Description of the Delta Corridors Plan

Delta Channel Modifications to Protect our Fish and our Water Supply

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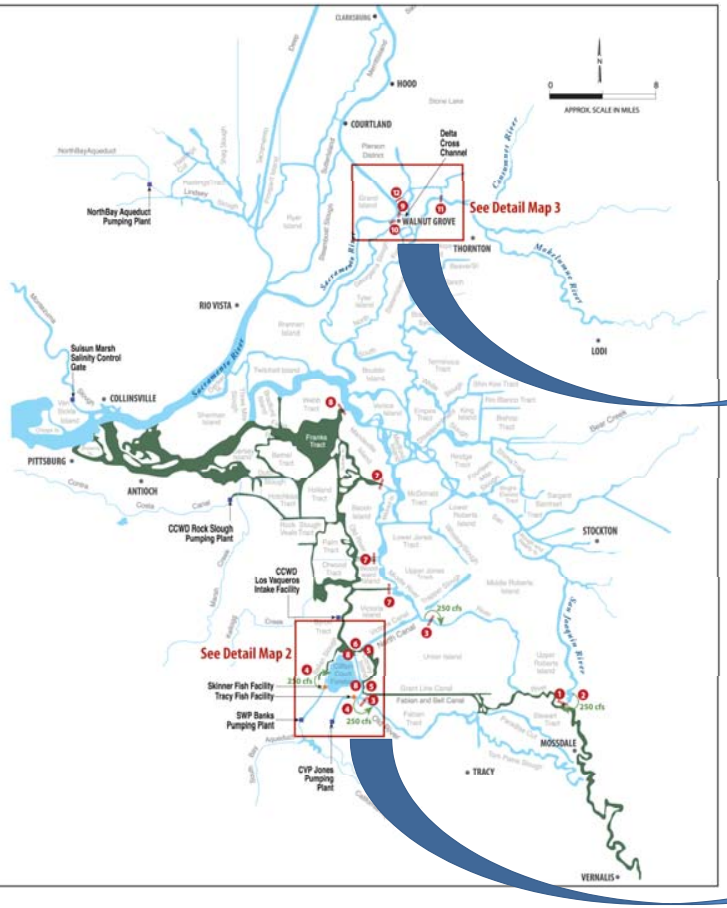
Delta Corridors Plan

