



ENVIRONMENTAL WATER CAUCUS

Crafting a Sustainable Water Plan for California

History, Context,
and Recommendations

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Executive Summary

California is at a crossroads. Intensifying impacts from climate change are straining the state's infrastructure, diminishing the resilience of the environment, and reducing quality of life for its population of nearly 40 million people. During the past two decades the state has experienced two extreme droughts, increasingly devastating wildfires, higher average temperatures and more extreme heat than ever before. In addition, the long-term trends for major flood events, aridification, and sea level rise are well documented and will compound existing harms.

The state's current patchwork of water law and policy is not adequate to provide healthy communities, ecosystems, and reliable food security in an era of increasing climate extremes. **Surface water has been vastly over-allocated, groundwater use has been under-regulated, and laws intended to safeguard the environment and public health remain unenforced.** Indeed, the Bay-Delta Watershed is already in a state of ecological collapse and hundreds of thousands of people still lack safe and accessible drinking water while agriculture and forestry contribute 7 percent of statewide greenhouse gas emissions.

There is a more equitable way to build economic and ecological stability. Just as the state is transitioning away from fossil fuels and toward a decarbonized grid, the state can transition away from harmful agricultural practices and toward revitalized ecosystems and reliable access to adequate supplies of clean water. But incremental measures, such as those proposed by the current administration¹, will not redress the ongoing harms to communities and ecosystems. We need a comprehensive approach rooted in environmental and economic justice, and responsive to climate change.

The Environmental Water Caucus (EWC) has a plan for addressing the state's water crisis. The plan is based on three fundamental goals:

- 1) Implementing and enforcing a water distribution system that prioritizes the ecological health of the Bay-Delta Watershed, and the human right to water.
- 2) Prioritizing food security and equitable allocation of agricultural water along with urban conservation and utilization of local supplies.

¹ See <https://resources.ca.gov/-/media/CNRA-Website/Files/Initiatives/Water-Resilience/CA-Water-Supply-Strategy.pdf>, accessed October 5, 2022.

- 3) Transitioning away from large storage and conveyance projects, and toward conservation, efficiency, and ecological restoration.

EWC recognizes the state is obligated by law to repair historical injustices, undo current inequities, and prevent future disproportionate impacts on tribes and disadvantaged communities. The state has taken important steps in recent years to redress historical racism and more equitably allocate resources, including a law that requires formal tribal consultation.² But institutional racism remains embedded in many state laws and policies, including those associated with the water rights system, operations of state and federal water projects, and groundwater management. We cannot achieve a fair and secure future for all Californians without confronting and remedying the injustices hobbling our existing systems.³

Likewise, a sustainable future requires transformation of the state's agricultural sector. It must include a net reduction in irrigated land, prioritization of food system security, support for small farmers, and public investment in alternate economic development and job creation. Although there has been some research on converting agricultural land to other uses (such as renewable energy), these studies have not analyzed the scale of change necessary to revitalize the Bay-Delta Watershed.⁴ EWC recommends the adoption of a state agricultural policy that identifies the specific actions necessary for achieving these actions in tandem with agricultural water delivery reductions.

The state must also evaluate the benefits associated with ecosystem restoration. These benefits, including recreation, fishing, energy conservation (from reduced pumping),

² AB 52 (2014) created requirements for Tribal consultations within California Environmental Quality Act (CEQA) processes. AB 3121 (2020) created a Reparations Task Force. SB 535 (2012) created investment requirements for projects in disadvantaged communities within the state's greenhouse gas reduction fund. Multiple state agencies, including the Transportation agency, Air Resources Board, Public Utilities Commission, and State Water Board are or have developed racial equity plans and policies. The state's Strategic Growth Council maintains a website with resources for state agencies developing racial equity plans. See: <https://www.sgc.ca.gov/programs/racial-equity/>, accessed October 5, 2022.

³ See: <https://www.restorethedelta.org/wp-content/uploads/2022-05-24-Petition-for-Rulemaking-FINAL.pdf>, accessed September 28, 2022, and <https://www.pcl.org/media/2022/02/Updating-California-Water-Laws-to-Address-with-Drought-and-Climate-Change.pdf>, accessed October 5, 2022, for documentation of how the water rights system is built on a foundation of violence against Native Americans and continues to perpetuate injustices. See: <https://www.communitywatercenter.org/sgmaresources>, accessed October 5, 2022, for multiple analyses of how the structure and implementation of the Sustainable Groundwater Management Act is not protecting access to drinking water in contravention of the Human Right to Water law.

⁴ See, for example, publications from the Public Policy Institute of California, such as: <https://www.ppic.org/publication/land-transitions-and-dust-in-the-san-joaquin-valley/>, accessed October 5, 2022, and <https://www.ppic.org/publication/exploring-the-potential-for-water-limited-agriculture-in-the-san-joaquin-valley/>, accessed October 5, 2022.

flood attenuation, water quality, and tribal uses often get overlooked in discussions about impacts to livelihoods and current farming economies. It is also time to abandon infrastructure projects that cannot pass a full benefit-cost evaluation. In the transportation sector, it is well-known that traffic increases in lockstep with the addition of new highway lanes.⁵ Likewise, adding water storage and conveyance infrastructure increases demand for water⁶ without necessarily increasing supply. EWC opposes proposals to raise Shasta Dam, build a Delta tunnel and create new reservoirs such as Sites and Temperance Flat because they are the water equivalent of adding highway lanes. Instead of using bond funds and ratepayer dollars for these projects, we should fund ecologically responsible farmland retirement, habitat restoration, non-agricultural jobs in the Central Valley, and urban conservation and supply diversification.

While urban water use has been declining due to conservation behaviors, installation of efficient appliances and fixtures, and, in some cases, price signals, there is still opportunity for additional reductions in use, particularly in the suburban communities of the Southern Bay Area and Southern California that receive State Water Project water. In addition, there is significant untapped potential for boosting local supplies to reduce reliance on imported water sources.⁷ EWC supports stronger regulations and progressive funding for diversified urban water supplies, including, conservation; recycled water; stormwater capture and reuse; publicly-owned, environmentally sustainable, small-scale desalination, and groundwater cleanup. In particular, EWC recommends state policy directing the Metropolitan Water District of Southern California to meet targets for imported water reductions, support increased use of local supplies, and ensure goals pertaining to the human right to water are met within its service area.

When the state's human right to water law was passed in 2012, it did not include the resources and authority necessary to achieve its goals. However, in the past decade, multiple laws have been passed that have augmented the original law's funding, regulatory authority, and data and analysis requirements; these supporting laws have led to significant increases in the number of people with access to safe drinking water.⁸

⁵ Duranton, Gilles, and Matthew A. Turner. 2011. "The Fundamental Law of Road Congestion: Evidence from US Cities." *American Economic Review*, 101 (6): 2616-52.

⁶ Di Baldassarre, G., Wanders, N., AghaKouchak, A., Kuil, L., Rangelcroft, S., Veldkamp, T.I.E., Garcia, M., Van Oel, P.R., Breinl, K., and Van Loon A.F. (2018). Water shortages worsened by reservoir effects. <https://www.nature.com/articles/s41893-018-0159-0>, accessed October 5, 2022.

⁷ <https://pacinst.org/publication/california-urban-water-supply-potential-2022/>, accessed October 5, 2022.

⁸ See: Ved P. Nanda, *The Human Right to Water: Challenges of Implementation*, 50 U. Pac. L. Rev. 13 (2018).; https://www.waterboards.ca.gov/drinking_water/safedrinkingwaterplan/docs/SDW-HR2W-FS-2021-web.pdf, accessed October 5, 2022; and <https://iwaponline.com/wp/article/23/5/1189/83931/Monitoring-the-human-right-to-water-in-California>, accessed October 5, 2022.

While the state does not have an environmental right to water law, it does have the 2009 Delta Reform Act, the 2014 Sustainable Groundwater Management Act, and numerous constitutional and statutory requirements that safeguard the public trust, protect endangered species, allow for fish passage, maintain water quality, and restrict wasteful and unreasonable use.

In sum, these laws and statutory requirements constitute a potent legal framework for maintaining healthy freshwater ecosystems; to be effective, they simply must be enforced. To date, such enforcement has been lacking.

The EWC recommendations below identify tangible actions the state legislature, state agencies, and the state and federal courts should take to enforce existing law, equitably allocate resources, and provide clear authority and direction to state and federal agencies tasked with managing water resources. EWC is committed to a robust legal strategy to hold state and federal agencies accountable through the courts; in accord with other environmental and social justice organizations, we also advocate vigorously at state and federal the legislatures and regulatory agencies.

