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Department of Water Resources

BULLETIN No. 149-65

PROJECT LEVEE
MAINTENANCE AND REPAIR
1965 INSPECTION REPORT



ITY OF CALIFORNIA
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MAY 1966

HUGO FISHER
Administrator
The Resources Agency

EDMUND G. BROWN
Governor
State of California

WILLIAM E. WARNE
Director
Department of Water Resources

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STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

EDMUND G. BROWN, Governor of California
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ABSTRACT

Bulletin 149-65

The report entitled, "Bulletin 149-65, Project Levee Maintenance and Repair", contains ratings of the quality of maintenance performed during 1965, on levees within the flood control project totaling 1,372 miles in length.

Project levees inspected include the Sacramento, American, San Joaquin, Calaveras, Littlejohns and Truckee Rivers, Merced County Stream Group, Middle Creek, Big Dry Creek Reservoir and Diversion and the Lower San Joaquin Flood Control Project.

The report also contains information in regard to standard maintenance procedures, levee reconstruction completed by the U. S. Corps of Engineers, results of the 1965 bank erosion survey and foldout plates showing locations of project levees and the various maintaining agencies.

CHAPTER I. INTRODUCTION

This is the annual inspection report for 1965, covering the flood control project works that were constructed, maintained and operated under cooperative state and federal agreements in the Sacramento and San Joaquin Valleys.

Inspection and detailed reports on the conditions of all project levees have been made each year since 1947. Copies of those reports were transmitted to the trustees, or other responsible officials, in each of the respective areas inspected and to The Reclamation Board and U. S. Corps of Engineers.

This report includes the results of the inspection made during the fall of 1965 and reports on the degree of progress made by each agency on the maintenance or repair of levees subsequent to the spring inspection. The ratings given each district reflect the latest conclusions of the Department of Water Resources as to the degree of compliance with federal regulations. The report also includes project maintenance deficiencies, standard maintenance procedures, major levee reconstruction during 1965 and the results of the annual bank survey of the Sacramento River and its tributaries.

Authorization

The State Water Code sets forth the duties and responsibilities of the Department of Water Resources and public districts or agencies with regard to operation and maintenance of federally constructed projects in all cases where the Federal

Government does not maintain or operate them. Those units, enumerated in Section 8361 of the Water Code, are maintained and operated at state expense by the Department. The maintenance and operation of all other project flood control works are the responsibility, liability, and duty of public agencies other than the State of California, in accordance with the provisions of Sections 8370 and 12642 of the Water Code. Since the enactment of Chapter 1528, Statutes of 1947, the Department has made semi-annual inspections of all the levees of authorized flood control projects in the Sacramento-San Joaquin Drainage Basin pursuant to the federal regulations of August 16, 1944, and reported its findings to the local agency, The Reclamation Board and the U. S. Corps of Engineers. This activity, initiated pursuant to Section 208.10(a) of the federal regulations, has in effect provided for transfer from the local agencies to the Department the obligation of complying with Sections 8371, 8372 and 8373 of the Water Code. The supervisory powers and duties of the Department are applicable to all works of the Sacramento River Flood Control Project maintained and operated by the local agencies, without regard to status of completion, construction of, or expenditure of federal funds on such works.

The Water Code, as amended by Chapter 1800, Statutes of 1957, sets forth a procedure which is available when necessary, whereby adequate and uniform maintenance throughout the State may be secured for all federal flood control projects authorized by the State for financial assistance, including Soil Conservation

Service projects. In substance, formation of a maintenance area is initiated by a finding of the Department that there has been a failure on the part of a local agency to properly maintain project works in accordance with federal regulations, or that a local agency no longer desires to operate and maintain the project. Thereafter, by following the prescribed procedure, including the holding of a hearing if protests are filed by the local agency, The Reclamation Board as to projects within the Sacramento-San Joaquin Drainage Basin, or the Department of Water Resources as to projects in other areas of the State, may form a maintenance area in which the Department of Water Resources maintains that particular unit of the project works. Cost of maintenance is apportioned upon the property benefited within the maintenance area on an ad valorem basis. The assessment is extended for collection with county taxes on the county assessment roll.

At present, there are eleven maintenance areas within the Sacramento River Flood Control Project and two on the Major and Minor Tributaries Project.

Area of Inspection

This report covers the following Project levees aggregating 1,372 miles in length situated in 100 districts or areas:

1. Sacramento River and Tributaries
2. American River
3. Lower San Joaquin River and Tributaries
4. Calaveras River Littlejohns Creek and Tributaries
5. Merced County Stream Group

6. Big Dry Creek Reservoir & Diversion
7. Middle Creek
8. Truckee River
9. Lower San Joaquin Flood Control District

Each levee unit of a district or area was inspected, and required maintenance or repairs noted on a check sheet.

CHAPTER II. STATUS OF LEVEE MAINTENANCE

Since the inception of the semiannual levee inspection program in 1947, improvement has been observed in the maintenance practices of all but a few local agencies. Since the fall of 1956, the joint field inspection program has resulted in further improvement. This improvement has been accomplished by scheduling a date, time and location to meet with representatives of each local maintaining agency to make a field inspection of their levee system. The maintenance regulations are explained and attention called to portions of levee work in urgent need of maintenance or repair. A copy of the inspection sheet, listing work that should be accomplished in order to comply with the federal regulations, is also given to the representatives of the local maintaining agency.

Many of the ratings listed as "poor" or "fair" could have been improved by the simple expedient of removing undesirable growth on the levee slopes and rock revetments. This task could have been accomplished by spraying the undesirable vegetation with selective herbicides in the spring and burning during the late summer season. Such treatment would have made it possible to view the levee section and allow for the repair of any burrow holes, caves, slough, or other damages to the levee not otherwise apparent.

Other examples of inadequate maintenance were: (a) Failure to shape crown roadways so as to provide proper drainage during

wet weather and to add gravel where needed. (b) Allowing fences, buildings and other unauthorized encroachments to remain or new ones to be constructed along the crown or any portion of the levee slope. Such practices cause maintenance problems during burning, dragging, spraying and rodent control work. (c) Allowing abandoned pipes not properly sealed, inoperative, and leaky pipes, to remain in the levee section. (d) Allowing unauthorized grazing or vehicular traffic on the levees. (e) Not burning grass and weeds during appropriate seasons.

Description of Tables

The status of maintenance is presented herein, in tabular form for convenience of review. The quality of maintenance provided for the levees of the various projects is shown for each maintaining agency.

Table 1 lists all maintaining agencies of Project Levees of the Sacramento River and its tributaries. Table 2 lists maintaining agencies for works completed to date on the San Joaquin River and Tributaries Project, the Calaveras River and Littlejohns Creek Project, the Merced County Stream Group Project, and the Big Dry Creek Reservoir and Diversion Project in Fresno County. Table 3 lists the maintaining agencies for all works completed to date on the Middle Creek Project and Truckee River Project. The latter two projects are located outside of the Sacramento-San Joaquin Valleys.

In Tables 1, 2, and 3, each district or area responsible for maintenance of the separate portions of levees within their boundaries of jurisdiction are listed along with the agency's levee unit number, the stream and bank on which the levee is located, and the length of levee in miles. The columns, under Compliance with Federal Regulations Governing Maintenance, list twelve major factors taken from the federal regulations and are the basis for determining the overall ratings assigned each district for performance of maintenance for 1965.

The two columns, under overall ratings, lists first the progress attained during the year and secondly the maintenance practices performed by the maintaining agencies. The last column lists any remarks that are pertinent to assigning the ratings.

Table 4 presents a tabulation of maintenance performance for each district or area in the Sacramento River and Tributaries Project from 1947 through 1965. The ratings for districts with more than one unit are composite ratings.

Table 5 presents a tabulation of maintenance performance for each district or area in the San Joaquin River and Tributaries Project and the miscellaneous projects from 1958 through 1965. The ratings for districts with more than one unit are composite ratings.

Tables 6 and 7 list the district or area according to their performance rating for 1965. The ratings for those districts and areas which have more than one levee unit are a composite of the ratings for the individual levee units.

Maintenance Ratings

Maintenance ratings are based upon adherence to the procedures outlined in a leaflet prepared by the Department of Water Resources, entitled "Recommendations for Levee Maintenance", which is a condensation of the federal regulations for levee maintenance. These recommendations, which are explained in Appendix A, have been made available to the various agencies responsible for the performance of maintenance.

The ratings assigned to a particular unit and shown in this report are the results of an appraisal of the twelve major factors listed below along with the important items considered in assigning the rating for each major factor:

1. District Maintenance Program - Has the maintaining agency initiated a definite maintenance program with a set budget to provide for the program?

2. Readiness For Flood Emergency - Has the maintaining agency organized a definite plan to effectively combat a flood situation? Has one individual been appointed to supervise and be responsible to carry out the plan? Does the maintaining agency have a stockpile of standard flood fighting equipment such as sacks, burlap, canvas, hand tools and access to portable radios for communications during levee patrolling?

3. Adequate Levee Section and Grade - Does the maintaining agency's levee system meet the standards for the levee section and grade for their particular levee system?

The following tabulation lists the standard levee sections for the various projects:

STANDARD LEVEE SECTIONS

<u>Project</u>	<u>Crown Width in Feet</u>	<u>Slope</u>		<u>Freeboard</u>
		<u>Landward</u>	<u>Waterward</u>	
<u>Sacramento River and Tributaries</u>				
Old Sacramento River	20 ^{1/}	1 on 2	1 on 3	3
Sacramento Major and Minor Tributaries	12	1 on 2	1 on 3	3
Bypasses(Yolo & Sutter)	20	1 on 2	1 on 3	5
<u>San Joaquin River and Tributaries</u>				
Rt. Bank San Joaquin downstream from Walthal Sl. to Burns Cut	20	1 on 2	1 on 3	3
Lt. Bank San Joaquin downstream from Banta Carbona Intake to Burns Cut	20	1 on 2	1 on 3	3
San Joaquin River & Tributaries above these points & Old River	12	1 on 2	1 on 3	3
Bear Creek	12	1 on 2	1 on 3	3

^{1/} The crown width at a number of locations exceeds 20 feet due to public highways or right-of-way agreements.

