

HISTORY OF WATER PROJECT CONVEYANCE IN THE DELTA

One of California's chief sources of water is the snowpack of the 400-mile-long Sierra Nevada mountain range. Mountain snow melts each spring and flows west and collects in major reservoirs. From behind dams, water is distributed through the year to farms and cities. The water flows from the reservoirs, down the Sacramento and San Joaquin rivers to the Sacramento-San Joaquin Delta (Delta). In the low-lying Delta, some water flows west into San Francisco Bay and out to the Pacific Ocean. Some water is lifted by federal and state pumping plants into southbound canals that supply the Bay Area, Central Valley, and Southern California. In all, the water diverted by the federal and state water projects in the Delta reaches 25 million Californians and three million acres of farmland.

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The Delta is an estuary where salty tides from the San Francisco Bay tangle with the discharge of rivers. The Delta was once a vast mosaic of freshwater and saltwater marsh, with riverside forest and myriad sloughs. Today the Delta consists of a few dozen islands protected from flooding by dirt and rock levees. Most of the islands are farmed, and many are sunken below sea level.

The current water conveyance system depends upon levees that are vulnerable to subsiding peat soils, earthquake, flood, even burrowing ground squirrels. Threats will only worsen as climate change brings higher sea levels and flashier storms.

When the State Water Project (SWP) was built in the 1960s, planners intended to carry water to the state and federal pumping plants through a 43-mile canal skirting the eastern edge of the Delta. The canal would carry water directly from the Sacramento River to the pumping plants, which sit on the southern edge of the Delta. The canal was intended to protect water quality and avoid significant damage to Delta fisheries caused in part by the federal and state pumping plants, which draw water directly from channels in the south Delta. The pumps can entrain fish directly and draw others off course by creating "reverse flows" in south Delta channels.

For cost reasons, the originally proposed peripheral canal was not built. Over time, the state has developed a better understanding of the danger to fish of pumping directly from the south Delta. With the current water challenges in California, populations of native fish have reached historically low numbers, and "reverse flows" and pump entrainment are important factors.

Other factors bolster the need for a more sustainable way to divert water from the Delta. The current water conveyance system depends upon levees that are

vulnerable to subsiding peat soils, earthquake, flood, even burrowing ground squirrels. Threats will only worsen as climate change brings higher sea levels and flashier storms.

Wide consensus exists that improvements to SWP facilities are needed. For decades, while environmental and water supply conditions deteriorate, Californians have debated whether and how to fix the system.





A Detailed Timeline

California WaterFix is the product of decades of deliberation and the evolution of California's twin goals of protecting and securing water resources to meet growing demand while maintaining a healthy environment.

1950s

A NEW ERA FOR CALIFORNIA WATER

1957

California Department of Water Resources (DWR) lays the framework for future water development in California. "The California Water Plan," Bulletin 3¹, calls for a "Trans-Delta system" to convey water to south Delta pumps via through-Delta isolated facilities. The facilities would also serve the federal Central Valley Project (CVP), construction of which began in 1937.²

1959

California voters pass the Burns-Porter Act, providing \$1.75 billion of additional construction funding for the SWP, or the equivalent of \$14.35 billion in 2015 dollars. DWR engineers scaled back the size and number of facilities originally proposed for the SWP due to cost concerns, missing the opportunity to minimize adverse flow conditions for fish.³

1960s

ISOLATED CONVEYANCE SOUGHT TO BENEFIT NATIVE FISH

1960s

Operation of the SWP begins.

California Department of Fish and Game (CDF&G)* biologists publish an article in American Fisheries Society Special Publication #3, showing that the best protection for native fish populations, and solution to the Delta's environmental problems, is abandoning sensitive river channels for water transport.

* CDF&G is now California Department of Fish and Wildlife (CDFW)

1965

U.S. Fish & Wildlife Service backs the Peripheral Canal proposal, calling it the only engineering plan that would not have detrimental effects on fish and wildlife while offering the biggest opportunity for fish enhancement.⁴

Interagency Delta Committee completes its report recommending various Delta facilities, including the Peripheral Canal.⁵

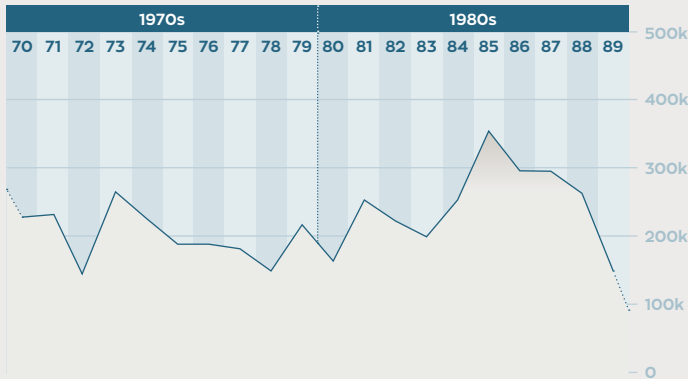
Next phase of the SWP again includes a peripheral canal to complete the project and improve flow conditions for fish.