Policy and Legal Recommendations and Desired Outcomes

Reducing Diversions from the Bay-Delta Watershed

LEGISLATURE

- Direct the State Water Board to submit a report on an equitable transition of the water rights system
 - Authorize a budget allocation through water rights fees to form a unit dedicated to an equitable transition of the water rights system
- Direct the State Water Board to adopt a policy with specific actions to recognize and assure tribal beneficial uses
- Establish goals and timelines for the Metropolitan Water District of Southern California to reduce use of the State Water Project water (and Colorado River water)

- Provide additional funding for:
 - Urban conservation and supply diversification
 - Economic transition
 - Habitat restoration

DEPARTMENT OF WATER RESOURCES (DWR)

- Consider a range of reasonable alternatives to the Delta Conveyance Tunnel Project including no-tunnel and export reducing alternatives including the Policy Recommendations and Desired Outcomes set forth in this Plan
 - Reduce deliveries from the State Water Project (SWP) and the Central Valley Project (CVP) down to 3 MAF over the next 5-10 years
 - Abandon infrastructure projects such as the Delta tunnel and new reservoirs and instead of using bond funds and rate payer dollars for these projects, develop and fund water conservation, water recycling, ecologically responsible farmland retirement including drainage-impaired lands, and other such modern measures
 - Renegotiate Table A allocations in the SWP contracts to reflect safe yield water availability, climate change analysis, and allocation of public trust resources

STATE WATER BOARD

- Adopt a time schedule order for reducing deliveries from the SWP and CVP down to 3 MAF over the next 5-10 years
 - Adopt Conclusions of Law that the public trust doctrine supersedes existing contract allocations (e.g., Settlement Exchange Contractors)
 - Declaration of climate change emergency and allowance for continuous annual use of emergency regulations to curtail senior water rights ahead of a proposal to redo the water rights system
- Submit a report to the State Legislature on an equitable transition of the water rights system

STATE COURTS

- Make findings and conclusions of law that:
 - The State Water Board has not fulfilled its legal duties to uphold the public trust doctrine
- Issue orders that:
 - Require the State Water Board to complete the following by June 2024, with non-compliance resulting in court supervision
 - Update the Bay-Delta Water Quality Control Plan
 - Adopt public trust policy to:
 - Prohibit Temporary Urgency Change Petitions and water transfers that do not protect public trust resources
 - Define “surplus water” in the context of climate change and the protection of public trust resources

FEDERAL COURTS

- Make findings and conclusions of law that:
 - The Bureau of Reclamation and the Army Corps of Engineers are subject to state law requirements for fish passage over, around, or through dams
 - US Public Law 84-99 standards for Delta levees are inadequate in light of climate change
- Issue orders that:
 - The Bureau of Reclamation and the Army Corps of Engineers must come into compliance with fish passage requirements by June 2027, with non-compliance resulting in court supervision

Transforming Agriculture in the Central Valley

LEGISLATURE

- Direct the State Water Board, after consultation with relevant agencies and community stakeholders, to submit a report to the legislature on a plan to reduce total irrigated land by up to 3 million

acre-feet to protect public trust resources, eliminate waste and unreasonable use, and achieve the human right to water. In drafting the report, the State Water Board shall incorporate recommendations from its report on an equitable transition of the water rights system

- Provide funding for economic development, including:
 - Job training
 - Regenerative agriculture
 - Renewable energy
 - Drinking water infrastructure and operations
 - Habitat restoration and recreation
- Add two voting members to the State Water Board, appointed by the Legislature, with expertise in environmental justice
- Direct DWR to renegotiate the Table A allocations in the State Water Project contracts to reflect safe yield water availability, including a climate change analysis
- Make findings and conclusions that:
 - The transfer of the Kern Water Bank was illegal under the public trust doctrine
- Issue orders to:
 - Return the Kern Water Bank to the state for the sole purpose of public trust protection and human right to water compliance
 - Mandate that the State Water Resources Control Board issue regulations to manage inflows and withdrawals from the Kern Water Bank

STATE WATER BOARD

- Submit a report on reducing total irrigated land beginning with the drainage impaired lands south of the Delta

FEDERAL COURTS

- Direct the Bureau of Reclamation to renegotiate all Central Valley Project contracts to reflect climate change water availability analysis

Urban Water Management

LEGISLATURE

- Require urban water agencies to adopt stronger conservation rate structures, consistent with Proposition 218
- Place an initiative on the 2024 ballot to reform Proposition 218 to allow to direct rate assistance to low-income households
- Fund direct installation of water conservation fixtures and devices for disadvantaged communities
- Require the Metropolitan Water District to ensure equitable cost allocation and assume responsibility for achieving the Human Right to Water goals within its service area

STATE WATER BOARD

- Adopt strong standards for urban water use efficiency that place the greatest conservation responsibility on households and businesses that use the most water and have the most financial capacity

STATE COURTS

- Make findings and conclusions that:
 - Urban water agencies that do not charge large users commensurate with their strain on infrastructure and water supply are in violation of Proposition 218's cost-of-service requirements
- Issue orders that:
 - The State Water Board shall oversee rate setting for agencies failing to comply with Proposition 218

Ending the Era of Destructive Storage and Conveyance Infrastructure

LEGISLATURE

- Allocate all future funding for water projects to the State Water Board
- Require State Water Board review and approval of all CEQA documents created by the Department of Water Resources

- Prohibit the Department of Water Resources from funding positions not related to the operation of the State Water Project from State Water Project funds

STATE WATER BOARD

- Deny permits to current proposed storage and conveyance projects as inconsistent with maintaining the public trust and related statutory requirements

STATE COURTS

- Make findings and conclusions that:
 - Current proposed storage and conveyance projects, namely, Sites Reservoir and the Delta tunnel, are inconsistent with state laws relating to the protection of environment

FEDERAL COURTS

- Make findings and conclusions that:
 - Federal agencies must operate storage and conveyance facilities consistent with state public trust regulations

EWC's full report details both the policies that must be undone and those that must be acted upon and enforced to build a more equitable and resilient future. These policies are feasible alternatives to the perpetuation and of community and ecological harms from projects designed to maintain unsustainable diversions from the Bay-Delta Watershed. We know the right thing to do: the only question now is whether we have the political will to do it.

The Environmental Water Caucus

This document represents decades of research, collaboration, and public advocacy. Formed in 1991 by David Nesmith, The Environmental Water Caucus (EWC) is a coalition of environmental organizations working toward sustainable and equitable water policy in California. United by a strong opposition to the water export model of The Delta Plan, the EWC first submitted an alternative plan in 2010. The plan was updated in 2017 in response to the Twin Tunnel Project, and now in 2022 in response to the single tunnel Delta Conveyance Project.

It is the position of the EWC that not all impacts of the Delta Conveyance Project have been taken into account, not all alternatives adequately explored, nor all existing laws appropriately considered.

Aqualliance

California Sportfishing Protection Alliance

California Striped Bass Association

California Water Impact Network

Center for Biological Diversity

Desal Response Group

Environmental Justice Coalition for Water

Environmental Protection Information Center

Fly Fishers International

Friends of the River

Institute for Fisheries Resources

Pacific Coast Federation of Fishermen's Associations

Planning and Conservation League

Sacramento River Council

Save the American River Association

Sierra Club California

Southern California Watershed Alliance

Crafting a Sustainable Water Plan for California

History, Context, and Recommendations

December 2022

“The supply of water is the primary resource battleground for the twenty-first century.”¹

JAMES G. WORKMAN

The consensus diagnosis for the Delta’s future is dire. To speed recovery of this critical West Coast watershed, the EWC prescribes greater river flows and reduced water exports. Our proposal specifies the actions that must be taken to prioritize the needs of the environment, communities, and small farmers; increase oversight and transparency, and equitably allocate costs. These criteria and recommendations could well decide the fate of the Delta – and the millions of Californians who live with water insecurity.

A Vision for Undoing Historical and Ongoing Harms

Our current water infrastructure was based on excessively optimistic assumptions about water supply volume and reliability.² This error was compounded through water allocation laws that instituted and reinforced inequitable diversions.

¹ From *The Heart of Dryness* by James G. Workman

² On the Colorado River, for example, it is well documented that the allocations between the basin states and Mexico vastly overestimated water availability. See: https://www.inkstain.net/colorado_river/, accessed October 11, 2022, and <https://pubs.er.usgs.gov/publication/sir20185049>, accessed October 11, 2022. Likewise, the recent history of State Water Project allocations demonstrates that planners were overoptimistic about the amount of water available for diversion. See: <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Management/SWP-Water-Contractors/Files/1996-2022-Allocation-Progression-083022b.pdf>, accessed October 11, 2022.

It didn't have to be this way. At the beginning of the 20th century, excessive and inequitable water rights claims led to legal challenges by state residents. The California State Legislature responded in 1913, passing the Water Commission Act – the first attempt to administer new surface water rights. However, the act also gave legal cover for pre-1914 water rights, many of which were established through white settlers' illegal and violent land-taking from Native Americans.³ Fifteen years later, voters amended the California Constitution following a state Supreme Court decision (*Herminghaus v. Southern Calif. Edison, 200 Cal. 81 (1926)*) that prioritized water use by certain rights claimants regardless of “reasonableness.” This landmark constitutional amendment stipulated that all water use in California must be “reasonable” and “beneficial.”

But, as the state grew, the letter and spirit of this amendment were never realized. California's water management is still deeply inequitable and ultimately unsustainable. Major water projects, including the State Water Project and the Central Valley Project, were developed and operated to benefit large agriculture and cities at the expense of the environment and small communities. The historical and ongoing harms are well documented, and contemporary legislation, including the 2009 Delta Reform Act, the 2012 Human Right to Water Act, and the 2014 Sustainable Groundwater Management Act have created frameworks and intent to improve conditions for disadvantaged communities and the environment. However, these laws do not eliminate some of the institutional arrangements that allow for damaging and unsustainable water use. EWC's focus is on the decisions and practices that must be revoked or transformed to achieve an equitable and resilient water management system.⁴ Specifically, EWC recommends the following:

- Eliminate irrigation of drainage-impaired farmlands south of the Bay-Delta
- Reduce or eliminate water transfers from the Sacramento Valley through the Delta to the San Joaquin Valley
- Undo the destructive provisions of the Monterey Amendments to the State Water Project
 - Return the Kern Water Bank to state control

³ See: <https://www.restorethedelta.org/wp-content/uploads/2022-05-24-Petition-for-Rulemaking-FINAL.pdf>, accessed September 28, 2022.

⁴ As explained in the Executive Summary, the water rights system must be eliminated and replaced with an equity-oriented allocation system. Elaborating a plan for that transition is not addressed in this document.

