

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
Central District

INITIAL STUDY
ROCK BARRIER AT SUTTER SLOUCH

District Report

February 1977

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CONVERSION FACTORS

English to Metric System of Measurement

<u>Quantity</u>	<u>English unit</u>	<u>Multiply by</u>	<u>To get metric equivalent</u>
Length	inches (in)	25.4	millimetres (mm)
		.0254	metres (m)
	feet (ft)	.3048	metres (m)
	miles (mi)	1.6093	kilometres (km)
Area	square inches (in ²)	6.4516×10^{-4}	square metres (m ²)
	square feet (ft ²)	.092903	square metres (m ²)
	acres	4046.9	square metres (m ²)
		.40469	hectares (ha)
		.40469	square hectometres (hm ²)
		.0040469	square kilometres (km ²)
	square miles (mi ²)	2.590	square kilometres (km ²)
Volume	gallons (gal)	3.7854	litres (l)
		.0037854	cubic metres (m ³)
	million gallons (10 ⁶ gal)	3785.4	cubic metres (m ³)
	cubic feet (ft ³)	.028317	cubic metres (m ³)
	cubic yards (yd ³)	.76455	cubic metres (m ³)
	acre-feet (ac-ft)	1233.5	cubic metres (m ³)
		.0012335	cubic hectometres (hm ³)
	1.233×10^{-6}	cubic kilometres (km ³)	
Volume/Time (Flow)	cubic feet per second (ft ³ /s)	28.317	litres per second (l/s)
		.028317	cubic metres per second (m ³ /s)
	gallons per minute (gal/min)	.06309	litres per second (l/s)
		6.309×10^{-5}	cubic metres per second (m ³ /s)
	million gallons per day (mgd)	.043813	cubic metres per second (m ³ /s)
Mass	pounds (lb)	.45359	kilograms (kg)
	tons (short, 2,000 lb)	.90718	tonne (t)
		907.18	kilograms (kg)
Power	horsepower (hp)	0.7460	kilowatts (kW)
Pressure	pounds per square inch (psi)	6894.8	pascal (Pa)
Temperature	Degrees Fahrenheit (°F)	$\frac{1F - 32}{1.8} = tC$	Degrees Celsius (°C)

INTRODUCTION

The year, 1976, is on record as one of the driest in California history. Many areas of the State suffered severe water shortages. The California State Water Project was forced to reduce agricultural water deliveries to the San Joaquin and Santa Clara Valleys, causing an estimated crop loss of \$25 million. Water quality and reverse flows became problems in the Sacramento-San Joaquin Delta.

To reduce storage water releases needed to meet Delta water quality objectives, a temporary rock dam was installed across Sutter Slough just southwest of the town of Courtland. The emergency structure reduced flow down Sutter Slough, thereby increasing the flow in the Sacramento River and around the easterly portion of the Delta through the Delta Cross Channel and Georgiana Slough.

Faced with the possibility of another drought year occurring prior to installation of a Delta Transfer Facility, the Department of Water Resources (DWR) determined that this Initial Study should be prepared to cover the reinstatement of the temporary rock closure of Sutter Slough. The emergency nature of the closure in 1976 did not allow time before installation to thoroughly evaluate its impacts on the environment. However, data were collected by DWR before, during, and after the closure to help in evaluation of water quality, river flows, siltation, and tidal action. Studies were made by the California Department of Fish and Game and the U. S. Fish and Wildlife Service to determine the effect of the closure on migrating fish. Information gathered during the 1976 period of closure was used to develop this Initial Study.

PROJECT DESCRIPTION

The Sacramento River flows into the Delta by several routes. Some of the water is diverted at Sutter and Steamboat Sloughs and flows into Cache Slough, then rejoins the Sacramento River just above Rio Vista. Another portion of the water flows into the Delta Cross Channel and Georgiana Slough and moves southerly through the Mokelumne River channels into the various waterways of the eastern Delta. These streams are shown in detail in Figure 3.

The pumping draft created by the federal Central Valley Project and the State Water Project induces a flow toward the south end of the Delta and portions of the flow from the San Joaquin and Sacramento Rivers eventually reach these pumping plants. Some of the flow from the Sacramento River blends with the saline waters from Suisun Bay as it flows easterly around Sherman Island then southerly toward the export pumps. Summer flow patterns in the Delta under present conditions are shown in Figure 2.

One way to reduce the salinity caused by this westerly movement of Sacramento River water is to reduce the flows through Sutter or Steamboat Sloughs and increase the flows through the Delta Cross Channel and Georgiana Slough. The easiest and most practical method to accomplish this is by installing a barrier across Sutter Slough.

When the Sacramento River flow diminishes to less than 8,000 to 10,000 cfs ^{1/} at Sacramento, all of the water that normally flows through Sutter and Steamboat Sloughs is needed downstream to meet water quality standards in the western Delta. However, as flows increase above the 10,000 cfs level, it is possible to reduce a portion of the Sutter Slough flow and increase flows in the Sacramento River below Sutter Slough so that a proportionately greater amount of water will flow into the Delta Cross Channel and Georgiana Slough and through the easterly channels of the Delta to the pumping plants. When flows in the Sacramento River exceed 16,000 to 19,000 cfs ^{1/} at "I" Street, enough water flows into the Delta to satisfy all demands for export, use within the Delta, and salinity repulsion without diverting a portion of Sutter Slough flow into the eastern Delta.

The approximate distribution of flow in the Sacramento River system between Sacramento and Rio Vista is shown on Figures 4 and 5. The table below shows the distribution of flow for the flow range between 8,000 to 10,000 cfs at "I" Street.

^{1/} Varies seasonally.

