to develop others,[23] and the SWRCB is currently working to update or develop binding flow requirements for some watersheds.[24] However, many watersheds either do not have flow standards or have inadequate flow standards that have not been updated in many years. The resulting gap-filled system does not readily support designing curtailments to protect water quality and environmental water uses.

The legal and political impediments to curtailment are also substantial and often intertwined. When the SWRCB implements curtailments, it imposes limits on water diversion and use, often at times when water is most scarce. Some water users naturally will oppose such limits, and they will often use their political clout to lend force to that opposition. Theoretically, the SWRCB has sufficient constitutional and statutory authority to allow it to issue and enforce curtailments against all water users. However, as this report will show, despite having been tasked with broad responsibility for ensuring that water rights are exercised in accordance with state and federal law, and given general authorities consistent with this responsibility, the SWRCB lacks a robust, consistent set of specific statutory tools to help it implement these responsibilities. Furthermore, in the intensely controversial context of California water allocation, legal authorities that would be clear in other contexts provide fodder for litigation. And, regardless of the merits of any particular claim, litigation results in delay, expense, and confusion. Water is legally and physically complex, and courts are sometimes reluctant to support agencies like the SWRCB that seek to implement new regulatory approaches, even when those approaches are supported by law and critical in the face of rapidly changing conditions.[25]

These technical, legal, and political challenges combine to impede current water right curtailments, and may also impede the administrative and legislative actions we recommend in this report to build an effective framework for water right curtailment.

Regardless of the many challenges it faces, the SWRCB needs to implement curtailments using the information and tools available to it now, despite their imperfections. Not doing so abdicates its important legal responsibilities, creating unacceptable risk for California's communities, ecosystems, and economy.

1.1.4. Building a fair and effective curtailment framework will require both administrative and legislative action.

Addressing the barriers described above will require action from both the Legislature and the SWRCB. First, the SWRCB can make the most of its general authorities and the statutory tools that are currently at its disposal. Second, the Legislature can step up by providing clearer, more effective, and more robust curtailment tools, as well as new funding, to assist the SWRCB in accomplishing its critical mission.

As we will explain in more detail in **Section 4.1**, the SWRCB can take some steps on its own to establish a basic framework for more effective curtailments, even if the Legislature does not act. It can adopt standard regulations to lay the groundwork for routine curtailments, explaining how the regulations and the procedures they outline meet due process requirements. It can also develop best practices for using emergency regulations to make temporary adjustments when needed.

However, we believe legislative action will also be crucial because so much of the SWRCB's authority is contested, both legally and politically. In **Section 2.1**, we will explain that California law gives the SWRCB broad responsibility and general authority to implement curtailments. Some parts of state statutory law provide more specific authorities relevant to curtailments, but even these have, or have been interpreted to have, important limitations. For example, they are only available under certain emergency circumstances or have been interpreted to apply only in the context of certain classes of water rights. That leaves the SWRCB needing to fall back on much more general doctrines, like reasonable use, or on general principles of water rights administration, when it needs to curtail outside of the specific situations identified in existing statutory law. This feat is politically very difficult. Curtailments can be controversial in any circumstance, and any government agency may struggle to take controversial action where legislative and gubernatorial backing is unclear. It can also be legally challenging. Controversial actions without specific and express statutory authority tend to generate litigation. And even if the Board ultimately prevails in that litigation, as we think it generally should, that outcome is not guaranteed. The threat of litigation, alone, can sap agency resources and deter needed actions. Therefore, legislative action to update the SWRCB's statutory toolset for implementing curtailments may be crucial for enabling the more-regular and nimble curtailments California needs.

1.2. CONTENTS AND ORGANIZATION OF THIS REPORT

This report describes the results of analysis and engagement aimed at identifying how the SWRCB could implement water right curtailments more regularly and nimbly in the future.

- **Section 1** (*Introduction*) describes the need for an effective framework for water right curtailment and flags that building such a framework will require action by both the SWRCB and the Legislature. We also explain how this report relates to a larger project to improve water rights administration during times of water scarcity.

- **Section 2** (*Legal Context*) reviews the legal context for water right curtailments in California. After summarizing the SWRCB's broad responsibilities and general authorities related to curtailments, we describe the specific tools and authorities the SWRCB can use to implement curtailments. We also discuss procedural due process requirements associated with curtailments.

- **Section 3** (*History of Curtailment Practices in California*) summarizes the history of water right curtailment practices in California. It provides an overview of the SWRCB's curtailment-related efforts since the 1970s, with an emphasis on the agency's actions during the 2020–2022 drought. We then discuss the central role emergency regulations have played in facilitating curtailments during the 2020–2022 drought and the key limitations of relying on an emergency-based approach to curtailments.

- **Section 4** (*Recommendations*) outlines actions the SWRCB and the Legislature can take to build an effective framework for implementing more regular and nimble water right curtailments that better meet California's hydrologic realities while addressing key legal and procedural challenges.

We define important terms, acronyms, and abbreviations at the end of this report.

1.3. ABOUT THE LARGER PROJECT

This report is part of a larger project aimed at improving water rights administration in times of water scarcity.

The project builds on our past research for California's Fourth Climate Change Assessment. In 2018, we published a pair of reports[26] for the Assessment that analyzed how the SWRCB carried out its water rights responsibilities during past droughts and offered recommendations for improving the agency's future drought response capabilities. The SWRCB plays an important and multi-faceted role in California water management that spans water rights, water quality, and drinking water responsibilities.[27] As a result, its actions before, during, and after periods of water scarcity affect water users, economies, and ecosystems across the state. The impacts of the SWRCB's actions are growing as droughts

become more frequent and intense with ongoing climate change. In 2018, we found that the SWRCB developed its drought response strategies on a largely ad hoc basis in the midst of each drought emergency, and the responses it mounted were not always timely, effective, or well received. Therefore, we recommended proactively creating a contingency-based framework to support the SWRCB's drought decision making.

The goal of this project is to begin to actualize that general recommendation[28] by developing specific recommendations for beginning to build a drought decision-support framework and identifying concrete ways to strengthen the SWRCB's ability to respond effectively when water scarcity arises. The project involves (1) developing a method for incrementally generating such a framework in a modular way and (2) developing proposed framework modules. Ideally, the SWRCB will consider and adopt elements of these modules, with the goal of incrementally but significantly improving the SWRCB's capacity to respond to droughts and, more generally, to implement California's water rights system in more fair, effective, and predictable ways.

Our forthcoming Module 1 Report addresses an important precursor consideration for curtailments: identifying when and where around the state the SWRCB might want to focus its attention and resources to determine whether curtailments are needed. That report offers "A Proposed Decision-Support Framework for Identifying and Prioritizing Watersheds for Which Water Unavailability Analysis (WUA) is Warranted."[29] Water unavailability analysis (WUA) is a watershed-specific analysis that compares estimated available water supply with estimated water demand for different types and priorities of water rights and claims. It is an important tool for identifying when water supply is insufficient to meet all demands and for identifying which water users need to curtail their diversions. To perform WUA, the SWRCB develops a watershed-appropriate methodology, which it commonly calls a water unavailability methodology. Because WUA is not easy, and the SWRCB has only developed water unavailability methodologies for a limited number of watersheds to date, the Module 1 Report proposes leverage existing data sources to help the SWRCB assess where and when investment of time and resources in WUA is most needed.

This Module 2 Report addresses a different, but related, question:

> *How can the process for water right curtailment be streamlined to enable more timely, effective, and transparent action to address water shortage during droughts?*

For California water management to avoid perennial water gridlock and confusion, the SWRCB needs to be able to provide effective water rights administration during droughts and other times of water scarcity. This module, and the overarching effort, respond to that need.

2. LEGAL CONTEXT

California's unique legal context forms the backdrop for curtailments. The SWRCB has broad responsibilities and general authorities related to curtailments. It also has access to some specific tools and authorities it can use to implement curtailments, but each has important limitations. When using these tools, the SWRCB must follow procedural due process requirements that arise from federal and state constitutional law.

The SWRCB administers California's water rights system. It has the broad responsibility and general authority to ensure that surface water is diverted and used in accordance with California water rights law and with other state and federal legal requirements. The SWRCB's authority to oversee water diversion and use, such as by implementing curtailments in watersheds that are experiencing water shortage, derives from the state constitution, state statutes, and case law.

To provide context for our recommendations for building a framework for effective water right curtailment, this part of the report explains the current legal framework the SWRCB works within.

In **Section 2.1**, we summarize the SWRCB's broad responsibilities and general authorities related to curtailments, and in **Section 2.2**, we survey the utility and limitations of some of the specific tools and authorities the SWRCB currently has at its disposal to implement curtailments. These sections draw from our discussion of surface water rights and their administration in the Module 1 Report,[30] as well as our 2018 report for California's Fourth Climate Change Assessment on "Water Rights Administration and Oversight During Major Statewide Droughts, 1976–2016."[31]

Finally, in **Section 2.3**, we discuss due process requirements associated with curtailments.

2.1. BROAD RESPONSIBILITIES AND GENERAL AUTHORITIES RELATED TO CURTAILMENTS

This section provides an overview of the broad responsibilities and general authorities that give the SWRCB both the duty and the power to implement curtailments—and to do so in a way that reflects not just water right priority rules but other critical legal requirements and policy priorities under state and federal law.

The Legislature has tasked the SWRCB with "exercis[ing] the adjudicatory and regulatory functions of the state in the field of water resources" in order to "provide for the[ir] orderly and efficient administration."[32] The SWRCB's "authority to prevent illegal diversions and to prevent waste or unreasonable use of water" extends to *all* water users, "regardless of the basis" of their rights.[33] These functions are especially important during droughts and times of water shortage, when water supply is insufficient to meet all demands, and more-junior water users must generally curtail their diversions.

To carry out its curtailment-related duties, the SWRCB theoretically has "any powers" authorized by law "that may be necessary or convenient."[34] Notably, the Legislature has intentionally consolidated "water rights, water quality, and drinking water functions of the state government" within the SWRCB "to provide for coordinated consideration of water rights, water quality, and safe and reliable drinking water."[35]

Various sources of law establish sometimes conflicting legal requirements and policy priorities that define the SWRCB's broad responsibilities and general authorities and, therefore, affect the exercise and administration of water rights. We discuss some important examples, and how they relate to curtailments, below. When these priorities conflict with one another, deciding how to reconcile them can be difficult and politically fraught.

Table 1 summarizes the SWRCB's broad responsibilities and key sources of authority for carrying out those responsibilities. It also summarizes their likely relevance in the context of curtailment. All can form the basis for curtailment, and all provide context for designing appropriate alternative compliance mechanisms. Additionally, the SWRCB's responsibilities to ensure reasonable use and protect human health and safety uses of water can serve as important bases for allowing and defining exceptions to curtailment.

2.1.1. Implementing water right priority

California has developed water right priority systems intended, in theory, to help resolve conflicts between water users and guide water allocation during times of shortage. The SWRCB has a responsibility to ensure that water rights and claims are exercised appropriately with respect to water right seniority and other important legal requirements and policy priorities, such as those we describe in subsequent sections.

Table 1. *Broad SWRCB responsibilities, their likely relevance to curtailment, and key sources of those responsibilities and related general authorities. Cell shading differentiates broad categories of responsibility.*

RESPONSIBILITY	BASIS FOR CURTAILMENT	BASIS FOR CURTAILMENT EXCEPTIONS	CONTEXT FOR ALTERNATIVE COMPLIANCE MECHANISMS	KEY SOURCES OF RESPONSIBILITY / AUTHORITY
Implementing water right priority (seniority)	Yes	–	Yes	- Cal. Constitution - Cal. Water Code - Case law
Ensuring reasonable use	Yes	Yes	Yes	- Cal. Constitution - Cal. Water Code - Case law
Protecting public trust uses	Yes	–	Yes	- Cal. Constitution - Case law
Implementing other protections for environmental water uses	Yes	–	Yes	- Cal. Constitution - Cal. Water Code - Cal. Fish & Game Code - Cal. Public Resources Code - CESA / CESA - CWA / Porter-Cologne - NEPA / CEQA - Case law
Protecting human health and safety uses of water	Yes	Yes	Yes	- Cal. Constitution - Cal. Health & Safety Code - Cal. Water Code - CWA / Porter-Cologne - Safe Drinking Water Act - Case law

CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CWA	Federal Clean Water Act
ESA	Federal Endangered Species Act
NEPA	National Environmental Policy Act
Porter-Cologne	Porter-Cologne Water Quality Control Act

Implementing seniority
Ensuring reasonable use
Protecting environmental uses
Protecting human health and safety

Curtailments are an important means of implementing the state's surface water right system, a hybrid system that includes multiple types of water rights, each with different characteristics and constraints. The two most common types of surface water rights are rights based on land ownership (riparian rights) and rights based on the actual diversion and beneficial use of water (appropriative rights):

- Riparian rights — The owner of land adjacent to a surface water body has the right to use its natural flow to support reasonable beneficial use on that land.[36] Riparian rights generally do not allow water storage or transfer and are not lost through non-use.[37] These rights are correlative, meaning that during "times of water shortage all riparians [on a stream system] must reduce their usage proportionately."[38] As a class, riparian rights are generally senior to all appropriative rights.[39] *Riparian rights do not require a permit from the SWRCB.*

- Appropriative rights — Surface water can be appropriated "provided that the water is used for reasonable and beneficial uses and is surplus to that used by riparians or earlier appropriators."[40] Appropriative rights with earlier priority dates are described as more senior than those with more recent priority dates. Under classic appropriative rights principles, a more-senior appropriator is entitled to have their reasonable needs met before any more-junior appropriator may take water. Although seniority differences among appropriators fall along a spectrum by priority date, there are two key subgroups of appropriative rights:

    - ***Pre-1914 rights:*** Appropriative rights or claims of right from before December 19, 1914, are known as pre-1914 rights or claims of right. *They do not require a permit from the SWRCB.*

    - ***Post-1914 rights:*** Appropriative rights established on or after December 19, 1914, are known as pre-1914 rights. *They are subject to approval and permitting by the SWRCB.*[41]

This hybrid system presents particular challenges for water allocation during times of shortage due to the complex interplay of the general seniority of riparian rights, among which shortages are shared, and the first-in-time, first-in-right seniority rule among appropriative users.[42] These issues are compounded by data limitations that make it difficult to understand actual flows and diversions in real time across the state or the roles of surface storage, releases from storage, return flows, and pumping and use of interconnected groundwater in modifying surface water flows.

Notably, California has a parallel hybrid, and largely distinct, groundwater rights system that is largely governed by common law.[43] Groundwater use under that system does not require a permit from the SWRCB. Nonetheless, California law recognizes that surface water and groundwater resources are often interconnected,[44] and, in certain contexts, curtailments must address both to be effective.

2.1.2. Ensuring reasonable use

The SWRCB has the responsibility to ensure that surface water rights and claims are exercised consistent with constitutional limitations,[45] including by implementing curtailments that prevent unreasonable uses of water.

The California Constitution describes important limits inherent in all water rights, regardless of their type or seniority. A water right holder has a usufructuary right (to use water), as opposed to ownership of the water itself.[46] And all water rights are bound by the overarching requirements that water resources be reasonably and beneficially used in the public interest, to the fullest extent possible, and not wasted.[47]

Every water right is expressly limited to the amount of water that is "reasonably required for the beneficial use to be served," and the state constitution makes clear that this does not include "the waste or unreasonable use or unreasonable method of use or unreasonable method of diversion of water."[48]

While the elasticity of the concept of reasonable use creates some uncertainty, it provides critical flexibility to adapt changing hydrologic conditions, societal values, and needs. The California Supreme Court has held that what is considered "reasonable" necessarily changes with time and "with the facts and circumstances" of each case,[49] but it is not a purely locally matter; instead whether a use is reasonable "cannot be resolved…isolated from state-wide considerations of transcendent importance."[50] Some uses of water that might be reasonable during an average year might not be reasonable during a time of shortage. For example, during the 2020–2022 drought, the SWRCB adopted statewide emergency regulations banning certain defined wasteful water uses, such as the "application of water to irrigate turf and ornamental landscapes during and within 48 hours after measurable rainfall of at least one fourth of one inch of rain."[51]

The requirement for reasonable use is relevant to determining when curtailments are needed in the first instance and to deciding what exceptions to curtailment and alternative compliance mechanisms are appropriate.

2.1.3. Protecting environmental water uses and water quality

Another overarching principle of California water law is the state's public trust doctrine. State courts and agencies, including the SWRCB, have a duty "to take the public trust into account in the planning and allocation of water resources, and to protect public trust uses whenever feasible." [52] This includes providing "continuing supervision over the taking and use" of water.[53] Public trust uses include fishing, boating, and preserving navigable waterways in their natural state and as environments that support fish and other wildlife.[54]

In addition to California's public trust doctrine, other protections for environmental water uses affect water rights. For example, the SWRCB plays important roles in establishing and implementing streamflow requirements needed "to assure the continued viability of stream-related fish and wildlife resources"[55] as well as other water quality objectives needed to "ensure the reasonable protection" of designated beneficial uses for particular water bodies.[56] Protections for environmental water uses come from wildlife and species protections under the federal Endangered Species Act (ESA) and its state counterpart the California Endangered Species Act (CESA)[57]; other statutes, like California Fish and Game Code section 5937, which requires dam owners to ensure that sufficient water passes over, around, or through a dam to maintain fish below it "in good condition"; water quality protections under the federal Clean Water Act (CWA) and state Porter-Cologne Water Quality Control Act[58]; environmental review requirements under the National Environmental Policy Act (NEPA)[59] and the California Environmental Quality Act (CEQA)[60]; and other sources.

Water quality requirements also protect other uses of water. For example, the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary sets flow, salinity, and other water quality objectives to support municipal and industrial, agricultural, and fish and wildlife uses.[61]

The SWRCB is responsible for implementing or complying with these state and federal protections when administering California's surface water rights system, including when it implements water right curtailments. Regardless of whether they define explicit duties for the SWRCB with respect to water rights, these protections inform the SWRCB's analysis of what uses of water are reasonable (or unreasonable), consistent with the SWRCB's public trust responsibilities, and in the public interest. For example, when examining SWRCB regulations aimed at curtailing, or otherwise limiting, surface water diversions to maintain minimum flows needed to protect native fish, California courts have concluded that "fish survival is an appropriate consideration in determining what is or is not an 'unreasonable use, unreasonable method of use, or unreasonable method of diversion of water in this state.'"[62]

Protections for environmental water uses can be a basis for curtailments. They also inform what alternative compliance mechanisms, such as local cooperative solutions for maintaining drought minimum flows, are appropriate.

2.1.4. Protecting human health and safety uses of water

Protecting human health and safety is also an important part of the SWRCB's role. Human health and safety protections come from various sources. At the most basic level, the California Constitution requires that water use be "in the interest of the people and for the public welfare."[63] More specific protections related to drinking water access and safety are codified in the California Water Code, including state policies establishing that "the use of water for domestic purposes is the highest use of water"[64] and requiring state agencies to consider the human right to water when making decisions that affect the right.[65] Other state and federal protections arise from the federal Clean Water Act and Safe Drinking Water Act, the state Water Code, and the state Health & Safety Code, including, for example, the requirement for public water systems to provide "a reliable and adequate supply" of safe drinking water to those they serve.[66] Protecting human health and safety may also involve water uses necessary to prevent adverse impacts to human health and safety, such as maintaining basic electrical grid reliability, addressing critical air quality impacts, and supporting fire preparedness.[67]

Similar to protections for environmental water uses, human health and safety considerations inform what uses of water are reasonable—or unreasonable—in particular watersheds during times of water shortage. Almost any use of water could be considered unreasonable if it deprives others of the ability to meet their basic human health and safety needs.

Curtailment exceptions for diversions needed to meet minimum human health and safety needs may be necessary and appropriate, for example, when curtailment would eliminate the diverter's sole source of water for their own (or their customers') urgent drinking and sanitation needs. Additionally, curtailment of other water rights, including more-senior rights, may be necessary to ensure that minimum human health and safety needs are met in times of shortage.

2.2. SPECIFIC TOOLS AND AUTHORITIES AVAILABLE FOR IMPLEMENTING CURTAILMENTS

The SWRCB has access to specific tools and authorities it can use to support curtailments. **Table 2** summarizes nine different tools. Informational tools, such as drought early warning letters and notices of water unavailability, can help to inform diverters and encourage water right compliance. The SWRCB can use other tools to establish curtailment requirements, initiate and adjust curtailments, and bring actions to enforce curtailment requirements. We do not discuss statutory adjudications here. Although they have the potential to make curtailments more straightforward, the SWRCB currently lacks the power to initiate a statutory adjudication on its own.[68]

Table 2. *Utility and limitations of tools for implementing curtailments. Cell shading reflects the basic role each tool serves.*

TOOL	BASIC ROLE	POTENTIALLY USEFUL FOR	KEY LIMITATIONS
Drought early warning letters	Inform	Encouraging preparation for potential impending water shortage	Very general/generic (as used to date)
Notices of water unavailability	Inform	Encouraging curtailment	Informational, not directly enforceable; courts may perceive them as defective curtailment orders
Terms in water right permits and licenses	Establish requirements	Implementing specific diversion limitations for specific rights	Amending existing rights to include such terms can take years
Regulations adopted via the regular rulemaking process	Establish requirements	Defining the basis and process for curtailments	Generally takes several years to adopt and implement effective regulations
Drought emergency regulations	Establish or adjust requirements	Defining or adjusting the basis and process for curtailments	Only available in a "critically dry year" after at least 2 consecutive below-normal or drier years, or when the Governor has proclaimed a drought state of emergency; expire after 1 year
Curtailment orders and status lists	Initiate and adjust curtailments	Issuing and updating curtailments as designated by regulation	No administrative interim relief for violations
Cease-and-desist orders	Enforce requirements	Stopping violations administratively	May take 20+ days to become enforceable, so harm may continue
Fines / financial penalties	Enforce requirements	Penalizing violations, administratively or by court order	May be too small, or come too late, to deter violations effectively or stop/prevent harm
Injunctive relief	Enforce requirements	Stopping violations via court order	May be too late to stop/prevent harm

Inform
Establish requirements
Initiate or adjust curtailments
Enforce requirements

Both individually and collectively, all of these tools have important limitations. Therefore, this section also highlights ways in which particular tools, or the SWRCB's ability to use them, are limited. Our discussion will demonstrate how the SWRCB's current toolbox is in some ways inadequate to support timely and effective curtailments that implement the state's water rights system, ensure reasonable use of water, and maintain compliance with environmental and public-health laws. In sum, the palette of specific tools that are readily accessible to the SWRCB does not match the SWRCB's broad responsibility and general authority to implement curtailments.

2.2.1. Informational tools

The SWRCB can provide information to water users to support those users' water decision making in many different ways. We highlight two the SWRCB has used in support of curtailments during multiple major statewide droughts. First, to encourage water users to engage in their own contingency planning, the SWRCB can provided advance warning via drought early warning letters when forecasts suggest that upcoming water shortage is likely. Second, the SWRCB can notify water users when the agency's calculations show that water is unavailable under their water rights, encouraging them to curtail their diversions. Ideally, notices of water unavailability would be followed up with curtailment orders (discussed in **Section 2.2.5**), although that has generally not been the case during past droughts.

Drought early warning letters (a.k.a. "notices of potential water shortage") — During all five major statewide droughts since the 1970s, the SWRCB has sent letters to at least some water users to provide them with advanced warning of drought conditions and the potential that water use reductions will be required later in the year. The letters explain that a dry trend is forecast to continue, which raises the likelihood that water might be unavailable for some diverters in the future. These letters are usually very general and encourage water users to prepare for potential water shortage, for example, by taking steps to conserve water. They are sometimes referred to by other names, such as "notices of potential water shortage" or "letters regarding ongoing dry conditions." These early warning letters sometimes remind water users of their water right reporting obligations. During past droughts, the SWRCB sent out drought early warning letters as follows:

- *1976–1977 Drought:* Sent letters to thousands of diverters in the Delta and Russian River watersheds as well as in the North Coast, San Francisco Bay area, Central Coast, and North and South Lahontan Basins (1977).[69]
- *1987–1992 Drought:* Sent letters to thousands of diverters in the Delta watershed during at least 2 years (1988, 1990) and > 10,000 across the state (1990).[70]
- *2007–2009 Drought:* Sent letters statewide (2009).[71]
- *2012–2016 Drought:* Sent letters statewide (2014, 2015).[72]
- *2020–2022 Drought:* Sent letters statewide (2021[73], 2022[74]).

Notices of water unavailability (a.k.a. "curtailment notices") — During four of the five major statewide droughts since the 1970s, the SWRCB has sometimes analyzed water unavailability for certain watersheds and issued water unavailability notices to diverters when its analyses suggest water is, or will imminently be, unavailable under their priority of right.[75] These notices have sometimes been described as "curtailment notices," but, importantly, they do not have the same effect as a formal curtailment order (discussed in **Section 2.2.5**). Before the 2020–2022 drought, notices of water unavailability were the primary tool the SWRCB used to implement curtailments to protect water right priority.. In early 2021, the SWRCB initially issued notices of water unavailability to certain diverters in certain watersheds to let them know the SWRCB thought they ***should*** curtail their diversions. It sent these notices out to encourage diverters to curtail before it was able to issue enforceable curtailment orders under emergency regulations (because those regulations were still in development or had been adopted, but were not yet effective). During past droughts, the SWRCB issued notices of water unavailability as follows:

- ***1976–1977 Drought:*** Issued notices to thousands of diverters in the Delta watershed (1977).[76]
- ***1987–1992 Drought:*** Issued notices to thousands of diverters in the Delta watershed during at least 2 years (1988, 1990).[77]
- ***2007–2009 Drought:*** Not known to have issued notices.[78]
- ***2012–2016 Drought:*** Issued notices to large numbers of diverters in the Delta (2014, 2015), Eel River (2014), Russian River (2014), and Scott River (2014, 2015, 2016) watersheds.[79]
- ***2020–2022 Drought:*** Issued notices to large numbers of diverters in the Delta,[80] Russian River,[81] and Scott River[82] watersheds before emergency regulations that laid the groundwork for curtailment orders went into effect (2021).

Both drought early warning letters and notices of water unavailability have important limitations:

- Drought early warning letters, as used to date, have provided a generic warning—that water users may need to reduce their water use later in the year—to a large group of diverters. Such warnings can help to encourage diverters to prepare for the possibility of upcoming water shortage and remind them of their legal obligations (including the obligation to curtail if water becomes unavailable under their priority of right). However, these general, advance warning notices do not help diverters understand when, specifically, curtailments are needed or who, specifically, must curtail.

- Notices of water unavailability are much better suited to helping diverters understand ***when*** they need to curtail than the more generalized drought warning letters, but they are still not an ideal instrument for implementing curtailments. In particular, failure to curtail after receipt of such a notice is not directly enforceable (i.e., as a violation of that notice), giving diverters less of an incentive to curtail than curtailment orders would.

Additionally, at times, courts have interpreted past notices of water unavailability as defective de facto curtailment orders because they stated that curtailment was required. In *California Water Curtailment Cases*, the superior court found that the SWRCB's 2015 notices of water unavailability (also known as curtailment notices) violated the petitioners' due process rights by functionally curtailing their water rights without "a hearing or other opportunity to challenge the Board's underlying water availability analysis and other findings."[83] The court was not convinced that the notices were truly informational. Instead, the court described the notices, together with a partial rescission notice the SWRCB issued to clarify the notices' informational nature, as "perpetuat[ing] the practical impairment of petitioners' water rights by . . . announcing that . . . [the SWRCB] might at any time commence enforcement proceedings against them to recover penalties that were already accruing."[84] Therefore, the court held that "a public, predeprivation process to satisfy due process" was required, calling on the SWRCB "to fashion a curtailment process that gives users some meaningful opportunity to challenge the underlying findings ***before*** they are ordered to curtail their water use and ***before*** fines for noncompliance begin to accrue against them."[85] The court suggested that such a process might include publishing the methodology the SWRCB planned to use to determine water unavailability and "holding a public hearing where water users and outside experts could challenge it" in order to "both reduce the risk of erroneously depriving water users of their rights and assist the Board in pursuing effective enforcement measures."[86] It is important to note that the trial court's determinations lack precedential value, and these issues were not directly addressed on appeal.[87] We discuss due process considerations related to curtailment in more detail in **Section 2.3**.

2.2.2. Terms in water right permits and licenses

The SWRCB can include curtailment-related terms when issuing or updating a water right permit or license. Such terms require the right holder to reduce or cease diversions under specified circumstances. If such terms are incorporated into a water right, they are effective and can be implemented immediately, with any violations subject to potential enforcement action.

In some instances, the SWRCB has developed a special "standard" water right term for a group of water rights that share particular diversion limitations in common. For example, Standard Terms 91 and 93 prohibit affected water right holders from diverting water when state or federal water managers are releasing stored water to meet water quality and flow requirements in the Delta.

- Standard Term 91[88] is included in 115 permits and licenses issued after 1965 in the Delta watershed.[89] Term 91 curtailments are triggered when the SWRCB notifies the affected right holders that the methodology shows "supplemental Project water" is being released,[90] which happens most years, often during the spring or summer.[91]

- Standard Term 93[92] is a similar term, included in 104 permits and licenses in the San Joaquin River watershed, that has been invoked much less frequently.[93]

Other curtailment-related terms may apply to just one or a few water rights, reflecting very specific obligations to reduce or cease diversions under certain conditions. For example, the SWRCB has amended two licenses the City of Los Angeles Department of Water and Power (LADWP) holds to divert and use water from several tributaries to Mono Lake, consistent with the California Supreme Court's 1983 decision in *National Audubon Society v. Superior Court*.[94] Today, the licenses include diversion limitations designed to protect public trust uses established under SWRCB Decision 1631, related water right orders, and a 2013 settlement agreement.[95] These limitations are linked to both the water level of Mono Lake and maintaining required ecosystem flows in its tributary streams.[96]

Amending existing water rights to add curtailment-related terms can be a lengthy and resource intensive process. For Term 91, approximately 4 years passed from the time of initial adoption to the term's incorporation in affected water rights. On August 16, 1978, the SWRCB issued Water Right Decision 1485, requiring the state and federal water projects to meet certain water quality standards in the Delta. In early 1980, the SWRCB adopted an initial version of Term 91 to ensure that more-junior diverters did not interfere with reservoir releases intended to meet those standards.[97] In 1981, it held a hearing and adopted a methodology for calculating water availability before adding the term to most post-August 16, 1978, Delta permits and licenses in 1983.[98] After an additional hearing in 1983, in 1984, the SWRCB added Term 91 to most water right permits issued in the Delta watershed since 1965 using its reserved jurisdiction under standard permit Term 80.[99] The term was first implemented in 1984.[100] As another example, although LADWP petitioned to amend its licenses to reflect changes associated with the 2013 settlement agreement soon after it was finalized, the licenses were not amended until late 2021, almost 8 years later.[101] The amended licenses not only incorporated the changes in the 2013 settlement agreement, but also "combine[d] all prior terms and conditions required by LADWP's water rights."[102]

By definition, pre-1914 appropriative rights and riparian rights cannot be amended this way, since they are not subject to permitting by the SWRCB.

Although water right terms can be an important vehicle for establishing curtailment requirements, to date this application has been limited and is unlikely to be expanded sufficiently to meet California's current needs for timely and effective curtailments. Establishing curtailment requirements via other means remains crucial.

2.2.3. Regulations adopted through the regular rulemaking process

Regulations might be the SWRCB's most useful tool for establishing curtailment requirements because they allow the agency to establish a clear and consistent foundation for issuing specific, enforceable curtailment orders to large numbers of diverters at once.

The SWRCB has clear authority to adopt regulations to help it carry out its statutory responsibilities.[103] The California Administrative Procedure Act (APA)[104] establishes basic requirements state agencies must follow when adopting, amending, or repealing regulations.[105] We summarize key aspects of the regular rulemaking process[106] below and discuss emergency rulemaking in the next section, where **Table 3** compares across processes.

Table 3. *Key differences between the regular and emergency rulemaking processes currently available to the SWRCB.*

CATEGORY	REGULAR RULEMAKING	EMERGENCY RULEMAKING UNDER GOVERNMENT CODE	EMERGENCY RULEMAKING UNDER WATER CODE
Threshold availability of rulemaking option	When the SWRCB deems regulations "advisable in carrying out its powers and duties."[107]	When a state agency makes and supports a finding that the emergency regulation is "necessary to address an emergency."[108]	During a critically dry year following 2+ consecutive below-normal or drier years *or* During a drought state-of-emergency proclaimed by the Governor.[109]
Public engagement requirements	Broad notice.[110] Public comment period(s) before adoption of at least: • 45 days initially • 15 additional days after changes.[111] If requested at least 15 days before the close of initial public comment, hold a public hearing.[112] Respond to comments received.[113]	Publish notice on the agency's website.[114] Unless delay would be "inconsistent with the public interest," (1) the agency must provide at least 5 working days notice to those requesting notice of regulatory action before it submits the adopted regulation to OAL,[115] and (2) OAL must allow 5 days for public comment before completing its review.[116]	*Same as ER under Government Code*
Time from notice to OAL submission	At least 45 days[117]	Generally at least 5 working days"[118]	*Same as ER under Government Code*
Effective term	No inherent limit	Up to 180 days,[119] with up to 2 renewals	Up to 1 year,[120] renewable if drought conditions persist
Duration of OAL review	Up to 30 working days[121]	Up to 10 calendar days, generally including 5 days for public comment[122]	*Same as ER under Government Code*
Content of OAL review	Compliance with 6 substantive standards[123] Compliance with procedural requirements for regular rulemaking	*Same as ER under Water Code* + Emergency finding[124]	Compliance with 6 substantive standards[125] Compliance with procedural requirements for emergency rulemaking[126]
CEQA compliance	Required, unless a categorical exemption applies[127]	Potentially statutorily exempt if adopted to mitigate an emergency[128]	*Same as ER under Government Code* + CEQA suspension by emergency proclamation[129]
Penalty for violation	Up to $500 per day.[130]	*Same as Regular Rulemaking*	*Same as Regular Rulemaking*

CEQA California Environmental Quality Act
ER Emergency regulations
OAL Office of Administrative Law

Preliminary rulemaking activities — An agency wishing to adopt a regulation must prepare supporting documents. These include the text of the proposed regulation (with citations to sources of authority and references), an initial statement of reasons for the proposed regulatory changes, an economic and fiscal impact statement, and a notice of proposed regulatory action.[131] The notice must include an informative digest which provides needed context for the proposed action.[132] For large or complex proposed regulations, agencies should "involve parties who would be subject to the proposed regulations in public discussions regarding those proposed regulations" prior to publication of notice.[133] Preliminary rulemaking activities may take months or years.

The formal rulemaking process — The formal rulemaking process begins when the agency issues the notice by publishing it in the California Regulatory Notice Register, mailing it to those who have requested notice of regulatory actions, and posting the notice, text, and initial statement of reasons on its website.[134] The notice must specify a deadline for written public comment that is at least 45 days after the date the notice was published.[135] The agency can hold a public hearing on the proposed regulation, and it must do so if "any interested person" submits a written request for a hearing at least 15 days before the written public comment period ends.[136] When a hearing is held, the public can provide both written and oral comments.[137] The SWRCB often holds a staff workshop to provide an overview of and receive feedback on a proposed regulation. If the agency makes changes to a proposed regulation that are "nonsubstantial" or substantial but "sufficiently related to the original text that the public was adequately placed on notice that the change could result from the originally proposed regulatory action," it must allow at least 15 days for additional public comment.[138] To make substantial changes that are not sufficiently related to the original proposal, the agency must publish a new notice.

Environmental Impacts Analysis — To inform its consideration of a proposed regulation, the agency must comply with the California Environmental Quality Act (CEQA). CEQA requires state agencies to evaluate the environmental impacts of "projects" they intend to carry out, mitigating or avoiding significant effects when feasible.[139] The goal is to provide the public and the agency with information about the potential effects of the proposed project and potential alternatives, as well as possibilities for minimizing negative impacts. For regulations, the most common form of compliance is an Environmental Impact Report (EIR) that analyzes the reasonably foreseeable environmental impacts of the methods of compliance with the regulation.[140] However, the need to prepare a full EIR, versus a more streamlined CEQA document, depends on the nature and extent of those foreseeable impacts.[141] Regulations that are benign from an environmental standpoint may qualify for one or more categorical exemptions.[142] While aspects of the CEQA process can be carried out in parallel with the development of a regulation, the agency must sometimes sift through multiple potential alternatives in advance. As a result, the CEQA process for a regulation can take years to complete. At a minimum, getting to a final regulation requires inviting and responding to CEQA public comments.

Office of Administrative Law (OAL) review — After an agency adopts a regulation, the Office of Administrative Law (OAL) must review and approve it before it can go into effect. The agency must submit the adopted regulation, an updated informative digest, a final statement of reasons, and other materials to the OAL within one year of the notice date.[143] The final statement of reasons must summarize and respond to objections and recommendations the agency received regarding the proposed regulation or the procedures the agency followed in adopting it.[144] OAL examines the package to determine whether the record demonstrates that the agency followed procedural requirements and complied with standards for necessity, authority, clarity, consistency, reference, and nonduplication.[145] Within 30 working days of receiving a regulation, OAL must approve or disapprove of it.[146]

To date, the SWRCB has not used its regular rulemaking authority to develop regulations to guide curtailments. Instead, the agency has generally waited until a major statewide drought is in progress before developing its drought response.[147] Regular rulemaking takes time and forethought, resources likely to be limited in the midst of serious, widespread drought. It is theoretically possible to initiate and complete a regular rulemaking over the course of several months. But preliminary rulemaking activities add months or years to the timeline for developing regulations that address complex or controversial issues. Additionally, once the formal rulemaking process has begun, any substantial changes may require the SWRCB to start over with a new notice in the California Regulatory Notice Register—something that is more likely to happen if the SWRCB tries to develop regulations quickly in the context of drought.

2.2.4. Drought emergency regulations

The SWRCB made extensive use of emergency regulations to guide curtailments during the 2020–2022 drought, following initial, more limited, use during the 2012–2016 drought.

Under some circumstances, the SWRCB can use a streamlined emergency rulemaking process to adopt temporary emergency regulations to help carry out its responsibilities. The SWRCB has both the general emergency rulemaking authority available to all state agencies under the Government Code and drought-specific emergency rulemaking authority under Water Code section 1058.5. We describe key differences between regular rulemaking, emergency rulemaking under the Government Code, and emergency rulemaking under the Water Code below. **Table 3** provides a summary of many of these differences.

Emergency findings — Emergency rulemaking under the Government Code requires a finding that the regulation is necessary to address an emergency,[148] "a situation that calls for immediate action to avoid serious harm to the public peace, health, safety, or general welfare"[149] Emergency rulemaking under Water Code section 1058.5 is only available when the SWRCB finds that the emergency regulation responds to "conditions which exist, or are threatened in a critically dry year immediately preceded by two or more consecutive below normal, dry, or critically dry years or during a period for which the Governor has issued a proclamation of a state of emergency under the California Emergency Services Act . . . based on drought conditions."[150] Furthermore, the SWRCB must find that it is adopting the emergency regulation "to prevent the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion, of water, to promote water recycling or water conservation, to require curtailment of diversions when water is not available under the diverter's priority of right" or to require reporting related to any of these purposes.[151] Regular rulemaking requires no emergency findings.

Public engagement — Emergency rulemaking under both the Government Code and the Water Code allows significantly streamlined public process. The SWRCB must "send a notice of the proposed emergency action to every person who has filed a request for notice of regulatory action with the agency" at least 5 working days before it submits the adopted emergency regulation to the OAL, unless "delaying action . . . would be inconsistent with the public interest,"[152] and also publish notice documents on its website.[153] After an agency submits an adopted emergency regulation to the OAL, the OAL must allow 5 days for public comment unless the delay would be inconsistent with the public interest.[154] These opportunities for public engagement are greatly compressed compared to those required for regular rulemaking. However, the SWRCB provided public engagement opportunities that far exceeded the statutory minimum requirements during the 2020–2022 drought (see **Sections 3.2** and **3.3**).