<u>Project</u>	<u>Crown Width</u>	<u>Slope</u>		<u>Freeboard</u>
		<u>Landward</u>	<u>Waterward</u>	
San Joaquin River & Tributaries above Merced River	12 ¹ / ₂	1 on 2	1 on 3	3
Bypasses (Eastside Mari- posa & Chowchilla)	12 ¹ / ₂	1 on 2	1 on 3	4

4. Adequate Encroachment Control - Has the maintaining agency made a concentrated effort on its own to protect the levee section from the establishment of unauthorized encroachments? Has the agency made an effort to remove any of the unauthorized encroachments?

5. Control of Wild Growth - Has the maintaining agency cleared all of the wild growth, such as willows, elderberry, locust, bamboo and other undesirable growth from both slopes and rock revetment?

6. Rodent Control - Has the maintaining agency put forth an effective program for exterminating burrowing animals? Do the maintenance crews make periodic inspections of the levee slopes to exterminate any new infestation of rodents?

7. Repair of Cracks, Burrows and Rainwash - Has the local maintaining agency made all the necessary repairs to any cracks, burrows or rainwash damage on the levee slopes? A number of the local districts exterminate the burrowing rodents but fail to backfill the open burrow.

8. Repair of Erosion and Caving - Has the local maintaining agency made repairs to eroded and caved

1/ At a few locations the crown width has been increased due to poor soil conditions or right-of-way agreements.

areas along their banks and levees? If early repairs are made to these damaged areas by the maintaining agency major bank protection work and levee repair can be avoided.

9. Condition of Rock Revetment - Has the maintaining agency effectively controlled and removed wild growth from the revetment? Have repairs been made to areas where the revetment has been displaced or damaged?

10. Condition of Crown Roadway and Gates - Has the maintaining agency properly shaped the crown roadway so as to provide proper drainage during wet weather? Have ruts been filled and gravel added to provide access at all times for maintenance, patrolling and flood fighting vehicles? Are all gates maintained and repaired to effectively control access by unauthorized vehicular traffic?

11. Control of Livestock Pasturing - Has the maintaining agency properly controlled unauthorized stock pasturing of the levee slopes and insured that any stock damaged sections have been repaired?

12. Condition of Pipes - The following items concerning pipes, if applicable, are noted during the inspection:

- a. Is there any debris or any other obstruction at the ends of the pipe to prevent its proper operation?

- b. Is there any damage or settlement to the pipe?
- c. Is the metal sound? Are rust holes beginning to show on the exposed portions of the pipe?
- d. Are all gates and valves in good operating condition?
- e. Have any cracks occurred in the headwalls?
- f. Is there any erosion occurring adjacent to the structures which might endanger its water tightness or stability?

It should be pointed out that a rating pertains only to the maintenance performance and not to the stability of the levee. For example, a poor maintenance rating does not necessarily imply that the stability of the levee is impaired.

The ratings used in classifying the quality of maintenance performed by each agency area are as follows:

1. "Outstanding" indicates the maintenance work is in complete accordance with the federal regulations governing maintenance and operation of flood control works.
2. "Good" indicates the maintenance work provided is in accordance with federal regulations or varies from that standard only in minor instances.
3. "Fair" indicates that while the work is generally acceptable, considerable improvement is required for compliance with standards.

4. "Poor" indicates that no maintenance or only a token amount has been performed, and indicates that the agency is not fulfilling its obligation to provide adequate maintenance.

SUMMARY OF THE 1965 MAINTENANCE PERFORMANCE BY PROJECT

<u>Project</u>	<u>Miles of Levees</u>	1965 Maintenance Evaluation (percent)		
		<u>Good</u>	<u>Fair</u>	<u>Poor</u>
Sacramento River Flood Control Project	1055.1	78	19	3
American River Project	8.3	100	-	-
San Joaquin River and Tributaries Project	114.7	59	31	10
Calaveras River and Littlejohns Creek and Tributaries Project	32.8	100	-	-
Merced County Stream Group Project	6.4	100	-	-
Big Dry Creek Reservoir and Diversion Project	9.3	-	100	-
Middle Creek Project	11.2	100	-	-
Lower San Joaquin Flood Control Project	127.0	100	-	-
Truckee River Project ^{1/}	0.6	100	-	-
Total (levee only) miles	1364.8 ^{2/}			
Percentage of total miles		79	18	3

^{1/} Channel only

^{2/} Seven miles of levee were not included in this total due to reconstruction work by the U.S.C. of E.

CHAPTER III. PROJECT MAINTENANCE DEFICIENCIES

In order to continue to improve the quality of maintenance in areas or districts in the Sacramento San Joaquin Flood Control Project, there must be an active public agency to perform the required maintenance work. However, areas still exist where there is no local organized district to perform the required maintenance of project works.

The following is a description of the areas in which there is no present organization:

1. Eastern Honcut Creek Area. The levee, 1.49 miles in length, is situated along the left bank of Honcut Creek, extending from the Western Pacific Railroad tracks easterly to high ground. The entire levee has been reconstructed by the Corps of Engineers.

2. The left bank of the San Joaquin River from Durham Ferry Road to Mossdale Bridge and the left bank of Paradise Cut from U. S. Highway 99 upstream to Paradise Dam and the right bank of Paradise Cut from S.P.R.R. crossing upstream to Paradise Dam. These levees total 11.9 miles in length. The Corps of Engineers has reconstructed 5.7 miles of the total.

AREAS OF PREVIOUS LEVEE INSTABILITY

During the 1965 inspection, areas of previous levee instability were inspected at the following locations:

Reclamation District No. 341 - Sherman Island

Levee mile 8.90 to 9.68 - Continued subsidence at this location has occurred since reconstruction of the levee in 1954.

Additional material has been placed on the levee section from time to time, then reshaped and additional material added, in an attempt to stabilize the levee section. In 1964, the U. S. Corps of Engineers enlarged and shaped the levee, placed stone protection on the waterward slope and graveled the crown roadway. Minor subsidence has occurred at several spots during 1965 between levee mile 9.01 and 9.27.

Reclamation District No. 536 - Egbert Tract

Unit No. 1, right bank of Lindsey Slough.

Levee mile 2.38 to 2.45 - Subsidence along landward side of levee crown and shoulder 1.5 to 2.5 feet below crown elevation. No change occurred during 1965.

Levee mile 3.50 to 3.57 - Subsidence along landward side of levee crown and shoulder 1.0 to 2.0 feet below crown elevation. No change occurred during 1965.

Reclamation District No. 1601 - Twitchell Island

Left bank, Threemile Slough

Levee mile 0.51 to 1.20 - Subsidence at this location occurred during reconstruction of the levee in 1954. Material was later added to the crown and landward slope from time to time and although the activity continues, the rate of subsidence has materially lessened. The Corps of Engineers has also, since 1954, placed rock on the waterward slope at several locations in this reach. During 1964 subsidence occurred between levee mile 0.78 and 1.01 along the landward side of levee crown and shoulder 2.0 to 3.0 feet below crown elevation. During 1965 subsidence continued to occur at the above location, but at a greatly reduced rate.

Reclamation District No. 2098 - Cache Haas Slough Area

Unit No. 1, left bank Yolo Bypass

Levee mile 3.63 to 3.68 - During 1964 subsidence occurred along the landward side of levee crown and shoulder, 2.5 to 3.0 feet below original crown elevation. In the summer of 1965, the Corps of Engineers reconstructed the levee to the required grade and section. In the fall, this section subsided about 0.5 foot.

Levee mile 3.70 to 3.75 - During 1964 the entire levee subsided 2.0 to 3.0 feet below original crown elevation. In the summer of 1965, the Corps of Engineers reconstructed the levee to the required grade and section. No new subsidence has developed.

Levee mile 3.80 to 3.89 - During 1964 the entire levee subsided 1.5 to 2.0 feet below original crown elevation. In the summer of 1965, the Corps of Engineers reconstructed the levee to the required grade and section. No new subsidence has developed.

Levee mile 4.16 to 4.43 - During 1964 the levee subsided as much as 3.0 feet below original crown elevation. In the summer of 1965, the Corps of Engineers reconstructed the levee to the required grade and section. No new subsidence has developed.

Unit No. 2, left bank Cache Slough

Levee mile 4.45 to 4.91 - During 1964 the levee subsided as much as 5.0 feet below original crown elevation. In the summer of 1965, the Corps of Engineers reconstructed the levee to the required grade and section. A portion of this section has again subsided approximately 1.0 foot, between levee mile 4.73 and 4.82.

Levee mile 5.14 to 5.22 - During 1964 the levee subsided 1.5 to 2.0 feet below original crown elevation. In the summer of 1965, the Corps of Engineers reconstructed the levee to the required grade and section. Active subsidence has reoccurred between levee mile 5.17 and 5.18. This 50-foot section has settled 0.5 to 1.0 feet.

Levee mile 6.90 - Slip along landward side of levee crown and shoulder 3.0 to 4.0 feet below original crown elevation. The District has continued to make repairs by adding additional material to the waterward slope in an effort to maintain a standard levee section.

Unit No. 3, left bank Haas Slough

Levee mile 7.39 to 7.44 - The crown and landward shoulder has subsided 1.0 to 2.0 feet below the original crown elevation. Longitudinal cracks have also developed along the landward slope.