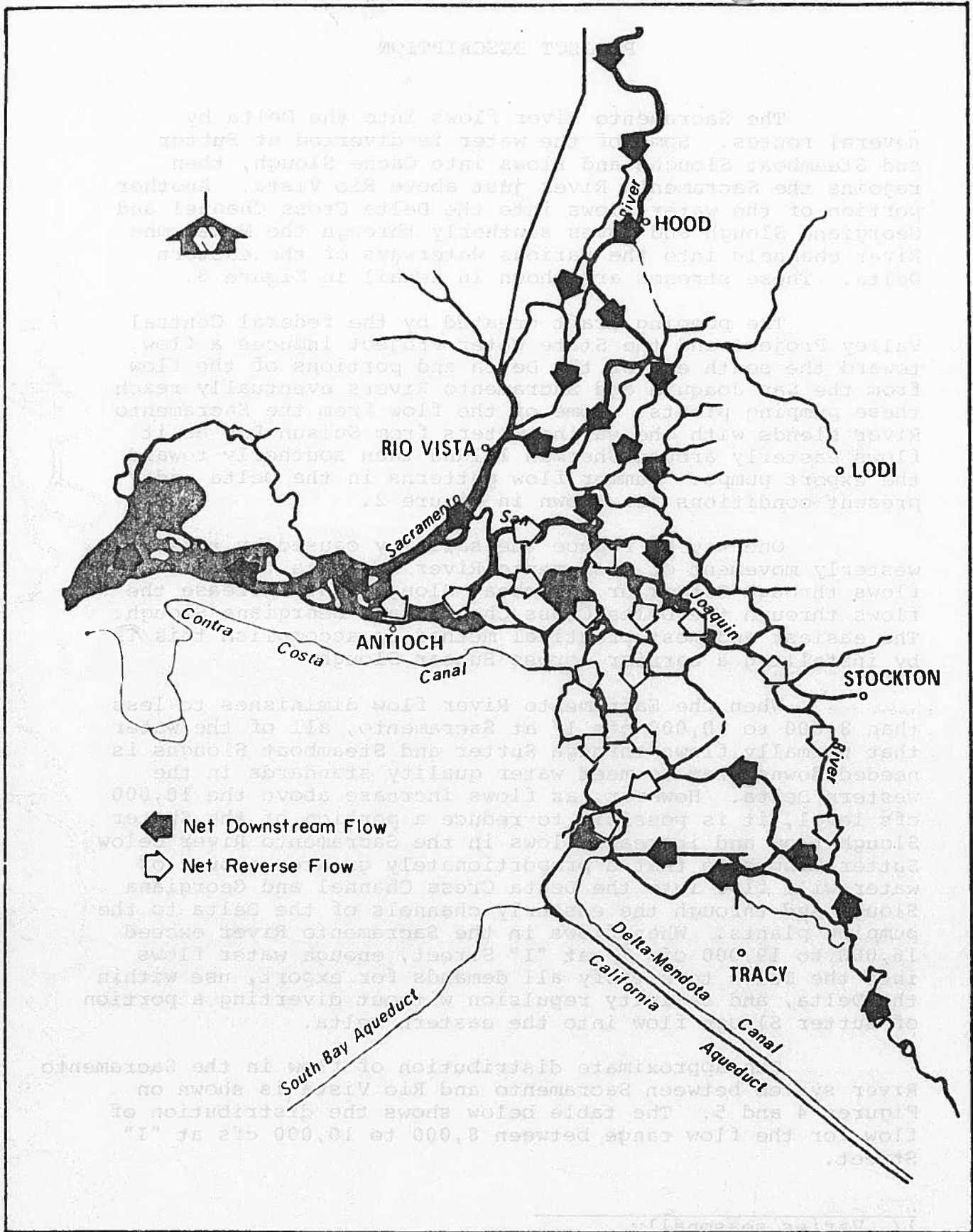


Figure 2. Summer flow patterns in the Delta under present conditions.

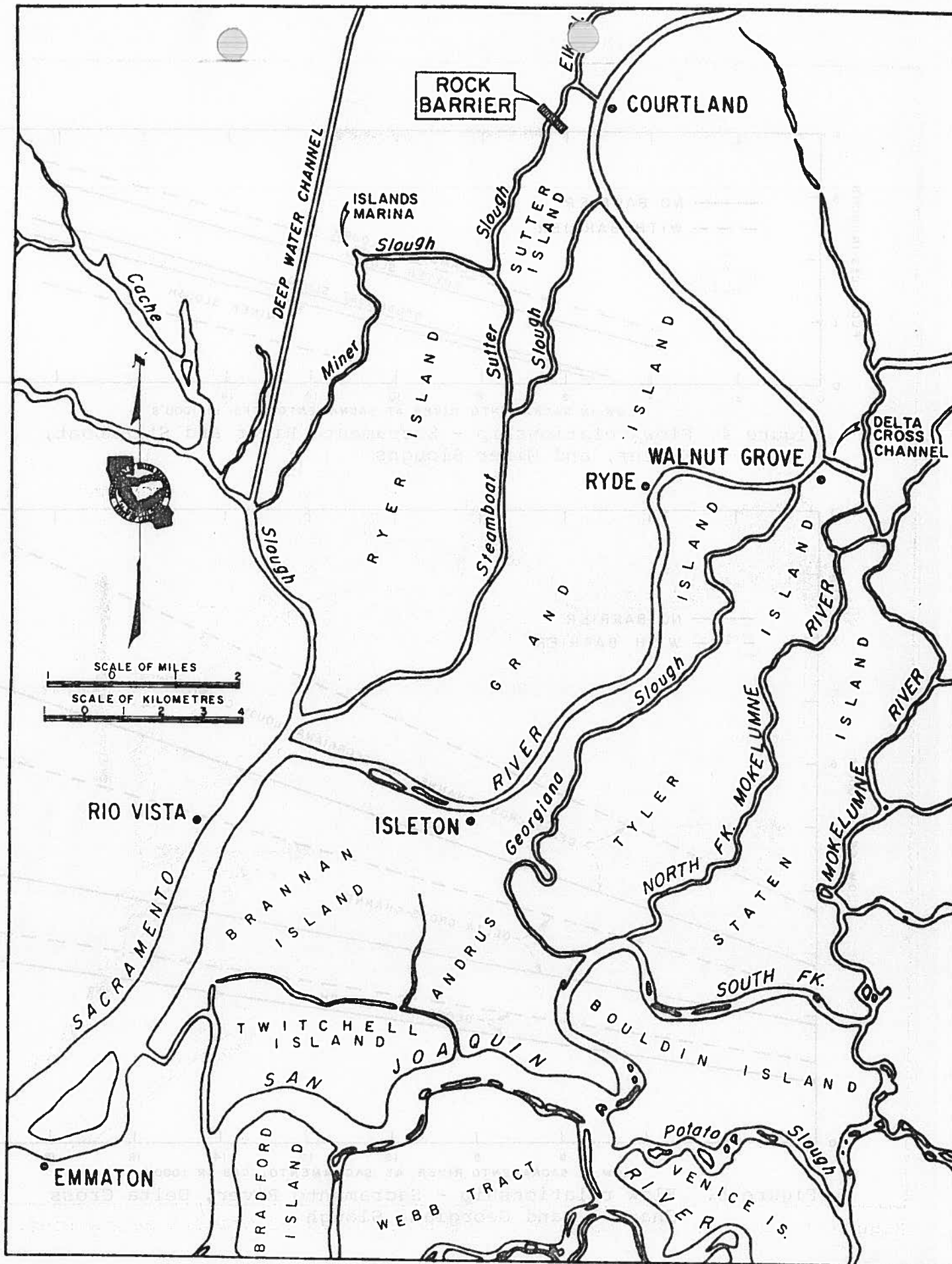


Figure 3. Location map, Sutter Slough rock barrier.