- Eliminate the surplus water provisions in the State Water Project contracts
- Return the “urban preference” (Article 18a)
- Restore the safeguard against “paper water” (Article 18b)
- Set and enforce water quality standards for the entire Bay-Delta watershed and cap Delta exports at 3 million acre-feet per year
- Create new policies for sustainable and equitable groundwater management
- Fund and implement comprehensive habitat restoration, fish passage, and upper watershed management programs

Eliminate Irrigation of Drainage-Impaired Farmlands South of the Bay-Delta

The Central Valley Project (CVP) has been supplying water to approximately 1.3 million acres of drainage-impaired land on the west side of the San Joaquin Valley since the late 1960s. The San Luis Act of 1960 requires a drain system as a condition of approval for the San Luis Unit CVP contracts, including the Westlands Water District. Initially, the U.S. Bureau of Reclamation planned to build a San Luis Master Drain that would transport drainage water from the irrigated units to the Bay-Delta, but the project was stopped after 93 miles of infrastructure were completed; the terminus was Kesterson Reservoir. By the early 1980s, thousands of migratory birds were dying from selenium poisoning at Kesterson due to toxic drain water.

Selenium, arsenic, boron, molybdenum, mercury and numerous other toxic salts and minerals are concentrated in the soils of the large portions of the San Joaquin Valley. Descriptions of these impaired soils are presented in the 1990 joint federal and state analysis popularly known as *The Rainbow Report*.⁵ In 2007, the United States Geological Survey estimated that it would take 65 to 300 years to eliminate the selenium deposited in San Joaquin Valley groundwater by agricultural activity even if the San Luis Drain were completed and irrigation of the San Luis Unit of the CVP halted. Further, completion of the drain would increase the risk to fish and wildlife in the

⁵ U.S. Department of the Interior, California Resources Agency. September 1990. A Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley. P. 2-3.



A crew pumps selenium-laden water out of the concrete-lined San Luis Drain into a field near Tranquility, California, in the 1980s as part of a previous cleanup project for selenium-contaminated farm runoff that poisoned birds at the Kesterson National Wildlife Refuge. (The Fresno Bee)

Bay-Delta, given it would result in the annual discharge of 42,500 pounds of selenium to the estuary.⁶

While farmers and water districts throughout the western San Joaquin Valley have been trying to reduce their drainage water, much remains to be done. Retiring impaired lands on the Westside of the Valley from irrigated agriculture is a cost-effective and reliable option available for eliminating harmful discharges to our surface water and aquifers. Any approach that is not based on land retirement will likely result in the increased concentration of selenium and salts in the shallow aquifers of the San Joaquin Valley, where they will be mobilized during flood events and groundwater transport. Eliminating or greatly reducing irrigation on these impaired lands would save up to two million acre-feet of water annually.⁷

Taking these tainted “badlands” out of agricultural production would reduce demand for Delta water diversions and greatly improve water quality in the San Joaquin River. A staged program of land retirement and associated drainage volume reduction

⁶ Presser, Theresa S., and Samuel N. Luoma. 2007. Forecasting selenium discharges to the San Francisco Bay-Delta Estuary: Ecological effects of a proposed San Luis Drain Extension. The US Geological Survey, Professional Paper 1646. Abstract P. 1. <http://pubs.usgs.gov/pp/p1646/>, accessed October 25, 2022.

⁷ Pacific Institute. 2008. More with Less: Agricultural Water Conservation and Efficiency in California. See: <https://pacinst.org/publication/more-with-less-agricultural-water-conservation-and-efficiency-in-california-special-focus-on-the-delta/>, accessed November 16, 2022.

actions also would mitigate impacts to the farm labor community resulting from reduced cropland acreage. As noted in *The Rainbow Report*, these lands ultimately will go out of land production, even if irrigation continues. Further irrigation simply accelerates drainage impairment. Solar energy arrays – ideally supported by state and/or federal incentives – are a far more reasonable and productive use of these impaired croplands.⁸

Reduce Water Transfers

Water transfers via market transactions have been used since the early 1900s to ameliorate “inflexibilities” in water rights priorities – i.e., “first in time, first in right.” Such transfers are most evident to the public during drought years, when junior rights holders such as the Central Valley Project and the State Water Project endure cutbacks as more senior water rights holders exert their priority over the available water. Junior water rights holders typically obtain more surface water by offering to purchase water directly from willing sellers – usually senior water rights holders. There are three ways this is accomplished:

- Crop shifting
- Fallowing
- Groundwater substitution

Fallowing and groundwater substitution have been the usual methods for water sellers. The U.S. Bureau of Reclamation and the California Department of Water Resources oversee fallowing and groundwater substitution transfers, but these methods are hobbled by an inadequate monitoring, mitigation, and reporting process; this means the environmental and economic impacts of the associated transfers are not readily apparent.⁹

Fallowing exerts negative impacts on downstream stakeholders and wildlife dependent on tailwater, as well as on local economies – but these downside effects are not

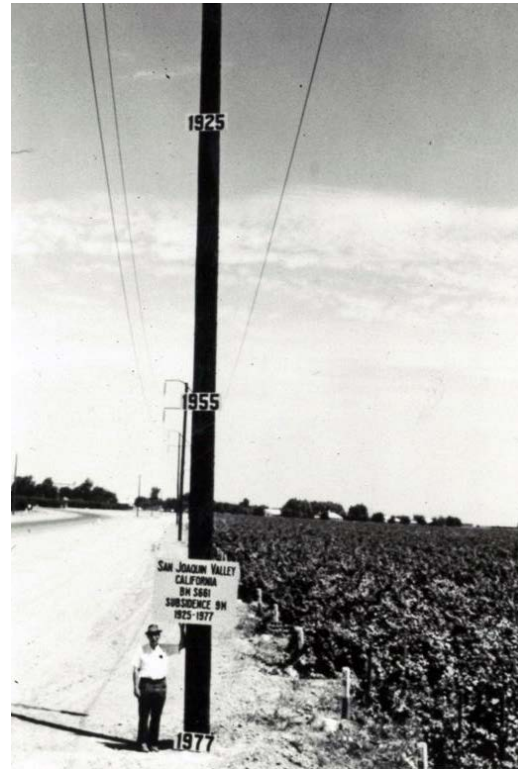
⁸ See: <https://www.latimes.com/business/la-fi-agriculture-farmlands-solar-power-20190703-story.html>, accessed October 14, 2022, for a description of solar projects built and planned on impaired farmland.

⁹ DWR Water Transfer White Paper (December 2019), available at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Management/Water-Transfers/Files/Draft-WTWhitePaper_20191203.pdf, accessed October 11, 2022. See also, Table 3-1 “Description of County Ordinances Related to Groundwater Substitution Transfers,” available at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Management/Water-Transfers/Files/Table3-1_County_Ordinances_GWSubs_Transfers_Ver1_021121.pdf, accessed October 11, 2022.

quantified, given the deficiencies in monitoring and reporting.¹⁰ Groundwater substitution occurs when surface water is sold, and groundwater is pumped to maintain crop production (usually rice). The agencies know that the most immediate and significant impacts from these transfers are felt by neighboring well users, streams and rivers, and the fish and wildlife dependent on rivers and riparian lands.¹¹ In sum, the current monitoring, analysis, and public reporting of the impacts of water transfers based on fallowing and groundwater substitution are wholly inadequate and mitigation measures are deficient.

While water transfers are intended to address water rights priority imbalances, they may also result in declining groundwater levels, overdraft (i.e., pumping outpacing the rate of aquifer recharge), land subsidence (sinking land surface elevation due to aquifer collapse resulting from over pumping), negative impacts to groundwater-dependent native vegetation, aquifer storage capacity loss associated with land subsidence, and accelerating stream flow losses due to falling groundwater tables.

All these phenomena have been observed in the Santa Clara Valley, the San Joaquin Valley, and in multiple groundwater basins in the greater Los Angeles region. They typically combine to destabilize formerly healthy hydrologic systems, and they are the result of the “conjunctive use” strategies that underpin state and federal water policy.¹² They must not be repeated in the Sacramento Valley, where groundwater already is in a depleted state (see Table 1, next page).



San Joaquin Valley land surface elevations have been sinking for as long as California has been pumping groundwater, as seen in this well-known image of USGS scientist Joseph Poland near Mendota. (Public Domain)

¹⁰ USBR and San Luis Delta Mendota Water Authority 2014. Final Environmental Assessment/Mitigated Negative Declaration for the 2014 San Luis/Delta Mendota Water Authority Water Transfers.

¹¹ Ibid.

¹² See: <https://www.usgs.gov/publications/enhancing-drought-resilience-conjunctive-use-and-managed-aquifer-recharge-california>, accessed October 14, 2022, for a description of the ongoing support for conjunctive use strategies.

Deep Wells (Max decrease gwe)

County	FALL '04 - '18	FALL '04 - '17	FALL '04 - '16
Butte	-36.4	-13.9	-28.3
Colusa	-42.6	-67.2	-66.4
Glenn	-141.4	-166.3	-65.8
Tehama*	-47.6	-44.0	-35.8

Intermediate Wells (Max decrease gwe)

County	FALL '04 - '18	FALL '04 - '17	FALL '04 - '16
Butte	-23.8	-22.1	-28.3
Colusa	-61.5	-62.4	-78.9
Glenn	-62.7	-51.5	-58.3
Tehama*	-34.0	-35.0	-29.3

Shallow Wells (Max decrease gwe)

County	FALL '04 - '18	FALL '04 - '17	FALL '04 - '16
Butte	-14.7	-10.8	-18.3
Colusa	-50.8	-51.8	-51.7
Glenn	-63.8	-58.7	-59.6
Tehama*	-31.5	-28.9	-36.3

* Tehama County portion in the Sacramento Valley groundwater basin.