T A B L E S

TABLE I
SACRAMENTO VALLEY STREAMS
SUMMARIES OF PROJECT LEVEE MAINTENANCE FOR -1965

SHEET 1 OF 8 SHEETS

District or area	Unit number	Stream	Bank	Length of levee in miles	Compliance with federal regulations governing maintenance of flood protection works										Overall ratings		Remarks				
					District maintenance program	Flood emergency	Adequate levee section & grade	Adequate encroachment control	Waters (including rock) on landside	Control of wild growth	Rodent control	Repair of cracks	Repair of blowouts	Repair of erosion and caving	Condition of rock revetment	Condition of crown roads & gates		Control of livestock pasturing	Condition of pipes	Progress	Maintenance
L.D. No. 1		Feather	X	16.7	O	G	F	G	G	G	G	G	G	G	G	G	G	C	C	Control Puncture Vine	
L.D. No. 2		Sacramento	X	4.9	G	F	G	F	G	G	G	G	G	G	G	G	G	G	G	C	C
L.D. No. 3		Sacramento	X	12.2	G	F	G	F	G	G	G	G	G	G	G	G	G	G	G	C	C
L.D. No. 9		Feather	X	6.2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	C	C
R.D. No. 3 do.		Steamboat Sl. Sacramento	X	11.0	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
R.D. No. 10 do.		Simmerly Sl. Feather	X	7.7	G	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
R.D. No. 70 do.		Feather Honcut Creek	X	11.2	G	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
R.D. No. 108 do.		Butte Bypass Sacramento	X	8.0	G	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
R.D. No. 150 do.		Colusa Drain Sutter Sl. Sacramento	X	20.5	G	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
do.		Elk Slough	X	9.6	P	P	G	P	P	P	P	P	P	P	P	P	P	P	P	P	P
R.D. No. 307		Sacramento	X	6.7	P	P	C	P	P	P	P	P	P	P	P	P	P	P	P	P	P
R.D. No. 317		Georgiana Sl.	X	2.0	F	G	G	F	F	F	F	F	F	F	F	F	F	F	F	F	F
R.D. No. 341 do.		Threemile Sl. Sacramento	X	3.3	G	F	C	F	G	G	G	G	G	G	G	G	G	G	G	G	G
R.D. No. 349 do.		Sacramento Steamboat Sl.	X	1.6	P	P	G	F	F	F	F	F	F	F	F	F	F	F	F	F	F
			X	4.4	P	G	F	P	P	P	P	P	P	P	P	P	P	P	P	P	P

O - Outstanding G - Good F - Fair P - Poor

TABLE I
SACRAMENTO VALLEY STREAMS
SUMMARIES OF PROJECT LEVEE MAINTENANCE FOR -1965

SHEET 2 OF 3 SHEETS

District of area	Unit number	Stream	Bank		Length of levee in miles	Compliance with federal regulations governing maintenance of flood protection works												Overall ratings		Remarks	
			R	L		District maintenance Program	Feasible emergency	Adquate section & grade	Water control	Waste (including rock)	Landside	Control of wild growth	Rodent control	Repair of cracks, burrows & snags	Repair of erosion and caving	Condition of rock retiemnt	Condition of roadways & gates	Control of livestock pasturing	Condition of pipes		Progress
R.D. No. 349	3	Sutter Sl.	X		6.6	P		G	F	F	F	F	F	F	F	F	F	P	P	No Maintenance Performed	
R.D. No. 369		Sacramento	X		0.8	P		G	F	P	P	P	P	P	P	P	P	P	P	No Maintenance Performed	
R.D. No. 407	1	Georgiana Sl.	X		4.0	G		G	G	G	G	G	G	G	G	G	G	G	G	No Maintenance Performed	
do.	2	Sacramento	X		3.4	G		G	G	G	G	G	G	G	G	G	G	G	G		
R.D. No. 501	1	Steamboat Sl.	X		6.8	G		G	G	G	G	G	G	G	G	G	G	G	G		
do.	2	Cache Sl.	X		3.6	G		G	G	G	G	G	G	G	G	G	G	G	G		
do.	3	Miner Slough	X		7.8	G		G	G	G	G	G	G	G	G	G	G	G	G		
do.	4	Sutter Sl.	X		2.3	G		G	G	G	G	G	G	G	G	G	G	G	G		
R.D. No. 536	1	Lindsey Sl.	X		5.7	F		G	P	G	P	P	P	P	P	P	P	P	P		
do.	2	Yolo Bypass	X		5.0	G		G	G	G	G	G	G	G	G	G	G	G	G		
R.D. No. 537	1	Sacramento	X		4.8																
do.	2	Yolo Bypass	X		1.3																
R.D. No. 551		Sacramento	X		6.8	G		G	P	G	P	P	P	P	P	P	P	P	P		
R.D. No. 554		Sacramento	X		1.2	P		G	P	P	P	P	P	P	P	P	P	P	P		
R.D. No. 556	1	Georgiana Sl.	X		5.5	P		G	F	F	F	F	F	F	F	F	F	F	F	No Maintenance Performed	
do.	2	Sacramento	X		5.7	P		G	F	F	F	F	F	F	F	F	F	F	F	Token Maintenance Only	
R.D. No. 563		Georgiana Sl.	X		12.4	F		G	F	F	F	F	F	F	F	F	F	F	F		
R.D. No. 755		Sacramento	X		1.9	P		G	F	P	P	P	P	P	P	P	P	P	P		
R.D. No. 765		Sacramento	X		1.7	G		G	F	F	G	G	G	G	G	G	G	G	G	G	
R.D. No. 777		Feather	X		4.1	G		G	G	G	G	G	G	G	G	G	G	G	G	G	
R.D. No. 784	1	Yuba	X		2.2	G		G	G	G	G	G	G	G	G	G	G	G	G	G	
do.	2	Feather	X		13.6	G		G	G	G	G	G	G	G	G	G	G	G	G	G	
do.	3	Bear	X		4.7	G		G	G	G	G	G	G	G	G	G	G	G	G	G	

0 - Outstanding G - Good F - Fair P - Poor

TABLE I

SACRAMENTO VALLEY STREAMS
SUMMARIES OF PROJECT LEVEE MAINTENANCE FOR - 1965

SHEET 5 OF 8 SHEETS

District or area	Unit number	Stream	Bank		Length of levee in miles	District maintenance program	Reasons for flood emergency	Adequate levee section & grade	Adequate encroachment control	Waterside lining	Control of wild growth		Repair of cracks, burrows & wash	Repair and coving	Condition of rock revetment	Condition of crown roadways & gates	Control of livestock pasturing	Condition of pipes	Overall ratings		Remarks
			Pl	Li							Landside	Roadside							Progress	Maintenance	
R.D. No. 2068	2	Back Levee	X		3.2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
R.D. No. 2098	1	Yolo Bypass	X		4.4	G	P	G	G	G	G	G	G	G	G	G	G	G	G	G	
do.	2	Cache Slough	X		2.9	G	P	G	G	G	G	G	G	G	G	G	G	G	G	G	
do.	3	Cache Slough	X		1.9	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
do.	4	Back Levee	X		3.0	F	G	G	G	G	F	P	F	-	G	G	G	G	G	G	
R.D. No. 2103	1	South Dry Cr.	X		4.6	District Just Formed															
do.	2	Bear	X		4.9	District Just Formed															
R.D. No. 2104	1	Cache Sl.	X		2.6	F	G	F	G	G	G	P	F	G	G	G	G	G	G	F	Improvement Needed
do.	2	Haas Slough	X		4.8	F	G	F	G	G	P	F	F	G	G	G	G	G	G	F	Improvement Needed
American River	1	Arcade Cr.	X		2.1	G	G	F	G	G	G	G	G	-	G	G	G	G	G	G	
FL. Cont., Dist.	2	Matomas East Canal	X		4.0	G	G	G	G	G	G	G	G	-	G	G	G	G	G	G	
do.	3	do.	X		3.4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
do.	4	American	X		11.0	G	G	G	P	G	G	G	G	G	G	G	G	G	G	G	
do.	5	Sacramento	X		9.4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
do.	6	Linda Creek	X		1.3	F	G	G	G	G	G	G	G	-	G	G	G	G	G	F	Entire Levee Needs Burning
do.	7	Arcade Creek	X		1.9	G	G	G	F	G	G	G	G	-	G	G	G	G	G	G	
Sacto. River West Side Levee Dist.		Sacramento	X		50.2	G	G	P	G	G	G	G	F	G	G	G	G	G	G	G	Maintenance Improved
City of Marysville	1	Simmerly Sl.	X		3.2	O	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
do.	2	Feather	X		1.3	O	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
do.	3	Yuba	X		6.9	O	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
City of Sacramento		Sacramento	X		3.6	G	G	F	F	G	G	G	G	F	G	G	G	G	G	G	
Knights Landing Ridge Drain Dist.	1	Knights Landing Ridge Cut	X		6.4	G	G	G	G	G	G	G	F	G	G	G	G	G	G	G	
do.	2	Knights Landing Ridge Cut	X		6.1	G	G	G	G	G	G	G	F	G	G	G	G	G	G	G	