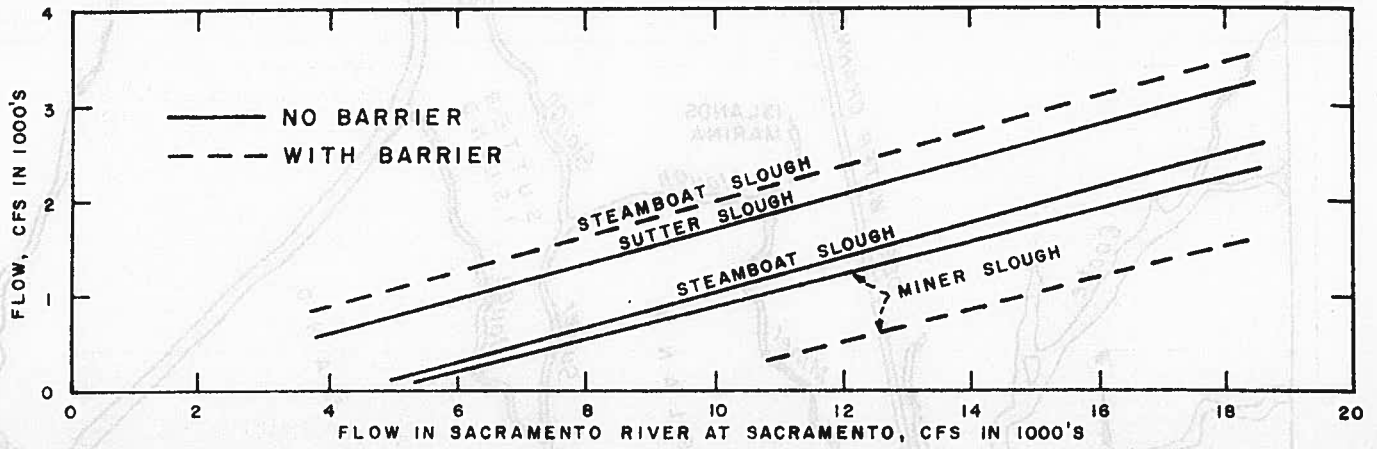


Figure 4. Flow relationship - Sacramento River and Steamboat, Sutter, and Miner Sloughs

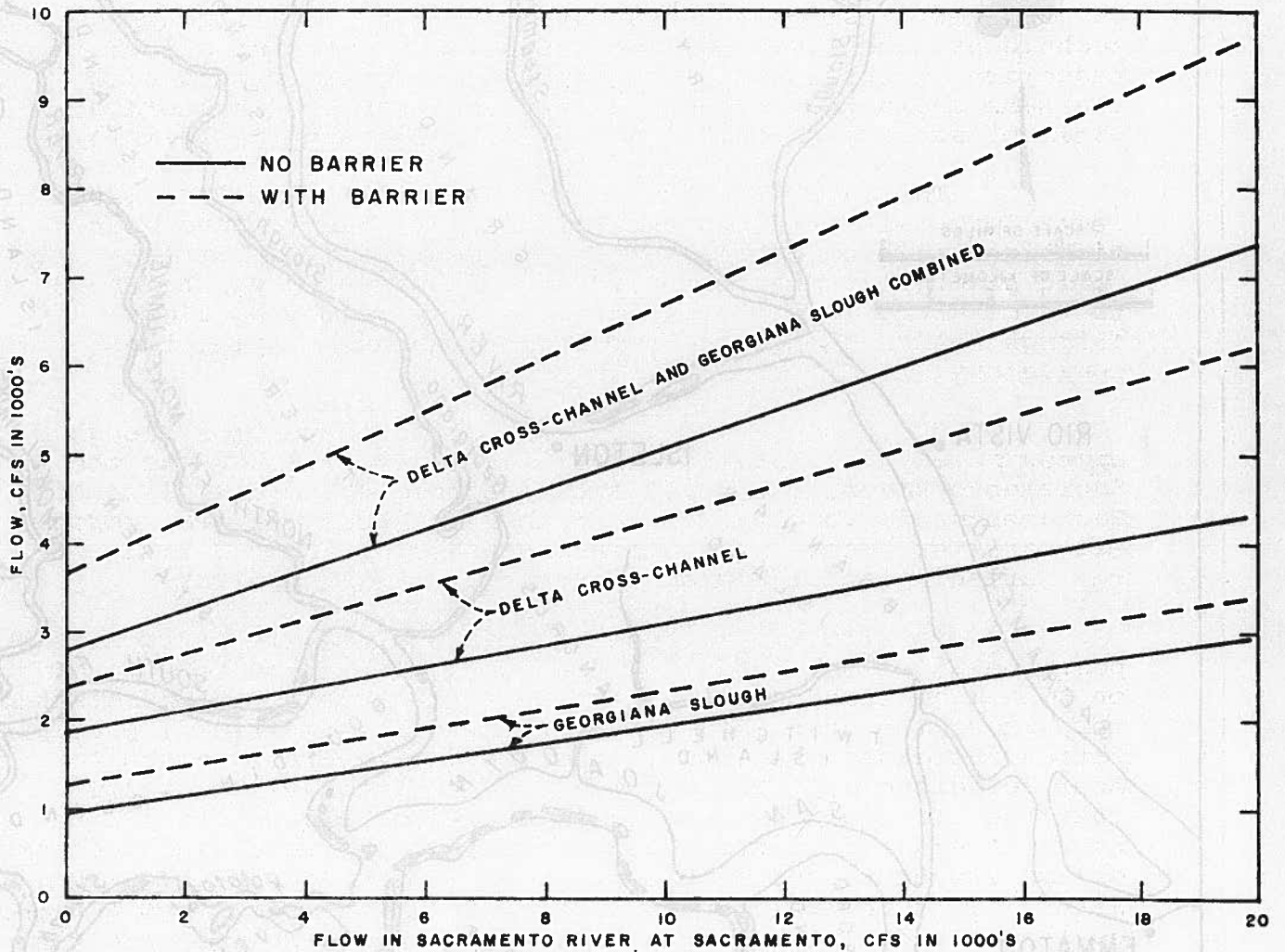


Figure 5. Flow relationship - Sacramento River, Delta Cross Channel, and Georgiana Slough

DISTRIBUTION

Portion of System	: Sutter Slough Closure	
	: Before	: During
Sutter Slough	19%	0%
Steamboat Slough	12%	21%
Delta Cross Channel	27%	39%
Georgiana Slough	18%	22%
Sacramento River at Ryde	24%	18%

For the range of flows shown, the transfer of Sacramento River flow through Georgiana Slough and the Delta Cross Channel is about 16 percent greater with a barrier in Sutter Slough. Assuming an average flow of 12,500 cfs for one month, a net transfer of about 120,000 acre-feet would be produced. Using standard outflow-export relationship techniques, the 2,000 cfs increased water transfer allows a reduction in outflow of about 1,000 cfs, while maintaining the same salinity control. A resultant savings in storage water of as much as 60,000 acre-feet per month is possible.

The barrier would be approximately 60 meters (200 feet) long, with the top about 1 meter (3 feet) above mean tideline, with a fishway gap in the center. The barrier would be made up of about 4,400 m³ (5,800 cubic yards) of 18 to 64 mm (5 to 18-inch) clean loose rock, allowing flows through Sutter Slough to be reduced without stopping them completely.