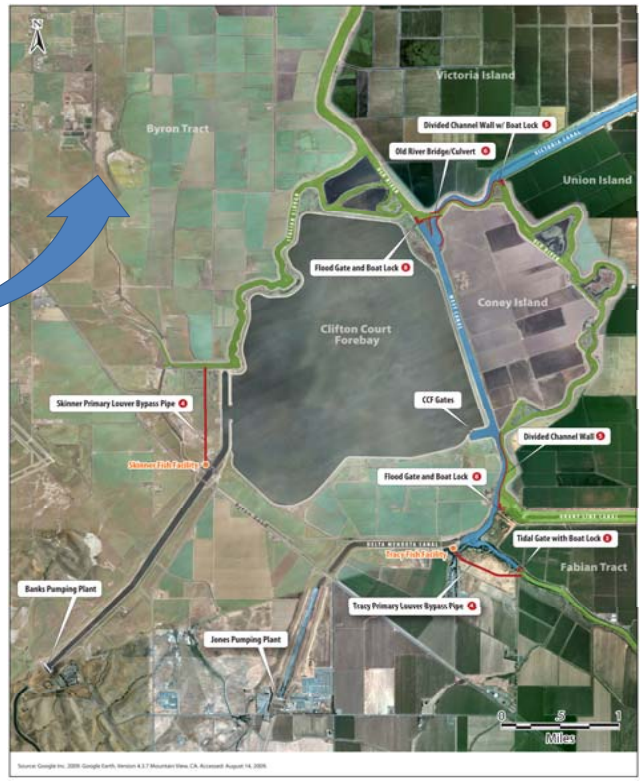
Major Components

1. **Floodgate** – A floodgate across the San Joaquin River (SJR) would direct all SJR flow down Old River, unless the flow was greater than 10,000 cfs.
2. **Pump** – A fish-friendly pump would move 250 cfs upstream into Old River to maintain flow (upstream) from the Stockton Deep Water Ship Channel and provide dilution flow.
3. **Tidal Gates** – Gates would be operated for upstream flow along Old and Middle Rivers. A 250-cfs fish-friendly pump would augment flow over the Middle River gate.
4. **Fish Flushing Flows** – The Tracy fish facility would be modified to pump the primary fish louver bypass flow of 250 cfs to Old River upstream of the gate. The Skinner fish facility primary fish louver bypass flow of 250 cfs would be pumped to Italian Slough.
5. **Divided Channel** – Old River channel would be divided to keep the SJR-estuary corridor separate from the water supply corridor between Grant Line Canal and Coney Island and between Victoria Canal and West Canal.
6. **Old River Bridge/Culvert** – A water bridge over a Victoria Canal culvert would allow the SJR-estuary corridor to cross over the water supply corridor.
7. **Barriers with Boat Locks** – Barriers with boat locks would be constructed across Woodward Canal, Santa Fe Cut, and Connection Slough to separate the SJR-estuary corridor from the water supply corridor.
8. **Floodgates** – A barrier with a floodgate and a boat lock at the mouth of Old River would separate Franks Tract from the San Joaquin River channel. Floodgates and boat locks at the mouth of Grant Line Canal and at the north end of the West Canal would separate the SJR-estuary corridor from the water supply corridor. The floodgates would be opened when the SJR flow exceeded 10,000 cfs.
9. **Delta Cross Channel Fish Screen** – The Delta Cross Channel (DCC) would be screened to protect migrating fish in the Sacramento River. The DCC gates would be opened all the time unless the Mokelumne River flow exceeded 5,000 cfs.
10. **Georgiana Slough Fish Screen** – Georgiana Slough would be screened to protect migrating fish in the Sacramento River.
11. **Mokelumne River Gate** – A gate across the Mokelumne River at Thornton would direct all flow and fish into Middle Slough and the The Meadows Slough. The gate would open when the Mokelumne River flow exceeded 5,000 cfs.
12. **Sacramento River Flood Gate** – A short channel and floodgate would connect the Mokelumne River flow and fish to the Sacramento River above Walnut Grove. The gate would close when the Mokelumne River flow exceeded 5,000 cfs.



Several of the Delta Corridors major fish components are located in the vicinity of Walnut Grove

Many of the Delta Corridors components are located in the vicinity of the SWP and CVP export facilities



The Delta Corridors Plan would connect the San Joaquin River (SJR) with the estuary at Franks Tract, and would separate the SJR salt and fish from export pumping and entrainment. The entire SJR flow would be diverted into Old River and down Grant Line Canal back to Old River. Old River between Grant Line Canal and Coney Island would be divided to separate the SJR flow from the water supply flowing from the Sacramento River at Walnut Grove to the CVP and SWP exports. The SJR flow would cross the water supply corridor with a "river bridge" over a large box culvert connecting Victoria Canal to West Canal at the north end of Coney Island. Four barriers would be constructed with boat locks to separate the Middle River water supply corridor from the SJR–estuary corridor in Old River.

The CVP and SWP fish facilities would continue to operate, although with fewer fish and much less floating debris because of the separation of the SJR from the export pumps. The primary louver bypass flows (of about 250 cfs) from each fish facility would be pumped into Old River and Italian Slough to allow most of the salvaged fish (from the water supply corridor) to return to the SJR-estuary corridor, improving the salvage efficiency by about 25% for most fish. The Delta Cross Channel (DCC) would be opened and large in-river fish screens would be installed at DCC and Georgiana Slough to protect migrating fish from diversion into the central Delta. A new connection between the Mokelumne River near Thornton and the Sacramento River above Walnut Grove would protect migrating Cosumnes River and Moklumne River fish from predation in the central Delta or entrainment at the CVP and SWP export pumps.