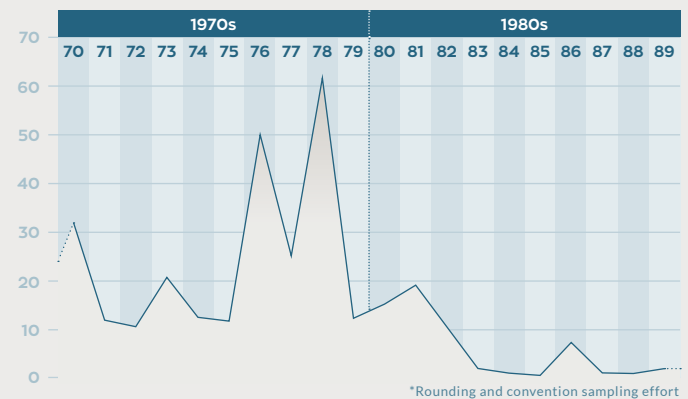
1970s - 1980s

STEADY DECLINE IN DELTA SMELT AND SALMON POPULATIONS⁶

TOTAL CHINOOK SALMON UPSTREAM MIGRATING ADULTS DURING THE FALL RUN ⁷



TOWNET DELTA SMELT SURVEY INDEX* ⁸



1990s

DEVELOPING DELTA SOLUTIONS

1990s

State and federal agencies look at the potential for both more natural Delta flow patterns and changed conveyance to help restore native fish populations.⁹

1994

Bay Delta Accord is signed, authorizing "CALFED," a joint state and federal agency process to develop water quality standards, coordinate operations of the SWP and CVP, and work toward long-term Delta solutions.¹⁰

1998

CALFED "Diversion Effects on Fish Team" finds that an isolated facility would substantially reduce entrainment and predation effects on the Delta's native fish populations.¹¹

2000s - 2010s

CALIFORNIA CLOSER THAN EVER TO DELTA SOLUTIONS

2000

CALFED Bay-Delta Program releases, "California's Water Future, a Framework for Action." Among the list of comprehensive actions, it identifies the need to evaluate a screened diversion facility on the Sacramento River to improve water quality in the Delta and at the export facilities. Construction would begin by late 2007.¹²

2007 - 2008

Delta Vision Blue Ribbon Task Force recommends an assessment of dual conveyance, saying new facilities for conveyance and storage, and better linkage between the two, are needed to better manage California's water resources for both the Delta and exports.¹³

2008

Public Policy Institute of California states a peripheral canal is the best Delta conveyance option for meeting the coequal goals of a healthy Delta ecosystem and water supply reliability.¹⁴

2000s - 2010s (con't)

CALIFORNIA CLOSER THAN EVER TO DELTA SOLUTIONS

2009

The Governor enacts the Delta Reform Act, which includes the coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem in a way that protects the Delta's unique characteristics. The law directs state and federal officials to examine a reasonable range of ways of changing Delta water project diversions, including isolated conveyance.¹⁵

TODAY AND BEYOND

CALIFORNIA WATER FIX PROPOSED AS SOLUTION

2015

For four decades, the existing water project diversion system in the Delta has limited efforts to restore native fish populations. California WaterFix proposes to build three intakes on the Sacramento River in the north Delta, with two 35-mile-long tunnels to carry water to the existing pumping plants in the south Delta. The proposed intakes would be screened to protect even young fish. (The existing pumping plants sit on dead-end channels that cannot be effectively screened.) The new intakes and conveyance, operated under rules to protect water quality and endangered species, would give water project operators flexibility to move water into storage when Sacramento River flows are high while minimizing harm to fish. New intakes and tunnels would also protect water deliveries from disruption in the event of multiple levee failures in the low-lying Delta.

California WaterFix is one element of the Governor's Water Action Plan, which seeks to bolster regional self-sufficiency in water supplies, reduce reliance on the Delta, recover native fish populations and, overall, bring reliability, restoration, and resilience to California's water supply systems.

¹ California Department of Water Resources, Division of Resources Planning: Bulletin No. 3, The California Water Plan (1957): http://www.water.ca.gov/waterdata/library/docs/historic/Bulletins/Bulletin_3/Bulletin_3_1957.pdf

² California Department of Water Resources, History of the State Water Project: <http://www.water.ca.gov/swp/history.cfm>

³ California Department of Water Resources, History of the State Water Project: <http://www.water.ca.gov/swp/history.cfm>

⁴ U.S. Fish & Wildlife Service: Memorandum – Peripheral Canal, Delta division, Central Valley Project, California (1965)

⁵ Source: Discover the Delta Foundation, California Department of Water Resources

⁶ Federal Register Notice (1993) Final Notice for listing of Delta Smelt as threatened under Fed ESA. https://ecos.fws.gov/docs/federal_register/fr2235.pdf

⁷ California Department of Fish and Wildlife: Central Valley Fall-Run Chinook Salmon

⁸ California Department of Fish and Wildlife, Delta Smelt Indices: <http://www.dfg.ca.gov/delta/data/townet/indices.asp?species=3>

⁹ Interagency Ecological Studies Program for the Sacramento-San Joaquin Estuary: Autumn 1993 Newsletter

¹⁰ The San Francisco Bay-Delta Agreement (1994): <http://www.calwater.ca.gov/content/Documents/library/SFBayDeltaAgreement.pdf>

¹¹ CALFED Diversion Effects on Fish Team: Diversion Effects on Fish, Issues and Impacts (1998): http://calwater.ca.gov/content/Documents/library/ERP/DEFT_Report_6-25-98.pdf

¹² Source: CALFED, pg. 17

¹³ Delta Vision Blue Ribbon Task Force: Our Vision for the California Delta (2008): http://deltavision.ca.gov/BlueRibbonTaskForce/FinalVision/Delta_Vision_Final.pdf

¹⁴ Public Policy Institute of California: Research Brief - Navigating the Delta: Comparing Futures, Choosing Options (2008): http://www.ppic.org/content/pubs/rb/RB_708EHRB.pdf

¹⁵ California Water Code, Section 85000 - 85004: <http://www.leginfo.ca.gov/cgi-bin/displaycode?section=wat&group=84001-85000&file=85000-85004>