OAL review — Regardless of the rulemaking process used, OAL approval requires compliance with applicable procedural requirements and substantive standards. The OAL has just 10 calendar days to complete review of an adopted emergency regulation,[155] compared to up to 30 working days to complete review of a regulation adopted via the regular rulemaking process. The 10-day review period includes the 5 days during which the OAL must generally accept public comment before approving or disapproving a proposed regulation.[156] For emergency rulemaking under the Government Code, the OAL reviews the emergency finding.[157] However, the emergency findings for emergency rulemaking under the Water Code are exempt from OAL review.[158]

Effective term — Emergency regulations adopted under the Government Code are limited to an effective term of 180 days, with the possibility of up to two 90-day readoptions if the agency is actively working to make the regulation permanent (through the regular rulemaking process).[159] Emergency regulations adopted under the Water Code can be effective for up to 1 year and are renewable as long as the SWRCB determines that emergency conditions are still in effect.[160] There is no inherent limit on the effective term of regulations adopted through the regular rulemaking process.

Penalties — The SWRCB may impose a civil penalty of up to $500 per day for violation of a regulation it has adopted, including an emergency regulation adopted under the Government Code or the Water Code or a regulation adopted through the regular rulemaking process.[161]

Several aspects of the SWRCB's emergency rulemaking authority under the Water Code stand out as better suited to supporting curtailments than its more general emergency authority under the Government Code. First, Water Code section 1058.5 expressly identifies requiring curtailments and preventing unreasonable use as appropriate applications of that emergency rulemaking authority. Second, emergency regulations adopted under the Water Code can be in effect for twice as long, and readoption is allowed as long as the emergency conditions justifying the emergency regulations persist. Finally, the availability of cease and desist orders for violations of emergency regulations adopted under Water Code section 1058.5 is important for encouraging compliance and enabling effective enforcement.[162]

The SWRCB has used emergency rulemaking under the Water Code to adopt drought emergency regulations to guide curtailments during the last two major statewide droughts.

- ***1976–1977 Drought:*** No emergency curtailment regulations adopted.[163]
- ***1987–1992 Drought:*** No emergency curtailment regulations adopted.[164]
- ***2007–2009 Drought:*** No emergency curtailment regulations adopted.[165]
- ***2012–2016 Drought:*** Adopted emergency regulations for curtailment of diversions due to insufficient flow for specific fisheries in 3 tributaries to the Sacramento River: Deer, Mill, and Antelope Creeks (2014, 2015).[166] Adopted, but did not implement, statewide emergency regulations for curtailment of post-1914 diversions to protect senior water rights (2014).[167]
- ***2020–2022 Drought:*** Adopted emergency curtailment regulations for the Russian River watershed[168]; the Klamath River watershed, focused on the Scott and Shasta River watersheds[169]; the Delta watershed[170]; and again for 2 tributaries to the Sacramento River: Deer and Mill Creeks[171] (2021, 2022).

As we previously noted, during the 2012–2016 drought, the SWRCB relied primarily on notices of water unavailability to implement curtailments when there was insufficient flow in a watershed to meet all water rights. It only issued actual curtailment orders for diverters in Deer and Antelope Creeks, where it had developed watershed-specific emergency curtailment regulations. In contrast, during the 2020–2022 drought, the SWRCB has greatly expanded its use of curtailment orders by laying the groundwork for them in watershed-specific drought emergency regulations.

Importantly, unlike notices of water unavailability (see **Section 2.2.1**) and certain enforcement tools (see **Sections 2.2.6.5** and **2.2.6.6**), courts have so far upheld the SWRCB's use of drought emergency regulations to curtail pre-1914 and/or riparian water rights. In *California Water Curtailment Cases*, the court of appeal concluded that the SWRCB lacked authority under Water Code section 1052(a) (an enforcement provision) to issue priority-based curtailment notices to pre-1914 appropriative water rights holders and claimants in 2015.[172] At the same time, the court emphasized that "[n]either section 1058.5 nor any of . . . [the SWRCB's drought emergency] regulations contains the limits found in section 1052(a)" of the Water Code for enforcing water right priorities among pre-1914 appropriate water rights holders and claimants.[173]

Despite drought emergency regulations being a better vehicle for implementing curtailments than most other tools we have discussed, this tool also has important limitations. We discuss these limitations at length in **Section 3.4**.

2.2.5. Tools for initiating and adjusting curtailments

The SWRCB can issue curtailment orders that have legal effect independent of subsequent potential enforcement actions.

To date, drought curtailment orders have been issued under emergency curtailment regulations (although they could be issued under non-emergency curtailment regulations, should the SWRCB adopt them).

- ***1976–1977 Drought:*** No curtailment orders issued.[174]
- ***1987–1992 Drought:*** No curtailment orders issued.[175]
- ***2007–2009 Drought:*** No curtailment orders issued.[176]
- ***2012–2016 Drought:*** Issued curtailment orders under emergency regulations (designed to protect fish flows in 3 tributaries to the Sacramento River) for Deer Creek (2014, 2015, 2016)[177] and Antelope Creek (2015, 2016)[178]; curtailment orders were not issued for the third tributary, Mill Creek, where diverters entered into voluntary agreements regarding minimum flows (see **Section 3.1.2**).
- ***2020–2022 Drought:*** Issued curtailment orders and status updates under emergency regulations for the Russian River Watershed,[179] the Scott[180] and Shasta[181] River watersheds, the Delta watershed,[182] and Deer[183] and Mill[184] Creek watersheds (2021, 2022).

Additionally, the SWRCB issues Term 91 curtailment "notices" (which courts have found function as curtailment orders[185]) at some point during most years.[186]

During the 2020–2022 drought, the initial drought curtailment order (or orders) for a watershed have built in provisions for updating curtailment status that do not require the issuance of new curtailment orders. In particular, the SWRCB has established watershed-specific email lists and web pages to provide status updates, and its curtailment orders inform water users they must sign up for the appropriate email list and check the website for changes in curtailment status. For curtailments based at least in part on insufficient flows to meet all water rights—in the Sacramento-San Joaquin Delta, Russian River, Scott River, and Shasta River watersheds—the SWRCB maintains web-based curtailment status lists and updates them when estimated water unavailability changes.[187]

2.2.6. Enforcement tools

The Legislature has emphasized the need to "take vigorous action to enforce the terms and conditions of permits, licenses, certifications, and registrations to appropriate water, to enforce…[SWRCB] orders and decisions, and to prevent the unlawful diversion of water."[188]

The SWRCB currently has access to several enforcement tools, both informal and formal, it can use to support curtailments to some extent. Informal enforcement actions can include sending reminders, for example, to diverters who miss the deadline for responding to a reporting or certification requirement in a curtailment order. We discuss the SWRCB's options for formal enforcement below. These options include issuing notices of violation, cease-and-desist orders, and administrative civil liability orders. Additionally, the SWRCB can refer cases to the California Attorney General to pursue penalties and/or injunctive relief in superior court.

Unfortunately, while the SWRCB has a number of enforcement tools, it does not always have the ability to take timely and effective action to enforce curtailments using these tools. Most enforcement mechanisms can take weeks to implement, if not longer, and the magnitude of available penalties may be insufficient to deter violations. These inadequacies allow bad actors to intentionally violate curtailment orders—causing irreparable harm to public trust resources and other water users—while risking only modest financial repercussions. Also, a recent court of appeal decision prevents the SWRCB from using one key tool to address violations of priority-based curtailment orders by pre-1914 appropriative water right holders and claimants.[189]

2.2.6.1. Notice of violation (NOV)

Before the SWRCB pursues further enforcement action against a diverter, its water rights enforcement team generally issues a NOV.[190] The NOV provides warning of the violation and potential repercussions and allows the diverter to come into compliance.[191] Although a NOV is not required as a pre-requisite to further enforcement, it is often used as a first step before the SWRCB takes additional enforcement action. In many ways, a NOV functions as a formal warning letter that attempts to bring the recipient into compliance before or in lieu of more lengthy enforcement proceedings. When further enforcement actions are necessary, the NOV provides clear evidence that the SWRCB informed the recipient of the violation, serving as a record that the recipient was aware of it.

2.2.6.2. Cease-and-desist order (CDO)

The SWRCB can issue a CDO to require a person who is violating or threatening to violate certain requirements to comply immediately or on "a time schedule set by the [SWRCB]."[192] Most relevant to curtailments, a CDO can address a violation or threatened violation of (1) "the prohibition set forth in Section 1052 against the unauthorized diversion or use of water subject to . . . [D]ivision [2 of the Water Code]," (2) any water right "term or condition," (3) any water-right decision or order of the SWRCB, or (4) a drought emergency regulation.[193]

A final, enforceable CDO cannot be issued immediately. Instead, the SWRCB can only issue a final CDO after providing notice of the CDO, personally or by certified mail, including a "statement of facts and information that would tend to show the proscribed action," and providing the opportunity for a hearing.[194] The SWRCB provides notice in the form of a draft CDO.[195] The diverter has 20 days from the date they receive the notice to request a hearing.[196] If they do not request a hearing, or after a requested hearing takes place, the SWRCB can issue a final, enforceable CDO.[197]

If a diverter fails to comply with a CDO, the SWRCB can issue administrative fines (described in the following section) and ask the state Attorney General to "petition the superior court for the issuance of prohibitory or mandatory injunctive relief as appropriate, including a temporary restraining order, preliminary injunction, or permanent injunction."[198] However, long before a CDO is finalized and becomes enforceable, curtailment violations can do significant harm. **Box 1** discusses a recent example in the Shasta River watershed.

2.2.6.3. Fines / financial penalties

The Water Code authorizes financial penalties for several types of violations that may be relevant in the context of curtailments. We summarize these in **Table 4**. In each case, financial penalties may be issued either administratively or by a superior court.[199]

Administrative civil liability (ACL) — The SWRCB has the authority to issue certain financial penalties directly. The ACL process, governed by Water Code section 1055, includes the following steps: First, the SWRCB's executive director issues an ACL complaint[200] alleging "the act or failure to act that constitutes a trespass or violation, the provision of law authorizing civil liability to be imposed, and the proposed civil liability."[201] The party served with the complaint then has 20 days from the date of service to request a hearing.[202] If a hearing is not timely requested (or after a requested hearing takes place), the SWRCB can adopt an order setting ACL, which becomes effective immediately.[203]

Penalties issued by a superior court — Alternatively, the SWRCB can ask the state Attorney General to bring an action for financial penalties in superior court,[204] a process that is likely to take longer and yield no additional benefit relative to acting administratively.

The maximum penalties available to the SWRCB are clearly insufficient to deter large diverters from committing intentional curtailment violations. The recent example from the Shasta River watershed discussed in **Box 1** makes this painfully clear. As **Table 4** shows, the potential penalties for most water rights violations top out at $500 per violation per day. While penalties of up to $10,000 per day would be available if a diverter violates a CDO during a qualifying drought period, it takes the SWRCB 20 days or more to issue a CDO. A diverter can simply stop violating curtailment requirements at any point before the SWRCB issues a final CDO to avoid incurring these hefty penalties. Additionally, one appellate court recently held that penalties for unauthorized diversion or use of water under Water Code section 1052 are not available for priority-based curtailment violations involving pre-1914 appropriative rights.[205]

BOX 1. A RECENT HIGH-PROFILE CURTAILMENT VIOLATION DEMONSTRATES THE INADEQUACY OF CURRENT ENFORCEMENT OPTIONS.

The Shasta River Water Association (SRWA) deliberately violated a curtailment order for 8 days in late August 2022. SRWA is a private non-profit association that distributes water to its member ranchers and farmers under a single 1912 water right.[206] It's right had been curtailed off and on since September 2021.[207] The violation occurred at a time when diverters were required to maintain drought emergency minimum flows of at least 50 cubic feet per second (cfs) at the Yreka gage, downstream of the SRWA's diversion location.[208] The SRWA diverted an estimated 30 cfs—over half of the river's flow—to fill stock ponds, irrigate pasture, and for other purposes. It stopped when these purposes were served, weeks before the final CDO could be issued, as this partial timeline of events shows:

AUGUST 17:

- Late in the day, the SRWA began diverting water in violation of the curtailment order.
- *Flows at the Yreka gage dropped from ~40 cfs to ~25 cfs.*

AUGUST 18:

- The SRWA continued to violate the curtailment order.
- *Flows dropped to ~17 cfs.*
- The SWRCB received a letter from the SRWA. Although the SRWA had not received approval for a curtailment exception—and none was available for irrigation—the letter explained that SRWA was about to begin diverting water "for the purposes of irrigation, livestock watering, watering trees, and fire suppression."[209]
- Staff from the SWRCB's Division of Water Rights inspected the headgates, witnessed the ongoing violation first hand, and spoke with representatives of the diverter, who indicated SRWA would continue to divert until its members stopped requesting water.[210]
- The SWRCB issued a NOV directing the SRWA to immediately cease diversions.[211]

AUGUST 19:

- SWRA's violation continued.
- The SWRCB issued a draft CDO, again directing the SRWA to immediately cease diversions.[212]

AUGUST 24:

- SWRA's violation continued until late in the day.
- *Flows dropped to as low as 12.2 cfs.*

SEPTEMBER 12:

- The SWRCB issued a final CDO.[213] If the SRWA violated the CDO going forward, that violation would be subject to penalties of up to $10,000 per day.[214] However, it did not do so.

NOVEMBER 4:

- The SWRCB issued an ACL complaint.[215] The complaint imposed the maximum possible penalty: $500 per day x 8 days $4,000,[216] or about $50 for each of the approximately 80 members of the SRWA, for violating the curtailment order.[217]

The SRWA made the financial calculation that it would rather violate the curtailment order and pay the penalty than abide by the curtailment order.[218] With its current enforcement toolbox, the SWRCB lacked the ability to prevent irreparable harm to other water users and the environment. It could not physically stop the unlawful diversion, despite having staff onsite on the second day of the violation. This is antithetical to a central purpose of the curtailments: providing "an emergency minimum level of protection for commercially and culturally significant fall-run Chinook salmon, threatened Southern Oregon/Northern California Coast coho salmon, and culturally significant steelhead" in the Shasta River watershed.[219]

Table 4. *Civil penalties that may be relevant in the context of curtailments.[220] Each can be imposed administratively or by a superior court. Maximum amounts are shown, however the Water Code requires the SWRCB to take into account a variety of considerations when determining the actual size of a penalty.[221] Cell shading distinguishes broad categories of violations.*

VIOLATION	STATUTORY AUTHORITY	MAXIMUM AMOUNT
Violation of a term or condition of a water right permit, license, certificate, or registration	Cal. Water Code § 1846(a)(1), (b), (c)	$500 per day
Violation of a regulation adopted by the SWRCB	Cal. Water Code § 1846(a)(2), (b), (c)	$500 per day
Violation of a drought emergency regulation adopted by the SWRCB	Cal. Water Code §§ 1058.5(d), 1846(a)(2), (b), (c)	$500 per day
Violation of an order adopted by the SWRCB	Cal. Water Code § 1846(a)(2)	$500 per day
Violation of a CDO issued by the SWRCB during a critically dry year following at least 2 consecutive below-normal or drier years, or during a period for which the Governor has proclaimed a drought state of emergency	Cal. Water Code § 1845(b)(1)(A)	$10,000 per day
Violation of a CDO issued by the SWRCB at another time	Cal. Water Code § 1845(b)(1)(B)	$1,000 per day
Unauthorized diversion or use of water subject to Division 2 of the Water Code during a critically dry year following at least 2 consecutive below-normal or drier years, or during a period for which the Governor has proclaimed a drought state of emergency	Cal. Water Code § 1052(a), (c)(1), (d)	$1,000 per day + $2,500 per AF of water diverted or used in excess of water rights
Unauthorized diversion or use of water subject to Division 2 of the Water Code at another time	Cal. Water Code § 1052(a), (c)(2), (d)	$500 per day

Of a requirement of a water right or regulation
Of a curtailment order or other order
Of a cease-and-desist order (CDO)
Unauthorized diversion or use

2.2.6.4. Injunctive relief

In some circumstances, the SWRCB also has the option of asking the state Attorney General to bring an action in superior court for injunctive relief on its behalf. One of these circumstances is threatened or actual unauthorized diversion or use of water that is "subject to" Division 2 of the Water Code, as provided in Water Code section 1052(b)(1). This option is also available to address a party's failure to comply with a CDO.[222] Injunctive relief could include a temporary restraining order, a preliminary injunction, or a permanent injunction.

Currently, the SWRCB lacks a way to administratively provide interim relief, i.e., to issue the equivalent of a temporary restraining order to halt diversions to prevent irreparable harm to water supplies for other water users or environmental resources pending an enforcement hearing. The SWRCB should be legislatively provided with such authority.

2.2.6.5. Limits of authority to impose or enforce curtailment requirements under Water Code section 1052

If the recent court of appeal decision in *California Water Curtailment Cases* holds, the SWRCB cannot pursue enforcement actions under Water Code section 1052 for violations of priority-based curtailment requirements committed by pre-1914 water rights holders or claimants. The court's interpretation of section 1052 has constrained the SWRCB's ability to impose curtailments under notices of water unavailability or to pursue enforcement actions to address violation of curtailment regulations or orders as forms of unauthorized diversion or use of water under Water Code section 1052. In its decision, the court of appeal concluded that this particular enforcement provision does not provide appropriate authority for "enforc[ing] priorities of right ***among*** pre-1914 appropriative right holders due to the lack of sufficient water to serve all pre-1914 appropriative right holders"—i.e., it eliminates Water Code section 1052 as a basis for priority-based curtailments of pre-1914 diverters.[223]

This decision does not affect other sources of authority the SWRCB has for implementing curtailments. Indeed, the court emphasized that nothing in its opinion precludes the SWRCB "from properly exercising its [curtailment] authority over pre-1914 appropriative water right holders under the public trust doctrine, applicable emergency regulations, or other appropriate authority," such as the California Constitution.[224]

2.2.6.6. Limits of Water Code enforcement provisions' utility for supporting curtailments

Instead of using regulations to lay the groundwork for issuing curtailment orders to many diverters at once, as the SWRCB has done during the 2020–2022 drought, some have suggested that individualized enforcement actions—i.e., one-off CDOs—are, or should be, the SWRCB's primary tool for implementing curtailments. We do not agree.

When tens, hundreds, or thousands of diverters in a watershed need to curtail, there is insufficient time and resources to provide each diverter with an individualized hearing before curtailments go into effect. Our overview of tools, their utility, and their limitations has demonstrated that such an approach would be highly impractical, or impossible, and also deeply ineffective. Collectively, such hearings would take years to complete and, as explained below, are not required by federal or state law. As a result, the SWRCB is appropriately relying on other tools and authorities to adopt and effectuate curtailment requirements, reserving its enforcement authorities to address violations of those requirements.

At the same time, as we note above, the SWRCB's existing enforcement authorities are, in critical respects, less effective than they need to be. Therefore, this report strongly recommends legislative action to enhance the SWRCB's enforcement toolkit.

2.3. PROCEDURAL DUE PROCESS REQUIREMENTS ASSOCIATED WITH CURTAILMENTS

The preceding sections explained the SWRCB's broad responsibilities and general authority to implement curtailments as well as the specific tools the SWRCB could use to implement curtailments and their key limitations. When implementing those tools, the SWRCB also must adhere to principles of procedural due process. Those principles arise from both federal and state constitutional law.

Constitutional due process principles also are important because they constrain the Legislature. The Legislature can enact or amend statutes governing SWRCB authority, but the procedures established by statutes must meet basic constitutional standards.

With that said, and as the discussion below will explain in more detail, both federal and state due process jurisprudence give ample flexibility for government entities to use expedited decision-making procedures. That is particularly true in situations—like regulation of water diversion and use—in which the delays arising from a slow and deliberate pursuit of accuracy can undermine the private rights and public interests government actors are supposed to protect.

2.3.1. Due process overview

In California, procedural due process requirements derive from two sources: First, the Fourteenth Amendment of the U.S. Constitution, which is binding upon state governments, states: ". . . nor shall any state deprive any person of life, liberty, or property, without due process of law." Second, from Article I, section 7(a) of the California Constitution, which similarly provides: "a person may not be deprived of life, liberty, or property without due process of law."

Where applicable, constitutional procedural due process imposes a variety of obligations, most centrally notice[225] and opportunity for "some kind" of hearing.[226] In some circumstances, due process may require that an agency provide an opportunity for an individual to participate in an evidentiary oral hearing, in which the individual may review the agency's evidence supporting its action, respond to such evidence, and provide evidence favoring the individual's position.[227] In some instances, a written opportunity to participate may suffice, and in others, no process may be required.[228]

2.3.2. When do due process principles apply?

An important threshold question is why procedural due process is important to the SWRCB's administration of water rights during droughts. The answer is that procedural due process requirements apply (among other circumstances) when government entities make decisions determining the scope of property rights.[229] Administering water rights during a drought necessarily involves making determinations about property rights, and due process requirements therefore apply.[230] There may be some circumstances in which SWRCB action does not implicate property rights—for example, if someone is diverting water without any credible claim to do so—but so long as the SWRCB's activities involve contested property claims, due process principles will apply.

One important principle limits the scope of applicability, however. As a general rule, the constitutional due process right to an individualized hearing applies only when agencies take certain kinds of adjudicatory action and not when agencies take legislative action.[231] Although some agency actions are clearly categorized as one or the other, the appropriate label for some agency decisions can be unclear.

Generally, an adjudicatory action is one in which an agency applies existing law to specific facts to determine the rights and obligations of specific parties.[232] Examples include issuance of a permit, approval of a change to a permit, or an enforcement action. Where an agency undertakes an action that is adjudicatory in nature, due process principles may require an individual hearing.

A legislative action, in contrast, is one in which agencies adopt general standards that govern larger groups. Typical examples of this type of agency action include adoption of regulations and other policies. In these "quasi-legislative" processes, an agency may consider both general and specific facts and may ultimately affect individual rights and obligations.[233] When an agency undertakes a legislative action, due process is satisfied by compliance with legislative procedures, and the due process right to an individual hearing generally does not apply.[234] This principle remains true even if the agency's legislative action may result in significant or even severe impacts to individual property interests, even "to the point of ruin."[235] The U.S. Supreme Court has explained that the reason for the distinction is pragmatic: "[w]here a rule of conduct applies to more than a few people, it is impracticable that everyone should have a direct voice in its adoption . . . [t]here must be a limit to individual argument in regard to matters affecting communities if government is to go on."[236]

The Court also has held that agencies have significant discretion in deciding whether to resolve issues through quasi-legislative, collective action or through adjudicatory, individualized action.[237]

2.3.3. What process is due?

When applying federal constitutional standards and considering the sufficiency of process, courts consider the three factors set forth in the United States Supreme Court's landmark *Mathews v. Eldridge*[238] decision. Courts have not established crisp rules for applying any of these factors, and they have repeatedly cautioned that the analysis should be sensitive to context.[239] The factors are:

- The nature and significance of the private interest that will be affected by the official action. Under this factor, courts assess the gravity of the private interest. Courts have held that even substantial private interests may not qualify for individual hearings, at least prior to deprivation, and that where the interest is economic in nature but not necessarily life-altering or affecting basic subsistence, more streamlined procedures may be appropriate.[240]

- The risk of an erroneous deprivation of such interest through the procedures used, and the probable value, if any, of additional or substitute procedural safeguards. This factor requires a reviewing court to consider how much risk of error existing procedures create and how much, if at all, additional or different procedures would reduce that risk. A court might consider, for example, how much can be gleaned from a paper record and whether an in-person hearing might supply valuable additional information.[241]

- The government and public interests affected, including the function involved and the fiscal and administrative burdens that the additional or substitute procedural requirement would entail.[242] Under this factor, the courts weigh the financial cost, staff investment, and other resources that are needed to provide additional procedures. They also weigh the opportunity cost of providing process in one venue and thereby preventing agency resources from being dedicated to other matters, potentially negatively affecting other members of the public.[243] As *Mathews v. Eldridge* explains, "[a]t some point the benefit of an additional safeguard to the individual affected by the administrative action and to society in terms of increased assurance that the action is just, may be outweighed by the cost."[244]

These principles generally reflect a broader theme of federal due process jurisprudence, which is a judicial reluctance to second-guess agency choices about appropriate decision-making procedures. Due process, federal courts have cautioned, is about avoiding egregiously flawed procedures, not achieving administrative perfection.[245]

2.3.4. Procedural due process under the California Constitution

California procedural due process jurisprudence is similar in many ways to federal procedural due process.[246] Where procedural due process protections apply, California uses the *Mathews v. Eldridge* test, but with one additional stated factor. Based on a key 1979 case, California courts also consider the "dignitary interest" of the plaintiff, which is another way of saying the importance of using processes that reflect the individual dignity of the person affected by government decision-making.[247] Courts often blur this fourth factor with the private-interest-at-stake analysis, however, making it hard to discern an independent influence on case outcomes. The basic elements of due process are largely the same: notice, an opportunity to be heard, and an impartial decision-maker, as is the general principle that due process tests are flexible and should be applied with attention to context.[248] Finally, California courts have clearly held that, where circumstances require expeditious decision-making, the SWRCB can issue an order without a pre-deprivation hearing if it provides affected parties with the opportunity to seek post-deprivation review.[249]

2.3.5. Application to curtailments

This legal framework leads to a few general conclusions about due process and California water rights governance.

First, due process principles ***do not*** require an opportunity for an individual hearing where the SWRCB adopts a regulation that establishes the framework for future curtailments. This is consistent with foundational due process principles and has been specifically confirmed by the Third District Court of Appeal in a recent case challenging SWRCB drought curtailments.[250]

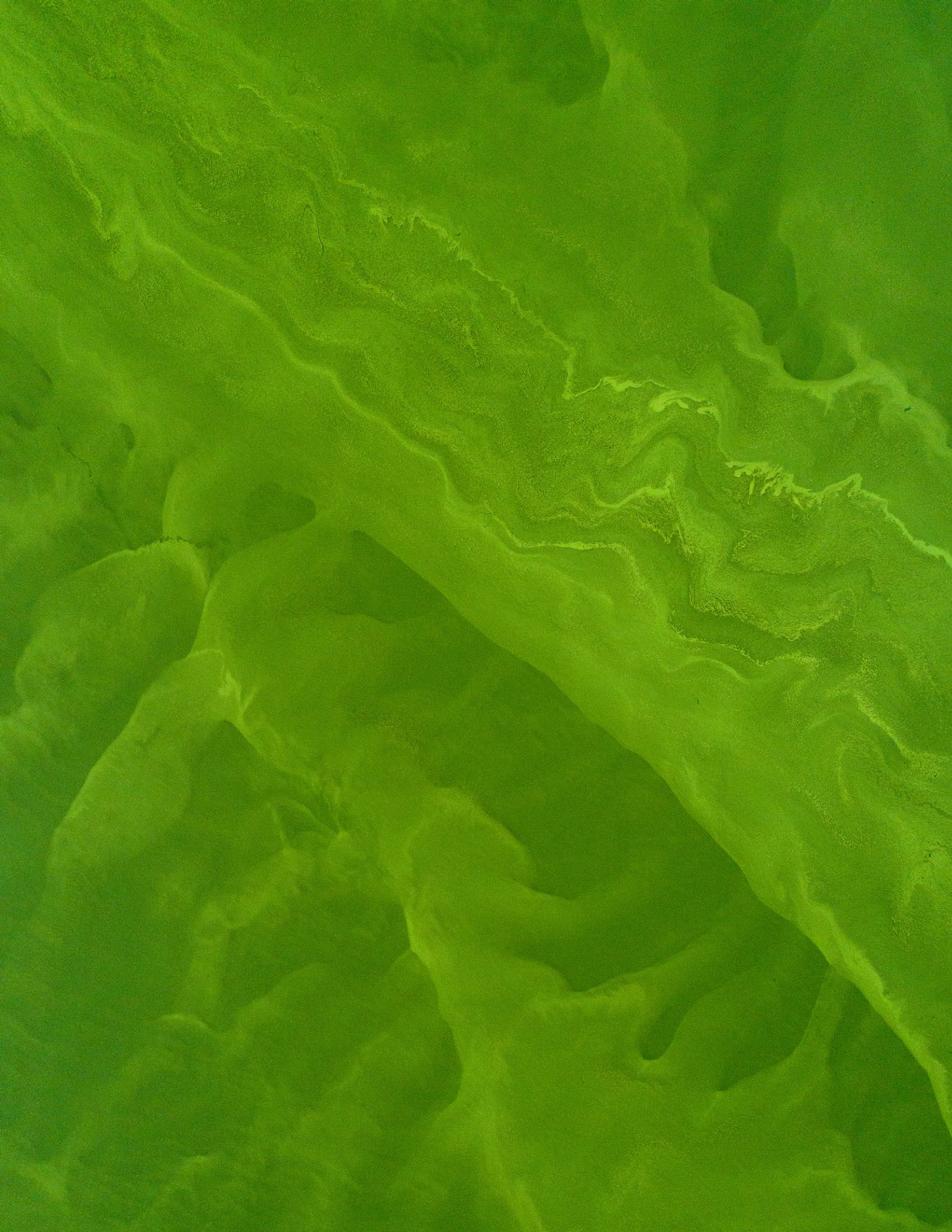
Second, due process principles ***do*** require an opportunity for an individual hearing where the SWRCB brings an enforcement action such as a CDO against a particular water user for violation of a curtailment requirement. However, that hearing does not necessarily need to occur before the order becomes effective. It should be consistent with due process, for example, for the SWRCB to order immediate curtailments, subject to challenge through post-deprivation review, if the SWRCB can explain why prompt action advances important public and governmental interests and does not create undue risks of error. In the context of water rights, where delay in resolving curtailment violations will immediately impact other water users, the need for expeditious decision-making should be clear.

Third, and more generally, the SWRCB likely has multiple layers of flexibility in deciding how to structure its decision-making, so long as it can articulate the public interest in the structures it chooses. It can choose, as it has chosen in the past, between using generalized decision-making processes, like rulemakings, and more focused mechanisms, like individualized decisions, orders, and enforcement actions. It also has flexibility to choose the timing of its actions.

Finally, it is important to note that while California does not have extensive jurisprudence on procedural due process and water rights decision making,[251] other western states have recognized that, for a water rights system to work, procedural due process must allow for expeditious decision-making.

For example, in *Nettleton v. Higginson*,[252] the Idaho Supreme Court considered a due process challenge, brought by the alleged holder of an adjudicated right, to the state's system of allocating water in times of shortage. The court rejected the challenge. It initially noted that allowing the continued exercise of a contested right in times of drought would mean placing other water rights at risk. "As to the private interests affected," it stated, "it is obvious that in times of water shortage someone is not going to receive water. Under the appropriation system the right of priority is based on the date of one's appropriation, i.e. first in time is first in right. However, as stated earlier, it is the state's duty to supervise the distribution of the waters through the Water Resource Board and its watermasters." This reality, it held, counseled in favor of an expeditious proceeding to resolve water disputes.

More recently, in *Clear Springs Foods., Inc. v. Spackman*,[253] the Idaho Supreme Court echoed and elaborated on these principles. *Clear Springs Foods* involved groundwater users who were ordered to curtail their pumping, and who were not granted hearings prior to the issuance of the order.[254] The groundwater pumpers sued, alleging due process violations. The Idaho Supreme Court rejected their claims. It agreed that the groundwater pumpers were entitled to due process, but it noted that "due process does not necessarily require a hearing before property is taken."[255] It noted that when water runs short, the state has a powerful interest in promptly enforcing its water-rights system, and that "deprivation of water for the time it would take for a hearing may cause serious economic or other harm to the senior appropriator."[256] Consequently, it held that due process did not require a hearing.



3. HISTORY OF CURTAILMENT PRACTICES IN CALIFORNIA

The SWRCB has undertaken efforts to implement water right curtailments during the five major statewide droughts California has experienced since the 1970s. Its current approach to curtailment, used extensively during the 2020–2022 drought, relies on emergency regulations. While this approach is the SWRCB's most advanced and effective yet, it has important limitations.

The SWRCB has changed its approach to curtailments over time. To provide additional context for our recommendations, **Section 3.1** provides an overview of the SWRCB's curtailment-related actions since the 1970s. In **Sections 3.2** and **3.3**, we focus in on the SWRCB's efforts to implement curtailments during the 2020–2022 drought and examine the central role emergency regulations have played in these efforts. Finally, **Section 3.4** discusses the limitations of relying on an emergency-based approach to curtailments.

3.1. OVERVIEW OF THE SWRCB'S CURTAILMENT-RELATED ACTIONS, 1976–2022

The SWRCB has taken steps to implement curtailments during the last five major statewide droughts. These droughts occurred during water years 1976–1977, 1987–1992, 2007–2009, 2012–2016, and 2020–2022, as indicated in **Figure 2**.

Statewide actions — Some of the SWRCB's curtailment-related actions addressed the state at large. First, during some drought years, the SWRCB sent drought early warning letters to diverters across the state.[257] Additionally, in 2014, it adopted emergency regulations with statewide effect to lay the groundwork for potential curtailments to protect water rights; however, the SWRCB did not use those emergency regulations to effect curtailments.[258]

We note the SWRCB's statewide efforts with asterisks (*) in **Tables 5**, **6**, **7**, and **8**.

Actions directed towards specific watersheds — In addition to statewide actions, the SWRCB took more particularized actions to implement curtailments in the watersheds shown in **Figure 3**. We provide brief summaries of these watershed-specific actions below. Note that these summaries are not comprehensive; they focus on the SWRCBs use of informational tools, emergency regulations, and curtailment orders. We do not discuss the SWRCB's use of enforcement tools here.

For more detailed descriptions of the SWRCB's curtailment-related actions, including enforcement actions, during past droughts, see our 2018 reports.[259]

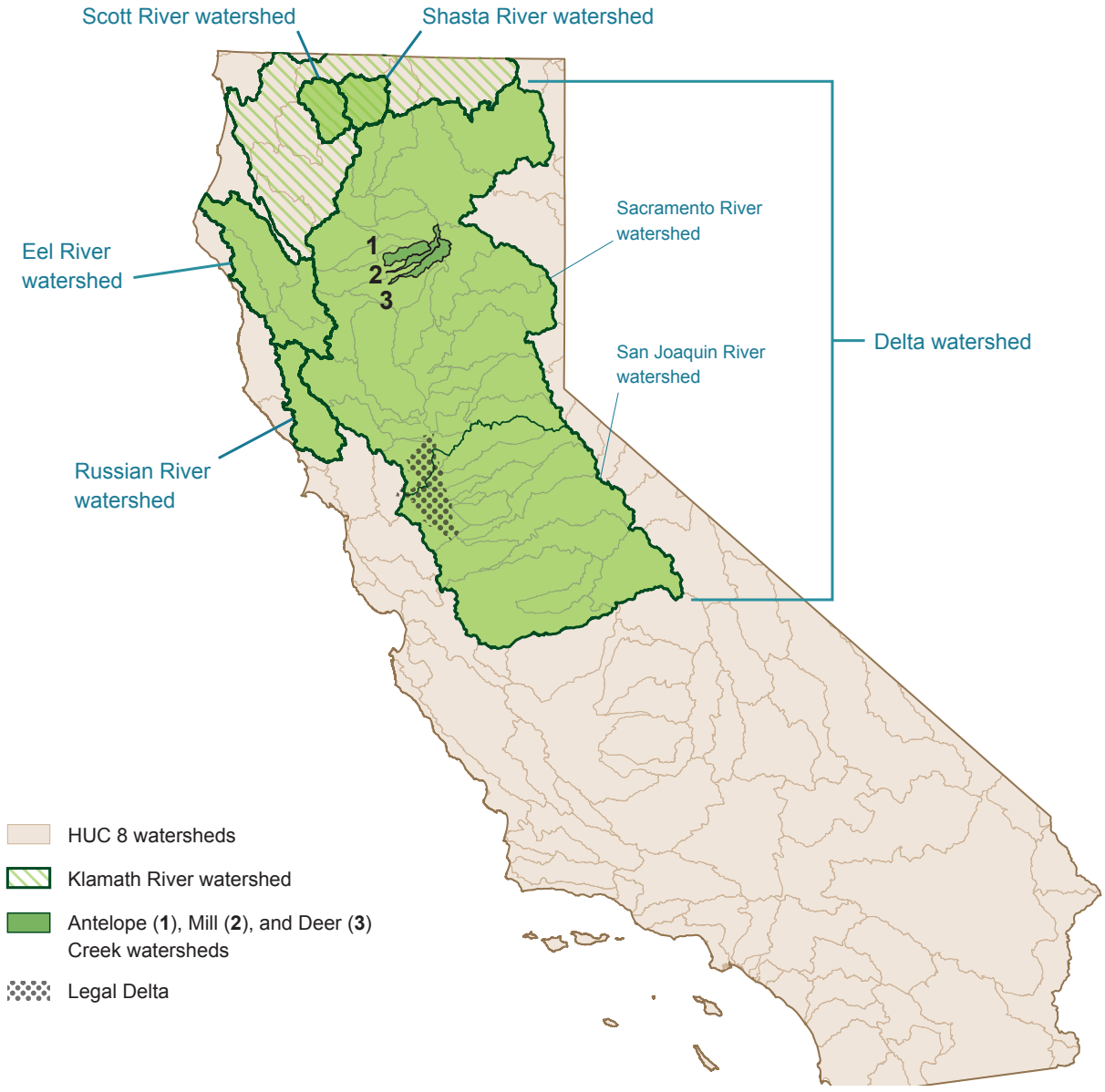


Figure 3. *Watersheds for which the SWRCB took specific actions to implement curtailments during one or more major statewide droughts since the 1970s.*[260]

3.1.1. Delta watershed summary

Of all the watersheds in the state, the SWRCB has so far focused the most attention on the Sacramento-San Joaquin Delta (Delta) watershed. The Delta watershed is California's largest watershed. It also has complex interconnections with watersheds up and down the state through federal, state, and local water conveyance and storage infrastructure. The SWRCB has taken at least some actions to implement water right curtailments in the Delta watershed during every major statewide drought since the 1970s, as shown in **Table 5**. Most of these actions were intended to protect more-senior diverters or releases of stored water. The Delta watershed was the only watershed to receive the SWRCB's concentrated attention during the 1976–1977 drought, likely because that drought was much more intense in the Delta watershed than in other parts of California, as shown in **Figure 2**.[261]

Prior to 2014, the SWRCB's approach to curtailment focused largely on sending drought early warning letters, performing some analysis of water unavailability, and sending notices of water unavailability to some diverters. The SWRCB's analysis of water unavailability and use of notices of water unavailability to implement curtailments of some Delta watershed diverters in 1977 served as the initial template and inspiration for similar actions in the Delta watershed, Russian River watershed, Scott River watershed, and Eel River watershed in 2014 and 2015.[262]

In addition, the SWRCB has issued Term 91 curtailments during most water years since 1984, including during each year of the last four major statewide droughts.[263]

During the 2012–2016 drought and the 2020–2022 drought, the SWRCB expanded the breadth and depth of its curtailment-related efforts in the Delta watershed. It did so by adopting emergency regulations to lay the groundwork for curtailments, and issuing curtailment orders under those regulations for certain subwatersheds during both droughts (discussed in **Sections 3.1.2** and **3.2.4**, below), as well as watershed-wide during the 2020–2022 drought. During this time, the purpose of curtailments in the Delta watershed also expanded, from largely focusing on protecting water rights and releases of stored water to protecting minimum flows for fish.

3.1.2. Deer, Mill, and Antelope Creek watersheds summary

In addition to implementing curtailments to protect water rights and releases of stored water in the larger Delta watershed, the SWRCB targeted several subwatersheds for additional curtailments to meet environmental water needs during the last two major statewide droughts.

At the request of state and federal wildlife agencies,[264] the SWRCB adopted emergency regulations to guide curtailments to protect minimum instream flows for threatened and endangered fish in specific tributaries to the Sacramento River in 2014, 2015, 2021, and 2022. The 2014 and 2015 emergency regulations applied to Deer Creek, Mill Creek, and Antelope Creek. The 2021 and 2022 emergency regulations applied only to Deer Creek and Mill Creek. All three subwatersheds are shown in **Figure 3,** and actions related to them are noted in **Table 5**.

