

# Water Blueprint

## for the San Joaquin Valley

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### Blueprint Paper<sup>1</sup> #16

## SEEKING BREAKTHROUGHS IN THE MANAGEMENT OF CALIFORNIA'S WATER

### Recommendation

**The Water Blueprint for the San Joaquin Valley recommends funding \$5 million for studies and pilot projects to adapt subsurface diversion technology to water diversions in the Delta.**

### California is facing an urgent and real problem

Much of central and southern California depend on water from the Sacramento-San Joaquin Delta delivered via state and federal water projects. That water supply comes at a biological cost – many fish are lost, including species listed as threatened or endangered, as the water is diverted. Water diversions should not result in the loss of fish, especially endangered fish. We can do better.

It is a common misconception that California has run out of water, but the Public Policy Institute of California<sup>2</sup> has determined that, on average, 10 million acre feet per year flow out of the Delta to the Pacific Ocean that is not needed to meet water quality standards or designated environmental needs. Those excess flows occur only in the winter and spring of wetter years. The water cannot be diverted currently because pumping during the winter and spring is restricted to reduce take of endangered fish at water project facilities and insufficient storage exists when these winter flood flows are available<sup>1</sup>. New regulations contained in the Sustainable Groundwater Management Act are being implemented in California to ensure groundwater supplies are sustainable. If the groundwater that is currently being pumped cannot be replaced with surface water, the losses to the San Joaquin Valley alone are estimated to be \$7 billion per year and 65,000 jobs<sup>3</sup>, with the people in disadvantaged rural communities being hardest hit. The loss to the world is one

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<sup>1</sup>Blueprint Papers summarize topic-specific information – typically a potential component of a water solution for California. It is hoped that these papers stimulate discussion and lead to new ideas and better solutions. Correspondence and questions concerning this paper may be directed to Scott Hamilton, [Scott@ResourceEconomics.net](mailto:Scott@ResourceEconomics.net) (661) 303 1540.

<sup>2</sup> PPIC (Policy Brief: Tracking Where Water Goes in a Changing Sacramento–San Joaquin Delta, 2022)

<sup>3</sup> Sunding (Water Blueprint for the San Joaquin Valley, Economic Impact Assessment, Phase I, 2020)

million acres of unique, versatile, and productive farmland. If the groundwater supplies can be replenished with high flow water from the Delta, this human and economic disaster can be averted.



*Flood flows in Yolo Bypass near Sacramento – a key source of water for protection from future droughts.*

The Delta Reform Act of 2009 recognized the dual needs of environmental enhancement and improved water supplies. While previously considered impossible, an opportunity now exists to realize those dual goals.

#### [An exciting pragmatic solution is at hand](#)

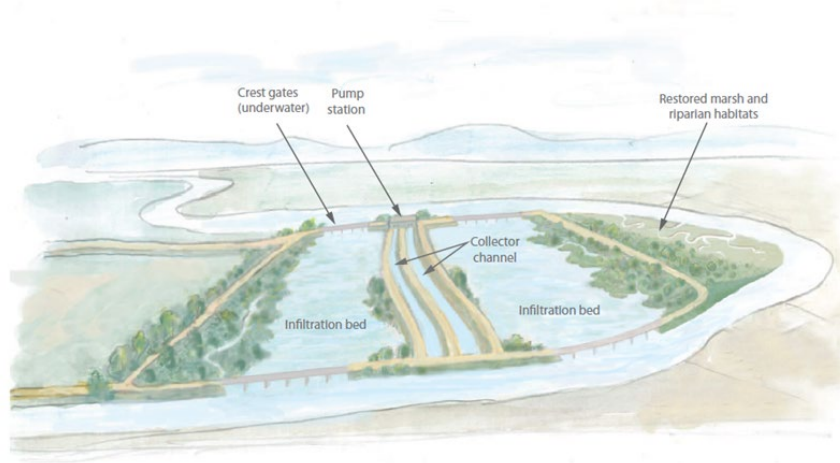
The groundwater basins in the San Joaquin Valley can store more than 75 million acre feet of water (15 times the capacity Shasta Reservoir). Groundwater storage is a more cost effective and resilient option than surface storage [2]. The economic feasibility of additional groundwater recharge capacity is largely dependent on the availability of additional water supplies.

The technology already exists to divert water without harming fish, but it has only been implemented in rivers, not tested in an estuary like the Delta. The technology draws water slowly from the bottom of the water column through perforated pipes buried in gravel, allowing fish to remain safely suspended in the water column. The investments to date in a Delta solution include 7 years of work and a nearly \$2 million investment by Valley water districts to undertake biological and engineering studies that have led to key insights in project design. A pilot project is now needed to provide proof of concept before committing to spend the billion dollars or more required for a full scale Environmentally



*Turlock Irrigation District's subsurface diversion system during construction before being covered by feet of gravel. This system diverts water from beneath the Tuolumne River without harming salmon and steelhead.*

Friendly Diversion project in the Delta. The pilot project is the key to opening a door to enormous additional water supplies without harming the delicate Delta ecosystem nor endangered fish.