O - Outstanding G - Good F - Fair P - Poor

TABLE I
SACRAMENTO VALLEY STREAMS
SUMMARIES OF PROJECT LEVEE MAINTENANCE FOR - 1965

District or Area	Unit number	Stream	Bank		Length of in Miles	Compliance with federal regulations governing maintenance of flood protection works												Overall Status		Remarks							
			Bank	RIU		District maintenance program	Repairs for flood emergency	Adequate levee section & grade	Waterside (including rock) encroachment control	Landslide Control of wild growth	Radem control	Repairs & brushwork	Repair of erosion and caving	Condition of rock retirement	Condition of crown	Control of rodents & gophers	Control of livestock poisoning	Condition of pipes	Progress		Maintenance						
Eastern Honcut Creek Area Tehama County Fl. Control Dist. do.		Honcut Creek	X		1.5	F	F	G	G	G	G	G	G	G	G	G	G	G	G	F		Unorganized Area					
	1	Deer Creek	X		3.5	F	F	G	G	F	G	G	G	G	G	G	G	G	G	G	G						
	2	Deer Creek	X		1.5	F	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G						
	3	Deer Creek	X		1.3	F	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G						
	4	Deer Creek	X		4.1	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G						
	5	Elder Creek	X		4.0	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G						
	6	Sacramento	X		0.2	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G						
	7	Sacramento	X		0.2	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G						
	8	Sacramento	X		0.3	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G						
	9	Sacramento	X		0.7	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G						
	10	Sacramento	X		0.7	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G						
	11	Sacramento	X		0.5	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G						
12	Sacramento	X		0.5	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G							
Yolo County		Cache Creek	X		0.2	F	F	G	G	G	G	G	G	G	G	G	G	G	G	G							
Butte County do. do. do. do. do.	1	Mud Creek	X		7.3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G							
	2	Mud Creek	X		8.2	G	G	G	G	F	G	G	G	G	G	G	G	G	G	G							
	3	Sycamore Cr.	X		4.2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G							
	4	Shiloh Creek & Sheep Creek	X		2.9	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G							
	5	Big Chico Diversion	X		1.8	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G							
STATE OF CALIFORNIA																											
Sacramento River East Levee do. do.	1	Sacramento	X		20.4	G	G	F	G	G	G	G	G	G	G	G	G	G	G	G							
	2	Colusa Bypass	X		2.0	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G						
	3	Moulton Bypass	X		2.3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G						
Wadsworth Canal do.	1	Wadsworth Canal	X		4.7	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G							
	2	Wadsworth Canal	X		4.7	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G							

1/ Channel & Rock movement signs 0 - Outstanding G - Good F - Fair P - Poor
2/ Channel Only

TABLE I
SACRAMENTO VALLEY STREAMS
SUMMARIES OF PROJECT LEVEL MAINTENANCE FOR -1965

District or oreo	Unit number	Stream	Bank		Length of levee in miles	Compliance with federal regulations governing maintenance of flood protection works												Overall ratings		Remarks									
			RU	BU		District maintenance	Adequate levee section & grade	Waterside encroachment control	Waterside (including rock)	Control of wild growth	Rodent control	Report of cracks, burrows & ravines	Repair of erosion and caving	Condition of rock revetment	Condition of roadways & gates	Control of livestock pasturing	Condition of pipes	Progress	Maintenance										
Sutter Bypass		Sutter Bypass	X		22.4	G	G	F	G	G	G	G	G	G	G	G	G	G	G										
Feather River Hamilton Bend		Feather	X		3.4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G							
Cache Creek do. do. do.	1	Cache Creek	X		11.8	G	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G						
	2	Cache Creek	X		6.9	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G					
	3	Settling Basin	X		1.8	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G				
	4	Settling Basin	X		2.6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G				
Sacramento Bypass	1	Sacramento Bypass	X		1.8	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	Garbage Dump Starting to Encroach on Landward Slope		
do.	2	Sacramento Bypass	X		1.8	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G			
West Levee Yolo Bypass	1	Yolo Bypass	X		2.7	G	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		
do.	2	Yolo Bypass	X		1.5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
do.	3	Yolo Bypass	X		1.2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
do.	4	Yolo Bypass	X		3.6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
East Levee Yolo Bypass		Yolo Bypass	X		2.0	G	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	Crown Roadway Needs Blading
Willow Slough Bypass	1	Willow Sl. Bypass	X		5.1	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
do.	2	Willow Sl. Bypass	X		7.4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
Putah Creek do.	1	Putah Creek	X		9.0	G	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
	2	Putah Creek	X		7.3	G	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
Tisdale Bypass do.	1	Tisdale Bypass	X		4.5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
	2	Tisdale Bypass	X		4.5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
Mtn. Area No. 1		Sacramento	X		17.1	G	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	

O - Outstanding G - Good F - Fair P - Poor

TABLE I

SACRAMENTO VALLEY STREAMS
SUMMARIES OF PROJECT LEVEE MAINTENANCE FOR - 1965

SHEET 8 OF 8 SHEETS

District or area	Unit number	Stream	Book		Length of levee in miles	Compliance with federal regulations governing maintenance of flood protection works												Overall ratings		Remarks								
			Part	Page		District maintenance program	Readiness for flood emergency	Adequate levee section & grade	Adequate encroachment control	Wetlands (including rock) Landslide	Control of wild growth	Rodent control	Repair of cracks, burrows & ramrows	Repair of erosion and caving	Condition of rock revetment	Condition of crown roadways & gates	Control of livestock pasturing	Condition of pipes	Progress		Maintenance							
Mtn. Area No. 2		Sacramento	X		12.4	G	G	G	G	G	G	G	G	G	G	G	G	G	G									
Mtn. Area No. 3		Feather	X		5.2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G								
Mtn. Area No. 4		Sacramento	X		3.4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G							
Mtn. Area No. 5	1	Butte Creek	X		15.4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G						
do.	2	Butte Creek	X		16.5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G					
Mtn. Area No. 6		Sacramento	X		6.0	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G				
Mtn. Area No. 7		Feather	X		12.1	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G			
Mtn. Area No. 8		Yuba	X		3.8	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		
Mtn. Area No. 9		Sacramento	X		19.6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		
Mtn. Area No. 10		American	X		4.3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		
Mtn. Area No. 11		American	X		4.0	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
Mtn. Area No. 12		Colusa Drain	X		11.3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
Mtn. Area No. 13	1	Cherokee	X		18.9	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
do.	2	Cherokee	X		23.1	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

O - Outstanding G - Good F - Fair P - Poor

TABLE 2

SAN JOAQUIN VALLEY STREAMS
SUMMARIES OF PROJECT LEVEE/ MAINTENANCE FOR - 1965

SHEET 1 OF 3 SHEETS

District or area	Unit number	Stream	Bank		Length of levee in miles	Compliance with Federal regulations governing maintenance of flood protection works											Overall findings		Remarks											
			Rt	Lt		District maintenance program	Redress for flood emergency	Adequate levee section & grade	Adequate engineering control	Woading (including rock) on levee	Control of wild growth	Levee control	Repair of control	Repair of erosion and caving	Condition of rock revetment	Condition of roadways & gates	Control of livestock pasturing	Condition of pipes		Progress	Maintenance									
R.D. No. 1		Old River	X		1.2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G					
R.D. No. 17	1	French Camp Sl.	X		1.8	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G				
do.	2	San Joaquin	X		14.4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G				
R.D. No. 404	1	San Joaquin French Camp Slough	X		2.3	F	G	G	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
do.	2	French Camp Slough	X		1.8	F	G	G	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
R.D. No. 524		San Joaquin	X		6.3	F	G	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F		Improvement Needed	
R.D. No. 544	1	San Joaquin	X		6.1	F	G	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F		Maintenance Improving	
do.	2	Old River	X		4.2	F	G	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
R.D. No. 2058		Paradise Cut	X		6.7	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		
R.D. No. 2062	1	San Joaquin	X		2.6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		
do.	2	Paradise Cut	X		4.0	G	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		
do.	3	Old River	X		5.6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		
R.D. No. 2063		San Joaquin	X		10.6	G	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		This Unit Is to Be Rebuilt by U.S.C.
R.D. No. 2064	1	San Joaquin	X		5.4	G	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F		This Unit Is to Be Rebuilt By U.S.C.
do.	2	Stanislaus	X		4.3	G	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F		
R.D. No. 2075		San Joaquin	X		7.6	G	G	F	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		
R.D. No. 2089	1	Old River	X		1.5	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F		
do.	2	Salmon Sl.	X		1.5	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F		
R.D. No. 2091		San Joaquin	X		7.6	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		
R.D. No. 2092		San Joaquin	X		3.8	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		
R.D. No. 2094	1	San Joaquin	X		2.8	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		
do.	2	San Joaquin	X		0.5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		

1/ Spur Levee

G - Outstanding G - Good F - Fair P - Poor

TABLE 2
 SAN JOAQUIN VALLEY STREAMS
 SUMMARIES OF PROJECT LEVEE MAINTENANCE FOR - 1965

SHEET 3 OF 3 SHEETS

District or area	Unit number	Stream	Bank	Length of levee in miles	Compliance with Federal regulations governing maintenance of flood protection works												Overall ratings		Remarks
					Distance from program	Readiness for flood emergency	Adequate levee section & grade	Adaptation to encroachment control	Wetlands including rock	Control of wild growth	Rodent control	Repair of cracks	Burrows & blowholes	Repair of erosion and caving	Condition of rock revetment	Condition of crown roads & dikes	Control of livestock pasturing	Condition of pipes	
Lower San Joaquin Levee District	10	Owens Creek	X	0.8	G	G	G	G	G	G	G	G	G	G	G	G	G		
	11	Mariposa Bypass	X	3.3	G	G	G	G	G	G	G	G	G	G	F	G	G		
	12	Mariposa Bypass	X	3.4	G	G	G	G	G	G	G	G	G	G	G	G	G		
	13	Ash Slough	X	1.3	G	G	G	G	G	G	G	G	G	G	G	G	G		
	14	Ash Slough	X	1.3	G	G	G	G	G	G	G	G	G	G	G	G	G		
	22	Canal	X	5.5	P	G	G	G	G	G	G	G	G	G	F	G	F	District Will Not Accept Maintenance Responsibility	
do.	25	Salt Slough	X	2.5	G	G	G	G	G	G	G	G	G	G	G	G	G		
Merced County Stream Group	1	Black Basal	X	1.6	G	G	G	G	G	G	G	G	G	F	G	G	G		
	2	Black Basal	X	1.9	G	G	G	G	G	G	G	G	G	G	G	G	G		
	3	Owens Creek	X	1.4	G	G	G	G	G	G	G	G	G	G	G	G	G		
	4	Owens Creek	X	1.4	G	G	G	G	G	G	G	G	G	G	F	G	G	Clear Channel Upstream From Siphon	
Fresno County Stream Group	1	Big Dry Cr. Reservoir	X	7.4	F	G	G	F	G	G	G	G	G	F	G	F	F		
	2	Big Dry Cr. Outlet	X	0.6	G	G	G	G	G	G	G	G	G	G	G	G	G		
	3	Little Dry Cr. Outlet	X	1.3	G	G	G	G	G	G	G	G	G	G	G	G	G		