The SWRCB issued curtailment orders under these emergency regulations during both droughts. During the 2012–2016 drought, diverters in the Deer Creek and Antelope Creek watersheds received curtailment orders, while diverters in the Mill Creek watershed avoided curtailments by entering into voluntary agreements with state and federal wildlife agencies to meet minimum flows in other ways.[265]

The SWRCB's initial use of emergency regulations in 2014 to support curtailments to ensure drought minimum flows was the agency's first use of emergency regulations to implement curtailments. The California Court of Appeal upheld the regulations in *Stanford Vina Ranch Irrigation Co. v. State* (2020).[266]

Table 5. *Actions to implement curtailments in the Delta watershed, 1976–2022.[267] Asterisks (*) indicate actions with statewide effect. For actions targeting specific subwatersheds, those subwatersheds are noted in parentheses. Cell shading reflects the basic role of the action, similar to* **Table 2.**

ACTION	1976–77 DROUGHT	1987–92 DROUGHT	2007–09 DROUGHT	2012–16 DROUGHT	2020–22 DROUGHT
Sent drought early warning letters	1977	1988 1990*	2009*	2014* 2015*	2021* 2022*
Sent notices of water unavailability	1977	1988 1990	–	2014 2015	2021
Adopted emergency curtailment regulations to protect water rights and releases of stored water	–	–	–	2014*	2021 2022
Adopted emergency curtailment regulations to protect fish flows[268]	–	–	–	2014 (A/D/M) 2015 (A/D/M)	2021 (D/M) 2022 (D/M)
Issued Term 91 curtailments to protect releases of stored water to meet water quality / flow requirements[269]	–	1987 1988 1989 1990 1991 1992	2007 2008 2009	2012 2013 2014 2015 2016	2020 2021 2022 2023
Issued curtailment orders to protect water rights and releases of stored water[270]	–	–	–	–	2021 2022
Issued curtailment orders to protect flows for fish[271]	–	–	–	2014 (D) 2015 (A/D) 2016 (A/D)	2021 (D/M) 2022 (D/M)

A Antelope Creek watershed
D Deer Creek watershed
M Mill Creek watershed

Inform
Establish requirements
Initiate or adjust curtailments

3.1.3. Russian River watershed summary

During recent droughts, the SWRCB has taken an increasingly active role in the Russian River watershed. In 1990 and 2009, the SWRCB sent drought early warning letters to Russian River diverters as part of its statewide drought response. During the 2012–2016 drought, it went further, for the first time analyzing water unavailability and sending notices of water unavailability to many diverters. The SWRCB has further stepped up its efforts to implement curtailments in the Russian River watershed during the 2020–2022 drought, as shown in **Table 6**.

Curtailments in the Russian River watershed have had multiple goals. In addition to protecting water rights and protecting releases of stored water, these goals have included maintaining adequate water in storage to serve critical environmental, municipal, and other watershed needs.

Table 6. *Actions to implement curtailments in the Russian River Watershed, 1976–2022.*[272] *Asterisks (*) indicate actions with statewide effect. Cell shading reflects the basic role of the action, similar to* **Table 2.**

ACTION	1976–77 DROUGHT	1987–92 DROUGHT	2007–09 DROUGHT	2012–16 DROUGHT	2020–22 DROUGHT
Sent drought early warning letters	–	1990*	2009*	2014* 2015*	2021* 2022*
Sent notices of water unavailability	–	–	–	2014	2021
Adopted emergency curtailment regulations to protect water rights and/or achieve other goals[273]	–	–	–	2014*	2021 2022
Issued curtailment orders[274]	–	–	–	–	2021 2022

Inform
Establish requirements
Initiate or adjust curtailments

3.1.4. Klamath River watershed summary

Similar to the Russian River watershed, the SWRCB has expanded its efforts to implement water right curtailments in the Klamath River watershed considerably during the two most recent major statewide droughts, as shown in **Table 7**. However, the majority of the SWRCB's efforts in the Klamath watershed have been focused in two subwatersheds: during the 2012–2016 drought, the Scott River watershed, and, during the 2020–2022 drought, both the Scott and Shasta River watersheds.

In addition to protecting water rights, a key driver for curtailments in these watersheds today is maintaining minimum instream flows for fish species that are threatened, culturally important, or commercially and recreationally important.

Table 7. *Actions to implement curtailments in the Klamath River watershed, 1976–2022.*[275] *Asterisks (*) indicate actions with statewide effect. For actions targeting specific subwatersheds, the subwatersheds are noted in parentheses. Cell shading reflects the basic role of the action, similar to* **Table 2.**

ACTION	1976–77 DROUGHT	1987–92 DROUGHT	2007–09 DROUGHT	2012–16 DROUGHT	2020–22 DROUGHT
Sent drought early warning letters	–	1990*	2009*	2014* 2015*	2021* 2022*
Sent notices of water unavailability	–	–	–	2014 (Sc) 2015 (Sc) 2016 (Sc)	2021 (Sc)
Adopted emergency curtailment regulations to protect water rights	–	–	–	2014*	2021 2022
Adopted emergency curtailment regulations to protect water rights and fish flows[276]	–	–	–	–	2021 (Sc/Sh) 2022 (Sc/Sh)
Issued curtailment orders to protect water rights and fish flows[277]	–	–	–	–	2021 (Sc/Sh) 2022 (Sc/Sh)

Sc Scott River watershed
Sh Shasta River watershed

Inform
Establish requirements
Initiate or adjust curtailments

3.1.5. Eel River watershed summary

The SWRCB has taken at least some actions to implement water right curtailments in parts of the Eel River Watershed during four of the five major statewide droughts since the 1970s. However, these actions were generally limited to sending statewide drought early warning letters to diverters in the watershed. Only during the 2012–2016 drought did the SWRCB do more, analyzing water unavailability and sending notices of water unavailability to many diverters in the watershed in 2014.

Unlike the other watersheds we have discussed, the Eel River watershed has not been a focus of curtailment efforts during the 2020–2022 drought.

Table 8. *Actions to implement curtailments in the Eel River Watershed, 1976–2022.*[278] *Asterisks (*) indicate actions with statewide effect. Cell shading reflects the basic role of the action, similar to* **Table 2**.

ACTION	1976–77 DROUGHT	1987–92 DROUGHT	2007–09 DROUGHT	2012–16 DROUGHT	2020–22 DROUGHT
Sent drought early warning letters	–	1990*	2009*	2014* 2015*	2021* 2022*
Sent notices of water unavailability	–	–	–	2014	–
Adopted emergency curtailment regulations to protect water rights	–	–	–	2014*	–

Inform
Establish requirements

3.2. THE SWRCB'S ACTIONS TO IMPLEMENT CURTAILMENTS DURING THE 2020–2022 DROUGHT

This section summarizes the SWRCB's actions to implement curtailments during the 2020–2022 drought.

Emergency regulations played an important role. They established the basis for curtailments, exceptions to curtailment, potential alternative compliance mechanisms, reporting requirements, and options for seeking changes or review. They also explained when and how notice would be provided of various curtailment-related actions and what constitutes compliance with or violation of the emergency regulations and orders that might be issued under them. In **Section 3.3**, we will discuss the central role emergency regulations have played in the SWRCB's approach to curtailment during the 2020–2022 drought and summarize the main categories of emergency regulation provisions across watersheds, pointing to specific provisions applicable to different watersheds for each category.

To convey the arc of curtailment developments over time, the remainder of this section is organized by watershed according to the order in which the SWRCB released draft emergency regulations for each in 2021:

(1) the Russian River watershed;

(2) the Klamath River watershed, for which most activity has centered on the Scott River and Shasta River watersheds;

(3) the Delta watershed; and

(4) the Deer Creek and Mill Creek watersheds within the Delta watershed.

Table 9 summarizes key dates of curtailment-related actions in 2021 and 2022 by watershed, including the dates the SWRCB released draft emergency regulations in 2021, which are highlighted in yellow.

Table 9. *Key dates of curtailment-related actions in water years 2021 and 2022, by watershed. Actions were taken by the SWRCB unless otherwise noted. Dates the SWRCB released draft emergency regulations in 2021 are highlighted in yellow.*

	2021 WATER YEAR				2022 WATER YEAR			
ACTION	RUSSIAN	SCOTT & SHASTA	DELTA	DEER & MILL	RUSSIAN	SCOTT & SHASTA	DELTA	DEER & MILL
Sent notices of water unavailability	5/25	6/1 (Sc)	6/15 7/23	–	–	–	–	–
Governor proclaimed or extended drought emergency	4/21	5/10	5/10	5/10	3/28	3/28	3/28	3/28
Released draft ERs	**6/5**	**7/16**	**7/23**	**9/1**	4/1	5/18	4/19 6/27 7/6	8/5
Held public meetings / workshops	6/10	7/1 7/20	5/21 7/27 10/20 12/15	–	4/14	5/4 5/25	5/12	–
Adopted ERs	6/15	8/17	8/3	9/22	5/10	6/21	7/20	8/16
OAL approved ERs	7/12	8/30	8/19	10/4	5/31	7/29	8/12	–
Issued initial curtailment orders under ERs	8/2 8/10	9/9 (Sc) 9/10 (Sh)	8/20	10/11	6/14	8/2 (Sh)	–	–

ERs Emergency regulations
OAL Office of Administrative Law
Sc Scott River watershed
Sh Shasta River watershed

3.2.1. Russian River watershed

The Russian River watershed was hit early and hard by the 2020–2022 drought, with Lake Mendocino storage reaching critically low levels in early 2021.[279] As a result, it was the first watershed to receive a drought emergency proclamation, and the first for which the SWRCB developed emergency regulations to guide curtailments. In addition to protecting water rights and protecting releases of stored water, a key of goal of curtailment was maintaining adequate water in storage to serve critical environmental, municipal, and other watershed needs if the drought continued.

Table 10 and **Figure 4** show key curtailment related actions, flow data, and storage data for the Russian River watershed during the 2021 and 2022 water years.

On March 22, 2021 the SWRCB sent a letter warning diverters statewide of ongoing dry conditions in most California watersheds. During March and April 2021, staff from the SWRCB's Division of Water Rights (Division Staff) communicated with stakeholders in the Russian River watershed including Sonoma County Water Agency, Mendocino County Russian River Flood Control and Water Conservation Improvement District (RRFCWCID), Mendocino County Farm Bureau, and representatives of various cities and municipalities. On April 21, 2021, the Governor issued a drought emergency proclamation for Mendocino and Sonoma Counties due to drought conditions in the Russian River watershed,[280] triggering the SWRCB's authority to adopt drought emergency regulations under Water Code section 1058.5. The emergency proclamation specifically directed the SWRCB to "consider…[a]dopting emergency regulations to curtail water diversions when water is not available at water rights holders' priority of right or to protect releases of stored water." [281] In late May, the SWRCB issued notices of water unavailability for post-1914 rights in the Upper Russian River watershed and sent warning notices urging pre-1914 and riparian water right holders and claimants in the Upper watershed to conserve water.

In early June 2021, the SWRCB released draft emergency regulation text, held a public workshop on the proposed regulations, and invited written feedback. On June 15, the SWRCB adopted the emergency regulation. The emergency regulation package was sent to the OAL on June 30. The OAL approved the emergency regulations on July 12. These initial emergency regulations tied curtailments in the Upper Russian River watershed to Lake Mendocino storage levels to try to slow the decline and hold water back in the event winter precipitation did not materialize. SWRCB staff modified a Drought Water Rights Allocation Tool (DWRAT), originally developed in collaboration with UC Davis, to analyze supply and demand in 28 subbasins within the watershed and identify which water rights needed to be curtailed. The SWRCB issued curtailment orders for the Upper watershed on August 2 and for the Lower watershed on August 10 and subsequently updated curtailment status several times before a wet October helped Lake Mendocino storage begin to bounce back, and the SWRCB temporarily suspended all curtailments in the watershed.

In 2022, the SWRCB began the process of revising the emergency regulations earlier, leaving more time for public feedback. It released draft text on April 1, held a public workshop on April 14, adopted the revised regulation on May 10, and submitted it to the OAL on May 17. OAL approved the regulation, and it went into effect, on May 31. Since Lake Mendocino storage levels improved significantly after a very wet December, the revised regulations did not use storage levels as a trigger for curtailments in the Upper watershed.[282] Instead, under the revised regulations curtailments in both the Upper and Lower watersheds were based primarily on DWRAT results. The revised regulations added explicit provisions regarding curtailments for riparian diverters, explaining that they would be subject to correlative sharing requirements.[283] On June 14, the SWRCB issued Orders Regarding Curtailment Status in the Russian River Watershed for riparian claims of right and for other rights.[284] For riparians, the order assigned an initial demand allocation based on recent reported water use under their riparian claim and explained that the curtailment status list on the SWRCB's website would be updated to reflect current correlative reduction requirements from this baseline allocation. The SWRCB reinstated curtailments on June 30, and updated curtailment status multiple times before the end of the 2022 water year.

Alongside the process of developing and implementing emergency curtailment regulations, SWRCB staff worked with diverters in the Upper watershed to develop an alternative compliance mechanism: a voluntary water sharing agreement[285] designed to enable more-junior diverters to receive some water when their rights are curtailed as a result of more-senior, uncurtailed diverters agreeing to forego diversions. The SWRCB approved the agreement on June 7, and it went into effect on June 30, when curtailments were reintroduced in the watershed. However, the program had to be put on hold less than 2 months later, when the Federal Energy Regulatory Commission approved PG&E's request for a variance to substantially reduce the flow of water into the Russian River Watershed from the Potter Valley Project in order to preserve cold water in the Lake Pillsbury to enable temperature control in the river below the dam to keep it habitable for salmonids.[286] This reduction in supply triggered curtailments for some of the more-senior right holders in the program, who no longer had water to share.

Table 10. *Timing of key curtailment-related actions for the Russian River watershed during the 2021 and 2022 water years. Actions were taken by the SWRCB unless otherwise noted. Cell shading reflects different categories of actions.*

DATE	CURTAILMENT-RELATED ACTIONS — RUSSIAN RIVER WATERSHED
1/13/2021	Sonoma County Water Agency filed TUCP.[287]
2/4/2021	Approved TUCP.[288]
3/22/2021	Sent statewide drought warning letter.[289]
4/21/2021	Governor issued drought emergency proclamation for Russian River watershed counties.[290]
5/14/2021	Sonoma County Water Agency filed TUCPs.[291]
5/25/2021	Sent notices of unavailable water for post-1914 rights in Upper watershed.[292]
6/5/2021	Released draft ERs.
6/10/2021	Held public workshop.[293]
6/14/2021	Approved TUCPs.[294]
6/15/2021	Adopted ERs.[295]
7/12/2021	OAL approved ERs and they took effect.[296]
8/2/2021	Issued curtailment orders for all diverters in the Upper watershed.[297]
8/10/2021	Issued curtailment orders for all diverters in the Lower watershed.[298]
11/17/2021	Sonoma County Water Agency filed TUCPs.
12/10/2021	Approved TUCPs.[299]
12/17/2021	NMFS and CDFW invited participation in voluntary initiative to minimize drought impacts on endangered fish populations.[300]
3/21/2022	Sent statewide drought warning letter.[301]
3/28/2022	Governor extended drought emergency proclamation.[302]
4/1/2022	Released draft revised ERs.[303]
4/14/2022	Held public workshop.[304]
4/14/2022	Discussed VSA at public workshop.
5/3/2022	Released draft VSA.
5/10/2022	Adopted revised ERs.[305]
5/26/2022	Sonoma County Water Agency filed TUCPs.
5/27/2022	Invited enrollment in VSA.[306]
5/31/2022	OAL approved revised ERs and they took effect.[307]
6/7/2022	Approved VSA for Upper watershed.[308]
6/14/2022	Issued orders regarding curtailment status.[309]
6/17/2022	Approved TUCPs.[310]
6/30/2022	VSAs took effect.[311]
7/27/2022	FERC approved reduced flows from Potter Valley Project.[312]
8/5/2022	VSA program temporarily suspended.[313]

CDFW	California Department of Fish and Wildlife
ERs	Emergency regulations
FERC	Federal Energy Regulatory Commission
NMFS	National Marine Fisheries Service
OAL	Office of Administrative Law
TUCP	Temporary urgency change petition
VSA	Voluntary water sharing agreement

Drought proclamation
TUCP-related action
Wildlife-agency or FERC action
ER-related action
Curtailment-related action by SWRCB
VSA-related action

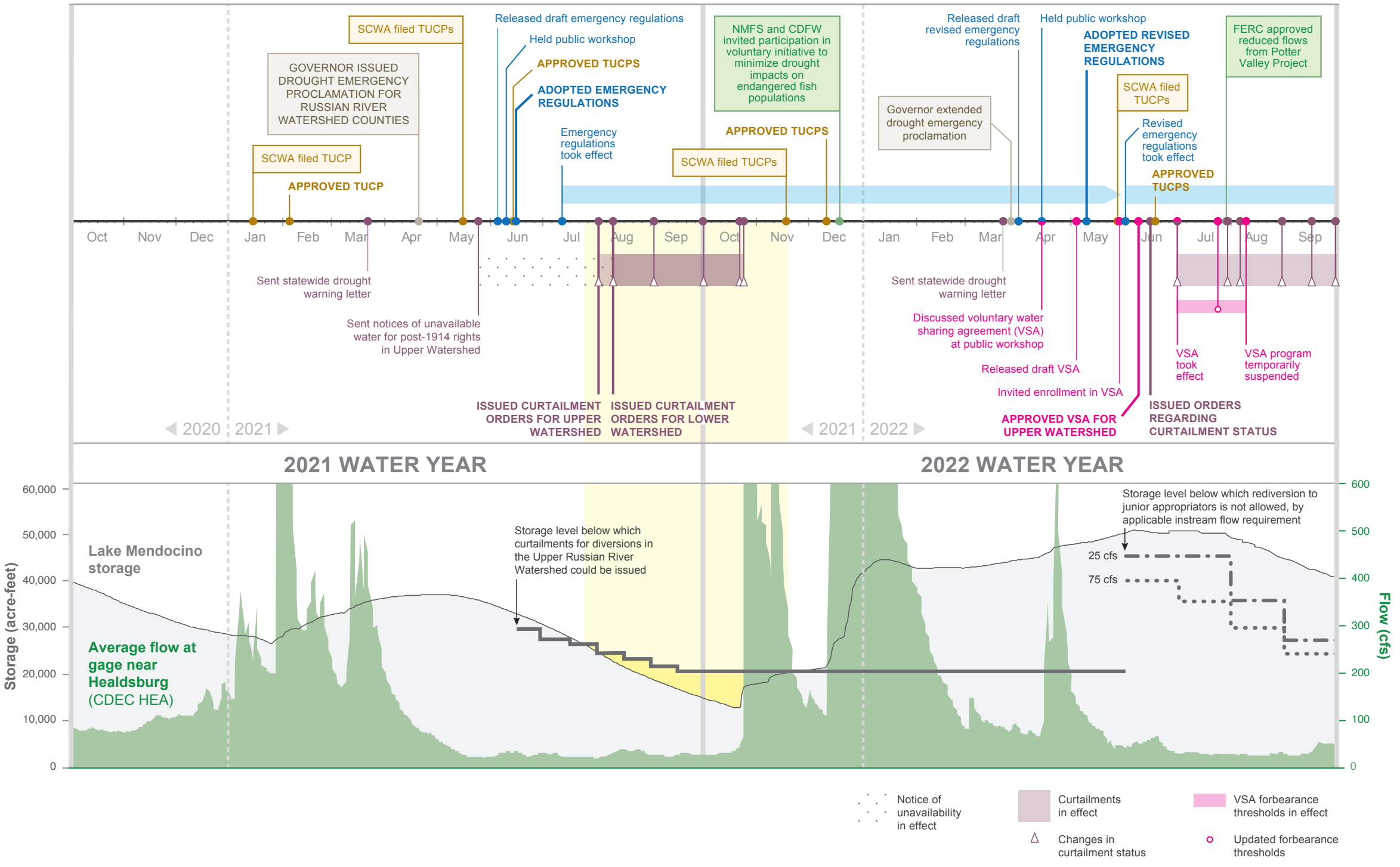


Figure 4. *Timeline of key curtailment-related actions for the Russian River watershed during the 2021 and 2022 water years.*[314] *Actions were taken by the SWRCB unless otherwise noted. Yellow bands show when Lake Mendocino dropped below the levels designated in the 2021 emergency curtailment regulations, indicating the need for curtailments in the Upper watershed. SCWA = Sonoma County Water Agency.*

3.2.2. Scott and Shasta River watersheds (Klamath)

During the 2020–2022 drought, the SWRCB implemented curtailments in the Scott and Shasta River watersheds, both in Siskiyou County, to address severe water shortage conditions that threatened the availability of water to meet critical needs.[315] Curtailments were targeted to ensure "minimum flows for migration, rearing, and spawning of fall-run Chinook and SONCC coho salmon," "to curtail diversions when water is not available under a diverter's priority of right," and "to ensure adequate water supplies remain available for minimum health and safety needs and minimum livestock watering use."[316]

Table 11 and **Figures 5** and **6** show key curtailment related actions, instream flow requirements, and flow data for the Scott River and Shasta River watersheds during the 2021 and 2022 water years.

On March 22, 2021 the SWRCB sent a letter warning diverters statewide of ongoing dry conditions in most California watersheds. The Governor proclaimed a drought state of emergency for additional counties, including Siskiyou County and Modoc County in the Klamath River watershed on May 10, 2021,[317] triggering the SWRCB's authority to adopt drought emergency regulations for the watershed under Water Code section 1058.5. The emergency proclamation specifically directed the SWRCB to "consider emergency regulations to curtail water diversions when water is not available at water rights holders' priority of right or to protect releases of stored water" or to protect minimum drought instream flows needed for salmon, steelhead, and other native fishes, "[t]o the extent voluntary actions are not sufficient." [318] On June 1, 2021, the SWRCB sent notices of water unavailability for some rights in the Scott River watershed.

In mid-June, 2021, the California Department of Fish and Wildlife (CDFW) provided the SWRCB with minimum flow recommendations for the Shasta and Scott Rivers to inform the SWRCB's development of emergency curtailment regulations for those watersheds. On July 1, the SWRCB held a public meeting on potential drought actions in the watersheds, before releasing draft emergency regulations on July 16, and holding a second public meeting to discuss the proposed regulations. The SWRCB adopted the emergency regulations on August 17, and they went into effect on August 30. The emergency regulations established drought emergency minimum flow requirements for the Scott and Shasta Rivers[319] and included other watershed-specific provisions. For the Scott River, the minimum flow requirements are similar to or less than the amounts assigned to the U.S. Forest Service's first priority right under the 1980 Scott River Adjudication, which was meant "to provide minimum subsistence-level fishery conditions including spawning, egg incubation, rearing, downstream migration, and summer survival of anadromous fish . . . in critically dry years."[320] The Shasta River requirements are similar to or less than the amounts identified in a 2014 instream flow needs assessment.[321] The emergency regulations also identified priority groupings for curtailment, drawing from the priority groupings assigned in applicable adjudications.[322]

For both watersheds, curtailment groupings expressly include groundwater rights. In its informative digests for the initial and revised emergency regulations, the SWRCB emphasized the importance of reaching both due to the interconnectedness of groundwater and surface water in the Scott and Shasta watersheds, the applicability of the "common source" doctrine in this situation, and the relevance of the reasonable use doctrine to all water diversion and use.[323]

The regulations also included specific provisions regarding livestock watering, including a conditional prohibition on inefficient livestock watering[324] and exceptions to curtailment for minimal livestock watering.[325]

On September 9 and 10, 2021, the SWRCB issued curtailment and reporting orders for all water rights in the Scott River watershed and for November 1912 and more junior appropriative diverters of surface and groundwater in the Shasta River watershed. The most senior right curtailed under this order was the Shasta River Water Association's November 25, 1912, appropriative surface water right. On October 12, the SWRCB issued a curtailment order for additional rights in the Shasta watershed that should have been curtailed under the September 10 order.[326] In mid-December, 2021, CDFW contacted the SWRCB to suggest that lower Shasta River flows may be sufficient for the rest of December, and a little more than 1 month later, the wildlife agency determined that adult salmon migration was functionally complete in the watershed. On April 8, 2022, and July 19, 2022, the SWRCB issued curtailment orders for still more rights in the Shasta watershed that should have been curtailed under the September 10, 2021, curtailment order.[327]

The SWRCB revised and re-adopted the emergency regulations in 2022. To inform re-adoption, it held a public meeting on May 4, 2022. The SWRCB then released draft revised emergency regulations on May 18, and held a meeting on the proposed revisions on May 25. On June 3, CDFW contacted the SWRCB to recommend softening the transition of Scott River minimum flows from 125 cs in June to 50 cfs in July by adding a rampdown to 90 cfs for the last week of June to reduce stranding potential. The SWRCB incorporated that change when it adopted revised emergency regulations on June 21. The revised regulations took effect on July 29. On August 2, the SWRCB expanded the scope of curtailments in the Shasta River watershed by issuing curtailment and reporting orders to appropriative surface water and groundwater diverters with priority dates between April 1, 1885, and April 1912. Later that month, the Shasta River Water Association diverted water from the Shasta River for more than a week in violation of the September 10, 2021, curtailment order. We discussed this violation and the SWRCB's enforcement response in **Box 1**, as part of the discussion in **Section 2.2.6** on enforcement tools.

Table 11. *Timing of key curtailment-related actions for the Scott River and Shasta River watersheds during the 2021 and 2022 water years. Actions were taken by the SWRCB, and applied to both watersheds, unless otherwise noted. Cell shading reflects different categories of actions.*

DATE	CURTAILMENT-RELATED ACTIONS — SCOTT & SHASTA RIVER WATERSHEDS
3/22/2021	Sent statewide drought warning letter.[328]
5/3/2021	CDFW sent letter on beginning a long-term flow-setting process to protect Coho and Chinook salmon (Sc).
5/10/2021	Governor extended drought emergency proclamation to Klamath River watershed counties.[329]
6/1/2021	Sent notices of water unavailability for some rights (Sc).[330]
6/15/2021	CDFW recommended emergency minimum instream flows.[331]
7/1/2021	Held public meeting on potential drought actions.[332]
7/16/2021	Released draft ERs.[333]
7/20/2021	Held public meeting on draft ERs.[334]
8/17/2021	Adopted ERs.[335]
8/30/2021	OAL approved ERs and they took effect.[336]
9/1/2021	Prohibited inefficient livestock watering.[337]
9/9/2021–9/10/2021	Issued curtailment / reporting orders for all water rights (Sc).[338]
9/10/2021	Issued curtailment / reporting orders for November 1912 and more junior appropriative surface water and groundwater rights (Sh).[339]
12/17/2021	CDFW suggested lower December flows may be sufficient (Sh).[340]
1/20/2022	CDFW found adult salmon migration functionally complete (Sh).[341]
1/21/2022	Suspended prohibition on inefficient livestock watering (Sh).[342]
2/1/2022	Let prohibition on inefficient livestock watering expire (Sc).
3/21/2022	Sent statewide drought warning letter.[343]
3/28/2022	Governor extended drought emergency proclamation.[344]
4/20/2022	CDFW sent letter supporting readoption of emergency regulations.[345]
5/4/2022	Held public meeting to inform re-adoption of ERs.[346]
5/18/2022	Released draft revised ERs.[347]
5/25/2022	Held public meeting on draft revised ERs.[348]
6/3/2022	CDFW sent letter recommending upcoming minimum flow modification (Sc).[349]
6/21/2022	Adopted revised ERs.[350]
7/29/2022	OAL approved revised ERs and they took effect.[351]
8/2/2022	Issued curtailment / reporting orders for April 1, 1885, to April 1912 appropriative surface water and groundwater rights (Sh).[352]
8/17/2022–8/24/2022	SRWA violated the 9/10/2021 curtailment order during this period, taking ~30 cfs from the Shasta River, about half the river's entire flow (Sh).[353]
8/18/2022	Issued notice of violation (NOV) to SRWA (Sh).[354]
8/19/2022	Issued draft cease-and-desist order (CDO) to SRWA (Sh).[355]
9/1/2022	Prohibited inefficient livestock watering.[356]

CDFW	California Department of Fish and Wildlife
Cfs	Cubic feet per second
ERs	Emergency regulations
OAL	Office of Administrative Law
Sc	Scott River watershed
Sh	Shasta River watershed
SRWA	Shasta River Water Association

Drought proclamation
Wildlife-agency action
ER-related action
Curtailment-related action by SWRCB
Major curtailment violation
Enforcement action by SWRCB

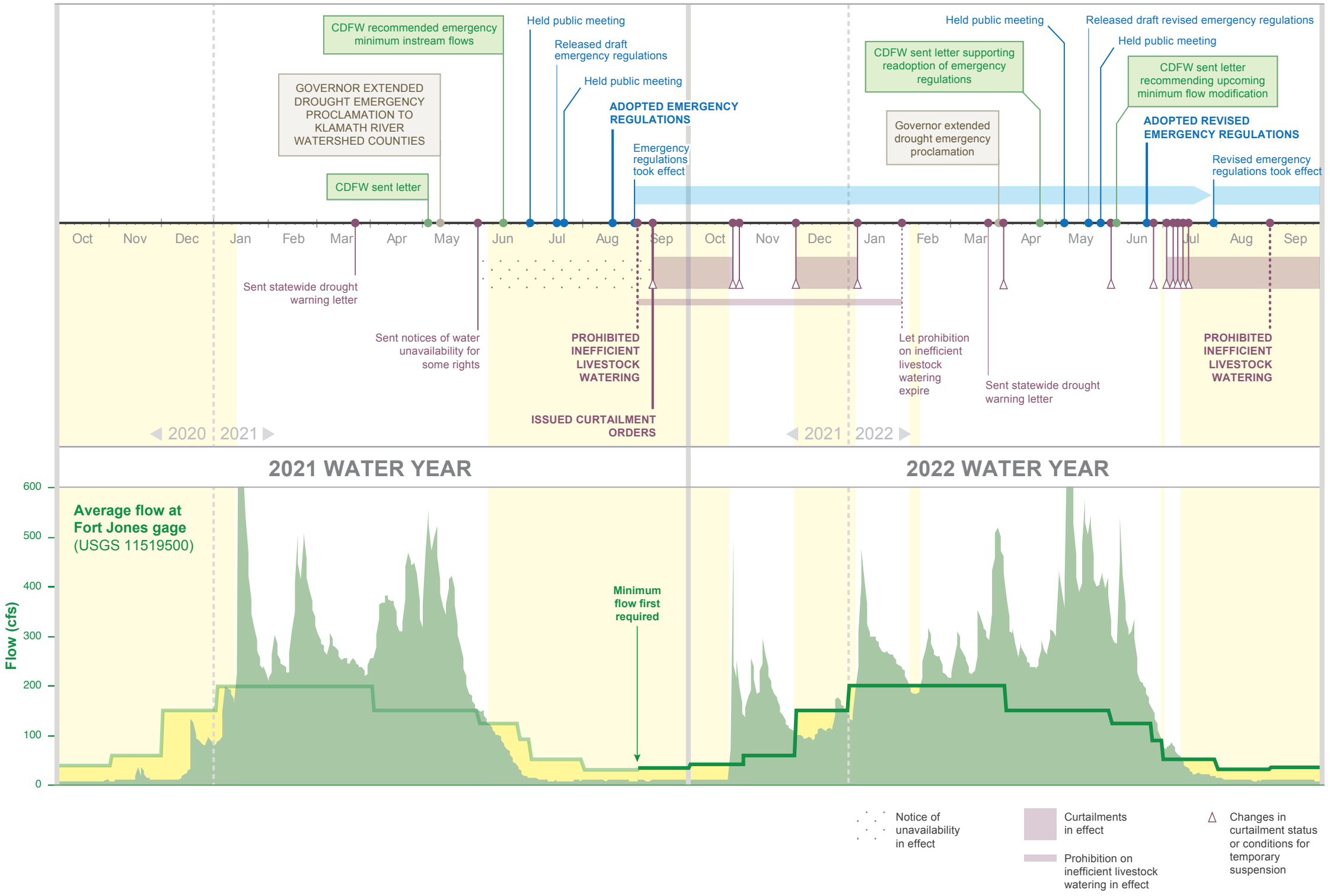


Figure 5. *Timeline of key curtailment-related actions for the Scott River watershed during the 2021 and 2022 water years.*[357] *Actions were taken by the SWRCB unless otherwise noted. Yellow bands show when flows at the Fort Jones gage dropped below the minimum flows designated in the emergency curtailment regulations, indicating that curtailments were needed.*

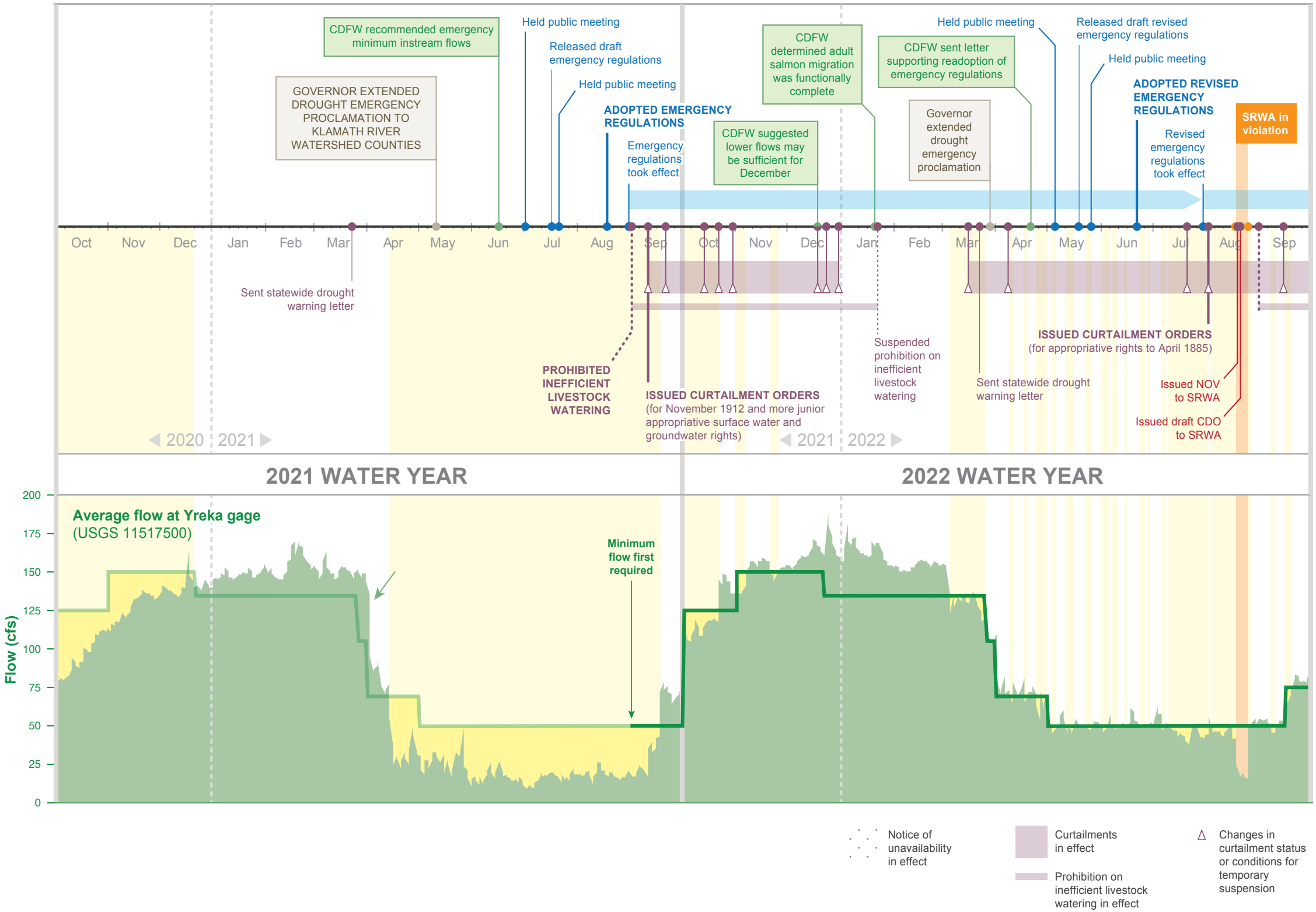


Figure 6. *Timeline of key curtailment-related actions for the Shasta River watershed during the 2021 and 2022 water years.*[358] *Actions were taken by the SWRCB unless otherwise noted. Yellow bands show when flows at the Yreka gage dropped below the minimum flows designated in the emergency curtailment regulations, indicating that curtailments were needed.*

3.2.3. Delta watershed

During the 2020–2022 drought, the SWRCB has implemented curtailments in the Delta watershed to protect senior water rights and releases of stored water. **Table 12** and **Figure 7** provide a timeline of key curtailment-related actions for the Delta watershed during the 2021 and 2022 water years.

After a dry 2020, 2021 was a critically dry year in the Delta watershed. In late March 2021, the SWRCB sent a letter warning diverters across the state of ongoing dry conditions and the potential for upcoming water supply shortages.[359] On May 10, the Governor proclaimed a drought state of emergency for the counties in the Delta watershed, among others, triggering the SWRCB's authority to adopt drought emergency regulations for the watershed under Water Code section 1058.5. The emergency proclamation directed the SWRCB to "consider emergency regulations to curtail water diversions when water is not available at water rights holders' priority of right or to protect releases of stored water."[360] Within days of the proclamation, the SWRCB released an initial draft of the water unavailability methodology it planned to use to guide curtailments in the Delta watershed for public review and comment. The methodology identifies "when available data indicates that natural and abandoned water supplies are unavailable for diversion by water right holders and claimants in the Delta watershed under their priority of right."[361] SWRCB staff held a public workshop to present and seek feedback on the draft methodology on May 21. The SWRCB sent notices of water unavailability for all post-1914 rights in the Delta watershed on June 15 and for many pre-1914 and riparian water right claims on July 23. On July 23, the SWRCB also released draft emergency curtailment and reporting regulations for the Delta watershed. On August 3, following a late-July staff workshop, the SWRCB adopted the emergency regulations. The emergency regulations became effective on August 19. Among the provisions unique to the Delta watershed are enhanced reporting requirements[362] and requirements to consult with the Delta Watermaster on proposals for alternative water sharing agreements in the Legal Delta.[363]

The following day, August 20, 2021, the SWRCB issued two curtailment and reporting orders for the Delta watershed, one for small diverters and one for large diverters (5,000 acre-feet or greater). Both small and large diverters were required to monitor their future curtailment status on the SWRCB's website, submit a compliance certification form by September 3, and submit any request for an exception to curtailment by September 10. Large diverters were also subject to requirements for enhanced reporting, including monthly reporting of actual diversion and use and projected demand. Both orders outlined the potential for enforcement and explained how diverters could request reconsideration of the order or submit additional information to ensure that their water rights were analyzed appropriately.

Over the next year, the SWRCB provided curtailment status updates for the Delta watershed on an approximately weekly basis. It also revised the Delta water unavailability methodology several times, informed by several public workshops.

Because drought conditions persisted in 2022, but emergency regulations are only effective for one year, the SWRCB needed to readopt them. It released draft revised emergency regulations in April 2022, held a public workshop on them in May 2022, and adopted revised emergency regulations for the Delta watershed in July. The revised emergency regulations went into effect on August 12, 2022.