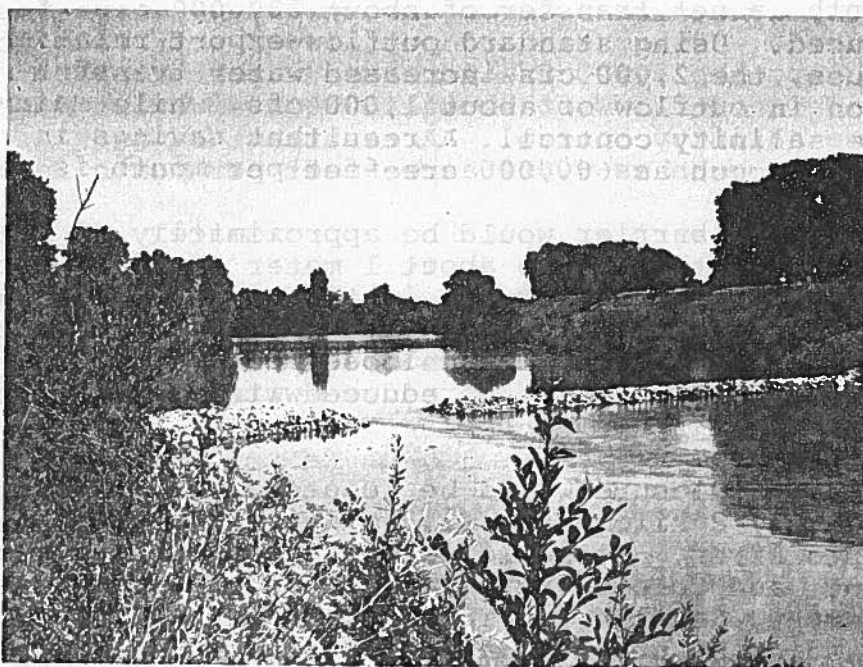
The closure would be located across Sutter Slough approximately 2 kilometers (1.3 miles) from its head at the Sacramento River. It would extend across the county line of Sacramento and Yolo Counties in the southwest quarter, north-east quarter, Section 36, Township 6 North, Range 3 East, in the jurisdiction of Reclamation Districts 349 and 999.

Construction of the barrier would begin as soon as possible after the spring salmon run (to minimize the impact on fish migrating downstream). The structure would be retained throughout the critically dry period until significant precipitation increases the flow of the Sacramento River enough to meet deficiencies. The construction contract will require that the structure be removed to Elevation -10 within 120 hours after notification, and removal of the remaining portion of the structure would be completed as soon as possible thereafter. This removal period is believed to be safe from a flood control standpoint based on flood forecasting ability and the large amount of upstream storage capacity presently available in reservoirs on the Sacramento River and its major tributaries.

Upon removal, rock from the barrier will be used for levee protection at Clifton Court Forebay or other ongoing riprapping projects.

Navigational blockades, consisting of three buoys with standard hazard markers and flashing white lights, will be placed 100 yards up and downstream of the dam. Log booms will be placed between the buoys and the barrier. Warning signs will be installed at four locations, as required by the Department of Navigation and Ocean Development. The State will take remedial measures required because of the installation of this barrier to retain the navigable access to the only marina located downstream of the barrier.

The State will install temporary pumping facilities, if needed, to assure the landowners downstream of the barrier that they will at all times have an adequate supply of irrigation water from the slough.



Looking upstream at the Sutter Slough rock barrier.

DESCRIPTION OF ENVIRONMENTAL SETTING

The project is located in the northern Delta, about 29 kilometers (18 miles) southwest of Sacramento and 2.4 kilometers (1.5 miles) southwest of the small town of Courtland. The area immediately surrounding the project site is agricultural, devoted entirely to orchards and field crops.

Downstream from Sacramento, water from the Sacramento River can enter several branch channels -- the man-made Delta Cross Channel and Sutter, Steamboat, and Georgiana Sloughs. That water passing through the Delta Cross Channel flows south into the two forks of the Mokelumne River. The relationship of this area to the entire Delta region is shown on Figure 1, on page 2.

The Sacramento-San Joaquin Delta is located at the confluence of the Sacramento and San Joaquin Rivers, near the center of California's Central Valley, approximately 80 kilometers (50 miles) northeast of San Francisco. The Cities of Sacramento, Stockton, Tracy, and Pittsburg circumscribe the roughly triangular area of the Delta. In its natural environment, prior to the 1850s, the Delta consisted of tidal swamp and overflow lands and grasslands covered with dense growth of tules and other water-dependent vegetation, which provided habitat for many early species of fish and wildlife. The early Delta was subjected to intermittent intrusion of ocean salts during the dry months of summer, and to uncontrolled flooding during winter and spring.

The Delta plays a key role in the management of California's water resources. While the major sources of water are in Northern California, most of the urban and agricultural lands needing water are in the central and southern portions of the State. Approximately 75 percent of the total streamflow occurs north of Sacramento and 25 percent south. About 80 percent of ultimate, projected urban and agricultural water requirements lie south of Sacramento. The season of highest demand for water is summer, while most precipitation and runoff occurs in winter and spring. Further, the large variations of runoff that occur from year to year contribute to California's water management problems.

Export water of the SWP and CVP must now pass through Delta channels to be diverted for use in water-deficient areas of California. The Delta channels also serve as a common source of water supply for Delta agricultural, industrial, urban, recreational, and fish and wildlife uses, as well as an outlet to the Pacific Ocean for waters that originate in the Sacramento and San Joaquin Valleys.

The Delta is subject to the intrusion of salt water by tidal action through San Francisco Bay. Salinity intrusion is presently controlled by Delta outflow, augmented as necessary by SWP and CVP reservoir releases during low flow periods.

Existing channel capacities limit the amount of water that can be transferred from the Sacramento River through the central Delta to the main SWP and CVP export facilities in the south Delta. This limitation causes a portion of the water to flow into the western Delta (where it picks up ocean salts) and then back upstream (reverse flow) where it blends with the cross-Delta flows on the way to the pumps. These flow conditions must be carefully balanced to avoid exceeding water quality criteria in the Delta and at diversion facilities for the Contra Costa Canal, the Delta Mendota Canal, and the California Aqueduct.

Principal species of anadromous and resident game fish in the Delta are striped bass, king salmon, steelhead, American shad, sturgeon, catfish, and sunfish.

The entire Delta environment is described in detail in the "Draft Environmental Impact Report, Peripheral Canal Project", Chapter IV, Section B (page IV-20).

POTENTIALLY SIGNIFICANT IMPACTS

Effect on Fishery

It has been hypothesized that diversion of water from the Sacramento River into the central Delta would detrimentally affect the migrating Sacramento River system juvenile salmon. To test the hypothesis, three groups of dye-marked juvenile king salmon were released at five locations in the Delta. The fish were released on October 18 and 20, 1976. The recaptures were made by trawling in mid-channel of the river off Chipps Island. Trawling commenced on October 18 and continued through November 16. A total of 373 tows were made. The salmon used for the experiment were raised at Coleman National Fish Hatchery near Anderson. The eggs were from salmon trapped at Keswick Dam and spawned in February, 1976.

The following table summarizes the experiment:

Release Site	Number	Mean Size in mm	Dye Color	Recaptures at Chipps Island
Steamboat Slough at Ferry Slip	125,732	95.08	Red	85
Sacramento River at Ryde	106,392	95.08	Red	
Georgiana Slough 500 feet south of bridge	45,962	104.68	Yellow	
North Fork Mokelumne River at Giusti's Place	39,396	104.68	Yellow	37
South Fork Mokelumne River at Wimpy's	126,904	97.09	Green	28

POTENTIALLY SIGNIFICANT IMPACTS

A statistically significant difference in recaptures when comparing the three groups suggests that fall migrant juvenile salmon in the Sacramento River are detrimentally affected if subjected to a migration route via the central Delta.