O - Outstanding G - Good F - Fair P - Poor

TABLE 4

SUMMARY OF MAINTENANCE BY YEARS
SACRAMENTO AND AMERICAN RIVER FLOOD CONTROL PROJECTS

District or Area	Total miles	Summary maintenance record by years																											
		47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74
L. D. No. 1, Sutter Co.	16.7	F	F	G	G	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
L. D. No. 2, Glenn Co.	4.9	P	P	F	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
L. D. No. 3, Glenn Co.	12.2	P	F	F	P	P	F	G	F	F	F	P	F	F	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G
L. D. No. 9, Sutter Co.	6.2	P	F	F	F	G	G	F	G	F	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
R. D. No. 3, Grand Island	28.6	P	P	P	P	P	F	F	F	F	P	P	F	F	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G
R. D. No. 10, Simmerly	21.9	F	F	F	F	F	F	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
R. D. No. 70, Meridian	23.6	F	F	G	G	F	F	F	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
R. D. No. 108, River Farms	20.5						G	G	G	G	G	F	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
R. D. No. 150, Merritt Island	18.1	P	F	F	F	P	P	P	F	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
R. D. No. 307, Lisbon	6.7	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
R. D. No. 317, Lower Andrus	2.0	P	P	P	P	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
R. D. No. 341, Sherman	9.7	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
R. D. No. 349, Sutter	12.6	P	P	F	F	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
R. D. No. 369, Libbey-McNeil	0.8	P	P	F	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
R. D. No. 407, Mid Andrus	7.4	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
R. D. No. 501, Fyer Island	20.5	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F

SUMMARY OF MAINTENANCE BY YEARS
SACRAMENTO AND AMERICAN RIVER FLOOD CONTROL PROJECTS

SHEET 2 OF 6 SHEETS

District or Area	Total miles	Summary maintenance record by years																											
		47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74
R. D. No. 536, Egbert	10.7	P	P	F	F	P	P	P	P	P	P	H	G	G	F	G	G	F	F	F									
R. D. No. 537, Lovdal	6.1	P	P	F	F	F	F	G	F	G	G	G	F	G	G	F	F												
R. D. No. 551, Pearson	6.8	P	P	F	F	F	P	P	P	P	P	P	P	P	P	F	F	F	F	F									
R. D. No. 554, Walnut Grove	1.2	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P									
R. D. No. 556, Upper Andrus	11.2	P	P	P	G	F	P	P	F	P	P	P	P	P	P	F	F	F	F	F									
R. D. No. 563, Tyler Island	12.4	P	P	P	G	G	P	P	F	P	G	F	F	F	F	F	F	F	F	F									
R. D. No. 755, Randall	1.9	P	F	F	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P									
R. D. No. 765, Glide	1.7	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P									
R. D. No. 777, Live Oak	4.1	F	F	F	F	P	F	P	P	P	G	F	F	G	G	F	G	G	G	G									
R. D. No. 784, Flumas Lake	32.4	F	F	G	G	F	F	F	F	G	G	G	G	G	G	G	G	G	G	G									
R. D. No. 785, Driver	5.7	P	P	F	F	P	P	F	F	F	F	F	F	F	F	F	F	F	F	F									
R. D. No. 787, Fair	4.4										G	F	G	G	G	G	G	G	G	G									
R. D. No. 817, Carlin	7.7	P	P	P	P	P	P	P	F	F	F	P	F	P	F	G	F	F	G	G									
R. D. No. 827, Elkhorn	4.2	P	P	F	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P									
R. D. No. 900, West Sacramento	13.7	F	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P									
R. D. No. 999, Netherlands	32.3	F	F	F	P	P	F	F	F	F	F	F	F	F	F	F	F	F	F	F									

TABLE 6

1965 SUMMARY
OF
MAINTENANCE PERFORMANCE ON SACRAMENTO RIVER AND TRIBUTARIES
AND AMERICAN RIVER FLOOD CONTROL PROJECT

GOOD	FAIR	POOR
L. D. No. 1 L. D. No. 2 L. D. No. 3 L. D. No. 9 R. D. No. 10 R. D. No. 70 R. D. No. 108 R. D. No. 407 R. D. No. 501 R. D. No. 765 R. D. No. 777 R. D. No. 784 R. D. No. 787 R. D. No. 817 R. D. No. 900 R. D. No. 1000 R. D. No. 1001 R. D. No. 1500 $\frac{1}{2}$ R. D. No. 1660 R. D. No. 2035 $\frac{1}{2}$ R. D. No. 2060 R. D. No. 2068 R. D. No. 2098 Ameri. R. Flood Control District Sacramento River West Side Levee District City of Marysville $\frac{1}{2}$ City of Sacramento Knights Landing Ridge D. D. Elder Creek (Tehama Co.) Sacramento River (Tehama County) Cache Creek (Yolo County) Chico, Mud & Sandy Creeks (Butte County) State Maintained Areas Maintenance Areas No's 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12 & 13	R. D. No. 3 R. D. No. 150 R. D. No. 317 R. D. No. 341 R. D. No. 536 R. D. No. 551 R. D. No. 556 R. D. No. 563 R. D. No. 755 R. D. No. 785 R. D. No. 1600 R. D. No. 1601 R. D. No. 2067 R. D. No. 2104 Deer Creek (Tehama County) Maintenance Area No. 9	R. D. No. 307 R. D. No. 349 R. D. No. 369 R. D. No. 554 R. D. No. 827 R. D. No. 999 Eastern Honcut Creek

$\frac{1}{2}$ Outstanding

TABLE 7

1965 SUMMARY
OF
MAINTENANCE PERFORMANCE ON SAN JOAQUIN RIVER AND TRIBUTARIES
AND MISCELLANEOUS PROJECTS

GOOD	FAIR	POOR
R. D. No. 1 R. D. No. 17 R. D. No. 2058 R. D. No. 2062 R. D. No. 2063 R. D. No. 2064 R. D. No. 2075 R. D. No. 2094 R. D. No. 2096 Littlejohns & Duck Creek Diversion Duck Creek Dikes A, B & C Bear Creek (San Joaquin County) Merced County Stream Group Middle Creek (Lake County) Truckee River (Channel) Lower San Joaquin Levee District	R. D. No. 404 R. D. No. 524 R. D. No. 544 R. D. No. 2089 R. D. No. 2091 Fresno County Stream Group	San Joaquin County (Unorganized)

A P P E N D I X A

STANDARD MAINTENANCE PROCEDURES



STANDARD MAINTENANCE PROCEDURES

Levee maintenance is a continuing task which must be carried on each year without interruption. Each year steps must be taken to exterminate burrowing animals and to provide for routine mowing and burning of grass and weeds, removal of wild growth and repair of damage by erosion or other causes. The principal objectives of annual maintenance are to produce a stable levee at the start of the high water season and to have the slopes clear for effective inspection and, if necessary, patrolling and flood fighting activities.

In order to secure a uniform degree of operation and maintenance on federal flood control projects throughout the nation, the U. S. Corps of Engineers has issued regulations governing the maintenance and operation of flood control works. These regulations established a high standard of maintenance.

"Recommendations for Levee Maintenance", listed hereafter with comments, were adapted from U. S. Corps of Engineers regulations by the Department of Water Resources:

"1. Clear brush, trees and wild growth, other than sod from the levee crown and slopes. Herbicides applied with suitable equipment, under proper control and conditions, have been successfully employed in eradicating pernicious growths of vegetation."

Contrary to the often expressed belief that growth of trees and brush is beneficial for protection of the levee slopes, long experience has demonstrated that this is in error for the following reasons:

Under wind and wave action the larger growths tend to pull at their root systems, causing them to uproot themselves, disturb the soil or rock revetment and permit accelerated erosion to take place. Fallen trees may also cause harmful current deflection and accumulate drift, which can compound the erosive action. The roots of large trees also attract burrowing animals to the protective shelter afforded.

Removal of such growth promotes a growth of sod or grass, the pliable roots of which tend to provide a soil binding net.

The application of herbicides, applied under permit obtained from the county agricultural commissioner, should be performed annually to eradicate noxious weeds and to prevent regrowth of larger plants.

"2. Burn weeds, grass and debris on the levee during the appropriate season, where not dangerous or impracticable, in order to permit the detection of cracks, holes, burrows, slips and other damage and to permit the detection and extermination of burrowing animals. Restrictions in the area in connection with air pollution control should be checked before undertaking any burning operation."

This task should be performed annually during the late summer months after adjacent highly inflammable crops have been removed. Fireguards should be established around improvements and burning should be performed in such a manner as to take advantage of prevailing winds.

Burning before July destroys wildlife habitats and delaying the task until after the first rains has been unsuccessful in nearly all instances due to the high absorption rate of dry material, particularly the woody stemmed weeds.

"3. Mow grass and weeds on the levee where removal by burning is dangerous or impracticable, such as on peat levees or where burning would constitute a hazard to improvements, or where burning is restricted for any purpose."

This item is in lieu of burning as provided for in the preceding item. It is for the most part, intended to apply only to peat levees which comprise only a few miles.

Protection for improvements may be accomplished by mowing, fireguarding, or the use of soil sterilants.

"4. Exterminate burrowing animals with the use of poison, gas, or traps. This task required frequent patrols in order to assure successful results."

The control and extermination of burrowing animals must be pursued frequently and persistently in order to assure the safety of the levee during flood periods.

The eradication of these animals is a necessity and their elimination from an infested levee is extremely difficult. It can only be effectively accomplished on a cleared levee through constant effort. Care should be exercised not to poison birds and other desirable wildlife.