Table 12. *Timing of key curtailment-related actions for the Delta watershed during the 2021 and 2022 water years. Actions were taken by the SWRCB unless otherwise noted. Cell shading reflects different categories of actions.*

DATE	CURTAILMENT-RELATED ACTIONS — DELTA WATERSHED
3/22/2021	Sent statewide drought warning letter.[364]
5/10/2021	Governor extended drought emergency proclamation to Delta watershed counties.[365]
5/12/2021	Released initial draft water unavailability (WU) methodology.[366]
5/17/2021	DWR and USBR filed TUCP for SWP and CVP.[367]
5/21/2021	Held public workshop on WU methodology.[368]
6/1/2021	Approved TUCP.[369]
6/15/2021	Sent notices of WU for post-1914 water rights.[370]
7/23/2021	Sent notices of WU for many pre-1914 and riparian water rights/claims.[371]
7/23/2021	Released draft ERs.[372]
7/27/2021	Held public workshop on draft ERs.[373]
8/3/2021	Adopted ERs.[374]
8/19/2021	OAL approved ERs and they took effect.[375]
8/20/2021	Issued curtailment / reporting orders with different reporting requirements for small (<5,000 af) and large diverters.[376]
10/20/2021	Held public workshop on potential changes to WU methodology.[377]
12/15/2021	Held public workshop on possible alternative curtailment methodologies.[378]
3/18/2022	DWR and USBR filed TUCP for SWP and CVP.[379]
3/21/2022	Sent statewide drought warning letter.[380]
3/28/2022	Governor extended drought emergency proclamation.[381]
4/4/2022	Approved TUCP.[382]
4/19/2022	Released draft revised ERs.[383]
5/12/2022	Held public workshop on updated WU methodology & draft revised ERs.[384]
6/27/2022	Released updated draft revised ERs.[385]
7/20/2022	Adopted revised ERs.[386]
8/12/2022	OAL approved revised ERs and they took effect.[387]

CDFW	California Department of Fish and Wildlife
CVP	Central Valley Project
DWR	Department of Water Resources
ERs	Emergency regulations
OAL	Office of Administrative Law
SWP	State Water Project
TUCP	Temporary urgency change petition
USBR	U.S. Bureau of Reclamation
WU	Water unavailability

Drought proclamation
TUCP-related action
ER-related action
Curtailment-related action by SWRCB

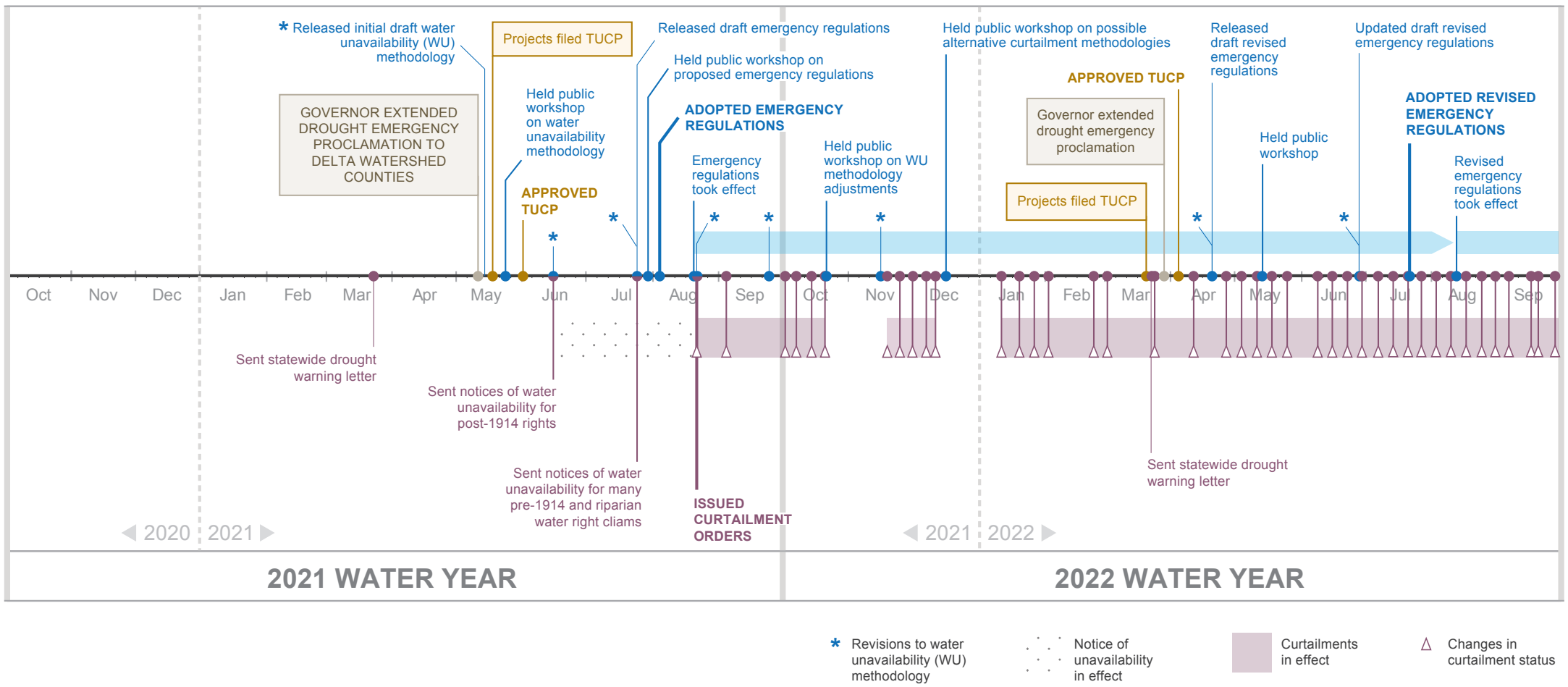


Figure 7. *Timeline of key curtailment-related actions for the Delta watershed during the 2021 and 2022 water years.*[388] *Actions were taken by the SWRCB unless otherwise noted. "Projects" refers to the State Water Project (operated by the California Department of Water Resources) and the Central Valley Project (operated by the U.S. Bureau of Reclamation.*

3.2.4. Deer and Mill Creek watersheds (Delta)

In addition to experiencing curtailments under the Delta emergency regulations described in the previous section, diverters in the Deer and Mill Creek watersheds have been subject to curtailments to protect minimum instream flows for fish during the 2020–2022 drought. These tributaries to the Sacramento River are considered high priority areas for protecting and supporting the recovery of wild populations of listed Central Valley spring-run Chinook salmon and California Central Valley steelhead.[389] Therefore, curtailments specific to these watersheds have focused on ensuring minimum flows needed for fish passage and survival when relevant life stages of Central Valley spring-run Chinook salmon or California Central Valley steelhead are present.[390] Unlike the fisheries-related curtailments in the Scott and Shasta River watersheds, these curtailments are structured to apply equally to all diverters, regardless of water right type or seniority.

The timelines in **Table 13** and **Figure 8** show key curtailment related actions, instream flow requirements, and flow data for Deer Creek and Mill Creek during the 2021 and 2022 water years.

On March 22, 2021 the SWRCB sent a letter warning diverters statewide of ongoing dry conditions in most California watersheds. In April and early May, the SWRCB met with diverters in Mill and Deer Creeks, the CDFW, and the National Marine Fisheries Service (NMFS) to discuss potential drought actions to protect listed species. The SWRCB requested that major diverters in these watersheds propose voluntary actions that could be implemented in lieu of curtailments to achieve this goal. On May 10, the Governor proclaimed a drought state of emergency for the counties in the Delta watershed, including Tehama County which contains the Deer and Mill Creek watersheds, triggering the SWRCB's authority to adopt drought emergency regulations for these watersheds under Water Code section 1058.5. The emergency proclamation specifically directed the SWRCB to "consider emergency regulations to establish minimum drought instream flows" in order "to protect salmon, steelhead, and other native fishes in critical stream systems . . . "[t]o the extent voluntary actions are not sufficient." [391] Shortly after the Governor's proclamation, the major diverters submitted their proposals for voluntary actions, which included, among other things, requests for safe harbor agreements, waivers of regulatory requirements for permits and approvals needed to implement restoration projects, and millions of dollars in state funding to complete the proposed projects. On June 28, the SWRCB responded to the proposals, finding them in need of significant revisions to be acceptable. NMFS expressed support for developing emergency regulations to guide curtailments to protect fish flows on July 30, and CDFW requested that the SWRCB adopt and implement drought emergency minimum instream flows for the two creeks on August 9.

The SWRCB released draft emergency regulations on September 1 and adopted them on September 22. The emergency regulations took effect on October 4. The regulations require the maintenance of minimum flows when relevant life stage of listed fish are present and require the SWRCB to take into account whether curtailments would affect diversions needed to meet human health and safety needs for water.[392] They also include provisions for pulse flows under certain circumstances.[393] Other unique features include a provision defining inefficient domestic lawn irrigation as an unreasonable use.[394] On October 8, CDFW requested curtailments under the regulations in both watersheds, and the SWRCB issued curtailment order to all diverters in the watersheds on October 11, 2021. Over the next month, curtailments were necessary when flows dipped below the established drought emergency minimums.

CDFW requested that the SWRCB readopt the emergency regulations for Deer and Mill Creeks on April 11, 2022, and requested pulse flows on May 11, 2022. The SWRCB responded, issuing pulse flows for Deer Creek on May 25 and for both watersheds on June 10. In late June, NMFS joined the call for readoption of the emergency regulations. On June 30, 2022, the SWRCB lifted the curtailment orders for both watersheds.

On August 5, 2022, the SWRCB released draft revised emergency regulations, and on August 16, the SWRCB adopted them. The revised regulations went into effect on September 21, 2022.

Table 13. *Timing of key curtailment-related actions for the Deer Creek and Mill Creek watersheds during the 2021 and 2022 water years. Actions were taken by the SWRCB, and applied to both watersheds, unless otherwise noted. Cell shading reflects different categories of actions.*

DATE	CURTAILMENT-RELATED ACTIONS — DEER & MILL CREEK WATERSHEDS
3/22/2021	Sent statewide drought warning letter.[395]
4/23/2021	Met with Deer Creek diverters, CDFW, and NMFS.[396]
5/5/2021	Met with Mill Creek diverters, CDFW, and NMFS.[397]
5/10/2021	Governor extended drought emergency proclamation to Delta watershed counties.[398]
6/28/2021	Responded to diverters' proposed terms.[399]
7/30/2021	NMFS recommended emergency minimum instream flows.[400]
8/9/2021	CDFW requested emergency minimum instream flows.[401]
9/1/2021	Released draft ERs.[402]
9/22/2021	Adopted ERs.[403]
10/4/2021	OAL approved ERs and they took effect.[404]
10/8/2021	CDFW requested curtailments.[405]
10/11/2021	Issued curtailment orders for all diverters.[406]
3/21/2022	Sent statewide drought warning letter.[407]
3/28/2022	Governor extended drought emergency proclamation.[408]
4/11/2022	CDFW requested readoption of ERs.[409]
5/11/2022	CDFW requested pulse flows.[410]
5/25/2022	Issued pulse flow for Deer Creek.[411]
6/10/2022	Issued pulse flows for both watersheds.[412]
6/28/2022	NMFS requested readoption of ERs.[413]
7/1/2022	Lifted curtailment orders.[414]
8/5/2022	Released draft revised ERs.[415]
8/16/2022	Adopted revised ERs.[416]
9/21/2022	OAL approved revised ERs and they took effect.[417]

CDFW	California Department of Fish and Wildlife
ERs	Emergency regulations
NMFS	National Marine Fisheries Service
OAL	Office of Administrative Law
WU	Water unavailability

Drought proclamation
Wildlife-agency action
ER-related action
Curtailment-related action by SWRCB

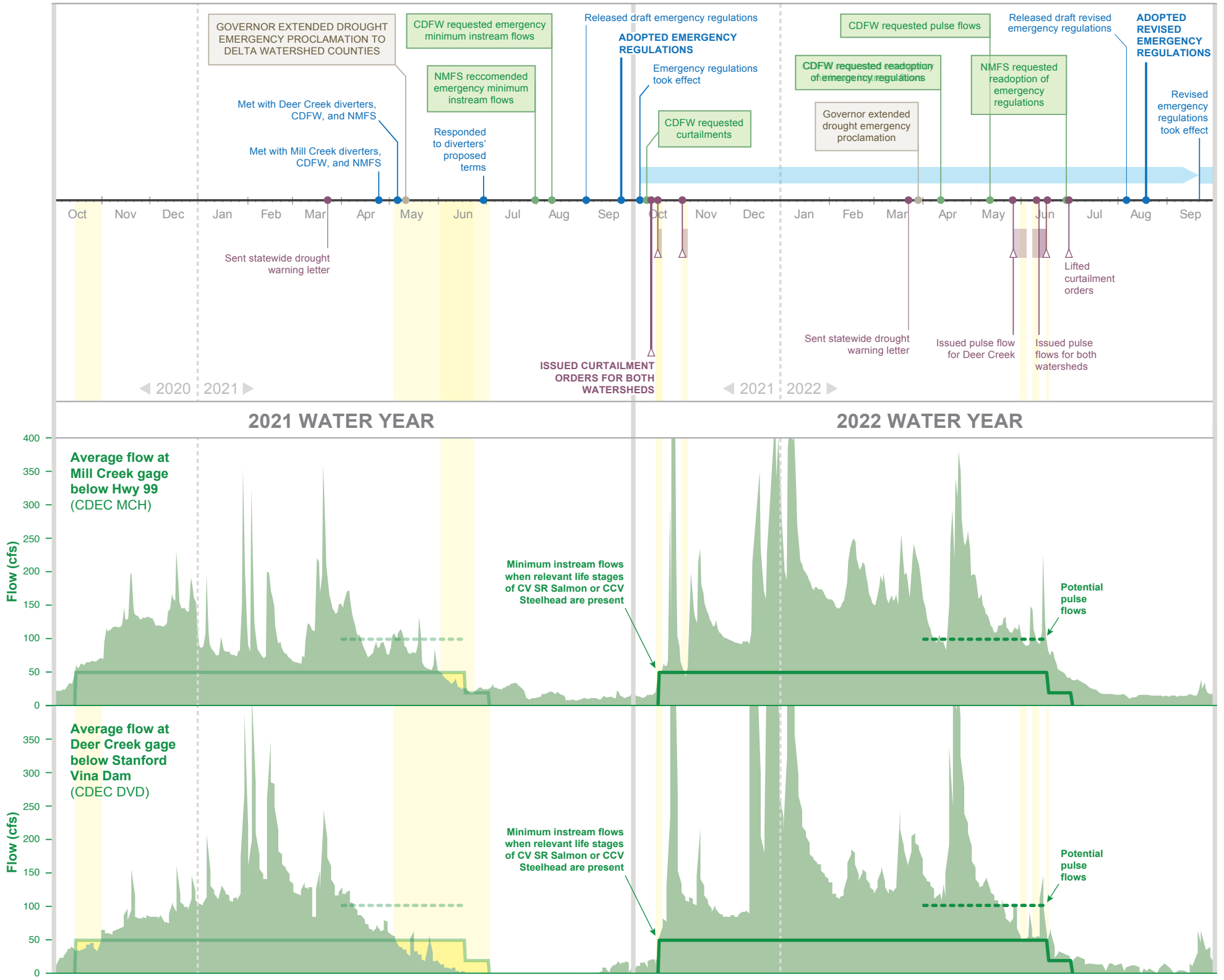


Figure 8. *Timeline of key curtailment-related actions for the Deer Creek and Mill Creek watersheds during the 2021 and 2022 water years.*[418] *Actions were taken by the SWRCB unless otherwise noted. Yellow bands show when flows at the applicable stream gages dropped below the minimum flows designated in the emergency curtailment regulations, indicating that curtailments were needed.*

3.3. EMERGENCY REGULATIONS ARE CENTRAL TO THE SWRCB'S CURRENT APPROACH TO CURTAILMENT.

Our review of the SWRCB's efforts to implement curtailments to date during droughts shows that its approach has evolved over time.

While it has continued to use other tools, emergency regulations have been central to the SWRCB's approach to curtailments during the 2020–2022 drought. In broad brush strokes, the SWRCB is now implementing curtailments using the following basic steps:

1. The SWRCB identifies a watershed where it wants to implement curtailments.
2. If the watershed meets the prerequisite conditions for emergency rulemaking under Water Code section 1058.5, the SWRCB proceeds to the next step. If the watershed does not meet the prerequisites, the SWRCB waits until it does, relying in the meantime on other tools, such as notices of water unavailability that alert diverters who should be curtailing.
3. The SWRCB develops and adopts drought emergency regulations to set the ground rules for curtailments. The SWRCB releases draft emergency regulations and supporting information, takes written public comments, (usually) holds a staff workshop to present an overview of the draft regulations and invite additional public feedback, revises the draft regulations, and adopts the revised emergency regulations. The emergency regulations explain on what basis and how curtailments will be implemented for the watershed. They describe curtailment exceptions, alternative compliance mechanisms, reporting requirements, how diverters and the broader public will receive notice of various actions, options for seeking changes or review, and potential enforcement actions. **Table 14** summarizes the main categories of provisions the SWRCB has included in its 2022 emergency curtailment regulations and the roles they play in curtailments. Some provisions, such as human health and safety exceptions to curtailment, are likely to be similar or identical across watersheds, while other provisions are necessarily unique to the particular watershed. Watershed-specific provisions include methodologies for analyzing supply and demand information to assess water unavailability and minimum flow requirements designed to protect fish and other public trust resources.
4. The Office of Administrative Law reviews and approves the emergency regulations, and they go into effect.
5. To initiate curtailments, the SWRCB issues curtailment and reporting orders as set out in the emergency regulations. The SWRCB follows the processes described in the emergency regulations to assess whether conditions warrant curtailment and, if so, which water rights should be curtailed. Orders explain diverters' obligations; how to seek curtailment exceptions, if applicable, or pursue an alternative compliance mechanism; options for seeking changes or review; and the potential repercussions of failure to comply.
6. The SWRCB frequently reassesses the need for curtailments and provides curtailment status updates, increasing or decreasing the scope of water rights curtailed as necessary. Diverters receive status updates via the SWRCB's website and a watershed-specific email list.

7. When violations occur, the SWRCB follows up with informal or formal enforcement actions to encourage compliance.
8. If drought conditions appear likely to continue for more than 1 year, the SWRCB refines and readopts the emergency curtailment regulations applicable to the watershed.

This approach to curtailment represents a substantial improvement over the SWRCB's practice during the 2012–2016 drought of relying primarily on notices of water unavailability to implement curtailments. This new emphasis on emergency regulations follows litigation that separately tested the SWRCB's use of both approaches during that drought. Diverters successfully challenged the SWRCB's use of notices of water unavailability to implement curtailments to protect water right priority in the *California Curtailment Cases*.[419] By contrast, a challenge to the SWRCB's initial use of emergency regulationsto implement curtailments to protect minimum streamflows, in *Stanford Vina Ranch Irrigation Co. v. State* (2020), failed.[420]

However, implementing curtailments effectively within an emergency-based framework requires the SWRCB to be able to adopt emergency regulations in a timely fashion, whenever and wherever they are needed. As we will discuss in the next section, this is not a given.

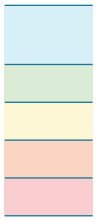
Table 14. *Main categories of provisions in the SWRCB's 2022 drought emergency curtailment regulations and their roles in curtailment. The last column identifies specific code provisions applicable to different watersheds for each category. Cell shading distinguishes broad categories of provisions.*

CATEGORY	ROLE IN CURTAILMENT	SPECIFIC PROVISIONS (FROM TITLE 23 OF THE CCR)
Basis for curtailments to protect water right priority	Explain / establish the basis for curtailments when flows are insufficient to support all water rights, including methodologies for analyzing water unavailability and prioritizing curtailments.	***Delta:*** § 876.1 ***Russian:*** §§ 877.2, 877.3(a) ***Klamath:*** § 875.4 ***Scott & Shasta:*** § 875.5
Basis for curtailments to protect public trust flows	Explain / establish the basis for curtailments when flows are insufficient to protect fish and other public trust resources, including minimum flows and triggering conditions.	***Deer & Mill:*** § 876.5(a), (c) ***Russian:*** § 877.2(c) ***Scott & Shasta:*** § 875
Basis for curtailments to protect stored-water releases	Explain / establish the basis for curtailments to protect releases of stored water, including triggering conditions.	***Russian:*** §§ 877.2(c), 877.5
Exceptions to curtailment: Non-consumptive uses	Explain / establish curtailment exceptions for non-consumptive uses.	***Delta:*** § 878** ° ***Deer & Mill:*** § 876.5, 878** ***Russian:*** § 878** ° ***Klamath:*** § 875.1(a)
Exceptions to curtailment: Minimum human health and safety needs	Explain / establish curtailment exceptions for minimum human health and safety needs.	***Delta:*** § 878.1** ***Deer & Mill:*** § 876.5, 878.1** ***Russian:*** § 878.1** ***Klamath:*** §§ 875.2, 878.1**

Basis for curtailments
Exceptions & alternative compliance mechanisms

CATEGORY	ROLE IN CURTAILMENT	SPECIFIC PROVISIONS (FROM TITLE 23 OF THE CCR)
Exceptions to curtailment: Minimal livestock watering	Explain / establish curtailment exceptions for minimal livestock watering.	***Deer & Mill:*** § 876.5(b) ***Klamath:*** § 875.3
Exceptions to curtailment: Other	Explain / establish curtailment exception for small diverters whose rights are not conditioned on bypass of natural or abandoned flow.	***Delta:*** § 879.1(b)** ***Deer & Mill:*** § 879.1(b)** ***Russian:*** § 879.1(b)**
Alternative compliance mechanisms: Local cooperative solutions	Explain / establish options and requirements for local cooperative solutions for meeting minimum flows when water rights are curtailed to protect public trust flows.	***Deer & Mill:*** § 878.4 ***Scott & Shasta:*** § 875(f)
Alternative compliance mechanisms: Water sharing agreements	Explain / establish options and requirements for water sharing agreements to enable more-junior diverters to receive some water when their rights, but not more-senior parties' rights, are curtailed to protect water right seniority.	***Delta:*** § 878.2 ***Russian:*** § 877.4
Reporting and other information requirements	Explain / establish reporting obligations, enhanced reporting requirements, and requirements related to information orders.	***Delta:*** § 879** ° ***Russian:*** § 879** ***Klamath:*** § 875.6 ***Scott & Shasta:*** § 875.8
Notice	Explain when and how notice will be provided of various curtailment-related actions.	***Delta:*** §§ 876.1(c), (f), (g); 878.1(f)**; 878.2 ***Deer & Mill:*** §§ 876.5(d), 878.1(f)**, 878.4 ***Russian:*** §§ 877.2(c), (e), (f); 877.4(c); 878.1(f)** ***Scott & Shasta:*** §§ 875(d)–(e); 875.8(a); 878.1(f)**
Options for seeking changes or review	Explain options for seeking reconsideration of a curtailment or information order; for seeking corrections in the assumptions that underlie curtailments; and for objecting to a proposal or petition for an alternative compliance mechanism, a related certification, or a decision regarding a proposed alternative compliance mechanism.	***Delta:*** §§ 878.2, 876.1(e), (h); 879(c)(3); 879(c)(7) ***Deer & Mill:*** § 878.4 ***Russian:*** § 877.3(b), (d) ***Scott & Shasta:*** § 875(f)(2)
Enforcement	Explain what constitutes compliance or violation. Explain potential enforcement actions, including financial penalties and cease-and-desist orders.	***Delta:*** §§ 878.2; 879(c)(5); 879.1(a)**; 879.2** ***Deer & Mill:*** §§ 878.4; 879.1(a)**; 879.2** ***Russian:*** §§ 877.3(c); 879.1(a)**; 879.2** ***Klamath:*** § 875.9(a), (b) ***Scott & Shasta:*** § 875(f)(2)

**	Shared in common with other watershed(s)
** °	Shares aspects in common with other watershed(s) and also includes watershed-specific aspects
CCR	California Code of Regulations
Delta	Delta watershed
Deer & Mill	Deer Creek and Mill Creek watersheds
Russian	Russian River watershed
Klamath	Klamath River watershed
Scott & Shasta	Scott River and Shasta River watersheds (within the larger Klamath River watershed)



Exceptions & alternative compliance mechanisms
Information requirements
Notice
Options for changes or review
Enforcement

3.4. KEY LIMITATIONS OF AN EMERGENCY-BASED APPROACH TO CURTAILMENT

The SWRCB's extensive use of emergency regulations in 2021 and 2022 has enabled it to implement curtailments more widely, transparently, precisely, and effectively than ever before. Nonetheless, this approach to curtailments has some important limitations that cannot be fixed—at least not completely—through better emergency procedures. Instead, many are unavoidable consequences of using emergency procedures to respond to routine situations.

3.4.1. Curtailments are needed when Water Code section 1058.5 emergency regulatory authority is not available.

Adopting emergency regulations is not always an option when curtailments are needed. Drought emergency rulemaking authority under Water Code section 1058.5 is only available under two narrow sets of circumstances: (1) when a critically dry year follows at least two consecutive below-normal or drier years or (2) when the Governor proclaims a state of emergency due to drought. Yet curtailments may be needed under other circumstances, such as during a dry year that was preceded by a wet year or only one additional dry year.

If water shortage develops quickly, the SWRCB's access to drought emergency rulemaking authority would depend on an attentive and quick acting Governor who does not hesitate to proclaim a drought emergency for a watershed that warrants it. There is no guarantee a Governor will proclaim a state of drought emergency on a schedule that enables the SWRCB to implement curtailments to prevent harm to water right holders, communities, and environmental resources. The timing of the SWRCB's curtailment-related actions for different watersheds in 2021 illustrates this problem. Because 2021 was only the second consecutive below-normal or drier year, the SWRCB had to wait until the Governor proclaimed a drought state of emergency for the counties that contained affected watersheds before developing emergency regulations to guide curtailments in those watersheds.

Moreover, curtailments are not only needed when conditions are bad enough to lead a Governor to proclaim a drought emergency. Periods of local or regional water shortage that meet neither of the threshold criteria in Water Code section 1058.5 could become increasingly common in the future, given year-to-year and within-year precipitation variability and increasing precipitation extremes.

California is a state of unique and variable water availability patterns, and, as a matter of law, water right priorities limit the scope of water rights at all times. Therefore, water right priorities ought to be routinely enforced, regardless of whether a drought "emergency" exists. In the absence of routine curtailments, diversions occur outside of water right priority (i.e., when water is unavailable under a water right) in California during all or most years. These illegal diversions come at a cost. Water from local, state, and federal reservoirs—and water that would otherwise go to the environment—ends up filling the gaps,[421] with long-term repercussions for water supply reliability, ecosystem resilience, fisheries health, and the survival of threatened or endangered species.

The foregoing demonstrates that emergency regulations are an inadequate vehicle for protecting California water right holders or the state's water resources more generally. The SWRCB, as the expert agency charged with administering California's water resources, needs the authority to routinely implement curtailments with the flexibility to respond to changing conditions as they occur.

3.4.2. Emergency regulations take time to develop in the midst of drought.

If the SWRCB relies on emergency regulations to set the stage for curtailments, it has to wait until a watershed meets the prerequisites for emergency rulemaking under Water Code section 1058.5—meaning the watershed is already in the midst of acknowledged drought. The emergency rulemaking process allows quicker action than is possible through regular rulemaking, as we described in **Section 2.2.4**, but it is not instantaneous. As a result, curtailments may have been needed for many weeks or months by the time the SWRCB is able to issue curtailment orders.

As an example: In the Russian River Watershed, 2020 was the third driest year in 127 years of record, leading Sonoma County Water Agency to seek temporary urgency changes to its instream flow requirements in June 2020 and January 2021. The agency's goals were to preserve storage in Lake Mendocino, which in turn would enable it meet instream flow needs for listed salmonid fisheries and serve municipal, agricultural, and other uses in the watershed.[422] On March 22, 2021, the SWRCB sent a statewide warning of "Ongoing Dry conditions in Most California Watersheds."[423] On April 21, the Governor issued his first drought emergency proclamation of the 2020–2022 drought, for Mendocino and Sonoma counties "due to drought conditions in the Russian River Watershed.[424] In late May, the SWRCB issued informational notices of water unavailability for all post-1914 rights in the Upper Watershed.[425] In early June, the SWRCB released the draft text of proposed emergency curtailment regulations for the Russian River Watershed and held a public workshop on the proposed regulations, before adopting them at a Board meeting on June 15.[426] It submitted the adopted regulations to the OAL for review on June 30, and the regulations went into effect after OAL approval on July 12.[427] Finally, the SWRCB issued curtailment orders for the Upper Watershed on August 2 and for the Lower Watershed on August 10.[428] Assuming that curtailments were warranted at least as of the time the SWRCB sent notices of water unavailability in late May, there was, at minimum, a 10 week delay, as **Figure 4** shows.

In 2021, curtailments would have been warranted in each of the watersheds for which the SWRCB eventually developed emergency regulations months before it was able to issue curtailment orders under those regulations. For example, based on comparison with the date it sent out notices of water unavailability, the SWRCB's curtailment orders were delayed by ~ 10 weeks for the Russian River Watershed (**Figure 4**), ~15 weeks for the Scott River watershed (**Figure 5**), and ~9 weeks for the Delta Watershed (**Figure 7**).

Similarly, flow conditions dropped below the minimum flows eventually required in the SWRCB's October 12, 2021, curtailment orders for Mill and Deer Creek Watersheds 4 to 5 months or more before the SWRCB issued those curtailment orders (see yellow shading in **Figure 8**). This pattern is repeated in the Scott River (**Figure 5**) and Shasta River (**Figure 6**) watersheds.

Curtailments were also warranted in many watersheds in 2020, as the yellow shading in **Figures 5**, **6**, and **8** makes clear. However, the SWRCB had no power to issue emergency curtailment regulations at the time, since neither criterion for triggering that authority was met, and it did not try to implement curtailments via alternative means (such as notices of unavailability, which have proven vulnerable to attack, as described in **Section 2.2.1**).

3.4.3. Emergency regulations are limited in duration.

During the 2012–2016 drought, drought emergency regulations could last up to 180 days (6 months). While their maximum duration has since doubled to 1 year, and drought emergency regulations can be readopted if the need for them continues, doing so takes significant staff time and financial resources that could be used in other ways during an ongoing drought. Additionally, although the SWRCB need not start from scratch during each successive drought and can reuse and build on past emergency regulation text, it may not be able to do so in short order.

3.4.4. Diverters may resist repeated reliance on emergency regulations to implement curtailments.

If the SWRCB continues to rely primarily on emergency regulations to implement curtailments during future droughts, it could face growing resistance from diverters. Resistance might be especially strong if droughts recur frequently. In particular, diverters may argue that the SWRCB is sidestepping options that would provide greater opportunities for public engagement and refinement, such as developing curtailment regulations through the regular rulemaking process. Treating drought—and the need to curtail—primarily as an emergency may seem inappropriate when it is clearly a core, and growing, water management challenge for California.

3.4.5. Emergency regulations may pose challenges for implementing effective alternative compliance mechanisms.

In theory, the SWRCB's 2021 and 2022 emergency curtailment regulations gave diverters the opportunity to develop and propose alternative compliance mechanisms. These mechanisms included local cooperative solutions for meeting minimum flows needed to protect public trust resources, as well as water sharing agreements that can enable those with more-junior water rights to get access some water when their rights would otherwise be curtailed. However, if the ground rules are not settled until well into a drought, when the SWRCB can most easily use its emergency regulatory authority, diverters may have trouble developing acceptable proposals that can be implemented in time to matter to the people they are intended to aid.

The Voluntary Water Sharing Program for the Upper Russian River demonstrates both the strong interest in developing alternative compliance mechanisms and their limitations. Stakeholders began working to develop the program in April 2021 with support from SWRCB staff.[429] They released a draft water sharing agreement in early May 2022 and invited enrollment in the proposed program beginning in late May. The program allows senior water right holders to agree to share some of their water with participants whose more-junior rights are curtailed. The SWRCB approved the agreement in early June 2022, and it took effect in late June. However, the program had to be put on hold less than 2 months later, when the Federal Energy Regulatory Commission approved PG&E's request for a variance to substantially reduce the flow of water into the Russian River Watershed from the Potter Valley Project. This reduction in supply triggered curtailments for some of the more-senior right holders in the program, who no longer had water to share. Having such a program in place before the drought arose would have lessened the impacts to junior diverters in the Upper Russian River watershed in 2021. Instead it took more than a year, in the midst of drought, to put in motion.

3.4.6. A system for regular curtailments would have many benefits an emergency-based system cannot provide.

Perhaps the most basic and important argument against reliance on an emergency-based approach to curtailments is that it is inherently incapable of supporting regular and nimble water right curtailments (as described above) and all the benefits they bring.

A system for regular curtailments would have many benefits, including reducing uncertainty for water users and the environment. Reducing uncertainty would enable water managers to transition from spending energy girding for and engaging in perennial fights over allocation to focusing on risk assessment, planning, and innovative approaches to systemic improvement that are currently stymied by ongoing conflict. A system for regular curtailments would be crucial to actualizing a simple but radical possibility: managing California's water resources in accordance with the law.

As **Box 2** illustrates, the experiences of other states suggest that regular curtailments are possible, but that California is not alone in needing to improve water rights administration during droughts. A wide range of differences in local conditions, and in state water rights law and environmental law, make interstate comparisons non-linear. However, where curtailments are a regular and accepted part of life, there is less conflict and the above benefits can be realized. California can take basic steps towards its own version of this vision.

BOX 2. KEY TAKEAWAYS FROM CURTAILMENT PRACTICES IN OTHER WESTERN STATES

As part of our research for this report, we investigated curtailment practices in other western states. The research involved reviewing legal authority and secondary-source descriptions and talking with people with direct knowledge of on-the-ground practices. Several key takeaways emerged, although perhaps the most important lesson from this research is that streamlined, routine curtailments do happen in other states, which demonstrates they are possible.

- *Curtailments occur routinely in some western states.* In some watersheds in eastern Oregon, for example, flows usually are too low to support junior water rights by early summer, and curtailments are an annual event.[430] Seasonal or more frequent curtailments are also common in many parts of Colorado[431] and in some watersheds in other states, such as Idaho, Washington, and Nevada.[432] California is an outlier in some respects, but there are other western states that have rarely implemented curtailments. New Mexico, for example, has created a statutory and regulatory framework for curtailments, including curtailments in basins without fully adjudicated rights, but it is rarely used, even during times of serious water shortage.[433] Throughout the western United States, there is room for improvement.
- *The needs of more-senior water right holders often drive curtailments.*[434] Curtailments are often triggered when a more-senior diverter places a "call" for water.[435]
- *Some states also implement curtailments to maintain instream flows for environmental purposes.* While we did not identify examples of curtailment procedures driven by background legal principles like the public trust doctrine or reasonable use, some states do curtail water diversions to meet certain instream flow obligations. These flow requirements are generally defined via regulation and assigned a priority date that corresponds with the date the regulation was adopted. As a result, flow-related curtailments generally apply only to more-junior water rights. This is the case in Kansas[436] and Washington.[437] Additionally, where tribes hold the most senior water rights, such as in parts of Oregon and Washington,[438] curtailments to protect senior rights can function as curtailments to maintain instream flows.
- *Some states curtail quickly, with minimal procedure.*[439] This is true where curtailments occur routinely (see above). For some watersheds, the process is as simple as a phone call from a watermaster saying, "it's time." However, we did not identify states where that simplicity was the norm for all watersheds; instead, it tends to occur where the relative priorities of water rights are clear, information on flows and diversions is readily available, and curtailments are an established tradition.
- *Many states use watershed-based field staff to implement curtailments.* Curtailments are often implemented by field staff (sometimes called watermasters, water commissioners, etc.) who are based in the watershed.[440] While field staff are often employees of the state water rights regulator, their work in the watershed builds local knowledge and credibility. Local diverters often must fund their work.[441]
- *Those implementing curtailments usually have the authority to physically shut off diversions to ensure compliance.*[442] This includes state water rights regulators.

4. RECOMMENDATIONS

The SWRCB and the State Legislature can take actions to build a fair and effective framework for water right curtailment in California. First, the SWRCB can establish a basic framework for curtailments through non-emergency rulemaking. Second, the Legislature can enable more effective curtailment regulations and enhance curtailment enforcement options. Finally, the SWRCB can take actions, with legislative support, to improve engagement and information for more effective curtailments.

This part of the report outlines a framework that would enable the SWRCB to implement more regular and nimble water right curtailments to help our state to adapt to the contemporary realities of a growing population, ongoing environmental crises, and the increasingly frequent and intense droughts (and floods) that are California's new normal. The framework includes elements the SWRCB can implement on its own, as well as elements that would require, or would benefit from, swift and decisive legislative action.

Regardless of whether the Legislature acts, the SWRCB can establish a basic framework for curtailments through regular rulemaking. This path, described in **Section 4.1**, would reduce the SWRCB's reliance on emergency regulations, shifting them to the role of making rapid adjustments to the basic framework on an as-needed basis.

The remainder of our recommendations would require (**Section 4.2**), or would benefit from (**Section 4.3**), legislative action. Readers should not infer that we make these recommendations because the SWRCB lacks authority to implement curtailments. As we explained in **Section 2.1**, the SWRCB has broad responsibility and general authority to implement curtailments under the California Constitution's requirement for reasonable use, the state public trust doctrine, and aspects of the Water Code. It also has access to specific tools it can use to implement curtailments. However, these tools have important limitations. And a lack of specific statutory language reinforcing aspects of the SWRCB's general authority enables diverters, and their lawyers, to argue the authority does not exist, generating uncertainty and impairing the SWRCB's ability to implement needed curtailments. Litigation to resolve these questions, and its historically glacial pace, has large transaction costs. This context suggests that solidifying and concretizing the SWRCB's authorities in statute and upgrading its statutory tool set to better reflect the SWRCB's critical role may be crucial for enabling effective curtailments during future droughts.

4.1. ESTABLISH A BASIC FRAMEWORK FOR ROUTINE CURTAILMENTS.

In the future, effective water rights administration is likely to involve implementing curtailments on a more regular basis. Curtailments will be needed not just in certain watersheds during major statewide droughts, and not just when the threshold conditions for emergency rulemaking under Water Code section 1058.5 are met. Therefore, the SWRCB needs to reduce its reliance on emergency regulations. Almost every year, some watersheds in California experience dry conditions that can create short-term water shortages and contribute to long-term imbalances between water supply, water demand, and environmental water needs. The particular watersheds experiencing dry conditions can change significantly from year to year, and even within a single year, and will sometimes include watersheds the SWRCB has not focused on in the past. Certain watersheds may experience water shortage as a persistent water management challenge and need curtailments at some point during most years, similar to the near-annual need for Term 91 curtailments.

To prepare itself to meet these needs, we recommend that the SWRCB establish the basic framework for curtailments through the regular rulemaking process, shifting emergency regulations to a peripheral role that supplements or adjusts the basic framework on an as-needed basis. This approach has several clear advantages. It will

- set the stage for more regular and nimble implementation of curtailments in watersheds across the state,
- provide diverters and other affected parties with more certainty about water availability,
- enable greater administrative efficiencies,
- provide more notice and opportunities for participation in regulation development by affected parties, and
- be more defensible against potential legal challenges.

In the following subsections, we provide a brief outline of the proposed framework and discuss its potential limitations. In **Sections 4.2** and **4.3**, we identify additional legislative and administrative actions that could provide critical support for the proposed framework, ensuring that it is effective.

The proposed framework is organized into two major framework elements: preparation and implementation. Actions included under the preparation element help to lay the groundwork for routine curtailments in the future, while the implementation element includes the actions required to actually administer curtailments and make in-drought adjustments to that groundwork. **Table 15** summarizes these elements and their key subcomponents.

Table 15. *Overview of major elements of the proposed framework for improved implementation of water right curtailments.*

PREPARATION Laying the groundwork for routine curtailments	1. **Adopt standard regulations to lay the groundwork for routine curtailments, including both** a. Generally applicable / default provisions regarding · The basis for curtailments; · Exceptions to curtailment; · Alternative compliance mechanisms; · Reporting and other information requirements; · Notice; · Options for seeking changes or review; and · Enforcement; b. Any watershed-specific provisions that are needed, e.g., · Water unavailability methodologies and · Minimum flows and triggering conditions. 2. **Include a due process analysis in the rulemaking record.** 3. **Develop best practices for using emergency regulations to support curtailments.**
IMPLEMENTATION Administering curtailments and making in-drought adjustments	1. **Implement curtailments when needed by** a. Analyzing water unavailability; b. Issuing curtailment orders; c. Providing curtailment status updates; d. Administering exceptions to curtailment; e. Administering alternative compliance mechanisms; f. Addressing requests for corrections, petitions for reconsideration, objections, etc.; g. Monitoring compliance; and h. Taking appropriate enforcement action. **2. Use emergency regulations to make temporary adjustments to the curtailment framework, when needed.**

4.1.1. Preparation

The first element, preparation, involves (1) adopting standard, non-emergency regulations to guide curtailments, (2) including a due process analysis in the rulemaking record, and (3) developing best practices for using emergency regulations to support curtailments. Ideally these actions would be taken in advance of drought. However, the likelihood of a prolonged period of calm, free of water shortage risks, is low. Therefore, we recommend that the SWRCB begin this preparatory work as soon as possible, building on the advances it has made—and, importantly, on the critical work it has done—during the 2020–2022 drought.

4.1.1.1. Adopt standard, non-emergency regulations to lay the groundwork for routine curtailments.

Our proposal is centered around using the regular rulemaking process to establish the basic framework to guide more frequent and routine curtailments. The framework would include both generally applicable provisions and, where needed, watershed-specific provisions that collectively address the same categories (shown in the first column of **Table 16**) as the SWRCB's 2022 emergency regulations (summarized in **Table 14**). The second column of **Table 16** identifies the roles we envision for non-emergency regulations. Note that, for each category, this column includes proposed roles for, first, generally applicable provisions and, second, watershed-specific provisions.

This basic framework would be designed to make many key decisions in advance, streamlining in-drought decision-making processes and minimizing the need for emergency rulemaking, including by specifying contingency measures that allow for situation-specific adjustments.

The SWRCB does not need to start from scratch. We anticipate that it can reuse much of the emergency regulation text it has developed and refined during the 2020–2022 drought. However, some reorganization will be necessary to sharpen and clarify commonalities and important differences between watersheds.