The DC Plan would not change conditions in Suisun Bay or in Suisun Marsh. The DC Plan would not change the Delta tidal fluctuations, which would allow the water supply to be transported through the Delta channels to the exports by "tidal energy." The DC Plan would not require a new canal or pumping plants.

ICF Jones & Stokes simulated the tidal elevations and tidal flows for the existing channel geometry with the Delta Simulation Model II (DSM2) and then modified the geometry and other input data files to allow the DC Plan to be accurately simulated. Results from these initial DSM2 tidal hydraulic simulations demonstrated the tidal elevation and tidal flow changes with the DC Plan. The modeling suggested that dredging of about 10 million cubic yards from Middle River and Victoria Canal— to a uniform bottom depth of 25 feet with 3:1 side slopes for channel stability— would be required for full CVP and SWP exports. The dredged material could be used to strengthen the levees for the Delta islands between the Middle River water supply corridor and the Old River estuary corridor. These Old and Middle River levees would form the "Delta Divide" that would allow rapid repairs along this 50-mile section and resumption of CVP and SWP exports following a major earthquake event with levee breaches.

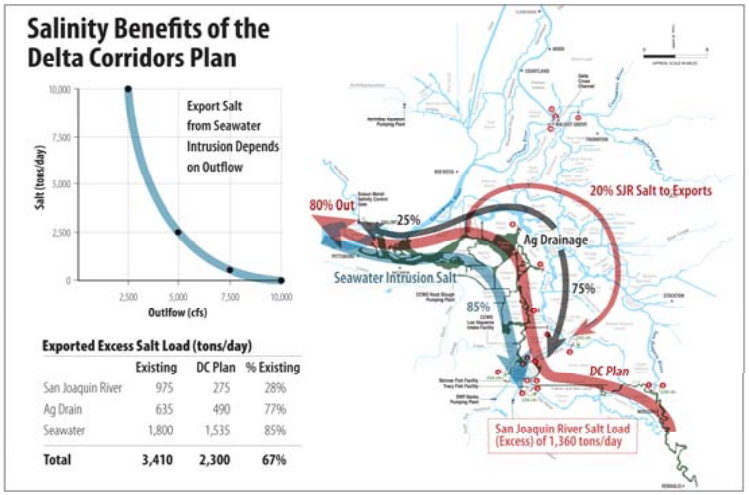
Dredging along 3.5 miles of Middle River to provide a cross-section area of 10,000 square feet would require about 3 million cubic yards. Dredging in Victoria Canal would require about 5 million cubic yards. Dredging in West Canal and Old River would require about 1 million cubic yards. This is a moderate amount of dredging (total of about 10 million cubic yards at an estimated cost of about $100 million) that would allow full existing exports to be supplied by the Middle River corridor, and allow the entire San Joaquin River flow to be separated from the water supply exports to reduce salinity and reduce fish entrainment impacts.

For More Information go to www.DeltaCorridors.com

Potential Benefits of the Delta Corridors Plan

Salinity Reductions and Fish Habitat Improvements (Migration and Entrainment)

Evaluations for the South Delta Water Agency and Central Delta Water Agency



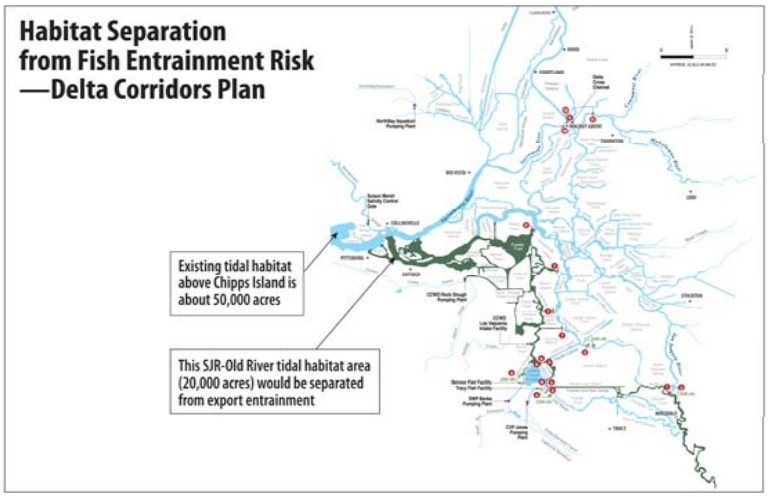
Exported Excess Salt Load (tons/day)