Observation indicates that, contrary to general belief, burrowing rodents can and do infest sand levees as well as those composed of heavier or more cohesive soils. A possible explanation for this condition is the fact that many of the sand levees are in reality a sand cover placed over an older soil levee. It is also a fact that some of the older pipe structures, those without cutoff walls, provide a means whereby burrowing rodents

can and do excavate burrows immediately under the pipe and thus provide a non-caving burrow.

"5. Repair caves, sloughs, burrows, holes, slips or other damaged portions of the levee with suitable material properly bonded and compacted in place."

This item of the recommendations clearly defines the procedure required. However, particular attention should be directed to the complete filling and compacting of rodent burrows.

It has often been observed that maintenance personnel have effectively exterminated the burrowing animals but have failed to backfill the burrows, the most essential part of the task. If the burrows are filled, the detection of fresh diggings will show that the rodents were not exterminated and repeated poisoning or gassing is required.

"6. Examine and repair, as required, drains and appurtenant control works and other structures through the levee."

A thorough examination of each and every structure situated in, on, or through the levee, should be made at least once yearly to determine its stability. All component parts should also be examined for effectiveness of operation and reliability. The installation of new, or repairs to older structures, should be made only in accordance with adopted standards and under the supervision of qualified personnel.

Defective structures should be immediately repaired or replaced. Abandoned structures should be removed from the levee or otherwise treated so as not to become hazards.

"7. Replace or repair displaced or damaged revetment work or riprap."

The very fact that revetment works have been installed at a location is indicative of the need for extra protection and such works should never be permitted to deteriorate.

Damages to existing revetment works are for the most part, few in number. However, those which have occurred are largely caused by nonmaintenance. Growth of trees and brush should be controlled in order to prevent damage or displacement or revetment.

The early detection of damage and prompt repair will, in most instances, result in a minimum of effort and expense to restore the revetment. Many times a simple rearrangement of the stones or cobble will produce the desired result. Occasionally it may be necessary to place additional rock at damaged locations in the existing work.

"8. Maintain the road on the levee and shape the crown so as to provide uniform drainage. Restrict unauthorized vehicular travel."

Surfaced crown patrol roadways have been established on nearly all project levees exclusively for the convenience of maintenance patrols and flood fighting personnel. It is essential that the roads be maintained in good condition for these purposes. The roadway should be bladed and maintained to provide a smooth surface, without ruts or potholes. The levee shoulder should be sloped so as to immediately drain rainfall away from the crown. In general, the entire crown should be rounded with the center higher than the shoulders. A flat, level section across the crown is considered poor practice.

Except for those levees upon which a public road has been established, vehicular traffic should be restricted to maintenance personnel only. Proper maintenance includes the placing of additional surfacing when and as required, to provide a stable, reliable roadway for maintenance, patrols, and flood fighting.

"9. Restrict stock grazing on the levee to conditions and seasons when the levee would not be seriously scarred or otherwise damaged thereby."

This item is probably the most controversial requirement in the recommendations. Although considered a proprietary right by many landowners and operators adjacent to the levee, this practice is a privilege only, and if allowed, should be carried on only under strict surveillance. Several legal decisions have been rendered in support of this recommendation.

Grazing on the levees should be tolerated only under the control of and by permit from the responsible district authority. Under this plan, those who abuse the privilege may be restricted and prevented from causing damage, the repair of which becomes a local district obligation.

"10. Remove or rectify obstacles to travel by authorized patrol vehicles."

This recommendation is self-explanatory and fully justified, however, some further explanation is presented.

The desirability of preserving property lines may be justified; however, some of the existing levee gates erected for this purpose appear to have been installed to impede traffic

and the numerous intervening structures of a like nature are unnecessary for any purpose other than an obstruction, or for the undersirable practice or confining livestock on the levee. If cross fences and gates are necessary, they should be so constructed that they may be quickly and easily operated.

All other obstructions or encroachments on the levee should be removed unless specifically authorized by permit from The Reclamation Board.

"11. Prevent the erection of structures on, additions to, or alterations of the levee unless authorized by permit from The Reclamation Board."

This recommendation is not only a part of the federal regulations, but is specifically covered by state legislation which is all inclusive of any encroachment on the levees and other flood control works.

It is the responsibility of all districts or agencies to insure that before any work is started on any structure, building, pipeline, poleline, or construction of any kind, whether it is in, on along or under any levee, or fill on or next to the levee, or on the berm, or on the landside near the levee or in the overflow or flooded area, that an application, complete with plans, be filed in triplicate with The Reclamation Board. Approved applications are covered by a permit which designates the conditions under which the proposed work may be accomplished. One of the conditions of the permit is that three-day notice prior to the start of construction must be given to the Department of Water Resources.

The Department inspects and supervises the installation of these encroachments to insure that the work conforms to the plans and conditions as approved by The Reclamation Board.

"12. Organize forces, stock materials, and procure equipment for general maintenance and for patrols and repairs during emergencies."

In order to meet these requirements, a permanent operating organization, properly equipped, is necessary to perform ordinary maintenance, make repairs and direct supplementary forces during emergencies.

It is therefore suggested that the district, or other agency responsible for performing the work, provide the following:

(a) A superintendent to organize forces and direct operations.

(b) Stocks of standard flood fighting materials and supplies, such as sacks, burlap, canvas, lumber and etc. These stocks should be seriously considered, particularly in localities which might become isolated from sources of supply during emergencies.

(c) Suitable equipment for the performance of maintenance, secured either through purchase or rental. A list of available equipment should be made prior to the flood season for possible use during emergencies.

(d) Frequent patrols and inspections of the levees. During flood periods constant patrols should be inaugurated and continued for the duration of the emergency. Such patrols should be equipped with supplies, materials and tools.

Prior to flood season, arrangements should be made for the ready procurement of flood fighting labor forces and supervisory personnel.

A P P E N D I X B

LEVEE CONSTRUCTION DURING 1965

MAJOR LEVEE RECONSTRUCTION
DURING 1965

During 1965, the U. S. Corps of Engineers completed levee construction, reconstruction, patrol roads, turnouts, bank protection and channel improvement work on the following projects:

SACRAMENTO RIVER FLOOD CONTROL PROJECT

<u>Specifica- tion No.</u>	<u>Site Mile or Unit No.</u>	<u>Location</u>	<u>Maintaining Agency</u>	<u>Levee Mile</u>	<u>Description of Work Completed</u>
3024	142.65	Right Bank Sacto. River	S.R.W.S.L.D. ¹	49.38 to 49.44	Levee Reconstruction, Rock Revetment & Graveled Crown Roadway
3024	118.70	Right Bank Sacto. River	S.R.W.S.L.D.	26.52 to 26.86	do.
3024	112.30	Right Bank Sacto. River	S.R.W.S.L.D.	19.77 to 19.90	do.
3024	112.30	Right Bank Sacto. River	S.R.W.S.L.D.	20.11 to 20.34	do.
3024	112.30	Right Bank Sacto. River	S.R.W.S.L.D.	20.42 to 20.61	do.
3024	142.95	Left Bank Sacto. River	State of California	4.38 to 4.66	do.
3024	130.22	Left Bank Sacto. River	R.D. 70 ²	7.85 to 7.95	do.
3024	128.80	Left Bank Sacto. River	R.D. 70	8.74 to 8.89	do.
3024	126.80	Left Bank Sacto. River	R.D. 70	10.51 to 10.78	do.
3024	125.17	Left Bank Sacto. River	R.D. 70	12.17 to 12.38	do.
3024	117.95	Left Bank Sacto. River	R.D. 1500	32.74 to 33.03	do.

1 Sacramento River Westside Levee District

2 Reclamation District

<u>Specification No.</u>	<u>Site Mile or Unit No.</u>	<u>Location</u>	<u>Maintaining Agency</u>	<u>Levee Mile</u>	<u>Description of Work Completed</u>
3024	113.3	Left Bank Sacto. River	R.D. 1500	28.03 to 28.14	Levee Reconstruction, Rock Revetment & Graveled Crown Roadway
3025	63.4 to 67.0	Right Bank Sacto. River	R.D. 537	0.40 to 0.53	Rock Revetment
3025	63.4 to 67.0	Right Bank Sacto. River	R.D. 537	0.72 to 1.20	Levee Reconstruction, Rock Revetment & Paved Crown Roadway
3025	63.4 to 67.0	Right Bank Sacto. River	R.D. 537	1.20 to 1.40	Levee Enlargement & Paved Crown Roadway
3025	63.4 to 67.0	Right Bank Sacto. River	R.D. 537	1.40 to 3.71	Levee Reconstruction, Rock Revetment & Paved Crown Roadway
3058	52.3	Right Bank Sacto. River	R.D. 900	6.51 to 6.97	do.
3159		Right Bank Steamboat Slough	R.D. 349	0.20 to 0.27	Berm Rock Revetment
3165		Left Bank Sacto. River	R.D. 341	8.90 to 9.44	Levee Enlargement Rock Protection & Graveled Crown Roadway
3231	1	Left Bank Deer Creek	Tehama Co. Fl. Cont. District	0.51 to 0.63	do.
3231	2	Right Bank Deer Creek	Tehama Co. Fl. Cont. District	0.18 to 0.32	Levee Reconstruction, Rock Revetment, Three Wingdams & Graveled Crown Roadway
3234		Left Bank Yolo Bypass	R.D. 537	0.00 to 1.28	Levee Reshaped & Graveled Crown Roadway
3234		Left Bank Yolo Bypass	R.D. 785	0.00 to 3.25	do.
3234		Left Bank Yolo Bypass	R.D. 827	2.17 to 2.84	do.
3283	5.84	Left Bank American River	A.R.F.C.D. ¹	5.63 to 5.93	Levee Reconstruction, Rock Revetment & Graveled Crown Roadway

<u>Specifica- tion No.</u>	<u>Site Mile or Unit No.</u>	<u>Location</u>	<u>Maintaining Agency</u>	<u>Levee Mile</u>	<u>Description of Work Completed</u>
3283	6.5	Left Bank Feather River	R.D. 1001	5.88 to 6.03	Levee Reconstruction, Rock Revetment & Graveled Crown Roadway
3283	7.5	Left Bank Feather River	R.D. 1001	4.69 to 4.99	do.
3283	8.0	Left Bank Feather River	R.D. 1001	4.43 to 4.58	do.
3283	49.6	Right Bank Feather River	Mtc. Area No. 7	3.18 to 3.35	do.
3283	152.47	Left Bank Sacto. River	State of California	11.52 to 11.65	do.
3283	0.56	Right Bank Elder Creek	Tehama Co. Fl. Control District	0.48 to 0.59	do.
3283	1.46	Right Bank Elder Creek	Tehama Co. Fl. Control District	1.38 to 1.54	do.
3283	1.85	Right Bank Elder Creek	Tehama Co. Fl. Control District	1.79 to 1.91	do.
3283	1.25	Left Bank Elder Creek	Tehama Co. Fl. Control District	1.21 to 1.30	do.