Table 16. *Proposed roles for standard and emergency regulations in the proposed framework. The first column lists the main categories of provisions in the SWRCB's 2022 emergency curtailment regulations (mirroring* **Table 14***). The second and third columns describe the roles we envision for regulations adopted via the regular rulemaking process and emergency regulations, respectively. In the second column, "General" denotes generally applicable provisions, while "Specific" denotes watershed-specific provisions. Cell shading distinguishes broad categories of provisions.*

CATEGORY	ROLE OF STANDARD REGULATIONS	ROLE OF EMERGENCY REGULATIONS
Basis for curtailments to protect water right priority	General: Explain the general basis for curtailments when flows are insufficient to support all diversions / water rights. Specific: Identify any watershed-specific water unavailability methodologies (incorporated by reference, if needed) or for prioritizing curtailments.	Adjust provisions regarding the basis for curtailments to protect water right priority, if needed.
Basis for curtailments to protect public trust flows	General: Explain / establish the general basis for curtailments when flows are insufficient to protect fish and other public trust resources. Specific: Identify minimum flows and triggering conditions for particular watersheds.	Adjust minimum flows, triggers, and other curtailment provisions, if needed.
Basis for curtailments to protect stored-water releases	General: Explain / establish the general basis for curtailments to protect releases of stored water, including triggering conditions. Specific: Identify any watershed-specific bases and triggering conditions.	Adjust provisions regarding the basis for curtailments to protect releases of stored water, if needed.
Exceptions to curtailment: Non-consumptive uses	General: Explain / establish basic curtailment exceptions for, e.g.: • Non-consumptive uses • Minimum human health and safety needs • Minimal livestock watering Specific: Identify any watershed-specific exceptions.	Adjust exceptions to curtailment, if needed..
Exceptions to curtailment: Minimum human health and safety needs	General: Explain / establish the general basis for curtailments to protect minimum human health and safety uses of water, including triggering conditions. Specific: Identify any watershed-specific bases and triggering conditions..	Adjust provisions regarding the basis for curtailments to protect human health and safety, if needed
Alternative compliance mechanisms	General: Explain / establish basic options and requirements for alternative compliance mechanisms, e.g.: • Local cooperative solutions for meeting minimum flows • Water sharing agreements Specific: Identify any watershed-specific options and requirements.	Adjust alternative compliance mechanism options and requirements, if needed.

Basis for curtailments
Exceptions & alternative compliance mechanisms

CATEGORY	ROLE OF STANDARD REGULATIONS	ROLE OF EMERGENCY REGULATIONS
Reporting and other information requirements	General: Explain / establish basic reporting obligations, enhanced reporting requirements, and requirements related to information orders. Specific: Explain any watershed-specific information requirements.	Adjust information requirements, if needed.
Notice	General: Explain basics of when / how notice will be provided of various curtailment-related actions. Specific: Explain any watershed-specific notice provisions.	Adjust notice provisions, if needed.
Options for seeking changes or review	General: Explain basic options for, e.g.: • Seeking reconsideration of curtailment or information orders • Seeking correctio***ns to*** the assumptions that underlie curtailments • Objecting to a proposal or petition for an alternative compliance mechanism, a related certification, or a decision regarding a proposed alternative compliance mechanism Specific: Explain any watershed-specific options for seeking changes or review.	Adjust options for seeking changes or review, if needed.
Enforcement	General: Explain enforcement basics, e.g.: • What constitutes compliance or violation • Potential enforcement actions, including financial penalties and cease-and-desist orders Specific: Explain any watershed-specific enforcement provisions.	Adjust enforcement provisions, if needed.

Information requirements
Notice
Options for changes or review
Enforcement

4.1.1.1.1. Generally applicable provisions

Generally applicable regulation provisions would be shared across all, or most, watersheds, and could perform the following important functions:

- Explaining, in general terms, the purposes of and potential bases for curtailment, including curtailments when flows are insufficient to support all anticipated diversions, when flows are insufficient to protect public trust resources, or when releases of stored water need protection. The goal of these provisions would not be to establish fixed bases for curtailment that would apply uniformly across the state, but to provide critical common context to help diverters and other stakeholders understand the aims and roles of water right curtailments. If the OAL deemed this content unnecessary (which would violate the "necessity" standard for regulations[443]), the SWRCB could instead include it in the initial statement of reasons or other rulemaking documents, in a general fact sheet about curtailment, and in FAQ text on the SWRCB's website.

- Establish default requirements and procedures likely to be broadly useful for many or all watersheds regarding exceptions to curtailment, alternative compliance mechanisms, reporting, notice, options for seeking changes or review, and enforcement, as shown in the second column of **Table 16**.

Many aspects of the 2022 emergency regulation provisions establishing curtailment exceptions share significant overlap and could usefully be combined. Some of these provisions are already present in emergency regulations for multiple watersheds. For example, most portions of California Code of Regulations title 23 section 878 (regarding non-consumptive uses) and section 878.1 (regarding minimum health and safety needs) apply to both the Delta watershed and the Russian River watershed. Both of these code sections also include some watershed-specific provisions.

4.1.1.1.2. Watershed-specific provisions

Where watershed-specific provisions have already been developed, they could be folded into the general rulemaking process. New or updated watershed-specific provisions could be adopted through separate rulemakings following the initial rulemaking. We expect that watershed-specific provisions will be most critical for establishing what water unavailability methodologies, minimum flows, and specific curtailment triggers are appropriate for each watershed. However, they may also be needed for other categories of provisions, as shown in the second column of **Table 16**.

When a water unavailability methodology involves voluminous documentation and explanation, such as the current methodology for the Delta watershed does, it can be incorporated by reference[444] into the regulation.

We note that, to achieve the best outcomes for water users and ecosystems, the SWRCB would ideally be able to update water unavailability methodologies whenever feasible improvements are identified. The SWRCB has only been allowed to put significant resources into developing and using water unavailability methodologies to guide curtailments in the last few years. The methodologies it has developed to date are a good start, but they are not perfect, and never will be. Such methodologies will always rely on imperfect data and simplifying assumptions. At the same time, the potential to iteratively improve these methodologies on short time scales is great. The SWRCB is learning from its experience using water unavailability methodologies and from stakeholder input and feedback, and available data are getting better over time, making rapid improvements possible.

Changes to a water unavailability methodology would generally need to go through the regular rulemaking process, and would be subject to CEQA. The exception would be temporary adjustments made via emergency regulation. Under current law, for such adjustments to become permanent, the SWRCB would need to undertake a full regular rulemaking process. However, in **Section 4.2.1.3**, we recommend that the Legislature direct the SWRCB to adopt certain watershed-specific provisions via emergency regulation.

4.1.1.2. Include a due process analysis in the rulemaking record.

As the SWRCB prepares the documents required to support regular rulemaking, it can incorporate a clear explanation of how the regulations, and actions subsequently taken under them, meet state and federal due process requirements. This explanation could be included in the Informative Digest and would reflect the types of considerations discussed in section 3.2 of Order WR 2022-0147-EXEC.[445] That order responded to multiple petitions for reconsideration of the SWRCB's August 2021 Emergency Curtailment and Reporting Regulation for the Sacramento-San Joaquin Delta Watershed and the August 2021 Curtailment and Reporting Orders the SWRCB issued under it.

Key elements to address (and support with appropriate citations) include the following:

Regarding adoption of the regulations:

- Explain that the SWRCB is not required to hold an evidentiary hearing before adopting the regulation; instead, it must comply with the APA.
- Summarize what the APA requires, how the SWRCB has met those requirements, and, if applicable, how it has gone beyond APA requirements to provide additional opportunities for public participation.

Regarding curtailment orders issued under the regulations:

- Explain why individualized hearings are not required before curtailments go into effect under a curtailment order issued under the regulations. As the SWRCB has noted in other contexts, "providing each curtailed diverter with the opportunity for a hearing before issuance of a curtailment order would present an impractical administrative burden."[446] That burden would render the SWRCB incapable of meeting its responsibilities to provide for the orderly and efficient administration of California's water resources, consistent with the constitutional requirement for reasonable use and other priorities established by state and federal law.[447] But, most critically, it would effectively prevent the SWRCB from stopping diversions that harm more-senior water users, jeopardize the ability to meet minimum human health and safety needs for water, or risk substantial harm to public trust resources. Given the strong public interest in timely curtailments, due process is satisfied by the opportunity to weigh in during regulation development, including the specific water unavailability methodologies that will guide curtailments, and the additional due process protections those regulations provide after a curtailment order is issued.

Regarding due process protections built into the regulations:

- Explain the many due process protections that are built into the regulations. These include protections for diverters who are affected by curtailments, by curtailment exceptions, and/or by alternative compliance mechanisms, such as:
    - *Notice of actions related to curtailment*, including
        - a curtailment order and subsequent curtailment status updates;
        - an information order;

- a petition for reconsideration;
- certifications, petitions, and decisions related to curtailment exceptions;
- a proposal or petition for an alternative compliance mechanism, a related certification, a decision regarding a proposed alternative compliance mechanism, or an objection to any of these; and
- a hearing (e.g., held to address an objection received to any of the above listed actions related to a proposed alternative compliance mechanism).

- ***Exception processes*** that protect life and health, such as for diversions needed to meet minimum human health and safety needs or for minimal livestock watering.
- ***Allowing diverters to develop alternative compliance mechanisms***, such as voluntary water sharing agreements that reduce curtailment impacts on more-junior diverters.
- ***Enabling affected parties to seek changes or review***, including processes for seeking reconsideration of a curtailment or information order[448]; for seeking corrections to the assumptions that underlie curtailments; and for objecting to a proposal or petition for an alternative compliance mechanism, a related certification, or a decision regarding a proposed alternative compliance mechanism.

Regarding potential enforcement actions:

- Explain that neither the regulations nor the curtailment orders modify the procedures, including notice and the opportunity for a hearing, that govern enforcement actions.

Providing this information up front would serve at least three important purposes. First, it would help the SWRCB to think intentionally about how best to ensure due process protections around curtailments. Second, it would educate diverters (and others) about the scope and nature of the SWRCB's due process responsibilities when implementing curtailments and the specific ways in which the SWRCB is meeting, and even going beyond, those responsibilities. Finally, it would establish a clear record courts can refer to and that would strengthen the SWRCB's arguments it has provided due process, if diverters pursue legal challenges to curtailments.

4.1.1.3. Develop best practices for using emergency regulations to support curtailments.

To guide when and how it uses emergency regulations to support curtailments, the SWRCB can develop and periodically revisit best practices. Most obviously, emergency regulations may be needed to make rapid adjustments to the groundwork for curtailments when changed circumstances or new information require an immediate response that is not possible via regular rulemaking. The best practices guidance could identify preferred timelines and potential triggers for preparing to adopt emergency regulations to address different contingencies.

This guidance would reflect the circumstances under which emergency rulemaking authority is available under Water Code section 1058.5. For example:

- The guidance would explain best practices for coordinating with the Governor's office, including gathering and providing information to demonstrate the need for a drought emergency proclamation—especially important (under current law) in the event a watershed in need of curtailment-process adjustments is not yet experiencing a critically dry year after two consecutive year of below-normal conditions.
- If the Legislature adopts our recommendations for legislative changes to enable more effective use of emergency regulations (ahead, in **Section 4.2.1**), best practices guidance would need to incorporate those changes:
    - If the SWRCB were able to exercise section 1058.5 authority during *any* critically dry year, the guidance would, e.g., identify the triggers for such a finding.[449] (We note that the drought-risk tracking we proposed as part of Module 1 could prove helpful here.)
    - If the Legislature directs the SWRCB to adopt and revise certain watershed-specific curtailment provisions via emergency rulemaking processes, the best practices would need to make that clear.

The best practices guidance would also need to address how, and under what circumstances, adjustments adopted via emergency regulation could be made permanent. Under current law, adjustments made via emergency regulations would, necessarily, be temporary. However, those temporary adjustments could subsequently be folded into the long-term curtailment framework via regular rulemaking, when appropriate. Best practices guidance could summarize what that process would involve and preferred timelines for initiating and completing it.

4.1.2. Implementation

The second major element of the proposed framework, implementation, involves (1) implementing curtailments when needed and (2) using emergency regulations to make temporary adjustments to the curtailment framework when needed.

4.1.2.1. Implement curtailments when needed.

After it adopts non-emergency regulations to guide curtailments, the SWRCB would implement curtailments when needed according to the processes established in those regulations. This would involve analyzing water unavailability using the water unavailability methodologies identified in the regulations to determine what water rights need to be curtailed in a particular watershed at a particular time, issuing initial curtailment orders, and providing curtailment status updates as water unavailability changes. It would also involve administering curtailment exceptions and alternative compliance mechanisms, as well as addressing requests for corrections, petitions for reconsideration of curtailment or information orders, and objections related to alternative compliance mechanisms. Finally, the SWRCB would need to monitor diverters' compliance with various requirements and take appropriate enforcement action when violations occur.

4.1.2.2. Employ emergency regulations to make temporary adjustments to the curtailment framework when needed.

Emergency regulations would likely continue to play an important, but less central, role in curtailments. They would not substitute for the more permanent regulations recommended above. As we have already discussed, and as shown in the third column of **Table 16**, we expect their primary role to be enabling rapid, temporary adjustments to the non-emergency curtailment framework when needed. The SWRCB's use of emergency regulations would be guided by the best practices and considerations we described in **Section 4.1.1.3**.

4.1.3. Potential limitations of using standard regulations to lay the groundwork for curtailment

The primary point of this report is that California would benefit from shifting from emergency to permanent regulations to support its drought response. But we recognize that this shift will pose challenges. Here, we briefly explain the most significant ones.

First, creating permanent regulations is time consuming. That would be particularly true for regulations with the level of ambition and importance we envision. In the best of circumstances, crafting and shepherding such regulations to adoption could take many months or even several years. Neither an emergency-based categorical CEQA exemption nor the Governor's suspension of CEQA for SWRCB emergency regulations to address drought (see **Table 3**) would apply in the context of regular rulemaking. The effort that goes into crafting the regulations would unavoidably divert agency resources from other tasks, which could be particularly problematic if a drawn-out regulatory process weakens the SWRCB's responses to ongoing drought or other near-term challenges.

Second, a major regulatory initiative is likely to become a focal point for political controversy. To some degree, that is the point; regulatory processes are designed to allow public input and policy deliberation. But controversy could turn into pressure to adopt a relatively weak curtailment system—particularly if the regulatory process occurs during a wet period, when the sense of urgency felt in the midst of drought may have dissipated. The resulting system might then be far more difficult to improve than a system created by soon-to-expire emergency regulations.

Finally, there will always be a tradeoff between crafting permanent regulations, which can be implemented more quickly (once they are finalized) but will be less situationally tailored, and crafting emergency regulations, which can be highly tailored to specific circumstances but will often be delayed. The SWRCB can ameliorate this tradeoff to some degree by crafting permanent regulations that set default regulatory measures while leaving room for adjustment. But the tradeoff will never entirely go away.

These are significant challenges, but we think they are outweighed by the need for and substantial benefits offered by more-permanent drought curtailment regulations, as we discussed in **Sections 1.1.2** and **3.4** and elsewhere throughout this report. To recap some key points:

- Adopting emergency regulations is not always an option when curtailments are needed.

- Curtailments need to happen more quickly than they have in the past to better protect water users, environmental flows, and public health and safety from harm.

- The current system is not climate adaptive and has fault lines that climate change will widen. In particular, periods of intense water shortage that meet neither of the threshold criteria in Water Code section 1058.5 could become increasingly common in the future. Rapidly declining flows can have significantly and long-lasting impacts during the weeks to months it will take to lay the groundwork for curtailments via emergency regulations.

- Water right priorities ought to be routinely enforced, regardless of whether a drought "emergency" exists. Emergency regulations are poorly suited to this application.

4.2. UPDATE THE SWRCB'S STATUTORY TOOLSET FOR IMPLEMENTING CURTAILMENTS.

The Legislature can take the following actions to update the SWRCB's statutory toolset for implementing curtailments.

4.2.1. Enable more effective curtailment regulations

Under our proposed framework, the SWRCB would lay the groundwork for regular and nimble implementation of curtailments with regulations it adopts through the regular rulemaking process. Emergency regulations would continue to be an important, if subsidiary, tool. The following recommendations would make both tools more effective and help reinforce the SWRCB's authority to implement curtailments, when needed, for any and all diverters, regardless of the type of right they hold or claim.

4.2.1.1. Clarify that the SWRCB has broad authority to implement priority-based curtailments for *all* diverters.

As we hope this report has made clear, the SWRCB has the responsibility and the authority to implement curtailments during times of water shortage to ensure that water rights and claims are exercised appropriately with respect to both water right seniority and other important legal requirements and policy priorities. As we have discussed in more detail in **Section 2**, the SWRCB's curtailment authority is inherent in its authority and responsibility to provide "orderly and efficient administration of the water resources of the state,"[450] to ensure reasonable use of water,[451] to "prevent illegal diversions … regardless of the basis under which the right is held,"[452] and to protect public trust resources. The SWRCB cannot fulfill these responsibilities if it lacks the ability to prevent diversion and use without or in excess of lawful rights.

Yet, some have argued that the SWRCB's primary, or sole, source of authority to implement curtailments that enforce water right priorities among pre-1914 or riparian diverters is section 1058.5 of the Water Code, which expressly allows the SWRCB to adopt drought emergency regulations "to require curtailment of diversions when water is not available under the diverter's priority of right." This argument suggests that non-emergency regulations can only form the basis for priority-based curtailments among post-1914 water rights. We believe this interpretation is incorrect. Water Code section 1058.5 offers one mechanism and source of authority for curtailments, but it is not the exclusive source or means of implementing that authority. The SWRCB has general authority that derives from the California Constitution, the public trust doctrine, and from elsewhere in the California Water Code, including its broad rulemaking authority under Water Code section 1058.

Although we believe these more general authorities support the SWRCB implementing curtailments for *all* diverters, water users who seek to prevent any expansion of the SWRCB's exercise of regulatory authority over water rights will continue to argue that its authority is tightly delimited. This reality creates significant barriers to the SWRCB actually exercising its general authorities. First, water users who seek to stonewall can sue, requiring the SWRCB to invest significant time and financial resources to defend its actions in court. One can make any argument in litigation, and even incorrect readings of the law sometimes win cases. Second, water users determined to protect the dysfunctional status quo will seek to create roadblocks to action within other branches of government. Although they represent only a segment of the larger water user community—many of whom support curtailments—the naysayers tend to be well resourced and influential. As a result, this faction is able to prevent critical regulatory measures needed to protect the state's scarce water resources.

We believe it is imperative for the Legislature to correct this stalemate by amending the Water Code to expressly provide the SWRCB with clear authority to adopt regulations through the regular rulemaking process, in addition to under section 1058.5, that enable priority-based curtailment of diversions for all water rights, regardless of the basis of right. This should include post-1914 and pre-1914 appropriate rights, riparian rights, and groundwater rights in areas where pumping affects hydrologically connected surface water.[453]

The Legislature could potentially go further, giving the SWRCB "clearly defined and comprehensive jurisdiction," including "permitting authority over all surface water rights . . . as well as groundwater pumping that has a significant effect on surface water resources," as PPIC researchers have suggested.[454]

4.2.1.2. Extend the SWRCB's emergency rulemaking authority under Water Code section 1058.5 to *all* critically dry years.

As we emphasized in **Section 3.4**, emergency rulemaking authority under the Water Code is not always available when it is needed. Currently, the SWRCB can only use this authority when either (1) a critically dry year follows at least two consecutive below-normal or drier years or (2) the Governor proclaims a state of emergency due to drought. California is facing growing precipitation extremes, with very dry periods likely to be interspersed with wet periods that will place this important drought rulemaking authority out of the SWRCB's reach regardless of conditions, if a Governor is not willing to issue a timely drought proclamation.

The Legislature should amend Water Code section 1058.5 to allow the SWRCB to adopt drought emergency regulations during *any* critically dry year. Specifically, subdivision (a)(2) of section 1058.5 should be amended as follows:

> The emergency regulation is adopted in response to conditions which exist, or are threatened, in a critically dry year ~~immediately preceded by two or more consecutive below normal, dry, or critically dry years~~ or during a period for which the Governor has issued a proclamation of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions.

We note that several other Water Code sections include similar language triggering the availability of higher civil liability penalties for violations. Those sections are 1052, 1845, 1846, 1846.5. We recommend also amending these sections as shown above.

Since water year types are not named or defined uniformly statewide,[455] and may not exist for parts of the state, the Legislature should consider whether a different characterization than "critically dry year" would be more useful and appropriate. Alternatively, the term could be maintained but clearly defined in a way that ensures broad applicability.

Furthermore, the Legislature should explicitly exempt the adoption of emergency regulations under Water Code section 1058.5 from CEQA.[456] To date, the SWRCB has only adopted emergency curtailment regulations after the Governor has proclaimed a drought emergency, directed the board to consider adopting them, and suspended Division 13 of the Public Resources Code for that purpose.[457] However, drought emergency regulations the board adopts on its own initiative would still be subject to CEQA. This should change.

4.2.1.3. Direct the SWRCB to adopt certain watershed-specific provisions of the curtailment framework by emergency regulation.

Watershed-specific aspects of the curtailment framework may need to be updated more frequently than other aspects of long-term curtailment regulations. In particular, the SWRCB will want to ensure that the methodologies it uses to analyze water unavailability (water unavailability methodologies) and the drought minimum flow requirements it adopts to guide curtailments to protect public trust uses reflect the best available information and practical lessons from implementation experience.

To ensure that needed improvements can be made in a timely way, the Water Code should expressly require the SWRCB to adopt and update these aspects of the curtailment framework by emergency regulation.

When the four sets of emergency curtailment regulations developed in 2021 were readopted in 2022, three of the four refined the water unavailability methodology and/or drought instream flow requirements. To enable critical refinements to happen in a timely way going forward, the Legislature should adopt a statute patterned after Water Code section 1530 that explains the importance of watershed-specific water unavailability methodologies and drought minimum flows to guide curtailments and directs the SWRCB to adopt and update them by emergency regulation under the Government Code. The Legislature can specify additional process components, such as a requirement to hold a staff workshop prior to adoption, to ensure adequate opportunity for public participation in these important rulemakings.

There is precedent for this approach. Water Code section 1841(b) required the SWRCB to adopt its initial regulations under SB 88 (2015) for measurement and reporting of water diversion and use as emergency regulations.[458] With Water Code section 1530, the Legislature went further, directing the SWRCB to adopt and periodically amend water right fee schedules via emergency regulation[459] and to "review and revise the fees each fiscal year" to ensure that they continue to meet certain requirements.[460] Water Code section 348 allows the SWRCB to "adopt emergency regulations providing for the electronic filing of reports of water extraction or water diversion or use required to be filed with the department or board under this code."[461] In all three statutes, the Legislature specifically defines the adoption of the regulations as an emergency and directs the Office of Administrative Law to consider such adoption "necessary for the immediate preservation of the public peace, health, safety, and general welfare." [462] Additionally, all three statutes provide that emergency regulations adopted under them "shall remain in effect until revised by the board," notwithstanding the time limits for emergency regulations set out in the Government Code.[463]

Like water right fee schedules, watershed-specific water unavailability methodologies and drought instream flows may need to be tuned and updated frequently.

4.2.2. Enhance curtailment enforcement options

Under the California Constitution, the public trust doctrine, and the Water Code, the SWRCB has broad responsibility for the orderly and efficient administration of water rights and resources in California, and has been tasked with protecting the public interest in water by balancing the needs of water users, water quality, and the environment. The SWRCB cannot effectively accomplish these objectives unless it has sufficient power to enforce the law in a timely manner, with financial penalties sufficient to incentivize compliance, create a deterrent for future violations, and protect water users, communities, and ecosystems.

4.2.2.1. Clarify that the SWRCB has the authority to bring enforcement action against *any* diverter who violates a curtailment regulation or order.

Under Article X section 2 of the California Constitution, the public trust doctrine, and the Water Code, the SWRCB has the legal authority necessary to adopt regulations to prevent the waste and unreasonable use of water, and to protect public trust resources, regardless of whether the water right at issue is a post-1914, pre-1914, or riparian right. The SWRCB's power to curtail pre-1914 and riparian users based on the combined authority of Water Code section 1058.5 and Article X section 2 was confirmed in *Stanford Vina Ranch Irrigation Co. v. State* (2020).[464]

However, significant uncertainties remain. The courts have not yet addressed the scope of the SWRCB's power to curtail under Article X section 2 by itself, absent the conditions required to trigger the SWRCB's emergency rulemaking authority under section 1058.5, or the public trust doctrine. Properly read, these authorities should support the SWRCB's exercise of curtailment authority over all water rights. If this is the case, then presumably the SWRCB could rely on its general enforcement authority to enforce such curtailments. However, as previously described, in *California Water Curtailment Cases* (2022), one court of appeal recently concluded that one enforcement provision, Water Code section 1052, does not authorize the SWRCB to "enforce priorities of right ***among*** pre-1914 appropriative right holders due to the lack of sufficient water to serve all pre-1914 appropriative right holders."[465] The court acknowledged that section 1052 can be applied to pre-1914 and riparian users on an individual basis, to address the validity or scope of a water right, forfeiture, or other water right issues, but concluded that section 1052 does not permit the SWRCB to monitor priority among those users via curtailment, and cannot serve as a source authority for enforcement related to such action. Although this decision does not foreclose enforcement under other Water Code provisions, the holding precludes the SWRCB from relying on section 1052 as an enforcement tool for curtailment, which removes a valuable tool from the agency's toolbox.

Moreover, given the predilection of some water users to challenge curtailments at every juncture, it is quite likely that this issue too would be used to attempt to legally and politically block the agency's exercise of authority. Again, resolution of these questions would take years, during which significant harm would be inflicted on other water users and instream resources.

Given the circumstances, we believe the Legislature should:

1. Enact legislation that directly authorizes the SWRCB to enforce its curtailment orders in all circumstances, including in non-emergency contexts, against all water users regardless of the basis of the claim of right.

2. Expressly authorize the SWRCB to rely on Water Code section 1052 to address unlawful diversion or use of water in violation of curtailment regulations or orders by riparian and pre-1914 appropriative right holders and claimants (in addition to post-1914 right holders), correcting the holding in *California Water Curtailment Cases*.

4.2.2.2. Provide stronger penalty options for violation of curtailment regulations and orders issued under them.

The financial penalties available to the SWRCB under the Water Code enforcement provisions are insufficient to serve the core purposes of enforcement: to incentivize compliance with the law, deter future violations, and, sometimes, to compensate for harm to other water users and the environment.

Available financial penalties are, in fact, so low that they incentivize water users to engage in a cost-benefit calculus of whether violating a SWRCB order will cost them more or less than compliance.[466] As we described in **Box 1**, in 2022, a group of water users under a single 1912 water right chose to willfully divert water—in direct violation of a curtailment order—for more than a week. Under the current penalty structure, violation of a regulation, drought emergency regulation, or order adopted by the SWRCB subjects the violator to administrative civil liability in an amount not to exceed five hundred dollars ($500) for each day in which the violation occurs.[467] Therefore, the maximum penalty the SWRCB could impose was only $4000, which is much less than the value of the water illegally diverted, much less than the harm caused, and obviously so low as to obviate any deterrence. As a result of the recent decision in *California Water Curtailment Cases*, higher penalties of up to $1,000 per day plus up to $2,500 per acre-foot of water diverted or used unlawfully were not available under Water Code section 1052, since the water right in question was a pre-1914 right. If section 1052 penalties had been available, the maximum potential penalty for this curtailment violation would have been on the order of $1,058,000,[468] about 265 times greater than the penalty the SWRCB was actually able to assess in this case, which would have translated to about $13,000, on average, per member of the Shasta River Water Association.

To ensure effective enforcement of curtailment requirements, the Legislature should revise the Water Code to broaden the SWRCB's enforcement authority and to ensure that penalty structures actually encourage compliance with the water right priority system and the SWRCB's regulations and orders.

Specifically, Water Code enforcement provisions should be amended to provide the following authorities for enforcement of *any* curtailment regulation, whether emergency or permanent, and any order issued under such a regulation against *any* diverter, regardless of the diverter's basis of right:

- Set maximum penalties high enough to reflect the market value of water diverted or used unlawfully, the scope of harm to water users or the environment, and the need for deterrence, and allow the SWRCB to determine penalties according to the equities of each case.

- Where penalties are limited to a flat amount per day, give the SWRCB the authority to add an additional volumetric penalty per acre-foot of water unlawfully diverted or used.

- Provide the SWRCB with the authority to impose at least the same maximum penalty as authorized for courts imposing civil liability.

- Eliminate the distinction between penalties allowable during a critically dry year following at least 2 consecutive below-normal or drier years or during a period for which the Governor has proclaimed a drought state of emergency and penalties allowed at other times (e.g., in Water Code sections 1052 and 1845(b)(1)). All penalties should be available in all year types.
- Ensure that existing and new penalty provisions provide for additive liability in all cases, allowing the SWRCB to enforce curtailments under multiple sections, without having to choose between them.
- Include an escalator clause that would automatically adjust all maximum penalties for inflation.
- Expressly exempt the SWRCB's enforcement actions from CEQA.

These changes could be made through enactment of new statutory authority; by amending Water Code sections 1052, 1058.5, 1845, and 1846; or via some combination of these approaches.

4.2.2.3. Give the SWRCB the authority to issue interim relief orders to prevent irreparable harm pending completion of enforcement proceedings.

Under current law, the SWRCB has the authority to issue a CDO requiring a water user to cease diversion and use immediately. However, CDOs require significant time to develop and issue, and a notice period of at least 20 days during which time the water user can request a hearing. If a hearing is requested, the SWRCB must then hold a full evidentiary hearing which can take weeks, months, or years to reach decision.

Courts, in contrast, have the ability to order interim relief, typically in the form of a temporary restraining order or a preliminary injunction, pending the opportunity for a full evidentiary hearing. Interim relief is an equitable remedy that seeks to prevent irreparable harm pending the party against whom enforcement is sought agreeing to comply with an order, settlement, or, alternatively, development of facts through a full evidentiary hearing. Courts provide streamlined *ex parte* procedures for imposition of interim relief, so that such relief can be imposed quickly to avoid irreparable harm.

The Water Code allocates to the SWRCB considerable responsibility—and general authority—to manage the state's water resources for the benefit of the people, and the SWRCB has the expertise and experience needed for effective management of water resources. Therefore, like courts, the SWRCB should also have the ability to adopt an order that would protect other water users and the environment from irreparable harm pending either: 1) water user agreement to comply with the order; 2) settlement; or 3) a full evidentiary hearing if requested by the water right claimant. A recent White Paper, "Updating California Water Laws to Address Drought and Climate Change" (hereinafter 2022 Reform Recommendations) made a similar recommendation,[469] with which we concur.

Authorizing legislation should include *ex parte* procedures and post-interim relief procedures as appropriate to ensure that due process principles are honored, and should specify that relief granted would be temporary pending: 1) water user agreement to comply with the order; 2) settlement; or 3) completion of a full hearing if requested by the water right claimant.

4.2.2.4. Give the SWRCB the express authority to physically stop unlawful diversions.

In some western states, the state water rights regulator has express statutory authority to physically close headgates and take other actions to stop unlawful diversions of water.[470] For example, Nevada law gives the State Engineer primary responsibility for the division and distribution of water. In particular, Nevada Revised Statutes provide that "[t]he State Engineer shall divide or cause to be divided the waters of the natural streams or other sources of supply in the State among the several ditches and reservoirs taking water therefrom, according to the rights of each, respectively, in whole or in part, and shall shut or fasten, or cause to be shut or fastened, the headgates or ditches, and shall regulate, or cause to be regulated, the controlling works of reservoirs, as may be necessary to insure a proper distribution of the waters thereof."[471] While, in practice, these functions are generally delegated to and carried out by local entities, such as water commissioners,[472] the authority remains a potentially valuable tool for oversight by the state water rights regulator, the entity with ultimate responsibility.

The SWRCB lacks such a statutory tool, which would be an important line of defense for preventing irreparable harm from curtailment violations. The authority to supervise the distribution of water was debated in 1913 during the creation of the State Water Commission—the first administrative regulator of water rights in California (and the SWRCB's predecessor). The authority was dropped from the recommendations to the Legislature "in a spirit of conciliation."[473] Although the State Water Commission subsequently proposed, more than 100 years ago, amendments to the act that included "detailed provisions for the public supervision of the distribution of water from natural streams . . . and lakes in accordance with defined water rights," no action was taken.[474]

The Shasta River Water Association's 8-day curtailment violation (discussed in **Box 1**) demonstrates why this tool is needed. Staff from the SWRCB's Division of Water Rights went to the diversion location, inspected the headgates, witnessed the ongoing violation first hand, noted that the diversion lacked a functioning flowmeter, and talked face-to-face with diverters. But they could not physically shut down the unlawful diversion. The SWRCB's ACL complaint recounted the following:

> *On August 18, 2022, Division staff inspected the Diverter's headgates and several of the member properties that were receiving water from SRWA's diversion. Staff witnessed and photographed the diversion facility and witnessed the pump station and fish screen operating, water flowing in the irrigation canal, and water flowing to multiple member properties. . . . During the inspection, staff spoke to three of the Diverter's directors. The directors stated that they turned on their diversion the night of August 17, 2022 and, in the absence of a working flowmeter, estimated that SRWA was currently diverting 30 cfs. They stated they would try to maintain river flows of between 20-25 cfs. . . half or less than half of the minimum flow requirements for the Shasta River.*[475]

One of the board members of the Shasta River Water Association later remarked that, "[t]hey obviously don't have much enforcement power, because they showed up and told us, 'Shut your pumps off right now.' And we said no."[476]

The Legislature should provide the SWRCB with the express statutory authority to physically stop an unlawful diversion, regardless of the diverter's basis of right, when it risks irreparable harm to the environment or other water users. Such legislation should provide that violations of physical shutdown orders are criminal offenses that may result in enforcement/prosecution by law enforcement authorities.

4.3. IMPROVE ENGAGEMENT AND INFORMATION FOR FAIR AND EFFECTIVE CURTAILMENTS.

The SWRCB can take the following actions, with legislative support, to improve engagement and information for fair and effective curtailments.

4.3.1. Strengthen the SWRCB's connections with watersheds.

We recommend enhancing the SWRCB Division of Water Rights' connections with watersheds that experience recurring water-scarcity issues. This could be accomplished in a variety of ways, some of which would require or benefit from legislative support. Regardless of the specific mechanism, the goal would be to get more SWRCB boots on the ground outside Sacramento.

We recommend two key actions to help achieve this goal:

- First, the SWRCB's Division of Water Rights should establish regional liaisons, hired as SWRCB staff, perhaps in partnership with the 9 Regional Water Quality Control Boards (which already have staff at the regional level and, in some cases, staff assigned to individual watersheds)[477] or the 24 Division of Drinking Water District Field Offices (whose staff are well suited to understand drinking water risks and impacts).[478] We discussed this recommendation in more depth in our Module 1 Report.[479] As we mentioned there, SWRCB Division of Water Rights Staff have made great strides during the 2020–2022 drought in engaging with local and regional parties in key watersheds around water unavailability analysis methodologies, emergency regulations, and other tools to support water right curtailments in those areas. Permanent, dedicated water rights regional liaisons could be a critical link in maintaining, deepening, and expanding those connections.
- Second, the state should expand its use of "watermasters" in a way that helps the SWRCB access more timely and accurate information to support curtailment decisions. In particular:
    - The Legislature should give the SWRCB the ability to appoint "watermaster" positions modeled after the Delta Watermaster (who, oversees day-to-day administration of water rights in the legal Delta[480]) for other watersheds.[481] Creating the Delta Watermaster did not increase the SWRCB's authority. Instead, such watermasters can make exercise of existing authority more timely and responsive to local conditions and needs.
    - The Legislature should also shift the traditional watermaster program,[482] directed at administering adjudication decrees, from the Department of Water Resources to the SWRCB, which is better suited to manage this regulatory program.

The costs of regional liaisons' and watermasters' work could be funded primarily by the holders of water rights and claims within their service area.[483]

We recommend these institutional reforms in a report focused on curtailments for several reasons. Most importantly, regional staff can be valuable sources of information about on-the-ground conditions. This information can help the SWRCB tailor its actions, including those related to implementing (and enforcing) curtailments, to better meet local needs and conditions. By facilitating dialogue with local water users, regional staff can enhance the credibility and quality of the SWRCB's regulatory actions and can provide a lightning rod for criticism and concern.

4.3.2. Improve the data that inform curtailments.

In our Module 1 report, we recommended a suite of efforts to improve the water supply and demand information the SWRCB relies on to understand how much water is available under different priorities of right in a watershed.[484] In other reports, some of us, along with many other authors, have stressed the importance of more thorough water diversion and use reporting and an effective water rights database.[485] We reiterate here that improving water supply and demand information is critical for improving the accuracy and effectiveness of curtailments, as it is for many other aspects of water management. And we further emphasize the need to improve the SWRCB's ability to track changes in water demand by giving the SWRCB more timely access to diversion data.[486]

To implement curtailments effectively, the SWRCB needs adequate information about water diversion and use. Without a good idea of how much water is being diverted and used (and is likely to be diverted and used in the near future, the SWRCB will lack crucial information about expected aggregate demand in a watershed and will not know how many (or which) diverters need to curtail in order to protect water users with more-senior rights, ensure water is available to meet minimum human health and safety needs, and maintain instream flows. Current inaccuracies and gaps in diversion reporting data impede this ability.[487]

4.3.2.1. Require more frequent reporting of water diversion and use.

The large lag time inherent in the statutorily defined diversion reporting schedule is fundamentally incompatible with the SWRCB's need for timely data—especially during times of water scarcity—to help it understand when and where curtailments are needed.

Water demand data are currently time lagged. The California Water Code requires all water users who divert more than 10 acre-feet per year to comply with measurement and reporting regulations the SWRCB adopts under SB 88.[488] Additionally, as of 2023, all diverters are required to report annually on February 1 the amount and rate of water they diverted during each month of the prior water year.[489] This change unifies reporting requirements across water right types and establishes a reporting period—the water year—that is more relevant to water management decisions. However, it maintains a considerable lag between the time water is diverted and when diversion is reported.

This reporting lag means that the water demand data the SWRCB has access to is historical data it uses as a proxy for current and future demand. For example, for water year 2023, which runs from October of calendar year 2022 through September of calendar year 2023, the annual report will not be due until a month into calendar year 2024.

Additionally, the SWRCB adopted regulations under SB 88[490] that (1) require diverters of more than 10 acre-feet of water per year to measure their diversions on an at-least-weekly basis and (2) allow the SWRCB to require diverters to report monthly or more frequently during times of water shortage.[491] The latter option is helpful, but it only becomes available when curtailments are likely already needed (when "flows or projected available supplies in a watershed or subwatershed are sufficient to support some but not all projected diversion demand").[492]

To give the SWRCB a more accurate picture of water demand, the Legislature should expressly authorize the SWRCB to adopt a regulation to require monthly or more frequent electronic reporting for water rights and claims with a face value greater than 10 acre-feet per year, regardless of their basis of right. This authorization should allow the SWRCB to require reporting of both prior diversions and projected demand.

The SWRCB could then develop tiered reporting requirements, with different frequencies of reporting required for different scales of diversions. This could be patterned after the enhanced reporting the SWRCB has required for water rights and claims with a face value of 1,000 or more acre-feet per year under emergency curtailment regulations for the Delta watershed during the 2020–2022 drought.[493] Under the enhanced reporting schedule, prior diversion information for a particular month is due approximately 5 weeks later.[494]

4.3.2.2. Require diverters to provide additional information needed to inform curtailments.

In addition to requiring more frequent diversion and use reporting, the SWRCB needs to address other information gaps and deficiencies that impede fair and effective curtailment. For example, the relative priorities of diverters' water rights, how much water they are actually using for different purposes, and how much water they plan to use for different purposes in the near future are all relevant to understanding water unavailability when there is insufficient supply to meet all demands.[495]

While the Water Code already gives the SWRCB significant information gathering authority to aid it in carrying out its water quality responsibilities,[496] its existing tools for information gathering in the water rights context have important limitations. In particular, Water Code section 1051 empowers the SWRCB to investigate water rights and use, but the statute uses vague language and does not expressly state that it applies to riparian and pre-1914 appropriative water rights.