The experiment will be repeated this spring (1977) using juvenile king salmon that normally migrate through the area during spring months. This group of fish (progeny from fall spawners) are by far the most numerous and probably more important than juveniles migrating during the fall months -- our test fish used in 1976.

Impacts of the project on the Delta fishery could possibly be significantly adverse, and should be examined -- along with possible mitigative measures -- in an Environmental Impact Report.

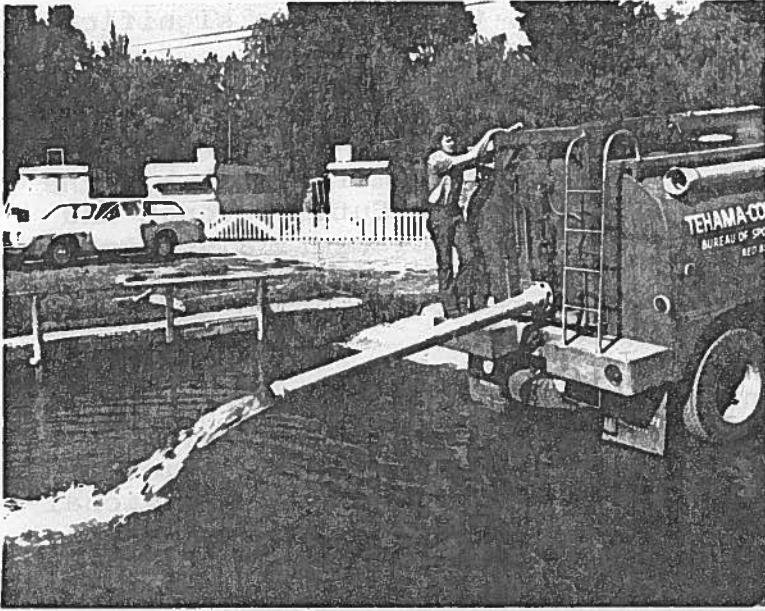
Effect on Agricultural Crops

Since the area of impact of the Sutter Slough Closure is almost entirely agricultural, effects on quantity and quality of irrigation water were a major concern before installation of the barrier in 1976. The Department of Water Resources took several precautions for meeting agricultural needs in an emergency.

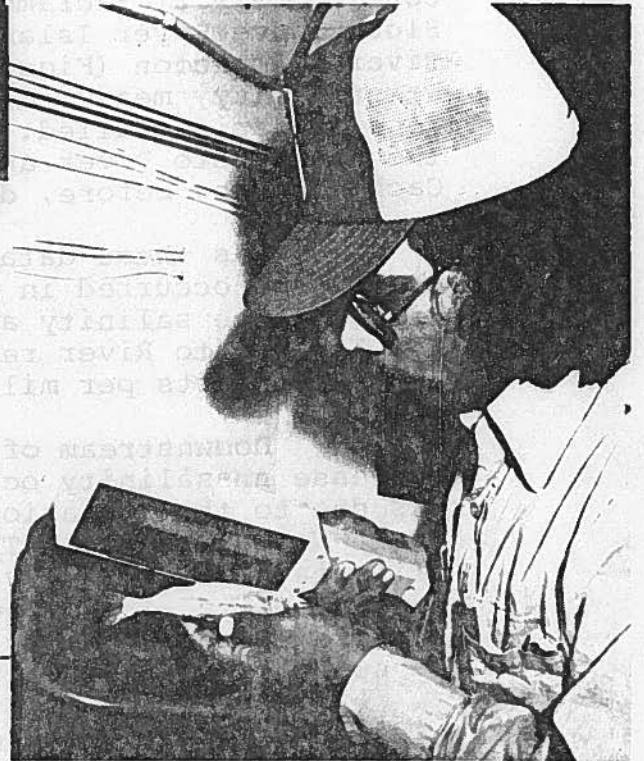
A survey was made of irrigation pumps and siphons below the barrier on Sutter and Miner Sloughs. These were checked daily while the barrier was in to see that they had enough water for proper operation. The Department stored four portable pumps and power plants at Reclamation District No. 501 headquarters, ready to use within 24 hours of any interruption of water supply. A 30-inch siphon that supplies water to the central portion of Ryer Island had a vortex (indicating a potential loss of suction) during operation even before the barrier was installed in 1976. Because of its size and importance, the Department installed a 24-inch pipe over the levee prior to the closure and connected it to three additional pumps. The pumps remained on standby at the Ryer Island siphon and at the Reclamation District's yard for the entire period of closure, although their operation was never required.

Various assurances such as these will be provided with any further closures of Sutter Slough and will fully mitigate any effect on supply of water for agriculture.

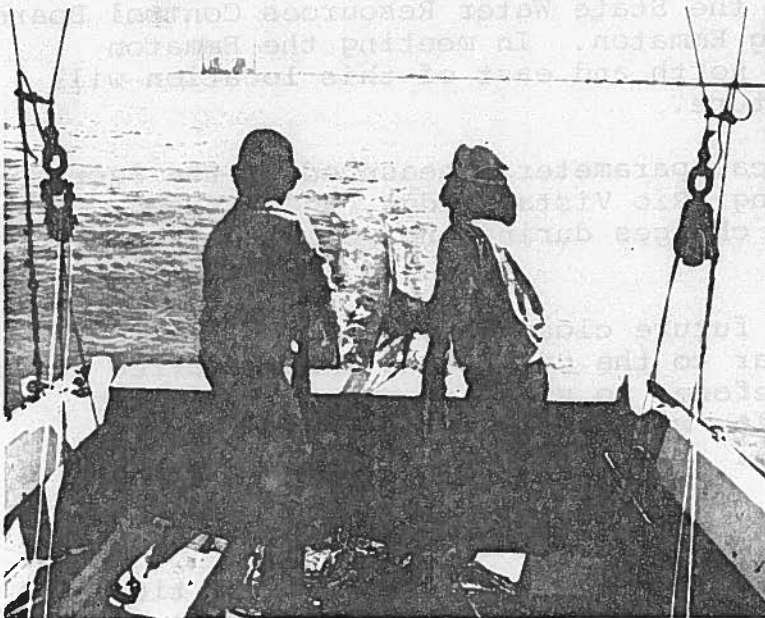
The quality of irrigation water is discussed in the "Water Quality" section.



Releasing dye-marked salmon for migration study.



Examining fish under black light for dye marking.



Trawling for the marked fish near Chipps Island.

The project, as mitigated, will have no significant effect on agricultural crops.

Effect on Water Quality

Installation of a closure on Sutter Slough has the effect of reducing the downstream flow in Sutter Slough and increasing the downstream flow in the Sacramento River to the Delta Cross Channel. Channels in this portion of the Delta are subject to tidal action and therefore experience reverse flows during portions of the tidal cycle.

Electrical conductivity (EC) is normally measured continuously at Sacramento River at Greene's Landing, Miner Slough above Ryer Island Bridge (Figure 6), and Sacramento River at Emmaton (Figure 7). The Department made additional water quality measurements before, during, and after the closure was installed. Figure 8 shows salinity profiles for the Sacramento River and for Sutter, Steamboat, Miner, and Cache Sloughs before, during, and after the closure.