*A concept for new environmentally friendly water diversions in the Delta. Perforated pipes buried in gravel create an infiltration bed feeding water into collector channels that supply pumps. Very slow vertical velocities and open ends allow fish to move freely over the infiltration beds.*

The pilot project opens the door to diverse benefits

As a state, we should not permit flood water to flow to the ocean when it can be put to more imperative uses. Under existing regulations, only one third of the high flow Delta water can be diverted. There is no intent, need, or ability to divert all of the high flow water. A fully implemented Environmentally Friendly Diversion project could provide up to 2 million acre feet of water per year to central and southern California – only 20% of the high flow water. Existing Delta regulations<sup>4</sup> and physical capacity constraints ensure that 80% of the high flow Delta water will continue to flow to the ocean. The project has multiple and diverse benefits for imperiled water systems. The initial beneficiaries of increased water supplies will be State and Federal Water Contractors that collectively provide primary or supplemental water supplies to nearly all of California south of San Francisco. Water-dependent ecosystems in the San Joaquin Valley have also suffered severely. Increased Delta exports enable the restoration of tens of thousands of acres of seasonal wetlands that provide habitat for waterfowl and migratory birds and restoration of floodplains that improve habitat conditions for endangered fish.



<sup>4</sup> SWRCB D-1641 prevents more than 35% of Delta inflows being diverted from February through June

### The cost of the pilot is small compared to the cost of doing nothing

The pilot project is estimated to cost \$4 million over two years (Appendix A). The basic objective of the pilot project is to demonstrate that subsurface diversions can work in the Delta. More specifically, the purposes of the pilot project are to: optimize design features such as hole sizes and spacing; to determine how to maintain the performance of the facilities and prevent fouling; to test the effectiveness of the facilities for protecting juvenile salmon; and to determine how to minimize indirect impacts, such as food depletion, of water diversions on fish.

Amid yet another severe drought, California is allocating millions of dollars in emergency funds for drought relief, but that money will not refill reservoirs. The time to prepare for drought is now – to develop the facilities to divert a small portion of surplus water to groundwater storage in times of plenty, without harming fish, to ensure we have water in reserve when it is otherwise scarce. While various federal and state funding opportunities exist, they are targeted for projects that directly produce water, not for pilot projects; those that do provide funds for pilot project have funding limits far short of what is needed. This gap in funding is delaying efforts that could save billions of dollars per year.

The existing water rights for State and Federal Water Contractors are sufficient to achieve substantial increases in water supplies. Full project implementation would require a large number of permits and approvals including a change in the point of diversion for SWP and CVP exports and a determination by the Delta Stewardship Council that the project is compliant with the Delta Reform Act.

We continue to engage with numerous stakeholders in advancing the project: the Bureau of Reclamation, the State Water Contractors, the Metropolitan Water District of Southern California, and federal water contractors. There are no easy water projects. A successful project takes great planning, sustained commitment, and political and financial support. In recognizing the challenges, we also recognize the consequences of inaction – an economic, humanitarian, and ecosystem tragedy. Investment in an environmentally friendly diversion pilot project is needed now.

*Initial Draft August 8, 2022*

*Updated December 17, 2022*

## References

[1] PPIC (2017) A new approach to accounting for environmental water. Public Policy Institute of California, Sacramento, California.

PPIC (2022) Policy Brief: Tracking Where Water Goes in a Changing Sacramento–San Joaquin Delta

[2] PPIC (2019) Water and the Future of the San Joaquin Valley. Public Policy Institute of California, Sacramento, California.

[3] Sunding D. (2020) Preliminary results of economic analysis, Memo to Austin Ewell, Executive Director of the Water Blueprint for the San Joaquin Valley.

[4] SWRCB (2000) Revised water right decision 1641, State Water Resources Control Board, Sacramento, California.

Appendix A Budget

FFD Pilot Cash Flow									
Uses HDR (11/1/21) and Hanson (5/15/21) Cost Estimate									
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	Month 1	Month 2	Month 3	Month 4	Month 5	Month 25	Month 26	Month 27	Total
	Construction		Operations			Cleanup			
<b>Construction</b>									
PREP	\$276,344	\$276,344							\$552,689
SITWORK	\$45,372	\$45,372						\$90,743	\$181,487
INTAKE	\$59,000	\$59,000							\$118,000
PILOT CHANNELS	\$40,000	\$40,000							\$80,000
YARD PIPING	\$80,176	\$80,176							\$160,351
ELECTRICAL, I&C, AND TEST EQUIP	\$34,000	\$34,000							\$68,000
TAXES (11%)	\$63,000	\$63,000						\$0	\$126,000
MOBILIZATION (5%)	\$27,000	\$27,000						\$0	\$54,000
GENERAL CONDITIONS (10%)	\$53,500	\$53,500						\$0	\$107,000
BOND (2%)	\$10,700	\$10,700						\$0	\$21,400
GENERAL CONTRACTORS OH AND PROFIT (15%)	\$80,250	\$80,250						\$0	\$160,500
CONTINGENCY	\$534,892	\$534,892						\$90,743	\$1,160,527
<b>Operations</b>									
O&M			\$29,600	\$29,600	\$29,600	\$29,600	\$29,600		\$710,400
Biological Studies			\$29,167	\$29,167	\$29,167	\$29,167	\$29,167		\$700,000
<b>Total</b>	<b>\$1,304,233</b>	<b>\$1,304,233</b>	<b>\$58,767</b>	<b>\$58,767</b>	<b>\$58,767</b>	<b>\$58,767</b>	<b>\$58,767</b>	<b>\$181,487</b>	<b>\$4,200,354</b>