Drought emergency regulations are also insufficient. During both the 2012–2016 and 2020–2022 droughts, the SWRCB used emergency regulations to improve its information base for curtailments by establishing curtailment-related reporting requirements regarding water diversion and use and providing for information orders to seek further information.[497] However, these were temporary requirements justified in the context of a drought "emergency"; they are not available as ongoing tools to support more regular curtailments.

The Legislature should amend the Water Code to give the SWRCB express authority to require diverters to provide additional information about water rights, diversion, and use, including—but not limited to—the authority to order the preparation of water rights-related technical and monitoring reports and to issue other information orders. This authority should extend to information related to the basis of a water right or claim, prior diversions, water transfers, projected future demand, water needed to meet minimum human health and safety needs, and any other information reasonably necessary to support fair and effective curtailment (such as studies of instream flow needs).

4.3.3. Accelerate development and implementation of instream flow requirements.

A final recommendation is that California greatly accelerate development and implementation of instream flow requirements to protect water quality and public trust uses. It is difficult, at best, to implement a successful curtailment system if the environmental outcomes that system is supposed to achieve are only amorphously defined.

Setting flow requirements is crucial for determining when curtailments are necessary. Instream flow requirements set relatively clear thresholds for action, letting the SWRCB know when curtailments should be initiated and water users know when those curtailments are coming. In the absence of instream flow requirements, in contrast, the SWRCB can still coordinate with state and federal fisheries agencies, but the process of developing instream flow thresholds for curtailments is likely to be relatively ad hoc, if such thresholds are developed at all. That often means uncertainty for water users and delayed and weakened protection for the environment.

Nevertheless, California has developed instream flow requirements for relatively few of its watersheds.[498] For some waterways, requirements have been in development for years but have not been finalized. For others, like the major south Delta tributaries, basic requirements have been established, but they have not yet been implemented.[499] For many other waterways, no instream flow standards exist.

Other studies have stressed the importance of instream flow requirements[500] and some have provided potential methodologies for developing those requirements.

In our Module 1 report, we recommended that the SWRCB work with the California Department of Fish and Wildlife (CDFW) to expedite its development of watershed-wide instream flow criteria reports that the SWRCB can ultimately use to inform its development of binding drought minimum flows and other instream flow requirements[501] for watersheds across the state using the California Environmental Flows Framework.[502]

We reiterate and expand on that recommendation here. In particular:

- The Legislature should require completion of instream flow studies for all high-priority rivers and streams[503] within a specified time frame: perhaps 5 years.
- This work should build on existing work by the CDFW and other organizations.[504]
- The Legislature should expressly allow the SWRCB to contract with entities other than CDFW to ensure that all studies are timely completed.

Funding will be needed to accomplish these goals. Therefore:

- The Legislature should budget specific funding to support timely development of instream flow requirements.
- The SWRCB should update water rights fees to spread the costs of developing drought minimum flow requirements for a watershed across all the water users in that watershed.
- To enable fair distribution of this cost burden, the Legislature should amend the water right fee statute, Water Code section 1525, to allow the SWRCB to adopt annual and other fees for ***all*** surface water right holders and claimants, including pre-1914 appropriators and riparians. With limited exceptions, the SWRCB's current fee toolbox applies primarily to those who hold post-1914 permits, licenses, or registrations.

CONCLUSION

California's State Water Resources Control Board (SWRCB) needs to be able to routinely curtail unlawful water uses. In this report, we described the legal context for and history of curtailments in California, and recommended specific actions the SWRCB and State Legislature can take to build a framework for fair and effective curtailment.

This report provides legal and historical context for curtailments in California and offers a framework for action to help California better manage water scarcity. The framework includes some elements the SWRCB can implement on its own. It also includes recommendations for swift and decisive legislative action to solidify and concretize the SWRCB's authorities in statute and upgrade its statutory tool set to better reflect the SWRCB's important role in managing water scarcity.

In summary, we recommend that (1) the SWRCB establish a basic framework for curtailments through non-emergency rulemaking, (2) the Legislature take actions to update the SWRCB's statutory toolset for implementing curtailments, and (3) the SWRCB take actions, with legislative support, to improve engagement and information for fair and effective curtailments.

Together, these actions will help the SWRCB meet one of its most basic and important responsibilities: implementing water right curtailments during times of water shortage.

Beyond improving California's drought response, regular and nimble implementation of water right curtailments is a crucial means of adapting California water management—and administration of California's water rights system—to climate change. The actions we recommend here will begin to close the unsustainable gaps between legal requirements and on-the-ground practice, enabling the SWRCB to better protect the water rights of more-senior diverters, to better maintain flows needed to support water quality and environmental water uses, and to more reliably ensure that water is available to meet the basic human health and safety needs of California communities.

GLOSSARY OF TERMS

Adjudicatory action: An action taken by a government entity in which the entity applies existing law to specific facts to determine the rights and obligations of specific parties. When an administrative agency takes this type of action, the action is considered "quasi-adjudicative."

Administration: See "water rights administration."

Administrative action: An action taken by the SWRCB, an administrative agency tasked with implementing state and federal laws.

Alternative compliance mechanism: An alternative means of complying with a curtailment order that achieves the same regulatory goals—such as achieving diversion reductions and/or maintaining minimum instream flows) as strict priority-based compliance would achieve through a voluntary arrangement that departs from strict priority-based curtailments. The SWRCB's 2021 and 2022 emergency curtailment regulations allowed two types of alternative compliance mechanisms: (1) "local cooperative solutions" for meeting minimum flows when water rights are curtailed to protect public trust flows and (2) "water sharing agreements" that enable more-junior diverters to receive some water when their rights, but not the rights of more-senior parties to the agreement are curtailed to protect water right seniority.

Appropriative right: A water right that depends upon taking (appropriating) and beneficially using water from a water body. In California, appropriate surface water rights are divided into "pre-1914" and "post-1914" rights, as described in **Section 2.1.1.**

Cease-and-desist order: A SWRCB order telling a diverter to stop an activity that violates or threatens to violate the terms of a water right, a water right decision or order, regulations, or other aspects of state or federal law. See **Section 2.2.6.2**.

Curtail: Reduce or stop water diversions.

Curtailment: Defined broadly to describe water users reducing or stopping their water diversions, whether voluntarily or under order, during times when there is not enough water available to fully support all uses. Curtailment is usually based on water right priority, with more-junior diverters curtailing before more-senior diverters, but other legal requirements and policy priorities also affect the availability of water and, therefore, the need to curtail.

Curtailment notice: Another name for a "notice of water unavailability."

Curtailment order: An enforceable order issued by the SWRCB that requires recipients to curtail their water diversions and comply with other requirements (e.g., for reporting) as described in the order.

Delta Watermaster: A state officer who reports jointly to the SWRCB and the Delta Stewardship Council and has been delegated significant day-to-day

responsibility for water rights administration and enforcement in the Delta.

Diversion: The act of taking water from a river, stream, or other waterbody for direct use or storage. See also Cal. Water Code § 5100(c). Diversion generally requires a water right.

Diverter: A person or entity that engages in diversion.

Division of Water Rights: The division of the SWRCB that implements the agency's water rights authorities and responsibilities on a day-to-day basis.

Division Staff: Defined broadly to encompass all levels of staff and leadership within the SWRCB's Division of Water Rights.

Drought early warning letter: A letter from the SWRCB that provides diverters with advanced warning of drought conditions and the potential that water use reductions will be required later in the year. These letters are usually general and explain that a dry trend is forecast to continue, which raises the likelihood that water might be unavailable for some diverters in the future. Drought early warning letters are sometimes referred to by other names, such as a "notice of potential water shortage" or a "letter regarding ongoing dry conditions." See **Section 2.2.1**.

Drought emergency proclamation: A proclamation by the Governor that a state of emergency exists in an area due to drought conditions, finding that strict compliance with certain statutes and regulations would interfere with effective drought response and directing state agencies to take certain actions to address the emergency.

Drought minimum flows: Minimum instream flow requirements designed to protect public trust resources during a drought. The SWRCB's 2021 and 2022 emergency regulations and curtailment orders for certain watersheds required water users to curtail their diversions in order to maintain drought minimum flows.

Due process (procedural): Minimum procedural protections that originate in the state and federal constitutions and apply when a government entity makes decisions that affect a party's property rights. See **Section 2.3** for more details.

Emergency regulations: Regulations adopted under an emergency rulemaking process specified in state statute. See **Section 2.2.4**.

Enforcement action: An action by the SWRCB to address a violation or threatened violation of state or federal law. See **Section 2.2.6**.

Exception to curtailment: A situation or need that allows a party to continue diverting water when their right would otherwise be curtailed. The SWRCB's emergency curtailment regulations in 2021 and 2022 included exceptions for non-consumptive uses of water that do not remove water from the water body, water needed to meet minimum human health and safety needs, and water needed to meet minimal livestock water needs.

Framework elements: Interrelated components of the proposed framework.

Implementing curtailments: Actions by the SWRCB to ensure that curtailments occur when needed. A key way the SWRCB implements curtailments is by informing diverters in critically dry watersheds when they are required to curtail their diversions because water is not available under their priority of water right.[505] Implementing curtailments also involves other actions, such as administering curtailment exceptions and alternative compliance mechanisms.

Injunctive relief: A court order to stop an activity that violates the law. See **Section 2.2.6.4**.

Instream flow requirements: Flows that must be maintained for a particular water body under state or federal law.

Legal requirements and policy priorities: Various requirements and preferences established under state or federal law that are relevant to the diversion, use, or oversight of water in California and which help to define what conditions constitute water shortage in a particular watershed (i.e., when water supply is insufficient to support applicable legal requirements and policy priorities), potentially indicating the need for water right curtailments or other responses.

Legislative action: An action taken by a legislative body to adopt general standards that apply to large categories of people or entities. When an administrative agency takes this type of action, such as when the

SWRCB adopts generally applicable regulations, the action is considered "quasi-legislative."

Minimum flows: Minimum instream flow requirements.

Modules: Proposed subcomponents of a contingency-based framework to support the SWRCB's decision making during droughts and other times of water scarcity.

Module 1 Report: Forthcoming report on the first module we worked on as part of the larger project described in **Section 1.3**. That report offers "A Proposed Decision-Support Framework for Identifying and Prioritizing Watersheds for Which Water Unavailability Analysis (WUA) is Warranted."

Module 2 Report: This report.

Notice of potential water shortage: See "drought early warning letter."

Notice of water unavailability: A notice from the SWRCB that alerts water users when the agency's calculations show that water is unavailable under their water rights. Notices of water unavailability are sometimes referred to as curtailment notices. See **Section 2.2.1**.

Policy priorities: See "legal requirements and policy priorities."

Priority of right: The relative seniority of a water right, relative to others, which helps determine who must curtail when there is insufficient water to fully support all demands. For appropriative rights, priority is based on the date the right was acquired, with earlier-acquired rights having greater seniority than rights acquired later. See **Section 2.1.1**.

Public trust doctrine: An overarching principle of California water law. Requires the state to take the public trust into account in water resource planning and allocation and to protect the public trust whenever feasible. See **Section 2.1.3**.

Reasonable use: An overarching principle of California water law. California's constitution prohibits unreasonable use of water. See **Section 2.1.2**.

Regional liaison: Proposed permanent SWRCB staff assigned to engage in depth with a particular watershed or region. See **Section 4.3.1**.

Riparian right: A water right based on ownership of land adjacent to a body of surface water. See **Section 2.1.1**.

Rulemaking: Process required to develop and adopt regulations. In addition to a regular rulemaking process, streamlined processes for emergency rulemaking are available under the California Government and Water Codes. See **Sections 2.2.3** and **2.2.4**.

Seniority: See "priority of right."

Standard regulations: Regulations adopted through the regular rulemaking process. See **Section 2.2.3**.

Watermaster: In addition to the Delta Watermaster, a unique position established by statute, California has various watermasters tasked with administering court decrees associated with water rights adjudications. See **Section 4.3.1**.

Water right priority: See "priority of right."

Water rights administration: The implementation, oversight, and enforcement of California's water rights system. The SWRCB is the only agency in California with this authority. It shares water rights enforcement authority with the courts.

Water unavailability analysis (WUA): The SWRCB's evaluation of whether available data indicate that water is, or will soon be, unavailable for direct diversion or diversion to storage for consumptive use by some segment of the water users in a watershed or subwatershed. See **Section 1.3**.

Water unavailability methodology: A methodology the SWRCB uses to analyze water unavailability during times of water scarcity. A water unavailability methodology is usually tailored to a particular watershed to reflect watershed-specific needs, conditions, and data availability. See **Section 1.3**.

Water year: California's water year runs from October 1st to September 30th. A water year is named for the calendar year it ends in (e.g., water year 2023 runs from October 2022 through September 2023).

ACRONYMS AND ABBREVIATIONS

§	Section
ACL	Administrative civil liability
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CDO	Cease-and-desist order
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
Cfs	Cubic feet per second
CWA	Federal Clean Water Act
DWR	Department of Water Resources
ER	Emergency regulations
ESA	Federal Endangered Species Act
FERC	Federal Energy Regulatory Commission
HUC	Hydrologic unit code
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOV	Notice of violation
OAL	Office of Administrative Law
Porter-Cologne	Porter-Cologne Water Quality Control Act
PDSI	Palmer Drought Severity Index
SCWA	Sonoma County Water Agency
SRWA	Shasta River Water Association
SWRCB	State Water Resources Control Board
TUCP	Temporary urgency change petition
USBR	U.S. Bureau of Reclamation
VSA	Voluntary water sharing agreement
WU	Water unavailability
WUA	Water unavailability analysis
WUAs	Water unavailability analyses
WY	Water year

ENDNOTES

1 P.A. Ullrich, Z. Xu, A.M. Rhoades, M.D. Dettinger, J.F. Mount, A.D. Jones, and P. Vahmani, "California's drought of the future: A midcentury recreation of the exceptional conditions of 2012–2017," 6 *Earth's Future* 1568, at 1571–72 (2018), available at URL: https://doi.org/10.1029/2018EF001007; California Department of Water Resources, *California Water Plan, Update 2013*, at 3-59 (2014) [hereinafter ***California Water Plan***], available at URL: http://www.water.ca.gov/waterplan/cwpu2013/final/index.cfm.

2 Michael D. Dettinger, "Historical and Future Relations Between Large Storms and Droughts in California," *S.F. Estuary & Watershed Science*, July 2016, at 1, 5–7, 10–11 (2016), available at URL: https://doi.org/10.15447/sfews.2016v14iss2art1; Michael D. Dettinger, Fred Martin Ralph, Tapash Das, Paul J. Neiman, and Daniel R. Cayan, "Atmospheric Rivers, Floods and the Water Resources of California," 3 *Water* 455, at 460–61 (2011), available at URL: https://doi.org/10.3390/w3020445.

3 David Carle, *Introduction to Water in California*, at 3 (2nd Edition, 2016), available at URL: https://www.jstor.org/stable/10.1525/j.ctv1xxwxp; ***California Water Plan***, supra note 1, at 3-36, 3-39.

4 See, e.g., C.A. Dieter, K.S. Linsey, R.R. Caldwell, M.A. Harris, T.I. Ivahnenko, J.K. Lovelace, M.A. Maupin, and N.L. Barber, *Estimated Use of Water in the United States County-Level Data for 2015* (Version 2.0, June 2018), U.S. Geological Survey data release, available at URL: https://doi.org/10.5066/F7TB15V5.

5 See, e.g., Jeffrey Mount et al., *Managing Drought in a Changing Climate: Four Essential Reforms* (2018) [hereinafter ***Managing Drought***], available at URL: https://www.ppic.org/publication/managing-drought-in-a-changing-climate-four-essential-reforms/.

6 ***California Water Plan***, supra note 1, at 3-60, 3-64; "Climate Change Basics," *California Department of Water Resources*, URL: https://water.ca.gov/Water-Basics/Climate-Change-Basics (website, last visited March 6, 2023).

7 ***California Water Plan***, supra note 1, at 3-64.

8 Noah S. Diffenbaugh, Daniel L. Swain, and Danielle Touma, "Anthropogenic Warming Has Increased Drought Risk in California," 112 *Proceedings of the National Academy of Sciences* 3931, at 3934–35 (2015), available at URL: https://doi.org/10.1073/pnas.1422385112.

9 Id. at 3934.

10 **Figure updated from** Nell Green Nylen, Michael Kiparsky, Dave Owen, Holly Doremus, and Michael Hanemann, *Addressing Institutional Vulnerabilities in California's Drought Water Allocation, Part 1: Water Rights Administration and Oversight During Major Statewide Droughts, 1976–2016* (2018) [hereinafter ***2018 Part 1 Report***], California's Fourth Climate Change Assessment, California Natural Resources Agency, CCCA4-CNRA-2018-009, available at URL: https://www.energy.ca.gov/sites/default/files/2019-12/Water_CCCA4-CNRA-2018-009_ada.pdf. **Data for precipitation and mean temperature were derived by querying the "Time Series" feature of the West Wide Drought Tracker for each variable using the "States" data retrieval method and the following parameters: Region: California; Start Year: 1970; End Year: 2022; Month: September; Span: 12-Month.** "West Wide Drought Tracker: Time Series," *Western Regional Climate Center*, URL: http://www.wrcc.dri.edu/wwdt/time/ (website, last visited February 6, 2023)

11 **We summarize these actions in Section 3 of this report and in our 2018 reports for California's Fourth Climate Change Assessment:** ***2018 Part 1 Report***, supra note 10; Nell Green Nylen, Michael Kiparsky, Dave Owen, Holly Doremus, and Michael Hanemann, *Addressing Institutional Vulnerabilities in California's Drought Water Allocation, Part 2: Improving Water Rights Administration and Oversight for Future Droughts* (2018) [hereinafter ***2018 Part 2 Report***], California's Fourth Climate Change Assessment, California Natural Resources Agency, CCCA4-CNRA-2018-010, available at URL: https://www.energy.ca.gov/sites/default/files/2019-12/Water_CCCA4-CNRA-2018-010_ada.pdf. See also Nell Green Nylen, Dave Owen, Michael Kiparsky, and Michael Hanemann, *A Proposed Decision-Support Framework for Identifying and Prioritizing Watersheds for which Water Unavailability Analysis is Warranted* (forthcoming) [hereinafter ***Module 1 Report***].

12 **Figure updated from** ***2018 Part 1 Report***, supra note 10. Individual images are from "California PDSI" *WestWide Drought Tracker*, URL: https://wrcc.dri.edu/wwdt/archive.php?region=ca (website, last visited March 23, 2023) (selecting the following "Climate Product Options" for June of each year: Variable>Drought Index>Palmer Index>PDSI; Select Month: 6).

13 "About," *WestWide Drought Tracker*, URL: https://wrcc.dri.edu/wwdt/about.php (website, last visited April 13, 2022). **Although PDSI treats "all precipitation as immediately available rainfall (i.e., no delayed runoff from melting snow)" and imprecisely treats some other processes, "PDSI values are significantly correlated with measured soil moisture content in the warm season and streamflow over many regions over the world, and satellite observed land water storage changes."** Aiguo Dai and National Center for Atmospheric Research Staff (Eds.), Palmer Drought Severity Index (PDSI), NCAR Climate Data Guide, (last modified December 2019), available at URL: https://climatedataguide.ucar.edu/climate-data/palmer-drought-severity-index-pdsi.

14 See, e.g., Michael Hanemann, Deborah Lambe, and Daniel Farber, *Legal Analysis of Barriers to Adaptation for California's Water Sector* (2012), California Energy Commission, CEC-500-2012-019, available at URL: https://www.law.berkeley.edu/files/ccelp/CEC(1).pdf; P.C.D. Milly, Julio Betancourt, Malin Falkenmark, Robert M. Hirsch, Zbigniew W. Kundzewicz, Dennis P. Lettenmaier, and Ronald J. Stouffer, "Stationarity is dead: Whither water management?," 391 *Science* 3573–74 (2008), available at URL: https://www.science.org/doi/abs/10.1126/science.1151915; Roger Pielke Jr, Gwyn Prins, Steve Rayner, and Daniel Sarewitz, "Lifting the taboo on adaptation," 445 *Nature* 597–98 (2007), available at URL: https://doi.org/10.1038/445597a.

15 See, e.g., California Natural Resources Agency et al., *California's Water Supply Strategy: Adapting to a Hotter, Drier Future* (2022), available at URL: https://resources.ca.gov/-/media/CNRA-Website/Files/Initiatives/Water-Resilience/CA-Water-Supply-Strategy.pdf.

16 ***Module 1 Report***, supra note 11; Alida Cantor, Michael Kiparsky, Rónán Kennedy, Susan Hubbard, Roger Bales, Lidia Cano Pecharroman, Kamyar Guivetchi, Christina McCready, and Gary Darling, *Data for Water Decision Making: Informing the Implementation of California's Open and Transparent Water Data Act through Research and Engagement* (2018) [hereinafter ***Data for Water Decision Making***], available at URL: https://doi.org/10.15779/J28H01.

17 Michael Kiparsky, Kathleen Miller, Richard Roos-Collins, Emma Roos-Collins, and Dan Rademacher, *Piloting a Water Rights Information System for California* (2021) [hereinafter ***Piloting a Water Rights Information System***], available at URL: https://www.law.berkeley.edu/wp-content/uploads/2021/07/Piloting-a-Water-Rights-Information-System-for-California-July-2021.pdf.

18 "Updating Water Rights Data for California (UPWARD)," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/upward/ (website last visited March 13, 2023).

19 Alida Cantor et al., "Making a Water Data System Responsive to Information Needs of Decision Makers," 3 *Frontiers in Climate* 761444 (2021), available at URL: https://doi.org/10.3389/fclim.2021.761444; ***Data for Water Decision Making***, supra note 16. For more details, see ***Module 1 Report***, supra note 11, including Sections 3.1 and 4.2.

20 **For example, improved diversion measurement and reporting under SB 88, development of a California Stream Gaging Prioritization Plan under SB 19.** "Senate Bill No. 19 – Stream Gaging Plan," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/stream_gaging_plan/ (website, last visited March 13, 2023). **Another example is implementation of AB 1755, the Open and Transparent Water Data Act.** "Open and Transparent Water Data Act — Implementation Journal," *Department of Water Resources*, URL: https://dwr.maps.arcgis.com/apps/MapJournal/index.html?appid=50323246e8d148a0a504038a0d40fb7f (website, last visited March 13, 2023).

21 See sources cited supra note 19.

22 See Section 3.1 of ***2018 Part 1 Report***, supra note 10.

23 See "CDFW Instream Flow Recommendations Map," *California Department of Fish and Wildlife*, URL: https://wildlife.ca.gov/Conservation/Watersheds/Instream-Flow/Recommendations (website, last visited March 13, 2023); "CDFW Instream Flow Studies," *California Department of Fish and Wildlife*, URL: https://wildlife.ca.gov/Conservation/Watersheds/Instream-Flow/Studies.

24 See, e.g., "San Francisco Bay/Sacramento – San Joaquin Delta Estuary (Bay-Delta) Watershed Efforts," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/ (website, last visited March 13, 2023).

25 *California Water Curtailment Cases*, 83 Cal. App. 5th 164, 193 (2022), as modified on denial of rehearing (Sept. 29, 2022) (stating that "[w]hether this approach to water rights in California represents sound policy in a time of increasing water scarcity is a question for the Legislature.").

26 ***2018 Part 1 Report***, supra note 10; ***2018 Part 2 Report***, supra note 11.

27 See Cal. Const. art. X, § 2; Cal. Water Code, §§ 100, 174, 13000, 13001.

28 See Nell Green Nylen, "A Contingency-Based Framework to Support Drought Decision Making: Part 4 in a Series on Improving California Water Rights Administration and Oversight for Future Droughts," *Legal Planet* (April 8, 2019), URL: https://legal-planet.org/2019/04/08/a-contingency-based-framework-to-support-drought-decision-making/.

29 ***Module 1 Report***, supra note 11.

30 ***Module 1 Report***, supra note 11.

31 ***2018 Part 1 Report***, supra note 10.

32 Cal. Water Code § 174(a).

33 *California Farm Bureau Federation v. State Water Resources Control Board*, 51 Cal. 4th 421, 429 (2011), as modified (Apr. 20, 2011); see also Cal. Water Code § 275; *Stanford Vina Ranch Irrigation Co. v. State of California*, 50 Cal. App. 5th 976, 1002–03 (2020), rehearing denied (July 6, 2020), as modified (July 8, 2020), review denied (Sept. 23, 2020), cert. denied, 209 L. Ed. 2d 128, 141 S. Ct. 1387 (2021).

34 Cal. Water Code § 186(a).

35 Cal. Water Code § 174(b). Note that the SWRCB only acquired its drinking water responsibilities in 2014. See "Transfer of Drinking Water Programs from the Department of Public Health to the State Water Board," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/drinking_water/programs/DW_PreJuly2014.html (website, last visited March 13, 2023); see also Nell Green Nylen, "California's Proposed Drinking Water Program Reorganization: A Primer," *Legal Planet* (Jan. 21, 2014), URL: https://legal-planet.org/2014/01/21/californias-proposed-drinking-water-program-reorganization-a-primer/.

36 See Cal. Const. art. X, § 2; see also "The Water Rights Process," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/waterrights/board_info/water_rights_process.html (website, last visited April 12, 2022).

37 See *Moore v. California Oregon Power Co.*, 22 Cal. 2d 725, 734–35 (1943); *United States v. Fallbrook Public Utility District*, 101 F. Supp. 298, 303 (S.D. Cal. 1951) (quoting *Lux v. Haggin*, 69 Cal. 255, 390 (1886)); *People v. Shirokow*, 26 Cal. 3d 301, 307 n.7 (1980); *Rancho Santa Margarita v. Vail*, 11 Cal. 2d 501, 538 (Cal. 1938) (citing *Anaheim Union Water Co. v. Fuller*, 150 Cal. 327, 331 (Cal. 1907)); see also Cal Const. art. X, § 2; Cal. Water Code § 101; "Water Rights Frequently Asked Questions: What is a riparian right?" *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/waterrights/board_info/faqs.html#toc178761088 (last visited March 23, 2023)

38 *United States v. State Water Resources Control Board*, 182 Cal. App. 3d 82, 101 (1986) (citing *Prather v. Hoberg*, 24 Cal. 2d 549, 559–60 (Cal. 1944)).

39 **Exceptions to this general rule occur because a private riparian right arises at the time land is transferred from state or federal ownership, and federal law makes such transfers "subject to any vested and accrued water rights."** 43 U.S.C. § 661. **Therefore appropriative rights that were established before a private riparian right will take priority over it.** See *Lux v. Haggin*, 69 Cal. 255, 372–76 (1886).

40 *United States v. State Water Resources Control Board*, 182 Cal. App. 3d 82, 101, 227 (1986).

41 See *People v. Shirokow*, 26 Cal. 3d 301, 308 (1980); Water Commission Act of 1913, Cal. Stats. 1913, ch. 586, at 1012.

42 See *Light v. State Water Resources Control Board*, 226 Cal. App. 4th 1463, 1478 (2014), as modified on denial of rehearing (July 11, 2014).

43 **For a discussion of groundwater rights and priorities**, see Section 3.1 and Appendix B.1.2 of ***2018 Part 1 Report***, supra note 10.

44 See Appendix B.1.2.6 of ***22018 Part 1 Report***, supra note 10, and the sources cited therein.

45 See Cal. Const. art. X, § 2; Cal. Water Code §§ 100; 174, 275, 1058; *Stanford Vina Irrigation Co. v. State of California*, 50 Cal. App. 5th 976, 1000–1004 (2020); *Light v. State Water Resources Control Board*, 226 Cal. App. 4th 1463, 1486–88 (2014), as modified on denial of rehearing (July 11, 2014), review denied (Oct. 1, 2014); *Millview County Water District. v. State Water Resources Control Board*, 229 Cal. App. 4th 879, 893–94 (2014), as modified on denial of rehearing (Oct. 14, 2014); see also *Imperial Irrigation District v. State Water Resources Control Board*, 186 Cal. App. 3d 1160 (1986).

46 See Cal. Water Code § 102 ("All water within the State is the property of the people of the State, but the right to the use of water may be acquired by appropriation in the manner provided by law."); Cal. Water Code § 1001 ("Nothing in this division shall be construed as giving or confirming any right, title, or interest to or in the corpus of any water.").

47 **The California Constitution declares that "[B]ecause of the conditions prevailing in this State the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare."** Cal. Const. art. X, § 2; Cal. Water Code § 100.

48 Cal. Const. art X, § 2; Cal. Water Code § 100; *Joslin v. Marin Municipal Water District*, 67 Cal. 2d 132, 144, 145 (1967); *Peabody v. City of Vallejo*, 2 Cal. 2d 351, 383 (1935).

49 *In re Waters of Long Valley Creek Stream System*, 25 Cal. 3d 339, 354 (1979); see also *Joslin v. Marin Municipal Water District*, 67 Cal. 2d 132, 139–140 (1967); *Light v. State Water Resources Control Board*, 226 Cal. App. 4th 1463, 1488 (2014), as modified on denial of rehearing (July 11, 2014), review denied (Oct. 1, 2014).

50 *Joslin v. Marin Municipal Water District*, 67 Cal. 2d 132, 139–40 (1967).

51 See Cal. Code Regs., tit. 23, § 995; State Water Resources Control Board, Resolution No. 2022-0002, to Adopt an Emergency Regulation to Supplement Voluntary Water Conservation (Jan. 4, 2022), available at URL: https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2022/rs2022_0002.pdf,

52 *National Audubon Society v. Superior Court*, 33 Cal. 3d 419, 446 (1983).

53 Id. at 447.

54 See *Marks v. Whitney*, 6 Cal. 3d 251, 259–60 (1971).

55 Cal. Pub. Res. Code § 10001; see also Cal. Pub. Res. Code §§ 10000–10004; Cal. Water Code §§ 1257.5, 13149.

56 Cal. Water Code § 13241. **Note that the "beneficial uses" of particular water bodies that are designated for water quality purposes and protected by water quality control plans overlap with, but are not identical to, "beneficial uses" defined for water rights purposes.** See "Water Rights: Public Trust Resources," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/public_trust_resources/ (website, last visited April 12, 2022)

57 16 U.S.C. §§ 1531–1544; Cal. Fish & Game Code §§ 2050–2115.5; see also Cal. Code Regs., tit. 23, § 876.5(c) (stating that "[t]he State Water Board has authority to ensure the protection and preservation of streams and to limit diversions to protect critical flows for species, including for state and federally threatened and endangered salmon and steelhead species."); Cal. Water Code § 1058.5; *Light v. State Water Resources Control Board*, 226 Cal. App. 4th 1463 (2014), as modified on denial of rehearing (July 11, 2014); *People ex rel. State Water Resources Control Board v. Forni*, 54 Cal.App.3d 743 (1976).

58 33 U.S.C. §§ 1251–1387; Cal. Water Code, §§ 13000–16104.

59 42 U.S.C. §§ 4321–4370m.

60 Cal. Pub. Res. Code §§ 21000–21189.57.

61 See, e.g., State Water Resources Control Board, Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (December 13, 2006), available at URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/wq_control_plans/2006wqcp/docs/2006_plan_final.pdf; "San Francisco Bay/Sacramento – San Joaquin Delta Estuary (Bay-Delta) Watershed Efforts," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/ (website, last visited March 13, 2023).

62 *Stanford Vina Irrigation Co. v. State of California*, 50 Cal. App. 5th 976, 1003 (2020) (citing *Light v. State Water Resources Control Board*, 226 Cal. App. 4th 1463 (2014)).

63 Cal. Const. art. X, § 2.

64 Cal. Water Code § 106; see also Cal. Water Code § 1254. **This policy informs decisions on water right applications, and is "relevant to assigning and protecting priorities among existing water rights holders" more broadly.** *Antelope Valley Groundwater Cases*, 59 Cal. App. 5th 241, 269 (2020), rehearing denied (Jan. 7, 2021) (making this statement in the context of rejecting an argument that Cal. Water Code §§ 106 and 106.5 «create a special avenue by which municipal water suppliers can acquire a correlative appropriative right in an overdrafted aquifer").

65 Cal. Water Code § 106.3 ("every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes"); see also State Water Resources Control Board, Resolution No. 2016-0010, Adopting the Human Right to Water as a Core Value and Directing Its Implementation in Water Board Programs and Activities (Feb. 16, 2016), available at URL: https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2016/rs2016_0010.pdf.

66 Cal. Health & Safety Code § 116555(a)(3); see also Cal. Code Regs. tit. 22, § 64554.

67 Cal. Code Regs. tit. 23, §§ 877.1(g).

68 See Cal. Water Code § 2525 (describing a "petition signed by one or more claimants to water of any stream system, requesting the determination of the rights of the various claimants to the water of that stream system," as the trigger for a potential statutory adjudication); see also, e.g., State Water Resources Control Board, Resolution No. 2020-0040, Petition by Madera Irrigation District for the Statutory Adjudication of Water Rights in the Fresno River Watershed (October 20, 2020), available at URL: https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2020/rs2020_0040.pdf.

69 See Appendix C.1.6.1 of ***2018 Part 1 Report***, supra note 10 and the references cited therein.

70 See Appendix C.2.6.1 of ***2018 Part 1 Report***, supra note 10 and the references cited therein.

71 See Appendix C.3.6.1 of ***2018 Part 1 Report***, supra note 10 and the references cited therein.

72 See Appendix C.4.6.1 of ***2018 Part 1 Report***, supra note 10 and the references cited therein.

73 See State Water Resources Control Board, Ongoing Dry Conditions in Most California Watersheds – Prepare for Drought Impacts Statewide (March 22, 2021) [hereinafter ***Ongoing Dry Conditions 2021***], available at URL: https://rwah20.org/wp-content/uploads/2021/05/BoardPacket-05-06-21.pdf (at page 90 of PDF).

74 See State Water Resources Control Board, Prepare for More Drought Impacts Due to Ongoing Dry Conditions (March 21, 2022) [hereinafter ***Ongoing Dry Conditions 2022***], available at URL: https://www.waterboards.ca.gov/drought/docs/2022/dyl_2022_web.pdf.

75 **Except where otherwise noted, the below information is from the following source and sources cited therein:** ***2018 Part 1 Report***, supra note 10.

76 See Appendix C.1.6.2 of ***2018 Part 1 Report***, supra note 10 and the references cited therein.

77 See Appendix C.2.6.2 of ***2018 Part 1 Report***, supra note 10 and the references cited therein.

78 See Appendix C.3.6.2 of ***2018 Part 1 Report***, supra note 10 and the references cited therein.

79 See Appendix C.4.6.2 of ***2018 Part 1 Report***, supra note 10 and the references cited therein.

80 State Water Resources Control Board, Notice of Water Unavailability for Post-1914 Water Right Holders and Warning of Impending Water Unavailability for Pre-1914 and Riparian Claimants in the Sacramento-San Joaquin Delta Watershed (June 15, 2021), available at URL: https://www.waterboards.ca.gov/drought/delta/docs/061521_notice.pdf; State Water Resources Control Board, Notice of Availability of Draft Emergency Curtailment and Reporting Regulation for the Sacramento-San Joaquin Delta (Delta) Watershed for Public Review and Comment and Notice of Water Unavailability for Senior Water Right Claims in the Delta Watershed (July 23, 2021), available at URL: https://www.waterboards.ca.gov/drought/delta/docs/notice_deltawatershed.pdf.

81 State Water Resources Control Board, Notice of Unavailable Water for Your Water Right (May 25, 2021) [hereinafter ***Notice of Unavailable Water, May 25, 2021***], available at URL: https://www.waterboards.ca.gov/drought/north_coast/docs/example_notice_of_unavailability.pdf; State Water Resources Control Board, Notice of Unavailable Water for Your Pending Water Right (May 28, 2021) , available at URL: https://www.waterboards.ca.gov/drought/north_coast/docs/rr_pending_rights_notice_of_unavailability.pdf.

82 State Water Resources Control Board, Media Release: "Extremely dry conditions prompt restrictions for some water right holders on the Scott River" (June 1, 2021), available at URL: https://www.waterboards.ca.gov/press_room/press_releases/2021/pr06012021_scott_river_notice_of_water_unavailability.pdf.

83 *California Water Curtailment Cases*, Final Statement of Decision, Phase I Trial, No. 1-15-CV285182, JCCP 4838 at 32–37 (Apr. 3, 2018).

84 Id. at 35.

85 Id. at 37–38 (emphasis in original).

86 Id. at 37. **The SWRB did not challenge the superior court's due process conclusion on appeal, so the appellate court did not address this issue.** *California Water Curtailment Cases*, 83 Cal. App. 5th 164, 178 (2022), as modified on denial of rehearing (Sept. 29, 2022).

87 **We discuss the appeal elsewhere in this report. The court of appeal described the issue it decided as whether the SWRCB "has the authority to curtail the diversion or use of water by holders of valid pre-1914 appropriative water rights . . . under Water Code section 1052, subdivision (a)3 . . . on the sole ground that there is insufficient water to service their priorities of right due to drought conditions."** *California Water Curtailment Cases*, 83 Cal. App. 5th 164, 172 (2022).

88 State Water Resources Control Board, Permit Term 91: Inbasin Entitlements - Delta and Tributary Rivers [hereinafter ***Term 91***], available at URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/permits/terms/permittterm091.pdf.

89 See "Term 91 Curtailment Information," *State Water Resources Control Boar*d, URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/term_91// (website, last visited March 13, 2023); State Water Resources Control Board, Implementing Standard Terms 91 and 93 for the Sacramento-San Joaquin Delta Watershed (2015) [hereinafter ***Implementing Terms 91 and 93***], available at URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/applications/docs/term9193.pdf.

90 See ***Term 91***, supra note 88.

91 See Andrew M. Schwarz, "California Central Valley Water Rights in a Changing Climate," *S.F. Estuary & Watershed Science*, June 2015, at 3, available at URL: http://dx.doi.org/10.15447/sfews.2015v13iss2art2.

92 State Water Resources Control Board, Permit Term 93, available at URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/permits/terms/permittterm093.pdf.

93 ***Implementing Terms 91 and 93***, supra note 89.

94 *National Audubon Society v. Superior Court*, 33 Cal. 3d 419, at 443, 446–447 (1983).

95 See State Water Resources Control Board, Amended License 10191 (Application A008042) (October 1, 2021), available at URL: https://ciwqs.waterboards.ca.gov/ciwqs/ewrims/DocumentRetriever.jsp?appNum=A008042&wrType=Appropriative&docType=DOCS; State Water Resources Control Board, Amended License 10192 (Application A008043) (October 1, 2021), available at URL: https://ciwqs.waterboards.ca.gov/ciwqs/ewrims/DocumentRetriever.jsp?appNum=A008043&wrType=Appropriative&docType=DOCS.

96 See sources cited supra previous note.

97 State Water Resources Control Board, Decision Amending Water Right Permits Within the Sacramento-San Joaquin Delta Watershed Which Are Subject to Standard Water Right Permit Term 80, Water Right Decision 1594, at 8 (Nov. 17, 1983) [hereinafter ***Decision 1594***], available at URL: https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/decisions/d1550_d1599/wrd1594.pdf.

98 State Water Resources Control Board, Order Approving Method of Calculating When Supplemental Project Water Exists, Order WR 81-15, at 4–7 (Nov. 19, 1981), available at URL: https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/orders/1981/wro81-15.pdf; ***Decision 1594***, supra previous note, at 8, 12, 27.

99 ***Decision 1594***, supra note 97, at 27–28, 35; State Water Resources Control Board, Order Amending and Affirming Decision 1594 and Denying Petitions for Reconsideration, Order WR 84-2, at 26–28 (Feb. 1, 1984), available at URL: https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/decisions/d1550_d1599/wrd1594.pdf; see also State Water Resources Control Board, Term 80: Reserved Jurisdiction - Delta and Tributary Rivers; and also the Russian River Watershed (last updated May 17, 2018), available at URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/permits/terms/permittermo80.pdf.

100 See Schwarz, supra note 91, at 3.

101 See State Water Resources Control Board, Division of Water Rights, Order Approving Petitions for Change and Issuing Amended Licenses In the Matter of Licenses 10191 and 10192 (Applications 8042 and 8043) held by the City of Los Angeles, Department of Water and Power, Order WR 2021-0086 EXEC (October 1, 2021), available at URL: https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/orders/2021/wro2021_0086_exec.pdf.

102 State Water Resources Control Board, Division of Water Rights, Media Release: "State Water Board approves new stream restoration measures for Mono Lake Basin" (October 8, 2021), available at URL: https://www.waterboards.ca.gov/press_room/press_releases/2021/pr10082021-mono-lake-press-release-10-4-2021.pdf; see also "Stream Restoration Order 2021-86," *Mono Lake Committee*, URL: https://www.monolake.org/whatwedo/restoration/streams/streamrestorationagreement/ (website, last visited March 13, 2023).