As these data show, very little change in salinity conditions occurred in the area upstream from the Rio Vista Bridge. The salinity above the confluence of Cache Slough and the Sacramento River remained less than 250 micromhos EC, or about 165 parts per million (ppm) total dissolved solids (TDS).

Downstream of Rio Vista on the Sacramento River, an increase in salinity occurred as shown on Figure 7. This change was due to the operation of the Central Valley Project and the State Water Project. The Department intends to comply with the criteria established by the State Water Resources Control Board for the Delta, including Emmaton. In meeting the Emmaton criteria, water quality north and east of this location will be suitable for agriculture.

Other biological parameters, measured on the Sacramento River at Greene's Landing, Rio Vista Bridge, and Emmaton, indicate no significant changes during the period of the closure.

The effect of future closures on water quality can be expected to be similar to the conditions that occurred during the fall of 1976. Therefore, no significant effect on the water quality of the Delta will result from the temporary closure of Sutter Slough.

Effect on Tidal Levels

With the barrier in place in 1976, the low tides were from 0.9 to 1.6 foot lower at the downstream face of the

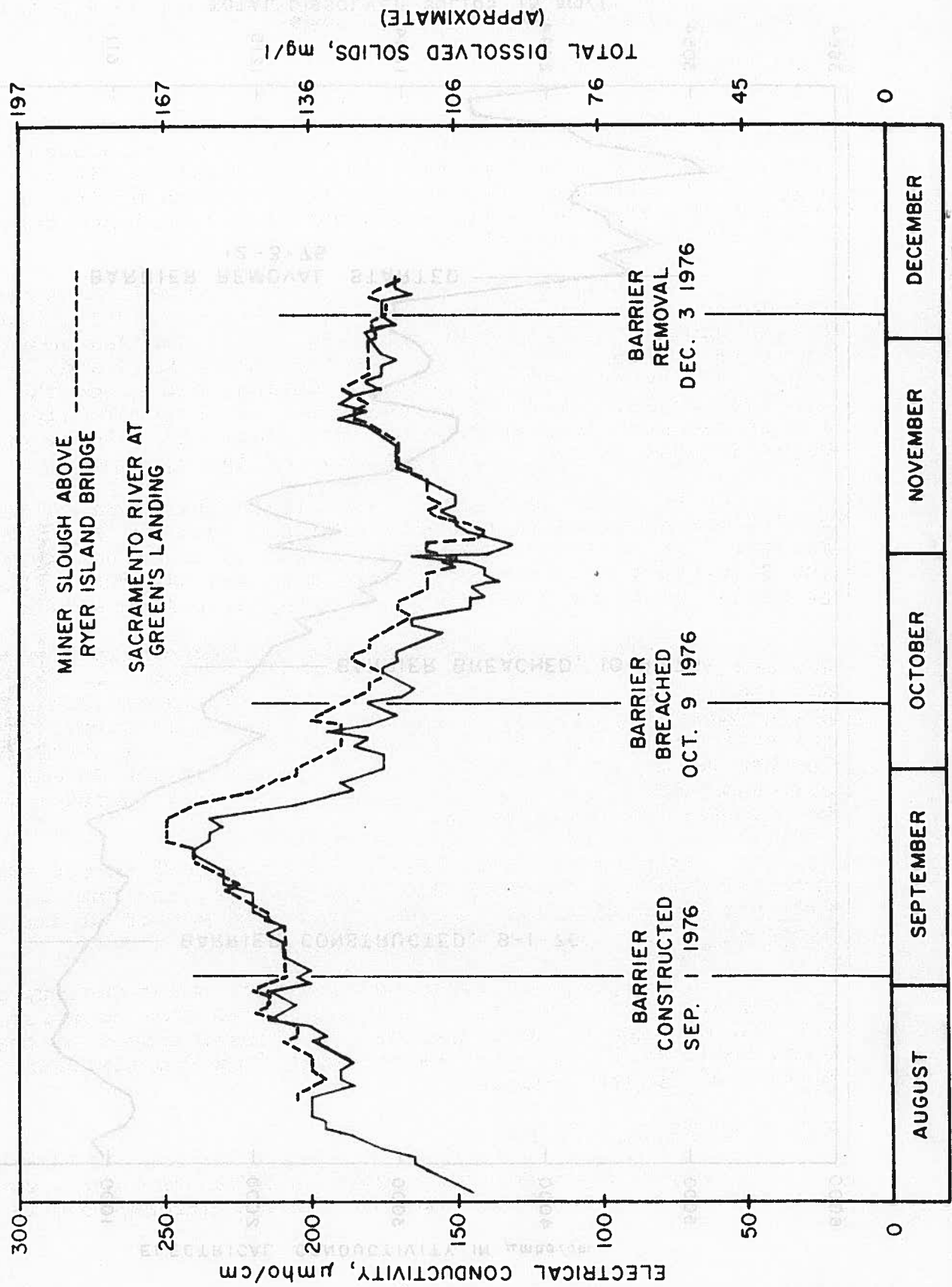


Figure 6. Mean daily EC and TDS measurements at Greene's Landing and Miner Slough.