	Existing	DC Plan	% Existing
San Joaquin River	975	275	28%
Ag Drain	635	490	77%
Seawater	1,800	1,535	85%
Total	**3,410**	**2,300**	**67%**

The DWR DSM2 Delta tidal hydraulics and salinity (EC) model was used to compare the simulated channel flows and EC for the existing Delta channel configuration with the tidal flows and salinity simulated for the Delta Corridors Plan configuration. The Delta inflows, exports, and outflows were simulated with CALSIM assuming the existing D-1641objectives, without any reverse Old and Middle River flow restrictions. The DSM2 study period (1976-1991) included the 1977 and 1987–1991 droughts. Excess EC is defined as EC greater than the Sacramento River EC (assumed to be 175 µS/cm). Only the excess EC can be reduced by the DC Plan (or PC).

The average EC of the combined exports was 463 µS/cm for existing conditions and was reduced by 112 µS/cm to 351 µS/cm with the DC Plan. This was a 25% reduction in the average EC. The excess EC of the combined exports was reduced from 293 µS/cm to 179 µS/cm with the DC Plan. This was a 40% reduction in the excess EC. About 80% of the excess salt load from the SJR would reach the estuary with the DC Plan.

The DC Plan reduced the excess EC from agricultural drainage and reduced the seawater intrusion at the exports by allowing Sacramento River flows to more quickly flush the central Delta during the first major storm each year. The DSM2 simulation tracked the seawater intrusion and identified that much of the excess salt load could be eliminated with slightly increased Delta outflow (See Chart above).

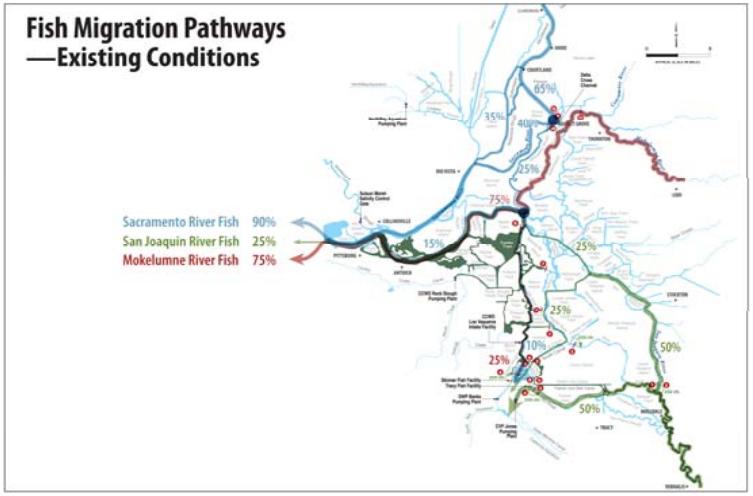


Potential Water Supply, Water Quality, and Fish Benefits of the Delta Corridors Plan:

- ❑ **reduced salinity and salt load at the CVP and SWP exports**
- ❑ **San Joaquin River flow and salt and fish would reach the estuary at Franks Tract with no recycle of SJR water or salt back into the DMC**
- ❑ **treated wastewater discharges and agricultural drainage from the SJR and the south Delta would be separated from the drinking water intakes**
- ❑ **full exports (E/I) should be possible during VAMP and reverse Old and Middle River flow restriction periods because all SJR fish would be separated from entrainment**
- ❑ **Sacramento River, Mokelumne River, and Cosumnes River migrating fish would be separated from the water supply corridor with fish screens at the DCC and Georgiana Slough**
- ❑ **delta smelt spawning in the lower San Joaquin River and along the Old River corridor would no longer be subject to entrainment losses**
- ❑ **the risk of water supply interruption following levee failure events would be reduced by the separation of Old River and Middle River**
- ❑ **seawater intrusion at the exports would be easier to control with slightly increased Delta outflow**