Total new construction during 1965 by Corps:

Miles of levee construction or
reconstruction 13.58

Miles of rock revetment 8.35

Miles of graveled or oil
surfaced road 13.58



A P P E N D I X C

SACRAMENTO RIVER BANK PROTECTION
PROJECT 1965 SURVEY

SACRAMENTO RIVER BANK PROTECTION PROJECT
1965 SURVEY

The Sacramento River Bank Protection Project was authorized by the Flood Control Act of 1960. The project is a modification of the existing Sacramento River Flood Control Project to include a long-range program for construction of bank erosion control works and setback levees within the limits of the existing levee system.

Starting in 1961, joint annual bank surveys have been made in the fall of each year by the U. S. Corps of Engineers, The Reclamation Board, and the Department of Water Resources to locate sites where erosion or sloughing has occurred on levees or banks. Priority numbers are assigned to each damaged site and repair contracts scheduled by the Corps.

The tabulations on the following pages are results of the 1965 fall inspection.



SACRAMENTO RIVER BANK PROTECTION PROJECT
1965 SURVEY

Stream and bank	Maintaining agency	River mile mid-point	Levee mile mid-point	Length in feet	Tentative reconstruction unit no.
Sacramento Right Bank	Mtc. Area #1	148.0	3.62	1,500	Unit No. 13
	do.	145.4	1.70	1,050	
	do.	143.6	0.09	200	
	do.	143.5	0.06	200	
	S.R.W.S.L.D. ¹	142.6	49.36	400	Completed 1965
	do.	142.6	49.30	800	
	do.	141.7	48.50	1,000	
	do.	139.7	46.44	1,400	Unit No. 13
	do.	139.1	45.76	1,850	Unit No. 13
	do.	137.6	44.70	800	Unit No. 13
	do.	137.5	44.75	500	
	do.	137.1	44.27	300	
	do.	136.6	43.65	600	
	do.	135.2	42.20	1,300	Unit No. 8
	do.	134.7	42.25	1,200	
	do.	132.7	39.78	1,600	
	do.	131.3	38.20	800	
	do.	130.7	37.70	200	
	do.	130.4	37.33	800	
	do.	128.2	35.95	950	Unit No. 8
do.	128.1	35.04	500		
do.	125.1	33.20	500		
do.	124.7	32.79	1,200		

1 Sacramento River West Side Levee District

Stream and bank	Maintaining agency	River mile mid-point	Levee mile mid-point	Length in feet	Tentative reconstruction unit no.
Sacramento Right Bank	S.R.W.S.L.D.	123.1	31.12	1,200	
	do.	121.1	29.21	700	
	do.	120.1	28.12	300	
	do.	119.4	27.40	300	
	do.	118.7	26.69	1,700	Completed 1965
	do.	117.5	25.46	700	Unit No. 8
	do.	116.5	25.54	200	Unit No. 8
	do.	115.7	23.78	275	Unit No. 8
	do.	114.1	22.24	1,300	Unit No. 16
	do.	113.9	22.06	550	Unit No. 8
	do.	113.5	21.53	2,400	Unit No. 8
	do.	112.3	20.50	1,050	Completed 1965
	do.	112.3	20.36	400	
	do.	112.3	20.23	1,275	Completed 1965
	do.	112.3	19.83	750	Completed 1965
	do.	111.0	18.91	800	Unit No. 8
	do.	105.9	14.85	600	
	do.	105.7	14.72	2,000	Unit No. 16
	do.	103.3	13.80	1,100	Completed 1964
	do.	101.7	12.18	1,000	
	do.	101.4	11.74	600	
	do.	100.9	11.25	2,000	Unit No. 12
	do.	100.3	10.60	600	Unit No. 12
do.	96.8	6.94	1,200		
do.	95.9	6.13	400		

Stream and bank	Maintaining agency	River mile mid-point	Levee mile mid-point	Length in feet	Tentative reconstruction unit no
Sacramento Right Bank	S.R.W.S.L.D.	95.3	5.64	1,500	Unit No. 12
	do.	94.7	4.98	2,500	
	do.	92.9	3.29	500	Unit No. 16
	Mtc. Area #6	89.5	0.51	800	
	do.	89.0	1.03	2,650	Unit No. 12
	do.	87.0	2.95	550	Unit No. 12
	do.	86.8	3.10	150	Completed 1964
	do.	85.7	4.26	1,050	Completed 1964
	do.	84.6	5.45	1,000	
	do.	84.5	5.59	700	Unit No. 16
	R.D. No. 1600	81.3	10.08	1,800	Completed 1964
	do.	81.0	9.80	1,200	
	do.	80.7	9.43	1,200	Unit No. 12
	do.	79.5	8.76	3,175	Unit No. 12
	do.	77.8	7.13	200	Unit No. 16
	do.	77.0	6.40	750	Unit No. 16
	do.	71.9	1.17	500	Unit No. 16
	do.	71.6	0.97	400	Unit No. 16
	do.	71.4	0.79	1,250	Unit No. 16
	R.D. No. 537	64.9	2.16	16,160	Completed 1965
	R.D. No. 900	57.6	1.68	400	
	do.	57.0	2.15	500	
	do.	56.6	2.50	1,000	
	do.	56.0	3.10	400	
do.	55.5	4.68	500		

Stream and bank	Maintaining agency	River mile mid-point	Levee mile mid-point	Length in feet	Tentative reconstruction unit no.
Sacramento Right Bank	R.D. No. 900	53.4	5.60	1,200	
	do.	52.9	5.86	2,200	Unit No. 11
	do.	52.3	6.79	2,400	Unit No. 6
	do.	51.6	7.50	5,000	
	R.D. No. 307	46.8	2.84	800	Completed 1964
	do.	46.4	3.24	1,000	
	do.	45.8	3.94	1,000	
	do.	45.5	4.10	1,000	
	do.	45.0	4.63	1,600	
	do.	44.5	3.13	2,500	
	R.D. No. 999	42.3	0.44	2,000	
	R.D. No. 150	41.2	7.14	1,000	Unit No. 6
	do.	40.8	5.12	500	
	do.	40.6	6.67	1,200	Unit No. 6
	do.	40.2	6.16	2,900	Completed 1963
	do.	38.3	4.33	2,150	Completed 1963
	do.	38.0	4.08	950	Unit No. 11
	do.	37.8	4.05	400	
	do.	37.7	3.73	1,700	Completed 1963
	do.	37.5	3.57	400	Unit No. 11
	do.	37.0	3.10	1,375	Completed 1963
	do.	36.8	2.85	500	
	do.	36.5	2.57	2,000	
do.	35.0	1.07	950	Unit No. 11	
do.	34.5	0.49	1,200		

Stream and bank	Maintaining agency	River mile mid-point	Levee mile mid-point	Length in feet	Tentative reconstruction unit no.
Sacramento Right Bank	R.D. No. 349	32.6	1.44	1,200	
	R.D. No. 3	31.8	17.02	800	Unit No. 6
	do.	31.4	16.55	850	Unit No. 6
	do.	31.3	16.41	675	Completed 1964
	do.	30.6	15.95	2,200	Unit No. 15
	do.	30.1	15.44	2,000	
	do.	29.6	14.87	700	Unit No. 6
	do.	29.3	14.45	2,000	
	do.	28.8	14.07	2,200	Unit No. 15
	do.	28.4	13.65	1,000	
	do.	27.6	12.78	2,500	
	do.	27.3	12.49	1,500	
	do.	26.9	12.09	1,000	
	do.	26.5	11.75	1,000	
	do.	26.0	11.31	500	Unit No. 6
	do.	25.6	10.88	1,000	
	do.	25.3	10.54	900	Unit No. 6
	do.	24.9	10.24	2,225	Completed 1964
	do.	24.9	9.86	625	Completed 1964
	do.	24.5	9.70	1,000	
	do.	24.1	9.25	1,600	Unit No. 11
	do.	23.7	8.87	950	Unit No. 11
	do.	23.4	8.55	1,000	
do.	23.1	8.15	1,600		
do.	22.1	7.09	500		

Stream and bank	Maintaining agency	River mile mid-point	Levee mile mid-point	Length in feet	Tentative reconstruction unit no
Sacramento Right Bank	R.D. No. 3	21.7	6.78	2,000	
	do.	21.3	6.44	2,000	
	do.	20.8	5.93	1,400	Unit No. 6
	do.	20.4	5.55	100	Unit No. 15
	do.	20.3	5.45	200	
	do.	20.1	5.17	600	
	do.	19.4A	4.67	575	Completed 1964
	do.	19.4	4.52	900	Unit No. 15
	do.	19.4B	4.09	475	Completed 1964
	do.	19.1	4.16	1,200	
	do.	18.8	3.89	400	Unit No. 11
	do.	18.5	3.58	600	Unit No. 11
	do.	18.1	3.61	600	
	do.	17.7	2.72	300	
	Sacramento Left Bank	do.	17.2	2.30	1,200
do.		16.0	1.17	500	
State of California		152.47	11.59	900	Completed 1965
Butte Slough		147.5	8.06	2,750	Unit No. 13
To Glenn Co. Line		143.6	4.05	1,600	
do.		142.9	4.52	1,400	Completed 1965
do.		140.7	2.35	1,400	Unit No. 13
do.		140.5	2.30	500	
do.		139.7	1.48	7,000	Unit No. 13
do.		138.5	0.30	1,600	
	R.D. No. 70	137.8	0.47	200	Unit No. 8