DATE OF MEASUREMENT: 12-3-76

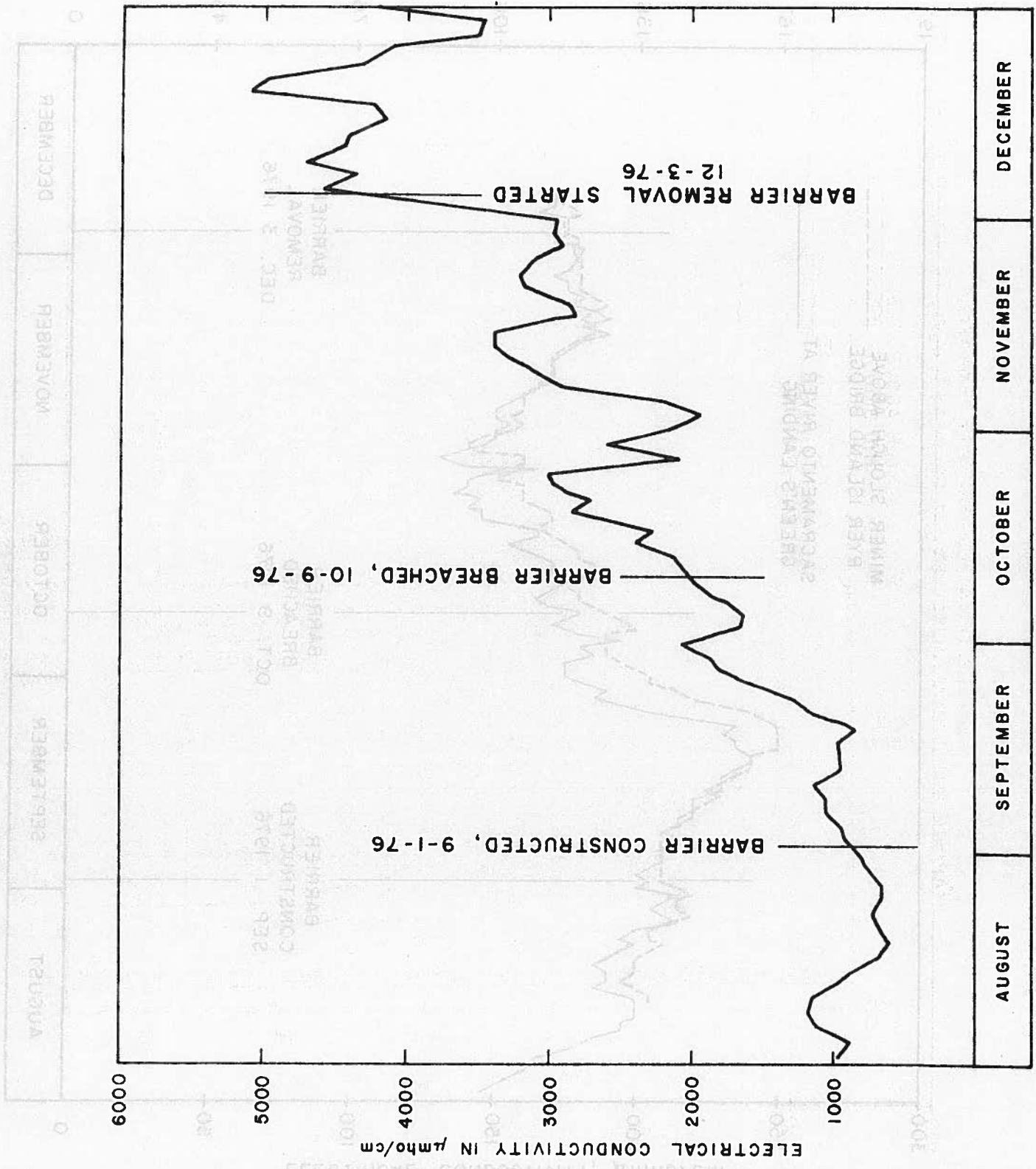


Figure 7. Mean daily EC and TDS measurements at Emmaton.

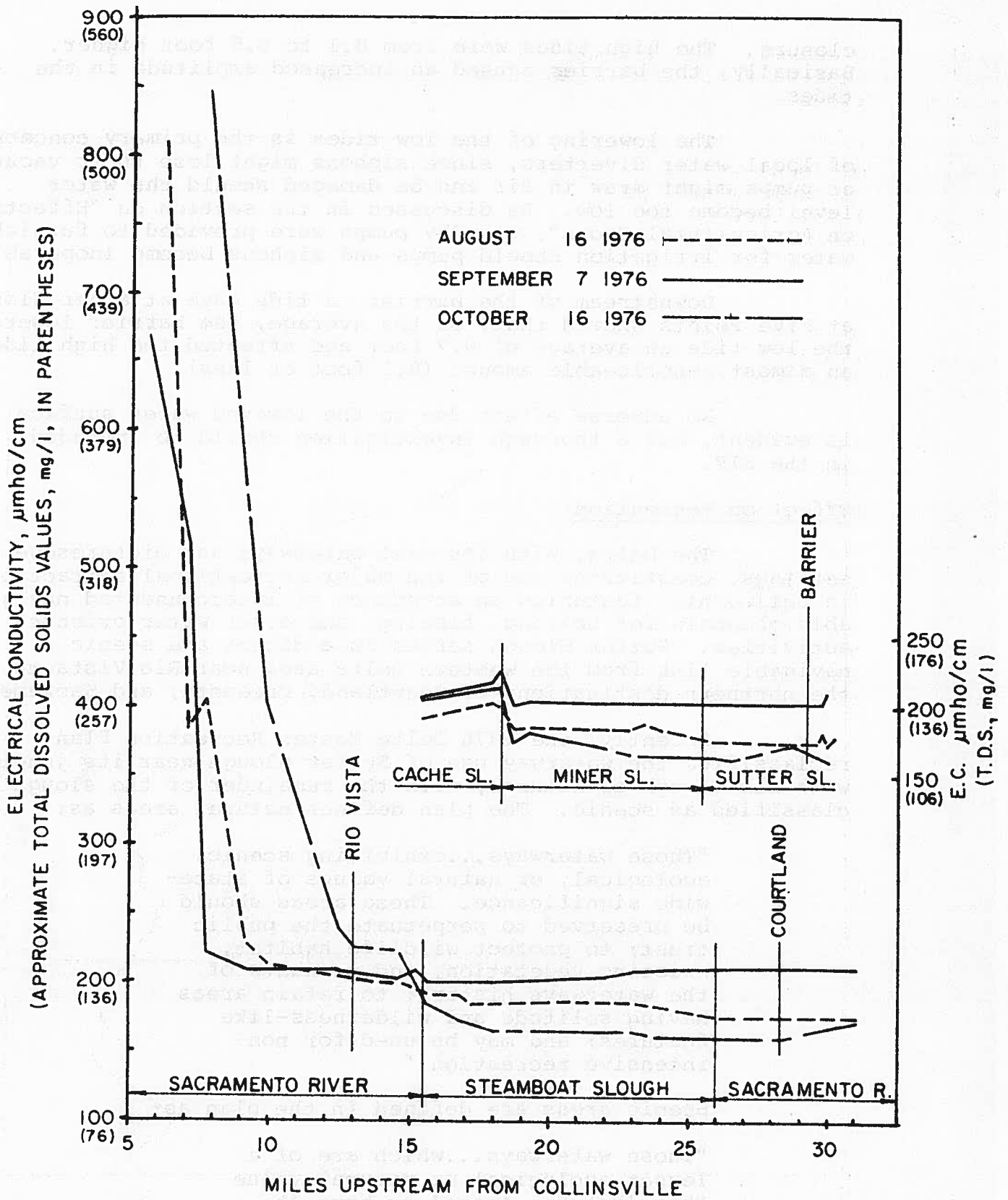


Figure 8. Salinity Profile.

closure. The high tides were from 0.1 to 0.5 foot higher. Basically, the barrier caused an increased amplitude in the tides.

The lowering of the low tides is the primary concern of local water diverters, since siphons might lose their vacuum or pumps might draw in air and be damaged should the water level become too low. As discussed in the section on "Effects on Agricultural Crops", standby pumps were provided to furnish water for irrigation should pumps and siphons become inoperable.

Downstream of the barrier, a tide gage at Miner Slough at Five Points showed that, on the average, the barrier lowered the low tide an average of 0.7 foot and affected the high tide an almost unnoticeable amount (0.1 foot or less).

No adverse effect due to the lowered water surface is evident, but a thorough investigation should be included in the EIR.

Effect on Recreation

The Delta, with its vast waterways and picturesque settings, constitutes one of the major recreational attractions in California, featuring an abundance of interconnected navigable channels for boating, fishing, and other water-oriented activities. Sutter Slough serves as a direct and scenic navigable link from the western Delta area near Rio Vista to the northern destinations of Courtland, Freeport, and Sacramento.

Recently, the 1976 Delta Master Recreation Plan reclassified the waterway use of Sutter Slough near its junction with Elk Slough as natural, with the remainder of the slough classified as scenic. The plan defines natural areas as:

"Those waterways...exhibiting scenic, ecological, or natural values of state-wide significance. These areas should be preserved to perpetuate the public trust; to protect wildlife habitat, existing vegetation, and remnants of the waterways history; to retain areas having solitude and wilderness-like features; and may be used for non-intensive recreation."

