1976 Installation of Emergency Drought Barrier on Sutter Slough

Information below is taken from DWR 1977 Initial Study Rock Barrier at Sutter Slough and the August 12, 1976 Memorandum of Permit between the North Delta Water Agency (NDWA) and Department of Water Resources (DWR) for the installation of drought barrier on Sutter Slough.

Purpose

- Reduce water storage releases necessary to meet Delta water quality objectives.
- Reduce salinity intrusion by reducing flows into Sutter Slough, thereby increasing the flow in the Sacramento River and through the Delta Cross Channel and Georgiana Slough (increase of approximately 16% to equal a net transfer of about 120,000 af of water and a reduction in outflow of about 1,000 cfs and a resultant savings in storage water of up to 60,000 af per month).

Project Description

- Constructed 9-1-76; breached on 10-9-76; and removal started 12-3-76.
- About 200 feet long and approximately 3 feet above mean tideline with a fishway gap in the middle.
- Approximately 5,800 cubic yards of 5 to 18-inch rock.
- Located about 1.3 miles from the head of Sutter Slough at Sacramento River, extending across the lines of Sacramento and Yolo Counties, in the jurisdiction of Reclamation Districts 349 and 999.
- Temporary pumping equipment for irrigation supply will be located on Ryer Island and RD 501.
- Navigational blockades (bouys with standard hazard markers and flashing white lights), log booms, and warning signs at four locations.
- Access to the only marina downstream of the barrier will be maintained.

Agricultural Impacts

- DWR staff conducted an extensive survey of all existing irrigation pumps and siphons on Sutter and Miner Sloughs that are located below the barrier; and checked them daily during the closure to ensure they had enough water for proper operation.
- To mitigate impacts, four portable pumps and power plants were available for landowner use within 24 hours of any water supply interruption and DWR installed a 24-inch pipe over the levee on Ryer Island and connected it to three additional pumps prior to the closure.
- With these mitigation measures in place, no significant impacts on agricultural crops were anticipated.
- DWR committed to providing these same assurances and mitigation measures in any future closure of Sutter Slough with a temporary drought barrier.

Water Quality Impacts

- Closure of Sutter Slough increases downstream flows in the Sacramento River to the Delta Cross Channels.
- Very little changes in EC/salinity conditions occurred in the area upstream of the Rio Vista Bridge.
- Salinity above the confluence of Cache Slough and the Sacramento River remained less than 250 micromhos.
- An increase in salinity did occur in the Sacramento River downstream of Rio Vista, due to the operation of CVP and SWP.

Tidal Level Impacts

- Barrier caused an increased amplitude in the tides.
- Low tides were 0.9 to 1.6 foot lower at the downstream face of the closure.
- Downstream of the barrier a tide gage at Miner Slough and Five Points showed that, on average, the barrier lowered the low tide on average of 0.7 foot and affected the high tide an almost unnoticeable amount (0.1 foot or less).
- High tides were 0.1 to 0.5 foot higher.
- The lowering of the low tides is the primary concerns of local diverters because siphons will lose their vacuum or pumps would draw in air and be damaged when the water levels become too low.
- As mitigation, DWR provided stand-by portable pumps to furnish irrigation water should existing pumps and siphons become inoperable.

Fishery Impacts

- Three groups of dye-marked juvenile salmon were released in five locations in late October with trawling capture (373 tows) continuing through November 16.
- Fall migrant juvenile salmon in the Sacramento River were found to be detrimentally affected if subjected to migration route via the Central Delta instead of Sutter Slough to Rio Vista.
- Impacts to Delta fishery could possibly be significantly adverse and should be fully analyzed and mitigated in an EIR if future re-installation is pursued.

Recreation Impacts

- Sutter Slough is direct and scenic navigable passage from the western Delta near Rio Vista to the northern destinations of Courtland, Freeport, and Sacramento.
- Annual boat use in Sutter Slough were estimated in 1975 to be approximately 4,500.
- Steamboat Slough provides an alternate boat route during closure of Sutter Slough, with increased trip of 4.5 miles.
- Only minor effects expected for fishing and marina operations.
- Signage and safety devices were installed to inform and protect boaters.

Erosion and Sedimentation

- Extensive bottom soundings were performed before and after barrier installation, both above and below the dam location.
- No evidence of erosion or sedimentation issues being aggravated by installation of the barrier.

Domestic Water Use

- Homes in project area use well-water supply and should not be significantly impacted by barrier.
- Impacts to North Bay Aqueduct were not analyzed or mitigated.

Flood Control

- Impacts to flood control were not analyzed or mitigated in the 1976 Initial Study, but a more detailed discussion was recommended for EIR.

Local Agency Assurances

- Aug 12, 1976 – A Memorandum of Permit was executed between DWR and NDWA:
  - DWR shall measure water quality every two weeks at 8 locations
  - DWR shall measure tidal fluctuations in Sutter, Miner, Steamboat, and Cache Sloughs
  - DWR shall obtain diversion info (pump/siphon capacity/elevation; acreage/crops served by diversions
  - DWR share store minimum of 5 portable pumps/power plants
  - If DWR can't provide alternative diversion capability within 24 hrs notice from affected landowner, DWR will immediately breach barrier
  - DWR shall pay for extra energy required to pump water during closure
  - Water quality in Sutter, Miner, Steamboat, and Cache Sloughs shall not exceed 25 parts per million total dissolved solids higher than Greens Landing
  - Water quality at Rio Vista, Three Mile and Mayberry Sloughs, and Emmaton shall not be less than what existed in July
  - DWR shall assure a minimum flow of 11,000 cfs during the closure at the Sacramento River at Sacramento
  - DWR shall remove the barrier and return channel to previous condition by Dec 20 or sustained flows of 30,000 cfs for 72 hrs
  - DWR shall reimburse NDWA for legal, engineering, and manager costs within 90 days of barrier removal
  - DWR shall hold NDWA harmless of and from any loss, injury, or expense to the Agency or claim or demand from third parties as a result of the dam installation
  - DWR will not request future emergency barrier in future unless preparation of an EIR is completed first

Environmental Analysis Commitments by DWR for Future Installation

- In the 1977 DWR Initial Study of Sutter Slough Barrier, DWR recommends that an EIR be prepared before any future reinstallation of barrier is proposed (page 23) and that it specifically analyze the following impacts:
  - Fishery (pg 12 and 23);
  - Erosion and Sedimentation (pg 23);
  - Flood Control (pg 7 and 23);
  - Installation and Removal (pg 23); and
  - Lowered Water Surface Elevation (pg 18 and 23);
- The commitment by DWR to only request to reinstall a drought barrier on Sutter Slough in the future only if an EIR is completed first is also contained in the August 12, 1976 Memorandum of Permit with the NDWA (provision #9).