TABLE 1
NORTHERN SACRAMENTO GROUNDWATER CHANGES

Maximum and average groundwater elevation decreases for the Sacramento Valley's Butte, Colusa, Glenn, and Tehama Counties; measurements were taken for three aquifer levels between the fall of 2004 and the fall of 2013.¹³

Annual transfers (frequently called “temporary” or “one year” transfers) occur congruently with the State Drought Water Bank Program, which is sometimes activated during drought years. These combined sales of Sacramento Valley surface water to South-of-Delta buyers cause two significant hydrological problems: First, the water that is sold must be transported through the Delta to the massive CVP and SWP export pumps, a process that degrades Delta ecosystems generally and is responsible for extensive fish kills. Second, landowners who sell their surface water may then pump

¹³ Groundwater elevation data is available through the California Statewide Groundwater Elevation Monitoring (CASGEM) Program. CASGEM data is available through a public portal located at: <https://water.ca.gov/Programs/Groundwater-Management/Groundwater-Elevation-Monitoring--CASGEM>, accessed October 11, 2022.

groundwater to irrigate their crops; this can cause groundwater tables to drop precipitously, adversely affecting all users, ecosystems, and all regional bodies of water.

The Sacramento Valley's surface waters, economy, ecology, and aquifer structure are highly dependent on natural groundwater abundance. All these values and resources are in dire jeopardy because of the state's conjunctive use programs. Accordingly, no additional water should be exported from north of the Delta. Such a policy would protect the Delta from new export pumping impacts and provide long-term protection of the Sacramento Valley's groundwater supplies.

Implementation of this proposed policy is the only way the Sacramento Valley's aquifers, which are already facing increasing subsidence (see Figure 1) and loss of contribution to streamflow¹⁴ and GDEs can be protected from the catastrophic groundwater depletion that has afflicted the aquifers of the San Joaquin Valley. In addition, water transfers should be taxed to fund the oversight necessary to ensure that Water Code requirements are met.

The Water Code states that transfers employing the facilities of any state, regional or local agency must meet certain criteria that are confirmed by the facility owners, including¹⁵:

- Water transfers cannot adversely affect any other legal water user
- Transfers cannot harm fish and wildlife
- Transfers may not have unreasonable negative economic impacts on the overall economies of the counties that are their origin points

Unfortunately, while the State Water Board process requires written findings regarding transfer requests, the Board is not required to hold hearings to determine that transfers meet these criteria, leaving only litigation as a compliance mechanism. EWC supports new legislation to require the Board to conduct a hearing with written testimony and witnesses and issue a decision with a finding of facts and conclusions of law prior to approving any transfers.

There are far better ways to manage California's water than maintaining maximum north-to-south Delta exports. As described throughout this report, EWC maintains

¹⁴ Per testimony of Dan Wendell from the Nature Conservancy as reported in Maven's Notebook, see <https://mavensnotebook.com/2014/04/28/groundwater-management-workshop-part-1-sustainable-groundwater-management-panel/>, accessed October 20, 2022.

¹⁵ Water Code Sections 386 and 1725 through 1737.

that the most sustainable and equitable water policies include retiring marginal land, prioritizing water for food security, and investing in ecosystem management that builds climate change resilience.

Accordingly, EWC makes the following recommendations regarding water transfers:

LEGISLATURE

- Adopt legislation to:
 - Require the State Water Board to hold hearings and make findings on water transfer applications
 - Authorize the State Water Board to collect fees from transfer applicants to cover the hearing costs
 - Levy a tax on approved water transfers and direct funds to be used for ecosystem restoration projects in the region where the water is being transferred
 - Make a policy declaration that no additional water should be exported from the Sacramento Valley to users South of the Delta and direct the State Water Board to require CEQA analysis for serial “annual” transfers by sellers
 - Provide funds for the State Water Board to hire sufficient personnel to administer expeditious and fair hearings on water transfer applications

STATE WATER BOARD

- When reviewing water transfer applications for compliance with Water Code section 1727(b)(1) and (2) (see text below), make a comprehensive assessment of potential impacts including:
 - The potential for consecutive years of extreme dryness during the transfer period
 - Impacts to domestic wells
 - Impacts to tribal beneficial uses
 - A determination that likely harm to fish and wildlife is unreasonable

Water Code section 1727 states:

(a) The board shall review a petition for a temporary change of water rights in accordance with this section.

(b) The board shall approve a temporary change if it determines that a preponderance of the evidence shows both of the following:

(1) The proposed temporary change would not injure any legal user of the water, during any potential hydrologic condition that the board determines is likely to occur during the proposed change, through significant changes in water quantity, water quality, timing of diversion or use, consumptive use of the water, or reduction in return flows.

(2) The proposed temporary change would not unreasonably affect fish, wildlife, or other instream beneficial uses.

Undo the Destructive Provisions of the Monterey Amendments to the State Water Project

The Monterey Amendments changed major provisions of the original State Water Project, ultimately resulting in increased exports from the Delta. This excessive pumping has undermined the ecological health and stability of the Delta, degrading water quality for the region’s family farms, threatening commercial and sport fisheries, and impairing wildlife habitat.

These destructive impacts are a direct result of four provisions in the Monterey Amendments:

- The elimination of Article 18a, aka, the “urban preference”
- The elimination of Article 18b, the safeguard against “paper water”
- The change of orientation for Article 21, or “surplus water”
- The privatization of the Kern Water Bank

To mitigate the damage caused by the Monterey Amendments, the following changes should be made to the SWP. These adjustments will reduce reliance on the Delta¹⁶,

¹⁶ For background on the Monterey Amendments, see: <https://www.c-win.org/the-monterey-amendments/>, accessed, October 14, 2022. For a review of the unsuccessful legal challenges to the Monterey Amendments, see: <https://www.californialandusedevelopmentlaw.com/2022/01/10/after-27-years-litigation-over-the-monterey-agreement-comes-to-an-end/>, accessed October 18, 2022.



Pumps at the Kern Water Bank. (© Chris Austin)

confirm public trust doctrine protections for our most essential resource, and enhance water security for urban ratepayers:

- “Paper water” must be eliminated. The state has failed to quantify the amount of water that is available under varying precipitation scenarios, and it has also neglected to bring user water allocations in line with supplies. As a result, each time the state faces consecutive drought years, despite minimal SWP allocations (e.g., 5%) and curtailments in some watersheds, reservoirs reach dangerously low levels, fish die, and increased groundwater pumping leads to dry domestic wells and additional land subsidence. “Paper water” cannot be justified in state water policy, nor sustained in the physical transport and use of water.
- The Kern Water Bank must be returned to the public. Originally, this aquifer was a public asset: it underlies land purchased by the California Department of Water Resources in the 1980s for the creation of a drought emergency water supply for California ratepayers. In a highly inappropriate move, it was transferred to private interests as part of the Monterey Amendments. This decision must be reversed. The Kern Water Bank must be returned to the ownership and operational control of the state and managed for its original purpose: providing water to south-of-Delta urban water users during drought.
- The urban preference must be reinstated; California must return to its original doctrine of prioritizing water access for people rather than corporate agriculture.

- The pumping of Article 21 water – also known as “surplus water” – must be curtailed. Article 21 implementation is unnecessary as effective water policy, and it is profoundly damaging to the fisheries and ecology of the Bay-Delta watershed – especially during dry years. The pumping and transport of Article 21 water should never be permitted during drought. EWC Recommendations:

LEGISLATURE

- Pass legislation requiring the Department of Water Resources to conform all future amendments to the State Water Project contracts with the following policy goals:
 - Revise allocations downwards to reflect long-term aridification from climate change
 - Return the Kern Water Bank to state ownership
 - Elimination of Article 21 “surplus” allocations in all but the wettest years
 - Prioritize supply for urban and domestic users
- The legislation should also require State Water Board concurrence on all future State Water Project amendments

STATE WATER BOARD

- Evaluate all proposed State Water Project amendments to ensure terms and project operations will protect public trust resources
- Adopt regulations setting rules for operation of the Kern Water Bank once it is returned to state ownership

Set and Enforce Water Quality Standards in the Bay-Delta Watershed that Cap Delta Exports at 3 Million Acre-Feet per Year

The federal Clean Water Act and the state Porter-Cologne Water Quality Control Act both stipulate that California’s water quality control plans are intended to improve water quality – not simply maintain it. However, the operational history of the state and federal water projects and the awarding of excess water allocations has resulted in deteriorating water quality and ecosystem health over the past six decades.

Since at least 1960, Department of Water Resources staffers knew it would be impossible to convey more than 3.2 million acre-feet of water from the Delta without the contribution of North Coast Rivers.^{17 18} All the evidence since then validates contemporary state policy of reducing reliance on the Delta for water supplies. It also confirms that any export level above 3 million acre-feet annually for all water year types is imprudent.

Moreover, data presented to the State Water Board during 2012 hearings on updating the Bay-Delta Water Quality Control Plan showed that water allocations exceeded water availability during “normal” years by a factor of five.¹⁹ Updating the Water Quality Control Plan for the Delta is an ongoing process. The current iteration began in 2009 with a staff report that identified issues requiring extended analysis. Notably, the Board’s own report concluded Delta flows were indeed too low and that exports probably were too high to sustain declining fish populations. The report stated that “...flow and physical habitat interact in many ways, but they are not interchangeable...” and that “...scientific certainty is not the standard for agency decision making.”²⁰

Work on the Water Quality Control Plan is proceeding through four phases²¹:

Phase One: Establish flow standards for the San Joaquin River and its major tributaries and evaluate South Delta salinity standards.

Phase Two: Set standards for Sacramento River inflow, Delta inflow, Delta outflow, and Delta/Suisun Marsh water quality.

Phase Three: Incorporate the revised standards into water rights permits via evidentiary hearings.