Potential effects of the DC Plan on adult smelt are difficult to evaluate. Estimating how many adult smelt enter the SJR channels (active migration or passive tidal transport), and determining how many would spawn in the SJR–estuary corridor between the confluence and Franks Tract or upstream in Old River, is uncertain. The separation of the SJR–estuary corridor along Old River, Grant Line Canal, Franks Tract, and the lower San Joaquin would separate about 20,000 acres of habitat upstream of the confluence. This would remove the existing entrainment risk from about 40% of the habitat area upstream of Chipps Island (total habitat of 50,000 acres). Only adult smelt that move upstream in the SJR past Bradford Island would be vulnerable at the CVP and SWP pumps with the DC Plan.

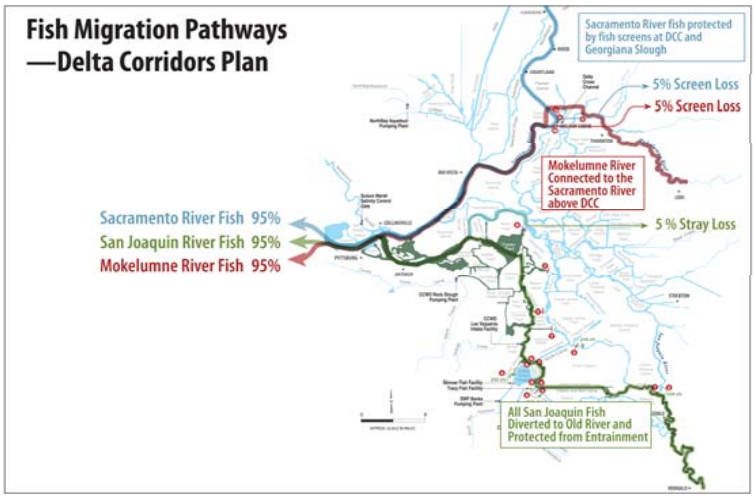
Other changes in Delta fish habitat conditions, and potential changes in the distribution and abundance of fish within the Delta that might be influenced by the DC Plan, can only be generally imagined. For example, turbidity along the SJR–estuary corridor should remain relatively high, providing more suitable habitat conditions for adult delta smelt (e.g., predation avoidance) and juvenile delta smelt (e.g., feeding). More of the SJR plankton may be available for juvenile fish feeding along the SJR–estuary corridor. More investigation and evaluation of the potential fish effects of the DC Plan are needed.



The DC Plan would separate the entire SJR flow from the CVP and SWP export pumping and would eliminate entrainment (i.e., salvage and loss) of migrating SJR fish. This would allow all SJR fall-run Chinook salmon, and the soon-to-be-restored spring-run Chinook salmon juveniles to migrate to the estuary without any CVP or SWP entrainment losses. Migrating SJR steelhead and splittail (in wet years) also would be fully protected from entrainment losses. Upstream migrating adult Chinook salmon would more easily detect the (entire) SJR flow leaving Franks Tract and migrate upstream in Old River to the SJR and tributaries.

Both the DCC and Georgiana Slough would have in-river fish screens to protect migrating Sacramento River fish from the water supply diversions and the higher predation assumed to occur within the central Delta. One panel on each screen could be opened in the summer and fall to allow upstream migrating Chinook salmon (and other fish) to pass without delay.

The Mokelumne River would be routed from near Thornton (I-5) to the Sacramento River above the DCC to reduce the predation and entrainment of migrating Mokelumne and Cosumnes River fish that otherwise would enter the water supply corridor. A river gate would divert the Mokelumne River flow into Middle Slough, Snodgrass Slough, and The Meadows Slough, and a river gate through the Sacramento River levee north of Walnut Grove would connect the Mokelumne River to the Sacramento River.



This Information is presented in two reports prepared for the SDWA and CDWA. "Tidal Hydraulic Modeling (DSM2) of the Delta Corridors Plan" (2007) and "The Delta Corridors Plan: and Its Potential Benefits" (2009)