Scenic areas are defined in the plan as:

"Those waterways...which are of a lesser ecological or natural value than 'Natural Areas' or have the

potential for enhancement and which can support a wider range of active recreational activities without adverse environmental impact. These areas shall be managed and used to protect and further the public trust, protect wildlife habitat and existing vegetation, permit compatible public recreation uses, retain remnants of the waterways history, restrict inappropriate development in the waterway, and maintain through-navigation."

The direct recreational impact of the closure is its restriction on through navigation. Based on data from boat movement activity surveys conducted in 1968 and 1975, daily boat counts in upper Sutter Slough varied from a low of 10 boats during a summer weekday to a high of 44 during Labor Day weekend. Based on these daily counts, annual boat counts in the upper reaches of Sutter Slough are estimated at approximately 4,500. The closure will cause boaters to take one or more of the following options: (1) avoid the area until the closure barrier is removed; (2) bypass the closure using Steamboat Slough as an alternative route; or (3) use the resulting blocked slough for mooring or other uses that are enhanced by the elimination of through navigation.

No significant effects are anticipated from the greater use of Steamboat Slough as an alternative route. Since during the summer months a large number of boats are moored along Steamboat Slough, through boats will be required at times to travel at slower speeds in Steamboat than in Sutter Slough. However, overall trip time from the junction of Steamboat/Sutter Sloughs to the entrance of Sutter Slough off the Sacramento River for boaters using either route is approximately equal. Using Steamboat Slough as an alternative route, the increased trip length from Islands Marina, located off Miner Slough, to the northern Sacramento River destinations upstream from Courtland, is approximately 7.2 kilometers (4.5 miles). The closure location will not impair water-skiing activities in Sutter Slough. However, during low tides, water level variations caused by the barrier may have some temporary impact on boating and water skiing.

It is felt that, with mitigation measures discussed below, the closure will have only a minor effect, if any, on Delta fishing. In addition, it is felt that the closure will not have any significant effect on marina operation.

The closure project will include the placement of signs advising the boating public of the closure and alternate routes they may take to reach their destinations. Signs will be placed at the following locations, as recommended by the Department of Navigation and Ocean Development for the 1976 closure.

1. The entrance to Miner Slough at Cache Slough.
2. The entrance to Sutter Slough at Steamboat Slough.
3. The junction of Sutter and Miner Sloughs.
4. The Sutter Slough Bridge by the Sacramento River.

In addition, the following safety devices will be installed across Sutter Slough upstream and downstream from the closure barrier.

1. Three buoys with standard hazard markers and flashing white lights 100 yards up and downstream.
2. Log booms between the buoys and closure barrier.

Effect on Erosion and Sedimentation

Extensive bottom soundings were performed above and below the closure and in the vicinity of Five Points in Miner Slough, both before and after the closure. All evidence at hand indicates that past erosion and sedimentation problems below the Sutter Slough Closure were not aggravated by installation of the barrier.

Effect on Air Quality

The only potential adverse impacts of the project on air quality will be the result of construction activity and the short extra distance some recreational boaters may travel. Because of the relatively minor level of construction and the relatively small amount of extra boat travel involved, these impacts will not be significant. Water is sprayed periodically from fire nozzles on the construction barge to keep dust to a minimum.

Effect on Noise

Noise levels during construction will be higher than usual in the immediate project area, but will be for a brief period and will not have a significant impact. No persons will be exposed to severe noise levels as a result of the project.

Extra vehicular travel in the immediate area and on public roads leading to the project area will be relatively minor and will not significantly contribute to noise levels.

Effect on Light and Glare

Light or glare will not be affected in any way by the proposed project.

Effect on Land Use

Since the project area is entirely agricultural, a survey was made to determine crop patterns in 1976. As mentioned in the section, "Agricultural Crops", irrigation water will be guaranteed to the farmers; therefore, no change in land use will occur as a result of the proposed project.

Risk of Upset

The tugboat, barge, and crane used to construct the barrier will carry only enough diesel fuel and oil for their operation and maintenance. Therefore, explosion or release of hazardous substances due to accident is unlikely during the construction or operation of the proposed rock barrier.

Effect on Population Growth

The proposed rock barrier at Sutter Slough is a temporary measure to allay critical water shortages on a short-term basis. Therefore, no population growth can reasonably be expected as a result of the project.

Effect on Housing

Construction workers are on the scene for only a few days and would not be expected to seek housing in the area. Surveillance personnel for the project will be employees of State agencies, and already living in nearby communities.

Effect on Public Services

Since construction of the temporary barrier involves very few people and a short time span, no change in fire or police protection or other government services will result.

Effect on Energy

Because of the relatively minor level of construction, fuel to operate the crane is not considered to be significant. Power for the standby portable pumps, should they be needed, would also be insignificant.

Effect on Utilities

The proposed project will not necessitate any change in utilities. Water for domestic use is supplied by wells on the islands and will, therefore, not be affected by the lower flows in the affected sloughs.

Effect on Human Health

As discussed under "Water Quality", no significant increase in pollutants will be allowed during operation of the project. No other potential impacts on human health can be found.

Effect on Aesthetics

The U. S. Corps of Engineers intends to riprap the banks in the immediate area of the closure, which will destroy any scenic riparian vegetation. The area around the proposed closure, being entirely agricultural, is not commonly viewed by the public. The installation is not particularly unsightly, and should not be aesthetically offensive to the few humans who might view it.

Effect on Archaeological or Historical Sites

No known archaeological or historical sites exist in the area of the project's impact. If any evidence of artifacts or sites are found during project installation, work will be halted and evaluations and appropriate salvage conducted.

Effect on Housing

Construction workers are on the scene for only a few days and would not be expected to seek housing in the area. Surveillance personnel for the project will be employees of state agencies, and already living in nearby communities.

Effect on Public Services

Since construction of the temporary barrier involves very few people and a short time span, no change in fire or police protection or other government services will result.

Effect on Energy

Because of the relatively minor level of construction, fuel to operate the crane is not considered to be significant. Power for the standby portable pumps, should they be needed, would also be insignificant.

CONCLUSIONS AND RECOMMENDATIONS

It is recommended that an Environmental Impact Report be prepared and based on this Initial Study. In addition to considering comments of those who review this Initial Study, the EIR should cover the following possible impacts.

Fishery

The EIR should discuss details of effects on the Delta fishery, along with suggested mitigating measures. The Department of Water Resources and the Department of Fish and Game should work closely to protect the fishery to the fullest possible extent during critical year closures of Sutter Slough.

Erosion and Sedimentation

Preliminary studies do not indicate erosion and sedimentation problems because of the 1976 barrier. However, such effects may exist, and a more detailed discussion of the subject should be included in the EIR.

Flood Control

As mentioned under "Project Description", the criteria for removing the barrier are believed to be safe from a flood control standpoint. However, a more detailed discussion should be included in the EIR.

Installation Conditions

The EIR should clearly describe the circumstances under which the barrier may be installed and removed.