¹⁷ California Department of Water Resources. 1960. Bulletin 76 Delta Water Facilities. Water Sources and Uses Table, Page 11.

¹⁸ Ibid

¹⁹ Testimony on Water Availability Analysis submitted by Tim Stroshane (C-WIN) before the State Water Resources Control Board, October 26, 2012. P. 11. See: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/comments111312/tim_stroshane.pdf, accessed October 25, 2022.

²⁰ http://www.swrcb.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/final_rpt.shtml, accessed October 25, 2022.

²¹ Information about the State Water Board’s process is available on its website: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/, accessed October 21, 2022. A valuable description of the history of actions (and inaction) on the water quality control plan(s) is contained in the petition filed by Restore the Delta, Tribes, and environmental justice advocates requesting that the State Water Board expeditiously complete a rulemaking to review and revise the Bay-Delta water quality standards. The petition, request for reconsideration, and State Water Board responses are available on Restore the Delta’s website at: <https://www.restorethedelta.org/2022/09/23/ca-state-water-board-issues-denial-of-request-for-reconsideration-on-delta-plan-implementation/>, accessed October 21, 2022.



Spring Chinook salmon. (Michael Bravo)

Phase Four: Establish instream flows for the Sacramento River’s major tributaries.

As with many planning processes, exigent events, and politics – including drought response – have intervened with the Water Quality Control Plan efforts, resulting in delays. In December 2018, the State Water Board adopted water quality standards with increased environmental flow requirements for the Lower San Joaquin River watershed (Phase 1). However, implementation of those standards was put on hold while the Newsom administration attempted to facilitate voluntary agreements for increased flows and habitat restoration.

When those voluntary agreements failed to produce significant commitments, the State Water Board re-started its regulatory implementation process in July 2022²². In October 2022, the U.S. Fish and Wildlife Service proposed adding the San Francisco Bay population of longfin smelt to the endangered species list, marking yet another grim milestone in the decline of the Bay-Delta ecosystem.²³

The EWC is committed to a total annual Delta water export figure of 3 million acre-feet or less. This baseline must apply to all state and federal export policies, projects, and operations – including any new Delta conveyance project. When exports exceed

²² See: https://www.waterboards.ca.gov/public_notices/notices/20220715-implementation-nop-and-scoping-dwr-baydelta.pdf, accessed October 18, 2022.

²³ See: <https://fws.gov/press-release/2022-10/service-seeks-public-comment-proposed-listing-san-francisco-bay-population>, accessed October 18, 2022.

the 3 million acre-feet figure, any meaningful restoration of the Delta’s ecology and fish populations effectively becomes impossible.

State policy as framed in every proposed Delta conveyance project – from the peripheral canal to the current single tunnel – promotes a fallacy: it’s somehow possible to increase exports while simultaneously restoring ecosystems and fish species.

The potential export capacity of the current single tunnel proposal could match the existing combined capacity of the Delta’s federal and state pumps.²⁴ The single tunnel thus continues the current and unsustainable approach to Delta water management. Moreover, its \$16 billion price tag constitutes a huge opportunity cost. That money could fund a significant amount of physical and social infrastructure to transition agricultural and urban water use to more resilient levels and reduce the growing risk of flooding and salinity intrusion from climate change. EWC recommendations:

LEGISLATURE:

- Update the Delta Reform Act of 2009 to:
 - Adopt state policy to reduce Delta exports to 3 million acre-feet per year by 2030
 - Prohibit the Department of Water Resources from spending money on additional planning for new Delta conveyance infrastructure
 - Direct the State Water Board to incorporate this policy in the Bay-Delta Water Quality Control Plans
- Provide funding and set a statutory deadline for the State Water Board to adopt the Bay-Delta Water Quality Control Plans

STATE COURTS

- Make findings that the Environmental Impact Report for the single tunnel project (the Delta Conveyance Project) did not sufficiently analyze the No Project Alternative pursuant to California Environmental Quality Act requirements

²⁴Chapter Two of the Draft EIR for the single tunnel project, known as the Delta Conveyance Project, states that DWR is proposing the project to “restore and protect the reliability of State Water Project water deliveries ...”. The Draft EIR is available at: <https://www.deltaconveyanceproject.com/read-the-document>, accessed October 21, 2022.

- Order that the state courts may need to oversee the completion of the Water Quality Control Plans if the State Water Board does not complete its update by a specified date

Equitable and Sustainable Groundwater Management

The EWC has long supported public groundwater management over the construction or expansion of additional surface storage facilities. We've also advocated for mandatory reporting of groundwater pumping and for the implementation of sustainable practices for groundwater management and utilization. In addition, EWC supports utilizing access to safe and reliable domestic supplies and groundwater dependent ecosystem health as keystone criteria in defining "sustainable" levels of pumping.

The legislature took an important step toward these goals with the Sustainable Groundwater Management Act of 2014 (SGMA). SGMA authorizes the establishment of "groundwater sustainability agencies" (GSAs) to manage local groundwater basins. The legislature granted broad discretionary powers to these agencies, including the authority to allocate groundwater supplies among users within their boundaries and to regulate, limit or suspend groundwater extractions.

GSAs may adopt rules, regulations, ordinances, and resolutions related to groundwater management, and they have broad powers over groundwater monitoring, the operation of established wells, and the construction and function of new wells. They may levy fees to fund the cost of sustainability programs, including permit fees, groundwater extraction fees and ad valorem property taxes.

The Act applies to groundwater within 515 basins identified throughout the state by the California Department of Water Resources.²⁵ DWR has categorized each of these basins as high, medium, low, or very low priority. The 94 basins designated as high or medium priority, along with the 26 adjudicated basins, account for 98% of total groundwater pumping (20 million acre-feet).²⁶

The GSAs are required to develop sustainability plans for all high- and medium-priority basins within their respective jurisdictions; DWR reviews each plan to ensure it meets sustainability goals. If, after a GSA is given the opportunity to cure deficiencies

²⁵ The Act does not apply to 26 basins – most in Southern California – that were previously adjudicated by the courts.

²⁶ See: <https://water.ca.gov/Programs/Groundwater-Management/Basin-Prioritization>, accessed October 12, 2022.



Ivan Rubio of Self-Help Enterprises checks the water level of a well at a home. (Matt McClain/The Washington Post)

in a sustainability plan, DWR determines that a sustainability plan is inadequate, the State Water Board may place the basin on probationary status and adopt an interim plan of the Board’s own creation.²⁷ Broadly speaking, the 2040 deadline for achieving sustainable pumping is too long – especially given the worrisome status of the medium- and high-priority basins, critical overdraft areas, and the ongoing reliance on substantial groundwater pumping as surface water supplies shrink due to climate change.

The Department of Water Resources recently released its statutory reviews of plans for 10 of the Central Valley’s 11 critically overdrafted basins. DWR judged them to be incomplete because the submitted plans failed to satisfy the objectives of the Act.²⁸

Some plans underestimated the extent of overdraft in their basins, and the need for solutions, while most of the plans appeared overly optimistic about the potential for new supplies to meet demand. There is a clear reluctance on the part of some agencies to seriously consider managing the demand side, including access for domestic wells, with most or exclusive emphasis placed on increasing supply.²⁹ Some plans allow aquifer level operational ranges that are significantly lower and wider than historical

²⁷ A summary of SGMA can be found on “Dark Clouds Over California”, a blog by Wes Strickland <http://privatewaterlaw.com/2014/11/19/dark-clouds-over-california/>, accessed October 13, 2022.

²⁸ Information on DWR’s assessment of Groundwater Sustainability Plans can be found on its SGMA portal at: <https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management>, accessed October 12, 2022.

levels and even suspend level goals during dry years. These plans jeopardize shallow domestic wells and groundwater dependent ecosystems (GDE).³⁰

There have been several well-documented critiques of SGMA's deficiencies³¹, and even former State Senator Fran Pavley, one of the SGMA authors, has stated publicly that the Act is inadequate as a response to California's rapidly changing climate.³² EWC shares in these critiques and makes the following recommendations for improving and expediting SGMA implementation with a focus on equity and environmental restoration.

LEGISLATURE

- Update SGMA to:
 - Ensure equity on GSA Boards
 - Accelerate compliance timelines and provide a quicker route to state control and more stringent requirements to exit state control for non-compliant GSAs
 - Allow for automatic state takeover for inability to protect domestic and GDE uses
 - Direct the State Water Board to adopt a regulation with mandatory restrictions on pumping in areas with documented subsidence
 - Ensure that SGMA GSPs do not supersede local ordinances that oversee groundwater substitution transfers.
- Pass legislation that creates a new framework for managed aquifer recharge
 - Create a water use priority system for stored water with the

²⁹ See comment letters from State Water Board staff to the Department of Water Resources on various groundwater sustainability plans: https://www.waterboards.ca.gov/water_issues/programs/sgma/gsp-comment-letters.html, accessed October 12, 2022.

³⁰ See: <https://aqualliance.net/solutions/litigation/northstate-groundwater-pumping-threats-provoke-law-suits/>, accessed October 19, 2022, for a description of lawsuits filed based on Groundwater Sustainability Plans allowing for excess pumping and inoperable domestic wells.

³¹ See, for example: <https://static1.squarespace.com/static/5e83c5f78f0db40cb837cfb5/t/5f3ec0c82c478a6bfc59e68a/1597948109576/Groundwater-Management-and-Safe-Drinking-Water-in-the-San-Joaquin-Valley-Brief-6-2020.pdf>, accessed October 12, 2022, and: <https://civicwell.org/civic-news/sgma-small-farmers/>, accessed October 12, 2022.