103 See Cal. Water Code § 1058. **This section draws on our discussion of regulations in Appendix B of *2018 Part 1 Report***, supra note 10.

104 Cal. Gov't Code §§ 11340–11361 (consisting of nine articles).

105 Cal. Gov't Code § 11346.

106 See "About the Regular Rulemaking Process," *Office of Administrative Law* [hereinafter ***"Regular Rulemaking"***], URL: https://oal.ca.gov/rulemaking_participation/ (website, last visited March 13, 2023). **A recent court of appeal opinion summarized many of these requirements.** See *American Chemistry Council v. Department of Toxic Substances Control*, 86 Cal. App. 5th 146, 302 Cal. Rptr. 3d 52, 75–82 (2022), review filed (Jan. 20, 2023).

107 Cal. Water Code § 1058.

108 See Cal. Gov't Code § 11346.1(b)(1).

109 Cal. Water Code § 1058.5(a)(2).

110 See Cal. Gov't Code §§ 11346.2, 11346.4, 11346.5; see also Cal. Gov't Code § 11340.85(c).

111 See Cal. Gov't Code §§ 11346.4(a), 11346.5(a)(15), (17), (18), 11346.8(c).

112 See Cal. Gov't Code § 11346.8.

113 See Cal. Gov't Code § 11346.9(a)(3).

114 See Cal. Gov't Code § 11340.85(c), (c)(10).

115 Cal. Gov't Code § 11346.1(a)(2), (3).

116 See Cal. Gov't Code § 11349.6(b).

117 See Cal. Gov't Code §§ 11346.4(a), 11346.5(a)(15), (17), (18), 11346.8.

118 Cal. Gov't Code § 11346.1(a)(2), (3).

119 See Cal. Gov't Code § 11346.1(e)–(h).

120 Cal. Water Code § 1058.5(c).

121 Cal. Gov't Code § 11349.3(a)

122 Cal. Gov't Code § 11349.6(b)

123 Cal. Gov't Code § 11349.1; see also Cal. Gov't Code § 11349 (definitions).

124 See Cal. Gov't Code § 11349.6(b) ("The office shall disapprove the emergency regulations if it determines that the situation addressed by the regulations is not an emergency.").

125 See Cal. Gov't Code § 11349.6(b) (referencing compliance with standards in § 11349.1).

126 Cal. Gov't Code § 11346.1.

127 See, e.g., Cal. Code Regs. tit. 14, §§ 15307, 15308.

128 See Cal. Public Resources Code § 21080(b)(4) ("This division does not apply to any of the following activities: . . Specific actions necessary to prevent or mitigate an emergency"); see also Cal. Code Regs. tit. 14, § 15269(c).

129 See Governor Gavin Newsom, State of Emergency Proclamation, April 21, 2021 [hereinafter ***Proclamation, April 21, 2021***], available at URL: https://www.gov.ca.gov/wp-content/uploads/2021/04/4.21.21-Emergency-Proclamation-1.pdf; Governor Gavin Newsom, Proclamation of a State of Emergency, May 10, 2021 [hereinafter ***Proclamation, May 10, 2021***], available at URL: https://www.gov.ca.gov/wp-content/uploads/2021/05/5.10.2021-Drought-Proclamation.pdf; Governor Gavin Newsom, Proclamation of a State of Emergency, October 19, 2021, available at URL: https://www.gov.ca.gov/wp-content/uploads/2021/10/10.19.21-Drought-SOE-1.pdf.

130 Cal. Water Code §§ 1058.5(d), 1846.

131 See Cal. Gov't Code §§ 11346.2, 11346.3, 11346.5; see also ***"Regular Rulemaking,"*** supra note 106.

132 See Cal. Gov't Code § 11346.5.

133 Cal. Gov't Code § 11346.45.

134 See Cal. Gov't Code §§ 11346.2, 11346.4, 11346.5; see also Cal. Gov. Code § 11340.85(c); see also ***"Regular Rulemaking,"*** supra note 106.

135 See Cal. Gov't Code §§ 11346.4(a), 11346.5(a)(15), (17); 11346.8.

136 See Cal. Gov't Code § 11346.8(a).

137 See Cal. Gov't Code § 11346.8(a).

138 See Cal. Gov't Code § 11346.8(c).

139 See Cal. Pub. Res. Code §§ 21002, 21002.1, 21100(a); see also id. § 21061.1 (defining "feasible"); id. § 21065 (defining "project").

140 See Cal. Pub. Res. Code § 21000 et seq.; see also Cal. Pub. Res. Code § 21159; Cal. Code Regs., tit. 14, §§ 15132, 15187.

141 See Cal. Pub. Res. Code §§ 21064, 21064.5.

142 **For example, a Class 7 exemption is available for "actions taken by regulatory agencies as authorized by state law or local ordinance to assure the maintenance, restoration, or enhancement of a natural resource where the regulatory process involves procedures for protection of the environment."** Cal. Code Regs., tit. 14, § 15307. **Similarly, a Class 8 exemption is available for "actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment."** Cal. Code Regs., tit. 14, § 15308.

143 See Cal. Gov't Code §§ 11346.4(b), 11346.9.

144 See Cal. Gov't Code §§ 11346.8(c), 11346.9.

145 See Cal. Gov't Code §§ 11349, 11349.1, 11349.3.

146 See Cal. Gov't Code § 11349.3.

147 See ***2018 Part 1 Report***, supra note 10; ***2018 Part 2 Report***, supra note 11; Nell Green Nylen, "Water Rights Administration and Oversight During Past California Droughts," *Legal Planet* (March 15, 2019), URL: https://legal-planet.org/2019/03/15/water-rights-administration-and-oversight-during-past-california-droughts/.

148 See Cal. Gov't Code § 11346.1(b)(1).

149 Cal. Gov't Code § 11342.545.

150 Cal. Water Code § 1058.5(a)(2).

151 Cal. Water Code § 1058.5(a)(1).

152 Cal. Gov't Code § 11346.1(a)(2), (3).

153 See Cal. Gov't Code § 11340.85(c), (c)(10).

154 See Cal. Gov't Code § 11349.6(b).

155 Cal. Gov't Code § 11349.6(b)

156 See Cal. Gov't Code § 11349.6(b).

157 See Cal. Gov't Code § 11349.6(b) ("The office shall disapprove the emergency regulations if it determines that the situation addressed by the regulations is not an emergency.").

158 See Cal. Water Code § 1058.5(b).

159 See Cal. Gov't Code § 11346.1(e)–(h).

160 Cal. Water Code § 1058.5(c).

161 See Cal. Water Code §§1058.5(d), 1846.

162 See Cal. Water Code § 1831(d)(4).

163 See Appendix C.1.11 of ***2018 Part 1 Report***, supra note 10 and the references cited therein.

164 See Appendix C.2.11 of ***2018 Part 1 Report***, supra note 10 and the references cited therein.

165 See Appendix C.3.11 of ***2018 Part 1 Report***, supra note 10 and the references cited therein.

166 See Appendix C.4.6.2 and C.4.11 of ***2018 Part 1 Report***, supra note 10 and the references cited therein; see also State Water Resources Control Board, Resolution No. 2014-0023 (Corrected Version), To Adopt Emergency Regulations for Curtailment of Diversions Due to Insufficient Flow for Specific Fisheries (May 21, 2014) [hereinafter ***Resolution No. 2014-0023***], available at URL: https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2014/rs2014_0023_corrected_with_regs.pdf; State Water Resources Control Board, Resolution No. 2015-0014, To Update and Readopt a Drought-Related Emergency Regulation for Curtailment of Diversions Due to Insufficient Flow for Specific Fisheries (March 17, 2015) [hereinafter ***Resolution No. 2015-0014***], available at URL: https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2015/rs2015_0014.pdf.

167 See Appendix C.4.6.2 and C.4.11 of ***2018 Part 1 Report***, supra note 10 and the references cited therein; see also State Water Resources Control Board, Resolution No. 2014-0031, To Adopt an Emergency Regulation for Statewide Drought-Related Curtailment of Water Diversions to Protect Senior Water Rights, at 3 (July 2, 2014) [hereinafter ***Resolution No. 2014-0031***], available at URL: https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2014/rs2014_0031.pdf.

168 Office of Administrative Law, In re: State Water Resources Control Board, Notice of Approval of Emergency Regulatory Action, July 12, 2021, available at URL: https://www.waterboards.ca.gov/drought/russian_river/docs/rr_reg_approval_oal.pdf (regarding emergency regulations for the Russian River watershed); Office of Administrative Law, In re: State Water Resources Control Board, Notice of Approval of Emergency Regulatory Action, May 31, 2022, available at URL: https://www.waterboards.ca.gov/drought/russian_river/docs/2022/2022_rr_reg_approval_oal.pdf (regarding re-adopted emergency regulations for the Russian River watershed).

169 Office of Administrative Law, In re: State Water Resources Control Board, Notice of Approval of Emergency Regulatory Action, August 30, 2021, available at URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/scott_shasta_rivers/docs/klamath_reg_oal_approval.pdf (regarding emergency regulations for the Klamath River watershed); Office of Administrative Law, In re: State Water Resources Control Board, Notice of Approval of Emergency Regulatory Action, July 29, 2022, available at URL: https://www.waterboards.ca.gov/drought/scott_shasta_rivers/docs/2022/klamath-reg-oal-approval-2022.pdf (regarding re-adoption of emergency regulations for the Klamath River watershed).

170 Office of Administrative Law, In re: State Water Resources Control Board, Notice of Approval of Emergency Regulatory Action, August 19, 2021, available at URL: https://www.waterboards.ca.gov/drought/delta/docs/deltareg_oal_approval.pdf (regarding emergency regulations for the Delta watershed); Office of Administrative Law, In re: State Water Resources Control Board, Notice of Approval of Emergency Regulatory Action, August 12, 2022, available at URL: https://www.waterboards.ca.gov/drought/delta/docs/2022/20220812-reg-oal-approved.pdf (regarding re-adoption of emergency regulations for the Delta watershed).

171 Office of Administrative Law, In re: State Water Resources Control Board, Notice of Approval of Emergency Regulatory Action, October 4, 2021, available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/2021-0924-01e-approval.pdf (regarding emergency regulations for Mill and Deer Creeks); Office of Administrative Law, In re: State Water Resources Control Board, Notice of Approval of Emergency Regulatory Action, September 21, 2022, available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/20220921-oal-approval-milldeer.pdf (regarding re-adoption of emergency regulations for Mill and Deer Creeks).

172 *California Water Curtailment Cases*, 83 Cal. App. 5th 164, 196, 299 Cal. Rptr. 3d 352, 373–374 (2022).

173 Id.

174 See Appendix C.1.6 of ***22018 Part 1 Report***, supra note 10 and the references cited therein.

175 See Appendix C.2.6 of ***2018 Part 1 Report***, supra note 10 and the references cited therein.

176 See Appendix C.3.6 of ***2018 Part 1 Report***, supra note 10 and the references cited therein.

177 State Water Resources Control Board, Curtailment Order In the Matter of Diversion of Water from Deer Creek Tributary to the Sacramento River in Tehama County, Order WR 2014-0022-DWR (June 5, 2014), available at URL: https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/orders/2014/wro2014_0022_dwr.pdf; State Water Resources Control Board, Curtailment Order In the Matter of Diversion of Water from Antelope Creek Tributary to the Sacramento River in Tehama County, Order WR 2015-0017-DWR (April 3, 2015), available at URL: https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/orders/2015/wro2015_0017_dwr.pdf; State Water Resources Control Board, Correction Order In the Matter of Diversion of Water from Deer Creek Tributary to the Sacramento River in Tehama County, Order WR 2014-0031-DWR (formerly Order WR 2014-0029-DWR) (October 14, 2014), available at URL: https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/orders/2014/wro2014_0031_dwr.pdf; State Water Resources Control Board, Curtailment Order In the Matter of Diversion of Water from Deer Creek Tributary to the Sacramento River in Tehama County, Order WR 2015-0019-DWR (April 17, 2015), available at URL: https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/orders/2015/wro2015_0019_dwr.pdf; State Water Resources Control Board, Curtailment Order In the Matter of Diversion of Water from Antelope Creek Tributary to the Sacramento River in Tehama County, Order WR 2015-0039-DWR (October 30, 2015), available at URL: https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/orders/2015/wro2015_0039_dwr.pdf; State Water Resources Control Board, Curtailment Order In the Matter of Diversion of Water from Deer Creek Tributary to the Sacramento River in Tehama County, Order WR 2015-0036-DWR (October 22, 2015), available at URL: https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/orders/2015/wro2015_0036_dwr.pdf.

178 See Appendix C.4.6 of ***2018 Part 1 Report***, supra note 10 and the references cited therein.

179 State Water Resources Control Board, Curtailment Order for Diversion of Water from the Upper Russian River Watershed (Aug. 2, 2021) (no longer available online); State Water Resources Control Board, Curtailment Order for Diversion of Water from the Lower Russian River Watershed (Aug. 10, 2021) (no longer available online); State Water Resources Control Board, Order Regarding Curtailment Status for Diversion of Water from the Russian River Watershed (June 14, 2022), available at URL: https://www.waterboards.ca.gov/drought/russian_river/docs/2022/2022-rr-letterrecurtailment-riparian.pdf (for riparian rights); State Water Resources Control Board, Order Regarding Curtailment Status for Diversion of Water from the Russian River Watershed (June 14, 2022), available at URL: https://www.waterboards.ca.gov/drought/russian_river/docs/2022/2022-rr-letterrecurtailment-other.pdf (for all other rights); "Russian River Drought Response: Russian River Watershed Curtailment Status List," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/drought/russian_river/#tableau [hereinafter ***"Russian River Watershed Curtailment Status List"***] (website, last visited March 13, 2023).

180 State Water Resources Control Board, Order Imposing Water Right Curtailment and Reporting Requirements for Adjudicated Groundwater in the Scott River Watershed, Order WR 2021-0083-DWR (Sept. 10, 2021) [hereinafter ***Order WR 2021-0083-DWR***], available at URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/scott_shasta_rivers/docs/scott_adjudicated_gw_curtailment_order.pdf; State Water Resources Control Board, Order Imposing Water Right Curtailment and Reporting Requirements for Reported Water Rights in the Scott River Watershed (Sept. 9, 2021) [hereinafter ***Order for Scott Reported Rights***], available at URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/scott_shasta_rivers/docs/surface_water_curtailment_order_scott.pdf; State Water Resources Control Board, Order Imposing Water Right Curtailment and Reporting Requirements for Water Right(s) Associated with the Parcel(s) Listed in Attachment A and Not Otherwise Curtailed, Order WR 2021-0084-DWR (Sept. 10, 2021) [hereinafter ***Order WR 2021-0084-DWR***], available at URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/scott_shasta_rivers/docs/scott_apn_curtailment_info_order.pdf; "Scott River Watershed Curtailment Orders, Addendums and Reminders," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/drought/scott_shasta_rivers/scott_addendums.html (website, last visited March 13, 2023).

181 State Water Resources Control Board, Order Imposing Water Right Curtailment and Reporting Requirements in the Shasta River Watershed, Order WR 2021-0082-DWR (Sept. 10, 2021) [hereinafter ***Order WR 2021-0082-DWR***], available at URL: https://www.waterboards.ca.gov/drought/scott_shasta_rivers/docs/shasta_curtailment_order.pdf (for rights junior to approximately November 1912); State Water Resources Control Board, Order Imposing Water Right Curtailment and Reporting Requirements in the Shasta River Watershed, Order WR 2021-0085-DWR (Oct. 12, 2021) [hereinafter ***Order WR 2021-0085-DWR***], available at URL: https://www.waterboards.ca.gov/drought/scott_shasta_rivers/docs/shasta-curtailment-order-2021-0085-dwr.pdf (for additional rights that should have been curtailed under WR 2021-0082-DWR); State Water Resources Control Board, Order Imposing Water Right Curtailment and Reporting Requirements in the Shasta River Watershed, Order WR 2022-0142-DWR (Apr. 8, 2022) [hereinafter ***Order WR 2022-0142-DWR***], available at URL: https://www.waterboards.ca.gov/drought/scott_shasta_rivers/docs/2022/shasta-curtailment-order-2022-0142-dwr-signed.pdf (for additional rights that should have been curtailed under WR 2021-0082-DWR); State Water Resources Control Board, Order Imposing Water Right Curtailment and Reporting Requirements in the Shasta River Watershed, Order WR 2022-0161-DWR (July 19, 2022) [hereinafter ***Order WR 2022-0161-DWR***], available at URL: https://www.waterboards.ca.gov/drought/scott_shasta_rivers/docs/2022/shasta-curtailment-order-wr-2022-0161-dwr-signed.pdf (for additional rights that should have been curtailed under WR 2021-0082-DWR); State Water Resources Control Board, Order Imposing Water Right Curtailment, Increased Coordination, and Reporting Requirements in the Shasta River Watershed, Order WR 2022-0162-DWR (Aug. 2, 2022) [hereinafter ***Order WR 2022-0162-DWR***], available at URL: https://www.waterboards.ca.gov/drought/scott_shasta_rivers/docs/2022/shasta-curtailment-order-wr-2022-162-dwr-signed.pdf (for rights to priority date April 1, 1885); "Shasta River Watershed Curtailment Orders, Addendums and Reminders," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/drought/scott_shasta_rivers/shasta_addendums.html (website, last visited March 13, 2023).

182 State Water Resources Control Board, Order Imposing Water Right Curtailment and Reporting Requirements in the Sacramento-San Joaquin Delta Watershed (Aug. 20, 2021), available at URL: https://www.waterboards.ca.gov/drought/delta/docs/082021_order_sm.pdf (for small diverters); State Water Resources Control Board, Order Imposing Water Right Curtailment and Reporting Requirements in the Sacramento-San Joaquin Delta Watershed (Aug. 20, 2021), available at URL: https://www.waterboards.ca.gov/drought/delta/docs/082021_order_lg.pdf (for large diverters); see also "Sacramento-San Joaquin Delta Watershed Drought & Curtailment Information: Delta Watershed Curtailment Status List," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/drought/delta/#tableau [hereinafter ***"Delta Watershed Curtailment Status List"***] (website, last visited March 13, 2023).

183 State Water Resources Control Board, Curtailment Order in the Matter of Diversion of Water from Deer Creek Tributary to the Sacramento River in Tehama County, Order WR-2021-0090 DWR (October 11, 2021), available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/deer-creek-curtailment-order-2021-0090-and-cover-letter.pdf; "Mill Creek and Deer Creek Drought Response," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/ (website, last visited March 13, 2023).

184 State Water Resources Control Board, Curtailment Order in the Matter of Diversion of Water from Mill Creek Tributary to the Sacramento River in Tehama County, Order WR-2021-0089 DWR (Oct. 11, 2021), available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/mill-creek-curtailment-order-2021-0089-and-cover-letter.pdf; "Mill Creek and Deer Creek Drought Response," supra previous note.

185 See *Phelps v. State Water Resources Control Board*, 157 Cal. App. 4th 89, 104–05 (2007) (finding that the Term 91 curtailment notices unequivocally "required plaintiffs to immediately discontinue diversion of water" and were therefore final actions, subject to judicial review).

186 See "Term 91 Curtailment Information," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/term_91/ (website, last visited March 13, 2023).

187 ***"Delta Watershed Curtailment Status List,"*** supra note 182; ***"Russian River Watershed Curtailment Status List,"*** supra note 179; State Water Resources Control Board, List of Curtailed Parties Associated with the Order Imposing Water Right Curtailment and Reporting Requirements for Adjudicated Groundwater Rights in the Scott River Watershed (Order WR 2021-0083-DWR) (September 10, 2021), available at URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/scott_shasta_rivers/docs/scott_gw_adj_curtailment_list.pdf; State Water Resources Control Board, List of Curtailed Parties Associated with Order Imposing Water Right Curtailment and Reporting Requirements in the Shasta River Watershed (Order WR 2021-0082-DWR) (September 10, 2021) [hereinafter ***Shasta List of Curtailed Parties***], available at URL: https://www.waterboards.ca.gov/drought/scott_shasta_rivers/docs/shasta-curtailment-list.pdf.

188 Cal. Water Code § 1825.

189 *California Water Curtailment Cases*, 83 Cal. App. 5th 164, 191 (2022).

190 See, e.g., State Water Resources Control Board, Notice of Violation – Failure to Comply with Curtailment Order, Shasta River Water Association (August 18, 2022) [hereinafter ***Shasta NOV***], available at URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/enforcement/docs/srwa-nov.pdf.

191 See "Water Rights Enforcement: Notices of Violation (NOVs)," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/enforcement/compliance/notices/index.html (website, last visited March 13, 2023).

192 Cal. Water Code § 1831(a), (b).

193 Cal. Water Code § 1831(a), (d).

194 Cal. Water Code § 1834 see also Cal. Water Code § 1831(c).

195 See, e.g., State Water Resources Control Board, Draft Cease and Desist Order WR 2022-0xxx-DWR, In the Matter of Violations or Threatened Violations of Emergency Regulations and Order WR 2021-0082-DWR, Shasta River Water Association (August 19, 2022) [hereinafter ***Draft CDO WR 2022-0xxx-DWR***], available at URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/enforcement/compliance/cease_desist_actions/2022/srwa-draft-cdo.pdf.

196 Cal. Water Code § 1834(b).

197 See, e.g., State Water Resources Control Board, Cease and Desist Order WR 2022-0168-DWR, In the Matter of Violations or Threatened Violations of Emergency Regulations and Order WR 2021-0082-DWR, Shasta River Water Association (September 12, 2022) [hereinafter ***CDO WR 2022-0168 DWR***], available at URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/enforcement/compliance/cease_desist_actions/2022/wro2022-0168-dwr.pdf.

198 Cal. Water Code § 1845.

199 See Cal. Water Code §§ 1845(b)(2), (3), 1846(b), (c), 1052(d).

200 See, e.g., State Water Resources Control Board, Administrative Civil Liability Complaint In the Matter of Violation of Klamath River Watershed Drought Emergency Regulations, Shasta River Water Association, Water Right SG005955 (November 4, 2022) [hereinafter ***ACL Complaint***], available at URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/enforcement/compliance/acl_complaint_actions/2022/shasta-river-water-assoc-aclc.pdf.

201 Cal. Water Code § 1055(a).

202 Cal. Water Code § 1055(b); see also Cal. Water Code § 183 (regarding hearings).

203 Cal. Water Code § 1055(c), (d).

204 See Cal. Water Code §§ 1845(b)(2), 1846(b), 1052(d).

205 *California Water Curtailment Cases*, 83 Cal. App. 5th 164, 191 (2022).

206 See Judgment and Decree, In the Matter of the Determination of the Relative Rights, Based Upon Prior Appropriation, of the Various Claimants to the Waters of Shasta River and Its Tributaries in Siskiyou County, California, No. 7035, at 170 (Dec. 29, 1932), available at URL: https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/judgments/docs/shastariver_jd.pdf.

207 ***Order WR 2021-0082-DWR***, supra note 181; ***Shasta List of Curtailed Parties***, supra note 187.

208 See Cal. Code Regs. tit. 23, § 875(c)(2).

209 ***ACL Complaint***, supra note 200.

210 ***CDO WR 2022-0168 DWR***, supra note 197.

211 ***Shasta NOV***, supra note 190.

212 ***Draft CDO WR 2022-0xxx-DWR***, supra note 195.

213 ***CDO WR 2022-0168 DWR***, supra note 197.

214 Cal. Water Code § 1845(b)(1)(A).

215 ***ACL Complaint***, supra note 200.

216 See id.

217 Rachel Becker, "Rural ranchers face $4,000 proposed fine for violating state drought order," *CalMatters* (Nov. 7, 2022), URL: https://calmatters.org/environment/2022/11/california-ranchers-drought-fine/.

218 See id. ("Rick Lemos, a fifth generation rancher and board member of the Shasta River Water Association, said violating the drought order 'was the cheapest way I could have got by … When you're to a point where you have no other choice, you do what you have to do.' He said the alternatives 'would have cost us, collectively, a lot more.'").

219 Cal. Code Regs. tit. 23, § 875(a).

220 **While we do not include them here, note that additional penalties are available for unauthorized use and other violations related to cannabis cultivation**. See, e.g., Cal. Water Code § 1052(c)(3).

221 Cal. Water Code § 1848(d).

222 Cal. Water Code § 1845.

223 *California Water Curtailment Cases*, 83 Cal. App. 5th 164, 191 (2022).

224 Id. at 196.

225 See *Joint Anti-Fascist Committee v. McGrath*, 341 U.S. 123, 171–72 (1951) (Frankfurter, J. concurring) ("No better instrument has been devised for arriving at truth than to give a person in jeopardy of serious loss notice of the case against him and opportunity to meet it.").

226 **The third central principle requires a neutral decision-maker. This standard is generally interpreted to preclude financial interest in decisions, although it can also implicate concentration of regulatory and prosecutorial functions in a single decision-maker. With respect to the former, there is no suggestion that this is an issue for drought actions. With respect to the latter, some years ago, the SWRCB restructured staff to separate Division of Water Rights staff and counsel from enforcement staff and counsel, and more recently add administrative hearing officers through the new Office of Administrative Hearings. These changes facilitate separation of functions consistent with administrative practice throughout the federal and state governments**.

227 *Floyd v. Board of Ada County Commissioners*, 164 Idaho 659, 665, 434 P.3d 1265, 1271 (2019) ("Generally, the right of due process gives a petitioner the opportunity to make an oral presentation to the court, as well as confront and cross examine adverse witnesses" (citing *Goldberg v. Kelly*, 397 U.S. 254, 268–69 (1970))).

228 E.g., *Morrissey v. Brewer*, 408 U.S. 471, 481 ("(D)ue process is flexible and calls for such procedural protections as the particular situation demands"); *Mitchell v. W. T. Grant Co.*, 416 U.S. 600, 610 (1974) (citing *Inland Empire Council v. Millis*, 325 U.S. 697, 710 (1945) ("The requirements of due process of law 'are not technical, nor is any particular form of procedure necessary.'"); *NLRB v. Mackay Co.*, 304 U.S. 333, 351 (1938) ("Due process of law guarantees 'no particular form of procedure; it protects substantial rights.'"); *Cafeteria Workers v. McElroy*, 367 U.S. 886, 895 (1961) ("The very nature of due process negates any concept of inflexible procedures universally applicable to every imaginable situation."). E**ven courts are not always required to provide an in-person hearing to satisfy due process. Every court has the authority "to control the disposition of the causes on its docket with economy of time and effort for itself, for counsel, and for litigants."** *Landis v. N. Am. Co.*, 299 U.S. 248, 254 (1936). **Judges are given broad discretion to determine whether a hearing is required**. See, e.g., *Amado v. Microsoft Corp.*, 517 F.3d 1353, 1358 (Fed. Cir. 2008) (citing *Nolan v. de Baca*, 603 F.2d 810, 812 (10th Cir. 1979), cert. denied, 446 U.S. 956 (1980)); *Nutrinova Nutrition Specialties and Food Ingredients GMBH v. Int'l Trade Comm'n*, 224 F.3d 1356, 1360 (Fed. Cir. 2000); *Remote Diagnostic Techs. LLC v. United States*, 133 Fed. Cl. 198, 203 (2017). **"[T]he parties' right to be heard may be fulfilled by the court's review of the briefs and supporting affidavits and materials submitted to the court."** *Geear v. Boulder Cmtv. Hosp.*, 844 F.2d 764, 766 (10th Cir.), cert. denied, 488 U.S. 927 (1988); see also *Toquero v. I.N.S.*, 956 F.2d 193, 196 n. 4 (9th Cir. 1992) ("It is well-settled that oral argument is not necessary to satisfy due process."); *Young v. United States*, 94 Fed. Cl. 671,675 (2010) ("There is no blanket due process right to oral argument." (citing *FCC v. WJR, The Goodwill Station*, 337 U.S. 265, 276 (1949)).

229 **Liberty interests also trigger procedural due process, but those interests are unlikely to be at issue in water rights regulation.**

230 See *United States v. State Water Resources Control Board*, 227 Cal. Rptr. 161, 168 (1986).

231 *Bi-Metallic Investment Co. v. State Board of Equalization of Colorado*, 239 U.S. 441 (1915); see also *California Gillnetters Assn. v. Department of Fish & Game*, 39 Cal.App.4th 1145, 1160 (Cal. Ct. App. 1995); *Beck Development Co. v. Southern Pacific Transportation Co.* 44 Cal.App.4th 1160, 1188 (Cal. Ct. App. 1996); *Horn v. County of Ventura* 24 Cal.3d 605, 612-614 (Cal. 1979); *California Optometric Assn. v. Lackner* 60 Cal.App.3d 500, 505-506 (Cal. Ct. App. 1976).

232 See, e.g., *United States v. Florida East Coast Ry. Co.*, 410 U.S. 224, 245 (1973); *Bi-Metallic Investment Co. v. St. Bd. of Equalization*, 239 U.S. 441 (1915); *Coniston Corp. v. Village of Hoffman Estates*, 844 F.2d 461, 468-69 (7th Cir. 1988); *Smith v. Strother,* 68 Cal. 194, 197 (1885), overruled on another ground in *Millholen v. Riley,* 211 Cal. 29, 35–36 (Cal. 1930) (Adjudicatory acts apply law that already exists to determine "question[s] of right or obligation, or of property."); *Prentis v. Atlantic Coast Line,* 211 U.S. 210, 226 (1908) ("A judicial inquiry investigates, declares and enforces liabilities as they stand on present or past facts and under laws supposed already to exist."); *City of Rancho Palos Verdes v. City Council,* 59 Cal. App.3d 869, 883 (Cal. Ct. App. 1976) ("A judicial inquiry investigates, declares and enforces liabilities as they stand on present or past facts and under laws supposed already to exist."). **The sole exception comes from a limited body of cases in which legislatures or agencies have tried to use collective action such as legislation or rulemaking to address an individual right, such as where a local legislative decision effectively revoked the liquor license for a single licensee.** See, e.g., *Club Misty, Inc. v. Laski*, 208 F.3d 615, 620-22 (7th Cir. 2000) (agency action permitting voters to revoke a liquor license of a single licensee rather than declaring the area "dry" was considered adjudication, subject to due process, rather than rulemaking). Compare *South Terminal Corp. v. EPA*, 504 F.2d 646, 660-61 (1st Cir. 1974) (full evidentiary hearing not required even though agency action adversely affected 'vital, clearly identifiable economic interests,' was allegedly 'condemnatory in purpose,' and property interests desired to present evidence regarding technical accuracy at the hearing).

233 See, e.g., *Santa Fe All. for Pub. Health & Safety v. City of Santa Fe, New Mexico*, 993 F.3d 802, 818 (10th Cir. 2021), cert. denied sub nom. *Santa Fe All. for Pub. Health & Safety v. City of Santa Fe*, 212 L. Ed. 2d 234, 142 S. Ct. 1228 (2022) (zoning); *Blocktree Properties, LLC v. Pub. Util. Dist. No. 2 of Grant Cnty. Washington*, 380 F. Supp. 3d 1102, 1123 (E.D. Wash.), affirmed, 783 F. App'x 769 (9th Cir. 2019) (implementation of rate-setting standards that would increase utility rates); *Stones v. Plattsmouth Airport Authority*, 193 Neb. 552, 228 N.W.2d 129 (1975) (selection of a site for public improvement).

234 *Bi-Metallic Investment Co. v. State Board of Equalization of Colorado*, 239 U.S. 441, 445 (1915); see *San Diego Bldg. Contractors Ass'n v. City Council*, 529 P.2d 570, 573 (Cal. 1974) ("it is black letter constitutional law that due process requires 'notice and hearing' only in quasi-judicial or adjudicatory settings and not with respect to the adoption of general legislation"); see also, e.g., *Stanford Vina Ranch Irrigation Co. v. State of California*, 264 Cal. Rptr. 3d 509, 515 (Cal. Ct. App. 2020).

235 *Bi-Metallic Investment Co. v. State Board of Equalization of Colorado*, 239 U.S. 441, 445 (1915) ("[Legislative actions are taken] that affect the person or property of individuals, sometimes to the point of ruin, without giving them a chance to be heard. Their rights are protected in the only way that they can be in a complex society -- by their power, immediate or remote, over those who make the rule.").

236 *Id.*

237 See, e.g., *SEC v. Chenery Corp.*, 332 U.S. 194, 203 (1947) ("[T]he choice made between proceeding by general rule or by individual, ad hoc litigation is one that lies primarily in the informed discretion of the administrative agency.").

238 *Mathews v. Eldridge*, 424 U.S. 319 (1976).

239 E.g. id. at 334 (observing that "due process, unlike some legal rules, is not a technical conception with a fixed content unrelated to time, place and circumstances. . . . [It] is flexible and calls for such procedural protections as the particular situation demands.") (internal quotation marks omitted) (quoting *Cafeteria Workers v. McElroy*, 367 U.S. 886, 895 (1961) and *Morrissey v. Brewer*, 408 U.S. 471, 481 (1972)).

240 See, e.g., *Mathews v. Eldridge*, 424 U.S. 319, 335, 340-42 (1976).

241 Id. at 335, 343-44.

242 Id. at 335, 347-49.

243 Id.

244 Id.

245 See *Osteen v. Henley*, 13 F.3d 221, 225 (7th Cir. 1993) ("[I]t is the outer bounds that the due process clause patrols.").

246 **The primary difference between California due process and federal due process is that California due process applies to a broader range of interests. But that difference should not matter to water rights administration, because water rights, as property rights, are protected by federal and state due process principles.**

247 *People v. Ramirez*, 25 Cal. 3d 260, 268–270 (Cal. 1979).

248 See *Today's Fresh Start, Inc. v. Los Angeles Cnty. Off. of Educ.*, 303 P.3d 1140, 1149-50 (Cal. 2013).

249 See *Barclay Hollander Corp. v. California Regional Water Quality Control Board*, 251 Cal. Rptr. 3d. 206, 229-33 (Cal. Ct. App. 2019); *Machado v. State Water Resources Control Board*, 109 Cal.Rptr.2d 116, 119-21 (Cal. Ct. App. 2001).

250 *Stanford Vina Ranch Irrigation Co. v. State of California*, 264 Cal. Rptr. 3d 509, 529–530 (Cal. Ct. App. 2020) (holding that although determination of whether a particular water right holder's use of water is reasonable is adjudicative ". . . this does not mean due process requires the Board to hold an evidentiary hearing before engaging in the *legislative* function of promulgating a regulation defining diversions of water under certain emergency circumstances to be per se unreasonable") (emphasis added).

251 *California Water Curtailments Cases*, **discussed infra, contains distinctive due process facts and therefore provides little guidance on due process for future curtailments. This case involved a challenge to the SWRCB's initial forays into curtailments in 2014–15, when the SWRCB implemented curtailments via a "notice of unavailability" and then brought enforcement actions under Water Code section 1052. The superior court held that curtailments required some sort of "public hearing" prior to agency action initiating curtailments.** *California Water Curtailment Cases*, Judicial Council Coordination Proceeding No. 4838, Santa Clara County Superior Court Case No. 2015-1-CV-285182, Final Statement of Decision, Phase I Trial (April 3, 2018) at p. 37, 39 ("Because the requirements of due process are flexible and dependent on circumstances, the Court will not attempt to define the specific process that must be used in a future drought. However, water users must be provided with some meaningful opportunity, including some form of public hearing, to challenge the Board's underlying findings before they are ordered to curtail their water use and before fines for noncompliance begin to accrue against them."). **On appeal, the SWRCB did not challenge the superior court's assessment of due process, and therefore the court of appeal did not address the issue in its subsequent published decision.** *California Water Curtailment Cases*, 83 Cal. App. 5th 164, 191, 299 Cal. Rptr. 3d 352, 370 (Cal. Ct. App. 2022), as modified on denial of rehearing (Sept. 29, 2022). **Additionally, the SWRCB significantly changed its procedural approach to curtailment after the superior court decision. As a result of both circumstances,** *California Water Curtailments Cases* **provides little meaningful guidance regarding current or future due process required for curtailments**.

252 *Nettleton v. Higginson*, 558 P.2d 1048 (Idaho 1977).

253 *Clear Springs Foods, Inc. v. Spackman*, 150 Idaho 790, 797, 252 P.3d 71, 78 (Idaho 2011).

254 Id. at 95.

255 Id.

256 Id. at 96.

257 See **Section 2.2.1**.

258 **In 2014, the SWRCB adopted statewide emergency regulations for curtailment of diversions to protect senior water rights, but ultimately did not use them to issue curtailment orders.** See *Resolution No. 2014-0031*, supra note 167.

259 *2018 Part 1 Report*, supra note 10; *2018 Part 2 Report*, supra note 11.

260 **This map draws from the following source:** California Department of Water Resources, California Water Plan Layered Map (2013) , available at URL: https://cadwr.app.box.com/s/no9baf6yzzc31umoans94asjzp7dpjy5. **The watershed layer was copied into Adobe Illustrator and edited.**

261 *2018 Part 1 Report*, supra note 10.

262 **Those early actions must also have served as a template for action in 1988 and 1990, as records suggest the SWRCB analyzed water unavailability and issued notices of water unavailability to thousands of diverters in the Delta watershed during those years. However, further details are hard to find, and staff in the SWRCB's Division of Water Rights recounted finding a "graphical summary" prepared in 1977 while looking for guidance on how to implement curtailments in early 2014.** See *2018 Part 1 Report*, supra note 10, at 34–35 and the sources cited therein.

263 **Term 91 curtailments are discussed briefly in Section 2.2.2.**

264 See State Water Resources Control Board, *Recommendations for Improving the Administration of the Water Rights Priority System in Dry Years*, at 1 (2015), available at URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/dryyear_report/docs/feb2015_dyr.pdf; National Marine Fisheries Service, NMFS letter to State Water Resources Control Board Executive Director re: Emergency Drought Regulations for Listed Salmonids during the 2021 California Drought for Mill and Deer creeks in the California Central Valley (July 30, 2021), available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/20210730_letter_from_nmfs_to_the_swrcb_exec_dir.pdf; California Department of Fish and Wildlife, CDFW letter to State Water Resources Control Board Executive Director re: 2021 Drought Emergency Minimum Flow Recommendations for Mill and Deer Creeks, Tehama County (August 9, 2021), available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/20210809_letter_from_cdfw_to_the_swrcb_exec_dir.pdf.

265 Elizabeth Vissers, "Low Flows, High Stakes: Lessons from Fisheries Management on Mill, Deer, and Antelope Creeks During California's Historic Drought," 23 *West-Northwest Journal of Environmental Law & Policy*, 169, 190–91 (2017), available at URL: https://repository.uchastings.edu/hastings_environmental_law_journal/vol23/iss1/17/; Jeffrey Mount, Brian Gray, Caitrin Chappelle, Greg Gartrell, Ted Grantham, Peter Moyle, Nathaniel Seavy, Leon Szeptycki, and Barton "Buzz" Thompson, *Managing California's Freshwater Ecosystems Lessons from the 2012–16 Drought, Technical Appendix: Eight Case Studies of Environmental Water Management During the 2012–16 Drought*, at 32 (2017), available at URL: http://www.ppic.org/wp-content/uploads/1117ccr_appendix.pdf.

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267 **Pre-2018 information is generally based on our *2018 Part 1 Report***, supra note 10, and the sources cited therein (see especially, Section 4.2 and Appendix C).

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271 See sources cited supra note 177.

272 **Pre-2018 information is generally based on our *2018 Part 1 Report***, supra note 10, and the sources cited therein (see especially, Section 4.2 and Appendix C).

273 Cal. Code Regs., tit. 23, § 877.2(c) (avoiding unreasonable interference with augmented stream flows or releases of stored water for environmental purposes).

274 See sources cited supra note 179.

275 **Pre-2018 information is generally based on our *2018 Part 1 Report***, supra note 10, and the sources cited therein (see especially, Section 4.2 and Appendix C..

276 See Cal. Code Regs. tit. 23, § 875(a)–(c).

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281 Id.

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295 State Water Resources Control Board, Media Release: "Worsening drought conditions prompt emergency action in Russian River watershed" (June 15, 2021) [hereinafter ***Russian River Media Release June 15, 2021***], available at URL: https://www.waterboards.ca.gov/press_room/press_releases/2021/pr06152021_russian_river_curtailments.pdf.