³² See: <https://www.latimes.com/environment/story/2021-12-16/its-a-race-to-the-bottom-for-agricultural-wells>, accessed October 12, 2022.

highest priority for domestic and environmental uses including GDEs.

- Direct funding to areas with greatest capacity to recharge aquifers used for domestic and environmental protection purposes
- Require funding awards be contingent upon groundwater management operations that do not perpetuate damaging pumping levels
- Prohibit GSAs from using aquifer level operation ranges designed to create storage space for recharge projects.
- Require enforceable intergovernmental agreements that prevent GSAs that manage “sub-basins” from operating in ways that thwart achieving aquifer-wide sustainability and equity goals
- Codify that the State Water Board’s public trust responsibilities extend to groundwater management

STATE COURTS

- Court rulings that the State Water Board has final authority over groundwater management as part of its constitutional and statutory responsibilities to uphold the public trust and prevent waste and unreasonable use

STATE WATER BOARD

- Adopt regulations for administration of groundwater basins that:
 - Prioritize management on behalf of domestic well users, small farmers, and groundwater dependent ecosystems
 - Issue clear timelines for reducing unsustainable extractions and create meaningful penalties for violating those timelines
 - Prohibit privatization of recharge projects
 - Prohibit conjunctive use recharge projects designed to integrate Sacramento Valley aquifers into the Central Valley wide water supply system

Fund and Implement Comprehensive Habitat Restoration, Fish Passage, and Upper Watershed Management Programs

In the 2009 Delta Reform Act, the legislature declared that the Delta watershed was in crisis and existing policies were unsustainable. While additional freshwater flows are critical to Delta watershed health, there is also a need for significant additional habitat restoration. Landscape-scale habitat networks are the only way to accommodate the full life cycles of many species.³³

A comprehensive approach to habitat restoration includes measures to improve upper watershed function, such as forest thinning, meadow restoration, more cold water retention, and enhanced fish passage, along with lower watershed improvements to floodplains, improved fish screens and non-physical barriers. In addition to habitat restoration projects, the state should direct greater resources toward Delta levee reinforcement to reduce seismic and flood risks.

These actions all have well-documented benefits beyond those associated with ecosystem health. For example, forest thinning and prescribed burns using Indigenous knowledge provide significant reductions in impacts from catastrophic wildfires, while floodplain restoration provides flood risk reduction. For a full description of these actions and their benefits, see Appendix A.

Although, habitat restoration and flood management projects carry a large price tag, the state has invested large sums over the past decade. Moreover, the state will likely continue to make significant funding available since these projects are generally less politically fraught than proposals to reduce water deliveries. The need for greater funding is yet another reason why the Delta Conveyance Project (single tunnel) should be abandoned. The opportunity cost of the project's \$16 billion price tag is fewer resources available for furthering the Human Right to Water and habitat and flood management projects.

To maximize the environmental and community benefits of habitat and levee projects, EWC recommends the following:

LEGISLATURE

- Set policy goals for state-funded restoration projects, including:
 - Habitat linkage

³³ See: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18366&inline>, accessed October 25, 2022, for a detailed description of California habitat connectivity information.



As part of the Pacific Flyway bird migration route, the Delta is an ecosystem of national and international significance. (Bob Wick)

- Floodplain restoration with:
 - Levee removal or setbacks where possible
 - Levee re-vegetation with native flora
- Upper watershed restoration within Integrated Regional Water Management Plans and through agreements with federal land management agencies
- Direct the State Water Board, in consultation with dam owners and other stakeholders, to develop a cost estimate and timetable for creating fish passage above all Central Valley rim dams
- Direct the Department of Water Resources to install enhanced fish screens and non-physical barriers at the intake zones for the South Delta export facilities
- Continue to fund habitat restoration projects in annual budget appropriations
- Conduct oversight hearings to ensure state agencies are funding projects in accordance with state policy goals

STATE WATER BOARD

- Require reporting by dam owners on compliance fish passage requirements
- Adopt regulations to maintain adequate cold water pool reserves

Transforming California’s Agricultural Sector

California’s 8-9 million irrigated acres generate over \$50 billion per year.³⁴ Under the EWC plan, total irrigated acreage would likely decrease by at least 2 million acres.³⁵ While a disorderly transition could create price shocks and significant economic impacts in the San Joaquin Valley, an orderly transition can maintain high productivity, food security, employment in both agriculture and new industries (i.e., renewables), and other benefits, such as improvements in air quality.

Fundamental to achieving the goal of returning water to ecosystems while maintaining a vibrant agricultural sector is the reallocation of water and an equity-based approach to financial incentives. Eliminating the water rights system, creating equitable groundwater management, retiring marginal land, and incentivizing the growing of fruits, vegetables, and grains for human consumption would support core agriculture while reducing water-intensive investments in nuts, animal feed, and cotton.

As the OnThePublicRecord blog has argued, allocating water to the most productive farmland (generally on the East side of the Central Valley) to grow “table food” would minimize the risk of food shortages while ensuring that water is not taken from the environment in dry years to grow nuts.³⁶ Moreover, as other analyses have documented, there are numerous agricultural water use efficiency measures, which, if widely

³⁴ According to USDA, California had 7.8 million irrigated acres in 2017. See: <https://www.ers.usda.gov/topics/farm-practices-management/irrigation-water-use/>, accessed October 24, 2022. However, some estimates of total irrigated acreage are higher. For example, the 2019 water fact sheet published by the Public Policy Institute of California states that over 9 million acres are irrigated. See: <https://www.ppic.org/wp-content/uploads/jtf-water-use.pdf>, accessed October 25, 2022. According to the California Department of Food & Agriculture, 2021 total agricultural output was \$51.1 billion. See: <https://www.cdffa.ca.gov/Statistics/>, accessed October 24, 2022.

³⁵ This is a rough estimate based on reducing total Delta exports and more restrictions on groundwater pumping. It is also consistent with other expert estimates. See: <https://onthepublicrecord.org/2015/12/14/2434/>, accessed October 25, 2022, for a comparison of estimates.

³⁶ See <https://onthepublicrecord.org/2022/05/19/our-leaders-do-not-have-the-courage-and-vision-to-fix-this/>, accessed October 24, 2022.

used (and without utilizing the saved water elsewhere), could result in conversation savings of 10-20% of total agricultural water use.³⁷

In housing policy, decades of barriers to building set by local governments has resulted in a housing crisis. Over the past decade state leaders have finally recognized the need for greater usurpation of local powers to increase housing production and the legislature has passed several bills that reduce or override local decision making. Unfortunately, in the water sector, deference to local control is still the default policy position. Until the state exercises greater control over agricultural production and water use, we risk escalating ecologic crisis and growing food insecurity as more acreage is converted to nuts and grapes.

EWC supports the development of a state agricultural policy, which would map out how to achieve a smooth transition toward a more sustainable and equitable future. The policy should be developed concurrently with the water and habitat management actions listed in this report.

Urban Conservation and Equity

While there is still further potential to reduce urban water use and invest in supply diversification to reduce reliance on imported water³⁸, current state policy reflects an over-emphasis on urban water use relative to total water use.³⁹ EWC supports equitable cost allocation for urban water conservation and supply diversification investments, including expanded economic analysis to demonstrate how urban ratepayers would benefit from forgoing payment for the single tunnel project.

As codified in the state's Human Right to Water Act, keeping water safe, clean, accessible, and affordable for people is the highest policy priority.⁴⁰ EWC supports the environmental justice organizations working toward that goal. The recommendations

³⁷ See: Pacific Institute. California Water 2030: An Efficient Future. September 2005. http://www.pacinst.org/reports/california_water_2030/ca_water_2030.pdf, accessed October 24, 2022. Also see: National Resources Defense Council, et al. Wetter or Not. November 2014. <https://www.nrdc.org/resources/wetter-or-not-actions-ease-current-drought-and-prepare-next>, accessed, October 24, 2022.

³⁸ The Pacific Institute has written multiple reports documenting urban water conservation potential. See: <https://pacinst.org/water-efficiency-and-reuse/>, accessed October 25, 2022.

³⁹ The Newsom administration's approach to water management relies heavily on supply augmentation and urban water investments and contains minimal detail on reducing agricultural water use. See: <https://resources.ca.gov/-/media/CNRA-Website/Files/Initiatives/Water-Resilience/CA-Water-Supply-Strategy.pdf>, accessed October 25, 2022.

⁴⁰ California Water Code, Section 106.3

in this report draw from, and are complementary to, environmental justice advocacy goals, as they would improve equity in groundwater management, reduce affordability burdens associated with financing large infrastructure, and improve water quality for disadvantaged communities in the Central Valley.

In Conclusion

California is at an existential tipping point: our very future depends on the management of our water resources. The accelerating impacts of climate change have made the natural limits of our water supplies obvious. Simultaneously, the profound inequities of our current water policies are receiving greater visibility and creating urgent calls for change. Our policy makers must come to grips with the dire threats we face, and they must act.

The proposals contained in this report are more efficient, equitable, and economically sound than new dams, reservoirs, and canals. California needs a water system that provides sufficient water for people, fish and wildlife, and sustainable agriculture. We know the right thing to do: the only question now is whether we have the political will to do it.

Appendix A: Habitat Restoration, Fish Passage, and Levee Improvements

Restore Floodplains

One integral part of Delta watershed restoration is revitalizing floodplains. Floodplains are extremely productive ecosystems that support high levels of biodiversity and provide numerous valuable ecosystem services.¹ Riverine floodplains consist of relatively level areas on both sides of a given stream bed that transport excess water during flood events. When a flood occurs, the floodplain becomes an expanded part of the stream.

This allows flood waters to spread out and slacken, expending downstream energy and velocities, reducing the risk to human life and minimizing damage to buildings and infrastructure. If a channel is narrowed, dredged, or riprapped, the floodplain cannot perform its proper function. Downstream flows are accelerated and concentrated, resulting in levee breaches or wholesale collapse, and damage becomes widespread. Channelization and dredging also destroy wildlife habitat, including sandbars and islands.

Floodplains also support wetlands that slow and filter water, improving water quality. These wetlands provide habitat for a broad variety of wildlife and serve as nurseries and foraging areas for fish. Other floodplain benefits include groundwater recharge, water filtration, and recreation. All these services and benefits underscore the extremely high monetary value of healthy floodplains.

To function properly, floodplains must flood periodically. By storing floodwaters over a broad landscape, floodplains recharge groundwater supplies, maintain proper in-stream flows, prevent bed/bank scour, sequester organic carbon, and support a broad suite of aquatic species essential to both local ecosystems and economies.²

Unfortunately, functional floodplains have been reduced dramatically in California by levees, dams, flood control projects, and general development. To reverse these losses,

¹ Postel, Sandra. Richter, Brian. 2003. *Rivers for Life*. Island Press. P 20-21. <https://islandpress.org/books/rivers-life>.

² Sommer T.R., Nobriga M. L., Harrell B., Batham W., Kimmerer W. J. 2001. Floodplain rearing of juvenile Chinook salmon: evidence of enhanced growth and survival. *Canadian Journal of Fisheries and Aquatic Sciences*. P. 325-333. https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/cmnt091412/sldmwa/sommer_et_al_2001a.pdf

a variety of agencies and organizations have devoted significant resources to restore floodplains as part of a larger effort that also addresses flood risk reduction.

Ongoing hydrologic impacts from climate change, including stronger atmospheric rivers and accelerated spring snow melts are increasing flood risk.³ Connecting natural floodplains to their rivers and proscribing future floodplain development are essential to community security and ecological sustainability.

The following actions must be incorporated in all floodplain restoration strategies:

- Removing or setting back levees from riverbanks wherever possible to allow floodwater dispersal across historic floodplains
- Where levee removal or setback is not possible, levees should be revegetated with native flora to provide maximum ecosystem benefits.
- Prioritizing the purchase of floodplain or flowage easements by flood control agencies
- Banning all new levee construction in floodplains
- Integrating the needs of low-income communities affected by floodplain restoration plans, ensuring that all impacts are fully mitigated

Invest in Healthy Headwaters and Meadow Restoration

There is a clear recognition among agencies and organizations concerned with water policy that we must do more to manage our headwaters systems for multiple benefits, including improved water quality, improved water supplies, and healthy ecosystems.⁴ Persistent drought and high temperatures associated with climate change are producing consistently bigger and more destructive Sierra wildfires, with devastating effects on water supplies, fish, and wildlife habitat.

Investments in ecologically sound forest management should therefore be a high priority with both state and federal agencies. In addition to the quantified benefits of stable and resilient watersheds, effective headwater management can reduce wild-fire and flood impacts; minimize erosion and sediment loss; improve water quality;

³ See: <https://pubmed.ncbi.nlm.nih.gov/35960799/>, accessed October 25, 2022.

⁴ See: https://waterinthewest.stanford.edu/publications/state_climate_policy_and_nature-based_solutions, accessed October 25, 2022.

improve human health by reducing illnesses associated with polluted air and water; and reduce insect pests.

Better headwater and meadow management can provide myriad benefits, including improvements in the natural water supply volume and storage; protection of existing supplies; improvements in natural water percolation; improvements in runoff water quality due to reduced silt and ash deposition; protection of fish and wildlife inhabiting upstream and headwaters areas; enhanced recreational opportunities; reduced damage and monetary loss to public and private properties located in headwater areas; protection of the scenic values of headwater habitats; and reduction of CO₂ in the atmosphere due to carbon sequestration in headwater and meadow plants and soil.

EWC will continue to advocate for:

- Implementation of catastrophic wildfire risk reduction projects across the Sierra Nevada and Cascade ranges, including prescribed burns, forest thinning, and the conservation and enhancement of summer base flows in forested streams, meadows, wetlands, and springs.
- Ongoing documentation of the significant groundwater storage benefits and dry year surface water benefits of forested watersheds, specifically those that connect to groundwater sources in the Delta and existing surface storage facilities. Given the high value of these watersheds, they warrant priority in any catastrophic wildfire risk reduction and ecology enhancement plans.
- Incorporating headwater and meadow management plans into local Integrated Regional Water Management Plans (IRWMPs). All relevant resource agencies should function as active stakeholders in IRWMPs, including the U.S. Forest Service, the California Department of Water Resources, the U.S. Bureau of Reclamation, and the California Department of Fish and Wildlife.

Reinforce Core Levees Above Current Standards

The EWC accepts and fully supports the Delta Protection Commission's 2012 recommendation to *"... improve many core Delta levees beyond the Public Law (PL) 84-99 standard that addresses earthquake and sea level rise risks, improve flood fighting and emergency response, and allow for vegetation on the water side of levees to*

*improve habitat....*⁵ (The Delta Stewardship Council’s current recommendations for levee upgrades are less protective and carry a lower price tag).⁶

Improving most core Delta levees to this higher standard was estimated to cost between \$2 to \$4 billion.⁷ Given that the Delta serves as a water source and water conveyance facility for much of California, there is a justifiable public interest in providing public funds to Delta reclamation districts and other Delta stakeholders for levee upgrades. To protect their water supplies, water exporters must identify all levees within their jurisdictions that require upgrades to higher standards (e.g., greater earthquake resistance). Delta counties and communities should be assisted in their efforts to comply with federal flood protection and emergency management programs.

Public safety and flood protection must remain the top priority for the State Plan for Flood Control and all associated levees and bypasses. Levees should be vegetated with native flora to aid in structure stabilization and the support of endangered species.

Earthquake risks to levees are cited as a major justification for Delta conveyance projects and the current single tunnel project is no different. However, given the costs between levee strengthening (\$2 to \$4 billion) and a new trans-Delta conveyance (\$16 billion), there is clear incentive for the state to initiate levee reinforcement immediately; such a program would negate the “catastrophic levee failure” justification for a new conveyance.

Install Improved Fish Screens at Existing Delta Pumps

As noted in a 2010 report, the fish protection facilities at the South Delta pumps – including fish screens and salvage systems – remain largely unchanged since they were first engineered more than 40 years ago.⁸ Currently, only between 11% to 18% of the salmon and steelhead entrained in the Clifton Court Forebay survive. Numerous studies by DFW, DWR, and academic researchers indicate that 75% of fish entering

⁵ Economic Sustainability Plan for the Sacramento-San Joaquin River Delta, January 19, 2012. See: <https://delta.ca.gov/wp-content/uploads/2021/05/Delta-Economic-Sustainability-Plan-2012-508.pdf>, accessed October 25, 2022.

⁶ See: <https://deltacouncil.ca.gov/pdf/dlis/2022-08-26-dsc-initial-statement-of-reasons-rrp1.pdf>, accessed October 25, 2022.

⁷ Economic Sustainability Plan for the Sacramento-San Joaquin River Delta, January 19, 2012, page 57.

⁸ Larry Walker Associates. A Review of Delta Fish Population Losses from Pumping Operations in the Sacramento-San Joaquin River Delta. January 2010. P. 2. See: <https://calsport.org/news/wp-content/uploads/2011/07/LarryWalkerfishlosses.pdf>, accessed October 25, 2022.

Clifton Court forebay are lost to predation. Of the survivors, 20% to 30% are lost at the salvage facility louvers, one percent to 12% are lost during handling and trucking, and 12% to 32% are lost to post-release predation.⁹ Losses of other species (such as Delta smelt), salmon fry, and the egg and larval stages of multiple pelagic species are believed to be even higher. Some species – including endangered Delta smelt – cannot survive salvage and transport; their losses approach 100%.

According to the draft report for the earlier dual tunnel proposal (the Bay-Delta Conservation Plan), South Delta export facilities may increase the entrainment of:

- Juvenile steelhead in dry and critical years
- Juvenile winter-run Chinook salmon in above normal and below normal years
- Juvenile fall-run Chinook salmon in all below normal and dry years
- Fall-run Chinook smolts in all years
- Juvenile late fall-run Chinook salmon in dry and critical dry years
- Juvenile longfin smelt in above normal, below normal, and dry years
- Adult longfin smelt in critical dry years
- Juvenile Sacramento splittail in all years¹⁰

DWR's 2011 *Delta Risk Management Strategy (DRMS) Phase 2 Report* found that the South Delta's pumping facilities could be successfully mitigated by installing in-canal vee-type screens with a 2,500 cubic feet per second capacity for each module. Placed at the entrance to the Clifton Court Forebay, such state-of-the-art screens would eliminate the ongoing predation of 75% of the Forebay's fish species of concern and protect fish longer than 25mm in length.¹¹

New screens would be expensive, and they would not eliminate the need for the transport of salvaged fish, completely resolve debris removal issues, or eliminate all fish

⁹ Ibid

¹⁰ ICF International. BDCP Effects Analysis, Entrainment, Appendix 5.B, Entrainment, Administrative Draft Bay Delta Conservation Plan. March 2012. PP. B.7-2 – B.7-4.

¹¹ DWR. Delta Risk Management Strategy, final Phase 2 Report, Risk Report, Section 15, Building Block 3.3: Install Fish Screens. June 2011. P. 15-18. DWR has removed the report from its website, however, a summary can be found at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/strategic_plan/comments/080319_strwp_dwr_ab1200report.pdf, accessed October 25, 2022.

entrainment. They would, however, dramatically reduce the appalling fish losses that currently occur at the export facilities.¹²

Modernization of the fish screens at the South Delta pumps is an essential component of the EWC's Sustainable Water Plan; the South Delta pumps will remain as the primary diversion facilities under this plan.