296 Office of Administrative Law, In re: State Water Resources Control Board, Notice of Approval of Emergency Regulatory Action, July 12, 2021, available at URL: https://www.waterboards.ca.gov/drought/russian_river/docs/rr_reg_approval_oal.pdf.

297 State Water Resources Control Board, Curtailment Order for Diversion of Water from the Upper Russian River Watershed (Aug. 2, 2021) (no longer available online).

298 State Water Resources Control Board, Curtailment Order for Diversion of Water from the Lower Russian River Watershed (Aug. 10, 2021) (no longer available online).

299 State Water Resources Control Board, Order Approving Temporary Urgency Change in the Matter of Permits 12947A, 12949, 12950, and 16596 (Applications 12919A, 15736, 15737, and 19351) of Sonoma County Water Agency (Dec. 10, 2021), available at URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/applications/transfers_tu_orders/docs/2021/122021sonoma-water-tucp-order.pdf.

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311 "Voluntary Water Sharing Program," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/drought/russian_river/voluntary_program.html (website, last visited March 13, 2023).

312 ***Reith***, supra note 286.

313 ***"Voluntary Water Sharing Program,"*** supra note 311.

314 **See Table 10 for citations for the items labeled here with text. For 2021, dates of curtailment status changes were drawn from emails sent to the "russian_river_drought" LYRIS email list. For 2022, dates of curtailment status changes were drawn from "Previous Curtailment Status Lists."** "Russian River Drought Response: Russian River Watershed Curtailment Status List," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/drought/russian_river/#tableau (website, last visited March 13, 2023). **Note that only dates of changes in curtailments status are shown; when successive "updates" included no changes, we did not include them in the figure. Flow data for the gage near Healdsburg (CDEC HEA) are from** "Historical Data Selector," *California Data Exchange Center*, URL: https://cdec.water.ca.gov/dynamicapp/selectQuery (website, last visited March 23, 2023) (using Station ID: HEA and Sensor Number: 41-(daily) – FLOW, MEAN DAILY). **Lake Mendocino storage data (CDEC COY) are from the same site** (using Station ID: COY and Sensor Number: 15- (daily) – Reservoir storage).

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316 Id. at 21–22.

317 ***Proclamation, May 10, 2021***, supra note 129.

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319 See Cal. Code Regs. tit. 23, § 875(c).

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326 ***Order WR 2021-0085-DWR***, supra note 181.

327 ***Order WR 2022-0142-DWR***, supra note 181; ***Order WR 2022-0161-DWR***, supra note 181.

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329 ***Proclamation, May 10, 2021***, supra note 129.

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332 State Water Resources Control Board, Presentation: Scott River and Shasta River Watershed Drought Response Meeting (July 1, 2021), available at URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/scott_shasta_rivers/docs/scott_shasta_drought_presentation_070121.pdf.

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353 ***Draft CDO WR 2022-0xxx-DWR***, supra note 195.

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357 **See Table 11 for citations for the items labeled here with text. Dates of curtailment status changes were drawn from** "Scott River Watershed Curtailment Orders, Addendums and Reminders," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/drought/scott_shasta_rivers/scott_addendums.html (website, last visited March 13, 2023). **Note that only dates of changes in curtailments status or the conditions for temporary suspension are shown; when successive "updates" included no changes, we did not include them in the figure. Flow data for the Fort Jones gage are from** "Scott R NR Fort Jones CA," *U.S. Geological Survey*, URL: https://waterdata.usgs.gov/monitoring-location/11519500/#parameterCode=00060&startDT=2020-10-01&endDT=2022-09-30 (website, last visited March 13, 2023). **Minimum flow required is from the emergency regulations.**

358 **See Table 11 for citations for the items labeled here with text. Dates of curtailment status changes were drawn from** "Shasta River Watershed Curtailment Orders, Addendums and Reminders," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/drought/scott_shasta_rivers/shasta_addendums.html (website, last visited March 13, 2023). **Note that only dates of changes in curtailments status or the conditions for temporary suspension are shown; when successive "updates" included no changes, we did not include them in the figure. Flow data for the Yreka gage are from** "Shasta R NR Yreka CA," *U.S. Geological Survey*, URL: https://waterdata.usgs.gov/monitoring-location/11517500/#parameterCode=00060&startDT=2020-10-01&endDT=2022-09-30 (website, last visited March 13, 2023).

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360 ***Proclamation, May 10, 2021***, supra note 129.

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363 See Cal. Code Regs. tit. 23, § 878.2.

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368 "Staff Workshop on Water Unavailability Methodology for the Delta Watershed, May 21, 2021," CA SWRCB – Web Support, *YouTube*, URL: https://www.youtube.com/watch?v=WLNROhzA5AE.

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374 State Water Resources Control Board, Resolution No. 2021-0028 to Adopt an Emergency Curtailment and Reporting Regulation for the Sacramento-San Joaquin Delta (Delta) Watershed (August 3, 2021), available at URL: https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2021/rs2021_0028_regs.pdf.

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384 State Water Resources Control Board, Presentation: Staff Workshop on Updated Water Unavailability Methodology and Draft Emergency Regulation for the Delta Watershed (May 12, 2022), available at URL: https://www.waterboards.ca.gov/drought/delta/docs/2022/20220512_workshop_ppt.pdf.

385 State Water Resources Control Board, Notice of Revised Draft Emergency Curtailment and Reporting Regulation for the Delta Watershed (June 27, 2022), available at URL: https://www.waterboards.ca.gov/drought/delta/docs/2022/notice_revised_draft_ereg_deltawatershed.pdf.

386 State Water Resources Control Board, Media Release: "Deepening drought prompts readoption of curtailment regulation for the Delta" (July 21, 2022), available at URL: https://www.waterboards.ca.gov/press_room/press_releases/2022/pr07212022-delta-emergency-regs-readoption.pdf.

387 Office of Administrative Law, In re: State Water Resources Control Board, Notice of Approval of Emergency Regulatory Action, August 12, 2022, available at URL: https://www.waterboards.ca.gov/drought/delta/docs/2022/20220812-reg-oal-approved.pdf.

388 **See Table 12 for citations for the items labeled here with text. Dates of curtailment status changes were drawn from the Weekly Updates and Curtailment Status Lists.** "Sacramento-San Joaquin Delta Watershed Drought & Curtailment Information: Delta Watershed Curtailment Status List," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/drought/delta/#tableau (website, last visited March 13, 2023). **Note that only dates of changes in curtailments status or the conditions for curtailment are shown; when successive "updates" included no changes, we did not include them in the figure. Dates of revisions to water unavailability methodology are from** "Water Unavailability Methodology for the Delta Watershed," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/drought/drought_tools_methods/delta_method.html (website, last visited March 13, 2023).

389 State Water Resources Control Board, 2021 Finding of Emergency and Informative Digest for Mill and Deer Creeks (Sept. 16, 2021), available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/20210916_ereg_finding_digest.pdf.

390 See Cal. Code Regs. tit. 23, § 876.5(c); State Water Resources Control Board, 2022 Finding of Emergency and Informative Digest for Mill and Deer Creeks (Sept. 12, 2022), available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/2022-ereg-finding-digest.pdf.

391 *Proclamation, May 10, 2021*, supra note 129.

392 See Cal. Code Regs. tit. 23, § 876.5(a), (b).

393 See Cal. Code Regs. tit. 23, § 876.5(c).

394 Cal. Code Regs., tit. 23, § 876.7(a).

395 *Ongoing Dry Conditions 2021*, supra note 73.

396 State Water Resources Control Board, Response to Proposed Outline of Key Terms for Drought Year 2021 Actions on Deer Creek (June 28, 2021), available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/20210628_letter_from_the_swrcb_exec_dir_to_svric.pdf.

397 State Water Resources Control Board, Response to Proposed Outline of Key Terms for Drought Year 2021 Actions on Mill Creek (June 28, 2021), available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/20210628_letter_from_the_swrcb_exec_dir_to_lmmwc.pdf.

398 *Proclamation, May 10, 2021*, supra note 129.

399 See sources cited supra notes 396 and 397.

400 National Marine Fisheries Service, Letter to State Water Resources Control Board Executive Director re: Emergency Drought Regulations for Listed Salmonids during the 2021 California Drought for Mill and Deer creeks in the California Central Valley (July 30, 2021), available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/20210730_letter_from_nmfs_to_the_swrcb_exec_dir.pdf.

401 California Department of Fish and Wildlife, Letter to State Water Resources Control Board Executive Director re: 2021 Drought Emergency Minimum Flow Recommendations for Mill and Deer Creeks, Tehama County (August 9, 2021), available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/20210809_letter_from_cdfw_to_the_swrcb_exec_dir.pdf.

402 State Water Resources Control Board, Notice of Opportunity for Comment: Preliminary Draft Drought Emergency Regulation for Mill Creek and Deer Creek Watersheds (Sept. 1, 2021), available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/20210901_notice_comment.pdf.

403 State Water Resources Control Board, Media Release: "State Water Board approves emergency curtailment regulation for Mill and Deer Creeks" (Sept. 22, 2021), available at URL: https://www.waterboards.ca.gov/press_room/press_releases/2021/mill-and-deer-creek-curtailment-press-release-final-9.22.21-updated.pdf.

404 Office of Administrative Law, In re: State Water Resources Control Board, Notice of Approval of Emergency Regulatory Action, October 4, 2021, available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/2021-0924-01e-approval.pdf.

405 California Department of Fish and Wildlife, Memorandum: Presence of Central Valley Steelhead on Deer and Mill Creeks Fall 2021 (October 8, 2021), available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/20211008-cdfw-steelheadpresence.pdf.

406 See sources cited supra notes 183 and 184.

407 *Ongoing Dry Conditions 2022*, supra note 74.

408 *Executive Order N-7-22*, supra note 302.

409 California Department of Fish and Wildlife, Letter to State Water Resources Control Board Executive Director re: Re-Adoption of Emergency Minimum Flow Regulations for Mill and Deer Creeks, Tehama County, Due to Continued Drought Conditions (April 11, 2022), available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/Readopt_Mill_Deer.pdf.

410 California Department of Fish and Wildlife, Letter to State Water Resources Control Board Executive Director re: Request for 72 Hour Pulse Flows in Spring 2022 to Aide Adult Spring-Run Chinook Migration in Lower Deer Creek, Tehama County (May 11, 2022), available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/20220511_CDFW_DeerCreek_PulseFlowRequest.pdf; California Department of Fish and Wildlife, Letter to State Water Resources Control Board Executive Director re: Request for 72 Hour Pulse Flows in Spring 2022 to Aide Adult Spring-Run Chinook Migration in Lower Mill Creek, Tehama County (May 11, 2022), available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/20220511_CDFW_MillCreek_PulseFlowRequest.pdf; California Department of Fish and Wildlife, Email re: Mill Creek Pulse Flow Hold (May 25, 2022), available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/20220525-cdfw-mill-creek-pulse-flow-hold.pdf.

411 State Water Resources Control Board, Email to Mill and Deer LYRIS List re: Notice - Deer Creek Pulse Flow Scheduled to Begin May 26, 2022 at 1:00 pm (May 24, 2022), available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/20220524-swrcb-deercreekpulseflow.pdf.

412 State Water Resources Control Board, Email to Mill and Deer LYRIS List re: Notice - Deer Creek Pulse Flow Scheduled to Begin June 12, 2022 at 1:00 pm (June 10, 2022), available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/20220610-deercreekpulseflow.pdf; State Water Resources Control Board, Email to Mill and Deer LYRIS List re: Notice - Mill Creek Pulse Flow Scheduled to Begin June 12, 2022 at 1:00 pm (June 10, 2022), available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/20220610-millcreekpulseflow.pdf.

413 California Department of Fish and Wildlife, Letter to State Water Resources Control Board Executive Director re: Re-Adoption of Emergency Drought Regulations for Listed Salmonids during the California Drought for Mill and Deer Creeks in the California Central Valley (June 28, 2022), available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/20220628_nmfs_memo_re-adoption.pdf.

414 See Email sent to "mill_deer_drought" LYRIS email list on June 30, 2022, with subject line "Curtailment Orders Lifted on Mill and Deer Creeks Starting July 1, 2022" (not available online).

415 State Water Resources Control Board, Notice of Proposed Emergency Rulemaking: Revision and Readoption of Emergency Actions to Establish Minimum Instream Flow Requirements, Curtailment Authority, and Information Order Authority in the Mill Creek and Deer Creek Watersheds (August 5, 2022), available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/2022-proposed-rulemaking.pdf.

416 State Water Resources Control Board, Media Release: "State Water Board readopts emergency drought regulation for Mill and Deer Creeks" (August 17, 2022), available at URL: https://www.waterboards.ca.gov/press_room/press_releases/2022/pro8172022-curtailment-regulation-readopted-mill-deer-creeks.pdf.

417 Office of Administrative Law, In re: State Water Resources Control Board, Notice of Approval of Emergency Regulatory Action, September 21, 2022, available at URL: https://www.waterboards.ca.gov/drought/mill_deer_creeks/docs/20220921-oal-approval-milldeer.pdf.

418 **See Table 13 for citations. Flow data for the Mill Creek gage below Highway 99 (CDEC MCH) are from** "Historical Data Selector," *California Data Exchange Center*, URL: https://cdec.water.ca.gov/dynamicapp/selectQuery (using Station ID: MCH and Sensor Number: 41-(daily) – FLOW, MEAN DAILY).

419 *California Water Curtailment Cases*, 83 Cal. App. 5th 164, 191 (Cal. Ct. App. 2022), as modified on denial of rehearing (Sept. 29, 2022).

420 *Stanford Vina Ranch Irrigation Co. v. State of California*, 50 Cal. App. 5th 976, 1002–03 (Cal. Ct. App. 2020)), rehearing denied (July 6, 2020), as modified (July 8, 2020), review denied (Sept. 23, 2020), cert. denied, 209 L. Ed. 2d 128, 141 S. Ct. 1387 (2021).

421 **Urban water use restrictions have also been implemented to try to make up for illegal diversions.**

422 See State Water Resources Control Board, Order Approving Temporary Urgency Change in the Matter of Permit 12947A (Application 12919A), Sonoma County Water Agency (Feb. 4, 2021), available at URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/applications/transfers_tu_orders/docs/2021/2021_SCWA_TUCP_order.pdf.

423 ***Ongoing Dry Conditions 2021***, supra note 73.

424 ***Proclamation, April 21, 2021***, supra note 129.

425 See sources cited supra note 81.

426 State Water Resources Control Board, Notice of Public Workshop on Proposed Russian River Emergency Regulation and Recently Issued Notices of Water Unavailability for the Upper Russian River Watershed (June 7, 2021), available at URL: https://www.waterboards.ca.gov/board_info/calendar/docs/2021/june/notice_russianriver.pdf; ***Russian River Media Release June 15, 2021***, supra note 295.

427 Office of Administrative Law, In re: State Water Resources Control Board, Notice of Approval of Emergency Regulatory Action, July 12, 2021, available at URL: https://www.waterboards.ca.gov/drought/russian_river/docs/rr_reg_approval_oal.pdf.

428 State Water Resources Control Board, Media Release: "Lake Mendocino water levels trigger curtailments for all water rights in Upper Russian River" (August 2, 2021), available at URL: https://www.waterboards.ca.gov/press_room/press_releases/2021/pro8022021_russian_river_curtailments.pdf.

429 "Voluntary Water Sharing Program," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/drought/russian_river/voluntary_program.html (website, last visited March 13, 2023); Water Sharing Program 2022: Upper Russian River Watershed (May 2022), available at URL: https://www.waterboards.ca.gov/drought/russian_river/docs/2022/2022-rr-water-sharing-program-factsheet.pdf.

430 See Oregon Water Resources Department, *Water Rights In Oregon: An Introduction To Oregon's Water Laws*, at 40 (2018), available at URL: https://www.oregon.gov/owrd/WRDPublications1/aquabook.pdf; Alvar Escriva-Bou, Henry McCann, Elisa Blanco, Brian Gray, Ellen Hanak, Jay Lund, Bonnie Magnuson-Skeels, and Andrew Tweet, *Accounting for California's Water Technical Appendix: Accounting for Water in Dry Regions: A Comparative Review*, at 116 (2016), available at URL: http://www.ppic.org/content/pubs/other/716EHR_appendix.pdf; see also "Klamath Basin Water Distribution Update," *Oregon Water Resources Department*, URL: https://www.oregon.gov/owrd/programs/regulation/KlamathRegulation/Pages/default.aspx (website, last visited March 13, 2023);

431 See "Administrative Calls – Active," *Colorado Division of Water Resources*, URL: https://dwr.state.co.us/Tools/AdministrativeCalls/Active (website, last visited March 13, 2023); "Administrative Calls – Historical," *Colorado Division of Water Resources*, URL: https://dwr.state.co.us/Tools/AdministrativeCalls/Historical (website, last visited March 13, 2023); see also Derek Maiolo, "Yampa River placed on call for only 2nd time in history amid 20-year drought," *Steamboat Pilot*, August 27, 2020, URL: https://www.steamboatpilot.com/news/yampa-river-placed-on-call-for-only-2nd-time-in-history-amid-20-year-drought/.

432 **For example, in Washington, water rights junior to instream flow regulations for Chehalis River basin have been curtailed frequently in recent years, and water allocations for junior water users the adjudicated Yakima basin have been restricted in more than one-third of years.** See Mike Gallagher, "Curtailments come to Chehalis River basin," June 4, 2021, *Washington Department of Ecology*, URL: https://ecology.wa.gov/Blog/Posts/June-2021/Curtailments-come-to-Chehalis-River-basin; Joye Redfield-Wilder, "Watching the water," June 11, 2019, *Washington Department of Ecology*, URL: https://ecology.wa.gov/Blog/Posts/June-2019/Some-Yakima-Basin-irrigators-water-rationed,-some; Julie A. Vano, Michael Scott, Nathalie Voisin, Claudio O. Stöckle, Alan F. Hamlet, Kristian E. B. Mickelson, Marketa McGuire Elsner, and Dennis P. Lettenmaier, "Climate Change Impacts on Water Management and Irrigated Agriculture in the Yakima River Basin, Washington, USA," Chapter 3.3 in *The Washington Climate Change Impacts Assessment: Evaluating Washington's Future in a Changing Climate*, at 136, 143 (2009), available at URL: https://doi.org/10.7915/CIG08W383. **Surface water rights are also curtailed frequently in certain watersheds in Idaho.** ***Escriva-Bou et al.***, supra note 430, at 63 (stating that, in Idaho, "[s]urface water rights are curtailed annually"); "Current Data," *Idaho Water District 1*, URL: https://www.waterdistrict1.com/current-data/ (website, last visited March 13, 2023) (showing which water right priorities are currently being filled); see also generally Tony Olenichak, *Concepts, Practices, And Procedures Used to Distribute Water Within Water District - 1: Upper Snake River Basin, Idaho* (February 28, 2020), available at URL: https://www.waterdistrict1.com/media/uabos05r/water-accounting-manual.pdf. **In Nevada, surface water right curtailments have long been accomplished through the active distribution of water in accordance with water rights and decrees.** See Hugh Shamberger, U.S. Geological Survey, & Nevada Division of Water Resources, *Evolution of Nevada's Water Laws as Related to the Development and Evaluation of the State's Water Resources from 1866 to About 1960,* at 50 (1991), available at URL: http://images.water.nv.gov/images/publications/water%20resources%20bulletins/Bulletin46.pdf; see also, e.g., Office of the State Engineer of the State of Nevada, Order No. 1329: Establishing Interim Procedures for Managing Groundwater Appropriations to Prevent the Increase of Capture and Conflict with Rights Decreed Pursuant to the Humboldt River Adjudication (December 7, 2021), available at URL: http://images.water.nv.gov/images/orders/13290.pdf (explaining how deliveries are prioritized and scheduled on a daily basis).

433 See Ed Merta, "Priority Administration," at 10-4, in *Utton Transboundary Resources Center, Water Matters!* (2015), available at URL: https://uttoncenter.unm.edu/resources/research-resources/water-matters-2015---full-pdf.pdf ("Water right owners have occasionally asked the State Engineer to implement a call—or sought court action to compel one. To date, the Engineer has usually avoided such a course in favor of alternatives, such as water sharing, or because it rained," and "curtailment of junior uses" has not occurred "for decades."); ***Escriva-Bou et al.***, supra note 430, at 94.

434 See, e.g., Colo. Rev. Stat. §§ 37-92-501(2)(e), 37-92-502(2); Idaho Code Ann. § 42-602; Or. Rev. Stat. §§ 540.045, 540.145; Wash. Rev. Code § 90.03.247; "Curtailing water use," *Washington Department of Ecology*, URL: https://ecology.wa.gov/Regulations-Permits/Compliance-enforcement/Water-use-compliance/Curtailing-water-use (website, last visited March 13, 2023).

435 See, e.g., Water Education Colorado, *Citizen's Guide to Colorado Water Law*, at 18–19 (5th ed. 2021); Colo. Rev. Stat. §37-92-502(2)(a); Walker River Irrigation District, Rules and Regulations Governing the Distribution and Use of Water, at 1–3, 9–10, 13–14 (Revised February 23, 2017), available at URL: http://www.wrid.us/WRID/rulesandregs (describing the distribution of water to and within the Walker River Irrigation District in Nevada according to water rights determined in a federal decree).

436 See Kan. Stat. Ann. §§ 82a-703a, b, c; "Minimum Desirable Streamflow," *Kansas Department of Agriculture*, URL: https://agriculture.ks.gov/divisions-programs/dwr/water-appropriation/minimum-desirable-streamflow (website, last visited March 13, 2023).

437 See Wash. Rev. Code §§ 90.22.010; 90.22.030, 90.54.020(3)(a); Wash. Admin. Code § 173-500-060; ***"Curtailing water use,"*** supra note 434; "Instream Flow Data," *Washington Department of Ecology*, URL: https://apps.ecology.wa.gov/continuousflowandwq/IRPP (website, last visited March 23, 2023).

438 **For Oregon**, see, e.g., *United States v. Adair*, 723 F.2d 1394, 1414 (9th Cir. 1983), cert. den., 467 U.S. 1252, 104 S.Ct. 3536, 82 L.Ed.2d 841 (1984) (explaining that the Klamath Tribe's water rights to support hunting and fishing "necessarily carry a priority date of time immemorial," and were "confirmed," "not created by the 1864 Treaty"); see also, generally *TPC, LLC v. Oregon Water Resources Department*, 482 P.3d 121 (Or. Ct. App. 2020). **For Washington**, see, e.g., Final Decree, State of Washington, Department of Ecology v. James J. Acquavella, et al., Yakima County Cause No. 77-2-01484-5, at 9–10 (May 9, 2019), available at URL: https://appswr.ecology.wa.gov/docs/WaterRights/wrwebpdf/yrb-finaldecree/FinalDecree.pdf; Final Schedule of Rights, State of Washington, Department of Ecology v. James J. Acquavella, et al., Yakima County Cause No. 77-2-01484-5at 2–4 (May 9, 2019), available at URL: https://appswr.ecology.wa.gov/docs/WaterRights/wrwebpdf/yrb-finaldecree/2022FSOR.pdf.

439 **Colorado is a good example.** See ***Escriva-Bou et al.***, supra note 430, at 44 (describing Colorado's curtailment process as "swift, effective, and relatively uncontroversial"); ***Water Education Colorado***, supra note 435, at 19 (describing "The Workings of a River Call").

440 **For example, in Nevada, the Office of the State Engineer is the primary entity responsible for the distribution of adjudicated waters (both surface and groundwater) in Nevada, with the exception of federally decreed stream systems.** Nev. Rev. Stat § 533.305. **However, the distribution of surface water is usually carried by others, including water commissioners appointed by the State Engineer and confirmed by the court with jurisdiction** (Nev. Rev. Stat § 533.270)**, a court-designated federal water master** (Fred W. Weldon, *History of Water Law in Nevada and the Western States*, at 6 (January 2003), available at URL: https://www.leg.state.nv.us/division/research/publications/bkground/bp03-02.pdf)**, irrigation district personnel** (Nev. Rev. Stat § 539.283)**, and people employed to regulate and operate headgates and other works for the diversion of water from a river into ditches ("river riders") and from ditches to farms ("ditch riders") as directed by a watermaster** (see, e.g., ***Walker River Irrigation District***, supra note 435, at 5–6. **For Idaho**, see Idaho Code Ann. §§ 42-602, 42-604; Idaho Department of Water Resources, *Watermaster Handbook*, at 9 (2013), available at URL: https://idwr.idaho.gov/wp-content/uploads/sites/2/districts/20130701-Watermaster-Handbook.pdf. **For Oregon**, see Or. Rev. Stat. §§ 540.010–540.045 (regarding watermasters); see also Oregon Water Resources Department, *Oregon's 2017 Integrated Water Resources Strategy*, at 135–136 (2017), available at URL: https://www.oregon.gov/owrd/WRDPublications1/2017_IWRS_Final.pdf. **For Washington**, see Wash. Rev. Code §§ 90.03.060, 90.03.070, 90.08.040 (regarding water masters and stream patrollers).

441 See, e.g., Nev. Rev. Stat §§ 533.270, 533.275; Or. Rev. Stat. §§ 540.080, 540.100–540.135; Wash. Rev. Code §§ 90.03.060, 90.08.050–90.08.070.

442 See, e.g., Idaho Code Ann. § 42-607; Nev. Rev. Stat §§ 533.305(1), (2), 533.445, 533.465; Or. Rev. Stat. § 540.045(1)(c), (d).

443 See Cal. Gov't Code § 11349.1; see also Cal. Gov't Code § 11349 (definitions).

444 See Cal. Code Regs., tit. 1, § 20; see also, e.g., *In re Dohner*, 79 Cal. App. 5th 590, 598 (Cal. Ct. App. 2022), review denied (Sept. 14, 2022).

445 State Water Resources Control Board, Order WR 2022-0147-EXEC, Denying Reconsideration, at 20–24 (May 9, 2022), available at URL: https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/orders/2022/wro2022-0147-exec.pdf (for petitions in the Delta watershed). **Other reconsideration orders include similar discussions.** See, e.g., State Water Resources Control Board, Order WR 2021-0095-EXEC Denying Reconsideration, at 10–11 (October 22, 2021) [hereinafter ***Order WR 2021-0095-EXEC***], available at URL: https://www.waterboards.ca.gov/drought/russian_river/petitions/reconsideration_order_S019769.pdf (for petitions in the Russian River watershed).

446 ***Order WR 2021-0095-EXEC***, supra previous note.

447 See id.

448 **Referencing reconsideration under** Cal. Water Code § 1122.

449 **E.g., for the Sacramento and San Joaquin watersheds**, see "Chronological Reconstructed Sacramento and San Joaquin Valley Water Year Hydrologic Classification Indices," *California Data Exchange Center*, URL: https://cdec.water.ca.gov/reportapp/javareports?name=WSIHIST (website, last visited March 13, 2023).

450 Cal. Water Code § 174.

451 Cal. Const. art. X § 2; Cal. Water Code § 275.

452 *California Farm Bureau Federation v. State Water Resources Control Board*, 51 Cal. 4th 421, 429, 247 P.3d 112, 118 (Cal. 2011), as modified (Apr. 20, 2011).

453 Cf. *Environmental Law Foundation. v. State Water Resources Control Board*, 26 Cal. App. 5th 844, 859–860, 237 Cal. Rptr. 3d 393, 403–404 (Cal. Ct. App. 2018); see also John Ugai, "Regulating with Reasonable Use: Lessons from Drought Management in the Russian River Watershed," 23 *Hastings West Northwest Journal of Environmental Law & Policy* 83 (2017), available at URL: https://repository.uchastings.edu/hastings_environmental_law_journal/vol23/iss1/15.

454 ***Managing Drought***, supra note 5; see also Brian Gray, Ellen Hanak, Richard Frank, Richard Howitt, Jay Lund, Leon Szeptycki, and Barton "Buzz" Thompson, *Allocating California's Water: Directions for Reform* (2015), available at URL: https://www.ppic.org/publication/allocating-californias-water-directions-for-reform/.

455 **For example, the term "critically dry year" has a clear meaning for the Sacramento and San Joaquin watersheds, which each has a hydrological index that defines what constitutes a "critical" water year.** See "Chronological Reconstructed Sacramento and San Joaquin Valley Water Year Hydrologic Classification Indices," *California Data Exchange Center*, URL: https://cdec.water.ca.gov/reportapp/javareports?name=WSIHIST (last visited March 13, 2023). **Similarly, the SWRCB has approved a hydrological index for the Russian River watershed that includes a "critical" condition.** See State Water Resources Control Board, Decision 1610 Approving Application in Part and Approving Petitions in Part, Sonoma County Water Agency at 14, 48 (April 1986), available at URL: https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/decisions/d1600_d1649/wrd1610.pdf.

456 **While regulations are potentially statutorily exempt if adopted to mitigate an emergency, a specific, explicit exemption for emergency rulemaking under Water Code section 1058.5 would eliminate any uncertainty.** See Cal. Public Res. Code § 21080(b)(4) ("This division does not apply to any of the following activities: . . Specific actions necessary to prevent or mitigate an emergency"); see also Cal. Code Regs. tit. 14, § 15269(c).

457 See, e.g., *Proclamation, April 21, 2021*, supra note 129, at paragraph 7.

458 **Cal. Water Code § 1841 states in full**:

(a) The board may adopt regulations requiring measurement and reporting of water diversion and use by either of the following:

(1) Persons authorized to appropriate water under a permit, license, registration for small domestic, small irrigation, or livestock stockpond use, or certification for livestock stockpond use.

(2) Persons required to comply with measurement and reporting regulations pursuant to subparagraph (B) of paragraph (1) of subdivision (e) of Section 5103.

(b) The initial regulations that the board adopts pursuant to this section shall be adopted as emergency regulations in accordance with Chapter 3.5 (commencing with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code. The adoption of the initial regulations is an emergency and shall be considered by the Office of Administrative Law as necessary for the immediate preservation of the public peace, health, safety, and general welfare. Notwithstanding Chapter 3.5 (commencing with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code, any emergency regulations adopted under this section shall remain in effect until revised by the board.

(c) The adoption of the initial regulations pursuant to this article is exempt from Division 13 (commencing with Section 21000) of the Public Resources Code.

459 **Cal. Water Code § 1530 states in full**:

(a) The board shall adopt, by emergency regulation, the schedules of fees authorized under this article. The emergency regulation may include provisions concerning the administration and collection of the fees. The fee schedules may be graduated in accordance with the number of diversions or the amount of water involved. The board shall periodically adjust the amount of the fees specified in the schedule in accordance with this article.

(b) The emergency regulations adopted pursuant to this section, any amendment thereto, or subsequent adjustments to the regulations, shall be adopted by the board in accordance with Chapter 3.5 (commencing with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code. The adoption of these regulations is an emergency and shall be considered by the Office of Administrative Law as necessary for the immediate preservation of the public peace, health, safety, and general welfare. Notwithstanding Chapter 3.5 (commencing with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code, any emergency regulations adopted by the board, or any adjustment to an annual fee made by the board pursuant to this section, shall remain in effect until revised by the board.

460 See Cal. Water Code § 1525.

461 **Cal. Water Code § 348 states in full:**

(a) The department or the board may adopt emergency regulations providing for the electronic filing of reports of water extraction or water diversion or use required to be filed with the department or board under this code, including, but not limited to, any report required to be filed under Part 5.1 (commencing with Section 5100) or Part 5.2 (commencing with Section 5200) of Division 2 and any report required to be filed by a water right permittee or licensee.

(b) Emergency regulations adopted pursuant to this section, or any amendments thereto, shall be adopted by the department or the board in accordance with Chapter 3.5 (commencing with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code. The adoption of these regulations is an emergency and shall be considered by the Office of Administrative Law as necessary for the immediate preservation of the public peace, health, safety, and general welfare. Notwithstanding Chapter 3.5 (commencing with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code, any emergency regulations or amendments to those regulations adopted under this section shall remain in effect until revised by the department or the board that adopted the regulations or amendments.

462 See Cal. Water Code §§ 348(b), 1530(b), 1841(b). **Water Code section 13149 applies a similar approach to the Department of Fish and Wildlife, allowing the Department to "establish interim requirements to protect fish and wildlife from the impacts of diversions for cannabis cultivation pending the adoption of long-term principles and guidelines by the board" by emergency regulation.** Cal. Water Code § 13149(a)(3), (b)(3)..

463 See Cal. Water Code §§ 1530(b), 1841(b).

464 *Stanford Vina Ranch Irrigation Co. v. State of California*, 50 Cal. App. 5th 976, 1002–03 (Cal. Ct. App. 2020)), rehearing denied (July 6, 2020), as modified (July 8, 2020), review denied (Sept. 23, 2020), cert. denied, 209 L. Ed. 2d 128, 141 S. Ct. 1387 (2021).

465 *California Water Curtailment Cases*, 83 Cal. App. 5th 164 (2022), as modified on denial of rehearing (Sept. 29, 2022).

466 See, e.g., ***Becker***, supra note 217.

467 Cal. Water Code §§ 1846(a)(2), 1058.5(d).

468 **The SWRCB estimated that the Shasta River Water Association diverted ~30 cubic-feet per second (cfs), or ~60 acre-feet (AF) per day, in violation of the curtailment order.** See ***ACL Complaint***, supra note 200 ("Water Board staff confirmed with the Diverter that they were diverting approximately 30 cfs, notwithstanding the curtailment under Order WR 2021-0082-DWR."). **Over a little more than 7 days, that would translate to ~420 AF of water diverted for a maximum penalty of: ($1,000/day x 8 days) + ($2,500/AF x 420 AF) = $1,058,000, an average of ~$13,000 for each of the Association's members. [NOTE: This endnote and the associated text were updated on June 16, 2023, to correct a math error that underestimated these amounts.].**

469 Clifford Lee, Jennifer Harder, Richard Frank, Barton Thompson, Tam Doduc, Holly Doremus, and Camille Pannu, *Updating California Water Laws to Address Drought and Climate Change* (Feb. 3, 2022), available at URL: https://www.pcl.org/media/2022/02/Updating-California-Water-Laws-to-Address-with-Drought-and-Climate-Change.pdf.

470 See **Box 2**.

471 Nev. Rev. Stat. § 533.305(1); see also Nev. Rev. Stat. § 533.430(2) (stating that "[u]pon any stream or stream system that has not been adjudicated and upon which the State Engineer has heretofore granted and may hereafter grant a permit or permits to appropriate water therefrom, any and all such permitted rights to the use of water so granted shall be subject to regulation and control by the State Engineer to the same extent and in the same manner as adjudicated and permitted rights upon streams and stream systems heretofore adjudicated pursuant to the provisions of this chapter").

472 See Nev. Rev. Stat. § 533.305(3).

473 Samuel C. Wiel, "Determination of Water Titles and the Water Commission Bill," 2 *California Law Review* 435–449 (1914), available at URL: https://www.jstor.org/stable/pdf/3473914.pdf; see also M. Hanemann, C. Dyckman, and D. Park "California's Flawed Surface Water Rights," in A. Lassiter (Ed.), *Sustainable Water: Challenges and Solutions for California*, at 62 (2015), available at URL: https://scholarcommons.scu.edu/econ/90/.

474 California State Water Commission, *Third Biennial Report of the State Water Commission of California, 1919–1920*, at 15 (1921), available at URL: https://digitalcommons.csumb.edu/cgi/viewcontent.cgi?article=1079&context=hornbeck_usa_3_d; see also ***Hanemann, Dyckman, and Park***, supra previous note, at 63.

475 ***ACL Complaint***, supra note 200, at 3.

476 ***Becker***, supra note 217.

477 See "State and Regional Water Boards," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/waterboards_map.html (website, last visited March 13, 2023).

478 See State Water Resources Control Board, Division of Drinking Water District Offices (July 2022), available at URL: https://www.waterboards.ca.gov/drinking_water/programs/documents/ddwem/DDWdistrictofficesmap.pdf.

479 ***Module 1 Report***, supra note 11.

480 Cal. Water Code § 85230; State Water Resources Control Board, Resolution No. 2015-0058, Delegation of Authority to the Delta Watermaster (Sept. 1, 2015), available at URL: https://www.waterboards.ca.gov/water_issues/programs/delta_watermaster/docs/rs2015_0058.pdf; "Role of the Delta Watermaster, State Water Resources Control Board, URL: https://www.waterboards.ca.gov/water_issues/programs/delta_watermaster/watermaster_role.html#RoleWatermaster (website, last visited March 13, 2023).

481 **Oregon uses a hybrid program, with regional staff overseeing watershed-based watermasters**. See "Regional Offices and Watermasters Directory," *Oregon Water Resources Department*, URL: https://www.oregon.gov/owrd/aboutus/contactus/pages/regionalofficesandwatermastersdirectory.aspx (website, last visited March 13, 2023).

482 **This program is governed by** Cal. Water Code §§ 4000–4407.

483 **See, for example, the funding model for administration and distribution of water in a watermaster service area with a court or Department of Water Resources appointed watermaster.** See Cal. Water Code §§ 4050, 4201, 4251.

484 ***Module 1 Report***, supra note 11.

485 See, e.g., ***Piloting a Water Rights Information System***, supra note 17.

486 **This recommendation draws heavily from Box 4 in** ***Module 1 Report***, supra note 11.

487 See Box 4 in ***Module 1 Report***, supra note 11; see also State Water Resources Control Board, Water Rights Workshop: Reported Data Assessment (April 20, 2021), URL: https://www.youtube.com/watch?v=LHvAWjtbnl4.

488 See Cal. Water Code §§ 1840, 1841, 5103.

489 Cal. Water Code §§ 5101(b), 5104(b); "Annual Water Diversion and Use Reporting Help," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/water_diversion_reporting/ (website, last visited March 13, 2023).

490 See Cal. Water Code § 1841.

491 Cal. Code Regs. tit. 23, § 917.

492 Id.

493 "Delta Watershed Enhanced Reporting," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/drought/delta/delta-watershed-enhanced-reporting.html (website, last visited March 13, 2023).

494 Id.

495 See Section 4 of ***2018 Part 1 Report***, supra note 10.

496 See Cal. Water Code §§ 13267, 13383.

497 See, e.g., ***2018 Part 1 Report***, supra note 10, Appendix C, Section C.4.12.2; Cal. Code Regs. tit. 23, § 879.

498 "Existing Flow Requirements," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/water_issues/programs/cannabis/existing_flow_requirements.html (website, last visited March 13, 2023).

499 See "San Francisco Bay/Sacramento – San Joaquin Delta Estuary (Bay-Delta) Watershed Efforts," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/ (website, last visited March 13, 2023).

500 See, e.g., Brian Gray, Jennifer Harder, and Karrigan Bork, "Implementing Ecosystem-Based Management," 31 *Duke Environmental Law & Policy Forum* 215-281 (2021), available at URL: https://scholarship.law.duke.edu/delpf/vol31/iss2/1; Jeffrey Mount et al., *A Path Forward for California's Freshwater Ecosystems* (2019), available at URL: https://www.ppic.org/wp-content/uploads/a-path-forward-for-californias-freshwater-ecosystems.pdf.

501 "Watershed-Wide Instream Flow Criteria," *California Department of Fish & Wildlife*, URL: https://wildlife.ca.gov/Conservation/Watersheds/Instream-Flow/Watershed-Criteria (website, last visited April 13, 2022).

502 "The California Environmental Flows Framework," *CEFF UC Davis*, URL: https://ceff.ucdavis.edu/ (website, last visited March 23, 2023).

503 See State Water Resources Control Board, *Instream Flow Studies for the Protection of Public Trust Resources: A Prioritized Schedule and Estimate of Costs*, at 7–23, 26 (2010), available at URL: https://www.waterboards.ca.gov/publications_forms/publications/legislative/docs/2011/instream_flow2010.pdf (identifying 138 high-priority rivers and streams for instream flow studies at an estimated cost of approximately $140 million by 2018).

504 See id. at 5.

505 "Water Board's Role in Drought," *State Water Resources Control Board*, URL: https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/water_boards_role.html (last visited April 13, 2022).

PHOTO CAPTIONS

All photos are from the California Department of Water Resources.

Cover: Low water levels at Lake Mendocino, a reservoir in Mendocino County, October 13, 2021, 2021_10_13_FL_Lake_Mendocino_0078.jpg.

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Middle: Aerial view of farmland and urban development along the Sacramento River in Sacramento County, October 1, 2015, 2015_10_01_KG_0018_Delta_waterways.JPG. *Bottom:* Aerial view of intertie pipeline between the California Aqueduct and the Delta-Mendota Canal, Alameda County, April 20, 2012, PJH_Intertie-076.jpg.

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