EWC supports applying the best available technology to the development and installation of modernized fish screen systems at the South Delta facilities and at all other existing in-Delta diversions. This effort would also include the installation of positive barrier fish screens on all diversions greater than 250 cubic feet per second in the Sacramento and San Joaquin River Basins, as well as installing the same devices on a significant percentage of the smaller unscreened diversions operating in the same regions.

An alternative course is the use of non-physical barriers to deter fish from entering the intake zones of the South Delta pumps. Non-physical barriers include the following methods:

- Electrical barriers
- Strobe lights
- Acoustic fish deterrents
- Bubble currents
- Velocity barriers
- Chemical toxicants
- Pheromones
- Magnetic fields

The U.S. Bureau of Reclamation has logged some research results on the use of non-physical barriers.¹³ Given the necessity of restoring fish populations through reduced mortality at the pumps, the feasibility of these alternative fish exclusion options must be thoroughly investigated.

¹²Id. 15.5.2.1 Conclusion at PP. 15-19 & 15-20.

¹³ Bureau of Reclamation. Non-Physical Barrier (NPB) for Fish Protection Evaluation: Can an Inexpensive Barrier Be Effective for Threatened Fish? <http://www.usbr.gov/research/projects/detail.cfm?id=8740>, accessed October 25, 2022.

Provide Passage for Fish Species of Concern Above and Below Central Valley Rim Dams

Dams have been a major factor – in many cases the prime mover – in the decline or extinction of numerous fish species, especially anadromous species. Anadromous fish migrate to and from rivers and the ocean, and they must have access to prime upper river habitats for spawning and rearing young fish¹⁴. Before the turn of the century, every Central Valley salmon and steelhead run went extinct, became endangered, or was in precipitous decline due to the habitat destruction and degradation caused by dams.¹⁵ The most serious fishery impact of California’s major dams is the blockage of migratory fish passage. More than 95% of the historic salmon and steelhead spawning habitat in the Central Valley’s River systems have been eliminated by large dams¹⁶; no significant river has escaped unscathed.

Figure 1 (next page) illustrates the long-term downward trend for Central Valley Chinook salmon. It is obvious that salmonids are doomed to extinction in the Central Valley biome unless we can get them above the major dams to their native habitats; no below-dam restorative measures, including hatcheries, can possibly save them.

Numerous solutions exist to mitigate dam impacts to fish. These include fish ladders; upstream fish channels; fish elevators; trap-and-truck operations; downstream by-passes; removal of small fish barriers; and dam removal.

All these techniques have been used at various locations with varying success. Some of the larger dams on the Columbia River system have operated fish ladders for many years. While the costs of many of these techniques are substantial, the commercial and recreational return provided by healthy rivers and robust fish stocks justifies the investment.

Furthermore, by providing Native American tribes essential access to historic cultural resources, fish passage above the dams would also rectify many of the treaty violations the state and federal governments committed by proceeding with these massive

¹⁴ National Marine Fisheries Service, Southwest Region. June 4, 2009. Biological Opinion and Conference Opinion on the Long-Term Operations of the Central Valley Project and State Water Project. See: <https://www.fisheries.noaa.gov/resource/document/biological-opinion-and-conference-opinion-long-term-operations-central-valley>, accessed October 25, 2022.

¹⁵ Friends of the River. 1999. Rivers Reborn: Removing Dams and Restoring Rivers. P 4-16. See: <https://docslib.org/doc/5819452/rivers-reborn-removing-dams-and-restoring-rivers-in-california>, accessed October 25, 2022.

¹⁶ See: <https://usbr.gov/mp/bdo/docs/20130827-bergpresentation.pdf>, accessed October 25, 2022, for an overview of habitat loss studies.

reclamation projects. Native beneficiaries would include the Winnemen Wintu on the Upper Sacramento, McCloud, and Pit Rivers; the Karuk on the Klamath River; and the California Valley Miwok and Maidu on the American and Feather Rivers.

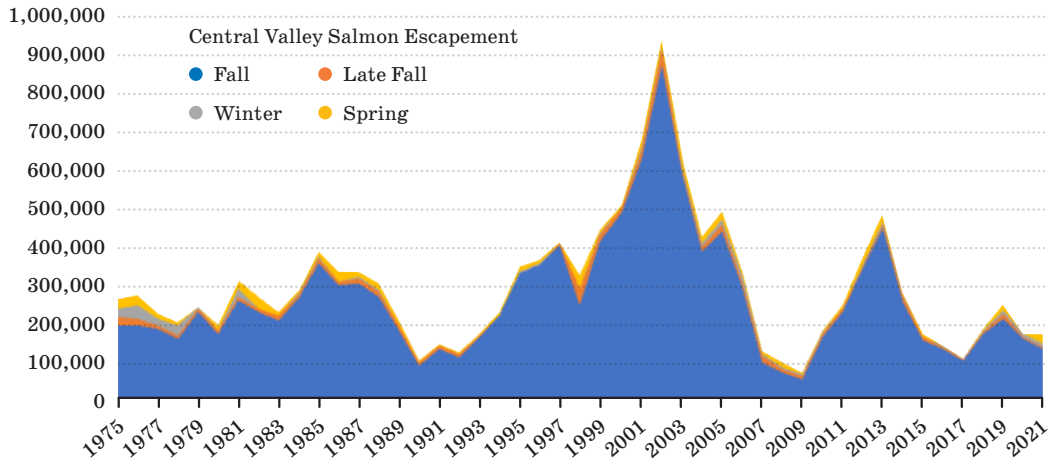


FIGURE 1
CENTRAL VALLEY CHINOOK SALMON POPULATION¹⁷

The EWC supports the National Marine Fisheries Service’s 2009 biological opinion on CVP and SWP operations. This opinion recommends fish passage pilot programs and analyses for dams associated with the Delta (e.g., those on the Sacramento, American, and Stanislaus Rivers), and advises the State Water Resources Control Board to direct the controlling agencies of each Delta-connected Central Valley rim dam to evaluate fish passage feasibility for any facility that blocks listed salmonid migration.¹⁸

Retain Cold Water for Fish in Reservoirs

Salmon, steelhead, and trout need cold water to exist. As California has grown over the decades, dams have been erected on every major river, changing both upstream and downstream flows. Downstream water temperatures have risen dramatically as a result. Temperatures ranging between 57-67°F are ideal for upstream

¹⁷ California Department of Fish & Game, Native Anadromous Fish & Watershed Branch. See: <https://www.calfish.org/ProgramsData/Species/CDFWAnadromousResourceAssessment.aspx>, accessed October 25, 2022, for data sets.

¹⁸ National Marine Fisheries Service, Southwest Region. June 4, 2009. Biological Opinion and Conference Opinion on the Long-Term Operations of the Central Valley Project and State Water Project.

salmonid migration; water temperatures over 70°F can be lethal to anadromous fish. Unfortunately, such high temperatures are now common in California's major rivers during the summer.

Some fish populations have been able to adapt to at least some degree, spawning and rearing young below major barriers; but their numbers have dwindled dramatically from their historic figures.

Because farms need most of their water in the summer when crops are growing and maturing, reservoir water levels typically are low and warm by fall. This coincides with the return of the state's remaining anadromous fish to their rivers of origin. At this juncture, the lack of cold reservoir water constitutes a clear threat to spawning fish, their eggs, emergent fry, and smolts.

Many of the affected fish are now listed under the U.S. Endangered Species Act (ESA). Maintaining water temperatures suitable for fish survival is thus required under the ESA and must become a central tenet of state water policy. However, the maintenance of cold-water pool reserves must not be accomplished through reliance on "supplemental" groundwater pumping in lieu of river diversions by settlement contractors.

About the Authors

Nick Di Croce is a lifelong public advocate and fisherman, serving on the board of CalTrout and as an advisor and facilitator of the the Environmental Water Caucus since 1998. He was instrumental in the precedent-setting CalTrout I and CalTrout II decisions that employed the principals of The Public Trust Doctrine to save Mono Lake. He has served on the Public Advisory Committee for the State Water Plan and he was the lead author of the EWC's *California Water Solutions Now* report. He is currently an advisor of the California Water Impact Network.

Nick's degree in economics from the Wharton School and experience in senior management at Toyota Corporation bring a unique economics-based approach to environmental solutions.

Glen Martin, a writer and media consultant for C-WIN, is a former senior environmental reporter for the San Francisco Chronicle. He has freelanced for more than 50 magazines and websites, including Audubon, Discover, the Utne Reader, Forbes, Men's Journal, Science Digest, Wired, Re/code, National Wildlife, BBC Wildlife, Outside and Sierra. He has published three books. His latest, *Game Changer: Animal Rights and the Fate of Africa's Wildlife* (University of California Press), was well-received by both the popular and peer-reviewed presses, and is considered a seminal work on conflicting African wildlife policies.

Mr. Martin was a Pulitzer nominee and has received numerous awards for his work, including the Associated Press Award for Enterprise Reporting, the Bay Institute Education Award, the California Newspaper Publishers Award for Environmental Reporting and the Council for the Advancement and Support of Education gold medal.

Max Gomberg is an independent consultant working with California-based and national advocates on water affordability and climate equity. Previously, he served as the water conservation and climate change manager at the State Water Resources Control Board (Water Board) where he led development of water conservation, access, affordability, and climate change policies across California. Under his leadership, the Water Board developed a statewide plan for low-income water rate assistance, acquired \$1 billion for water debt relief, adopted a comprehensive climate change mitigation and adaptation policy, and implemented regulations to reduce urban water use. Mr. Gomberg has 15 years of water policy experience and holds a BA from the University of Chicago and a Masters in Public Policy from UCLA.

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