Stream and bank	Maintaining agency	River mile mid-point	Levee mile mid-point	Length in feet	Tentative reconstruction unit no.	
Sacramento Left Bank	R.D. No. 70	137.6	0.57	1,150	Unit No. 13	
	do.	137.5	0.73	500		
	do.	136.7	1.45	500		
	do.	136.6	1.55	700		
	do.	136.1	2.23	500		
	do.	135.3	2.83	300		
	do.	131.1	6.86	800		
	do.	130.2	7.90	600		Completed 1965
	do.	129.8	8.40	600		
	do.	129.3	8.60	500		
	do.	128.8	8.81	800		Completed 1965
	do.	127.5	10.00	500		
	do.	127.0	10.45	600		
	do.	126.8	10.67	1,400	Completed 1965	
	do.	126.6	10.86	400		
	do.	126.0	11.38	200		
	do.	125.6	11.83	300		
	do.	125.3	12.07	800		
	do.	125.1	12.28	1,000	Completed 1965	
	do.	124.3	13.21	1,150	Unit No. 8	
do.	123.0	14.79	300			
do.	122.5	15.00	100			
	R.D. No. 1660	119.7	1.63	400		
	R.D. No. 1500	117.9	32.89	1,500	Completed 1965	
	do.	117.7	32.73	1,000		

Stream and bank	Maintaining agency	River mile mid-point	Levee mile mid-point	Length in feet	Tentative reconstruction unit no.
Sacramento Left Bank	R.D. No. 1500	117.5	32.34	1,500	Unit No. 8
	do.	117.3	32.11	1,600	
	do.	116.4	31.20	800	
	do.	115.6	30.35	1,400	Unit No. 16
	do.	114.8	29.63	750	Unit No. 8
	do.	114.3	29.12	1,000	
	do.	114.2	29.00	200	Unit No. 8
	do.	113.3	28.08	575	Completed 1965
	do.	112.5	27.40	1,850	Unit No. 8
	do.	111.8	26.70	800	Unit No. 16
	do.	111.3	26.06	1,200	
	do.	105.3	20.47	3,500	
	do.	103.2	18.13	2,000	Completed 1964
	do.	102.7	17.72	2,000	
	do.	102.2	17.20	1,000	
	do.	101.5	16.65	600	
	do.	101.2	16.37	750	Completed 1964
	do.	100.7	15.85	800	
	do.	99.7	15.21	1,525	Completed 1964
	do.	99.6	15.07	400	
do.	99.3	14.75	1,050	Completed 1964	
do.	98.4	13.86	2,300	Unit No. 16	
do.	97.5	13.75	800		
do.	96.3	12.25	800		
do.	95.7	11.62	650	Unit No. 16	

Stream and bank	Maintaining agency	River mile mid-point	Levee mile mid-point	Length in feet	Tentative reconstruction unit no	
Sacramento Left Bank	R.D. No. 1500	95.4	11.12	900	Unit No. 16	
	do.	94.7	10.70	3,000		
	do.	94.0	9.92	400		
	do.	93.8	9.78	1,200	Unit No. 16	
	do.	93.2	9.06	2,500		
	do.	92.8	8.83	615	Completed 1964	
	do.	91.6	7.53	2,800	Unit No. 12	
	do.	89.6	5.52	500	Unit No. 16	
	do.	89.4	5.07	1,065	Completed 1964	
	do.	89.0	4.83	1,300		
	do.	88.7	4.58	1,000	Unit No. 12	
	do.	88.2	3.78	500		
	do.	87.0	2.40	200		
	do.	86.5	2.26	675	Completed 1964	
	do.	86.2	1.63	200		
	do.	86.0	1.43	600		
	do.	85.5	0.85	3,000		
		R.D. No. 1000	77.6	1.25	500	Unit No. 8
		do.	61.5	17.47	600	Unit No. 12
		do.	61.0	18.04	800	Unit No. 16
	City of Sacramento	57.1	2.50	400		
	Mtc. Area #9	55.5	0.42	400		
	do.	53.7	2.18	800		
	do.	53.3	2.61	800		
	do.	49.8	5.92	1,600		

Stream and bank	Maintaining agency	River mile mid-point	Levee mile mid-point	Length in feet	Tentative reconstruction unit no.
Sacramento Left Bank	Mtc. Area #9	49.6	6.19	400	
	do.	48.5	7.38	2,500	
	do.	44.5	11.49	800	Completed 1964
	do.	44.1	11.71	300	
	do.	43.5	12.60	1,450	Completed 1964
	do.	42.9	12.99	1,600	
	do.	42.6	13.30	1,050	Completed 1964
	do.	42.0	13.96	1,600	
	do.	41.5	14.46	950	Unit No. 6
	do.	40.5	15.50	325	Unit No. 6
	do.	40.1	15.85	400	
	do.	39.2	17.02	1,800	Unit No. 15
	do.	38.7	17.35	1,000	
	do.	38.3	17.76	600	
	do.	37.7	18.26	200	Unit No. 15
	do.	37.6	18.53	700	Unit No. 15
	do.	37.4	18.75	1,100	Unit No. 6
	do.	37.0	19.12	825	Completed 1964
	do.	36.6	19.50	400	
		R.D. No. 755	36.5	0.20	350
	do.	35.5	1.20	1,600	
	R.D. No. 551	34.7	0.05	1,600	
	do.	34.0	0.82	2,500	
	do.	33.0	1.81	2,000	Unit No. 11
	do.	32.2	2.58	500	Unit No. 11

Stream and bank	Maintaining agency	River mile mid-point	Levee mile mid-point	Length in feet	Tentative reconstruction unit no
Sacramento Left Bank	R.D. No. 551	31.9	2.90	500	Unit No. 11
	do.	31.2	3.60	3,900	Unit No. 11
	do.	31.0	3.88	2,000	Unit No. 15
	do.	30.4	4.40	1,200	
	do.	29.9	4.86	500	Unit No. 11
	do.	29.4	5.46	2,350	Unit No. 11
	do.	29.0	5.80	750	Completed 1964
	do.	28.7	5.10	1,800	Unit No. 6
	do.	28.4	6.41	700	Unit No. 15
	do.	28.2	6.59	700	Unit No. 6
	R.D. No. 369	27.5	0.55	500	
	R.D. No. 554	26.5	0.76	300	
	R.D. No. 556	26.1	0.35	1,200	
	do.	25.3	1.17	300	
	do.	25.0	1.46	300	
	do.	24.7	1.70	800	
	do.	22.7	3.71	750	Unit No. 15
	do.	22.1	4.28	700	Unit No. 15
	do.	21.3	5.04	1,600	
	R.D. No. 407	18.6	2.06	300	
	do.	17.5	3.15	1,000	
	R.D. No. 2067	17.0	0.50	1,000	
	do.	16.7	0.59	1,200	Unit No. 15
do.	16.6	0.81	500	Unit No. 11	

Stream and bank	Maintaining agency	River mile mid-point	Levee mile mid-point	Length in feet	Tentative reconstruction unit no.
Sacramento Left Bank	R.D. No. 2067	15.4	1.99	400	Unit No. 15
	do.	15.2	2.10	500	
	do.	14.7	2.70	780	Completed 1964
	do.	12.8	4.39	650	Completed 1964
Feather Right Bank	Mtc. Area #7	49.7	3.27	1,200	Completed 1965
	R.D. No. 777	41.4	1.17	1,300	Unit No. 12
	do.	39.5	0.45	600	Unit No. 12
	L.D. No. 1	24.5	10.25	2,300	Unit No. 8
Feather Left Bank	R.D. No. 1001	8.0	4.50	800	Completed 1965
	do.	7.5	4.84	1,600	Completed 1965
	do.	6.6	5.68	400	Completed 1963
	do.	6.5	5.95	800	Completed 1965
	do.	5.7	6.78	1,100	Unit No. 12
	do.	2.1	10.41	1,100	Unit No. 12
	do.	1.8	10.70	500	Unit No. 12
	do.				
Steamboat Slough Right Bank	R.D. No. 349	25.0	1.13	750	Unit No. 10
	do.	24.4	1.74	1,100	Unit No. 10
	R.D. No. 501	21.8	0.01	200	Unit No. 10
	do.	21.4	0.42	1,400	Unit No. 10
	do.	21.0	0.85	1,600	
	do.	20.3	1.59	450	Unit No. 10
	do.	19.6	2.25	400	
	do.	19.3	2.55	900	Unit No. 10
	do.	18.3	3.63	600	
	do.	17.0	4.71	1,000	

Stream and bank	Maintaining agency	River mile mid-point	Levee mile mid-point	Length in feet	Tentative reconstruction unit no.
Steamboat Slough Right Bank	R.D. No. 501	16.4	5.30	500	
	do.	16.2	5.22	400	
	do.	15.3	6.44	850	Unit No. 10
Steamboat Slough Left Bank	R.D. No. 3	25.9	0.20	2,100	
	do.	24.4	1.67	900	Unit No. 10
	do.	24.2	1.84	325	Unit No. 10
	do.	24.0	2.03	700	Unit No. 10
	do.	23.8	2.24	300	
	do.	23.7	2.37	200	Unit No. 10
	do.	23.4	2.70	200	Unit No. 10
	do.	23.3	2.78	1,200	
	do.	22.8	2.24	200	Unit No. 10
	do.	22.5	3.67	1,000	
	do.	22.2	3.90	300	Unit No. 10
	do.	21.8	4.36	750	Unit No. 10
	do.	21.3	4.86	900	Unit No. 10
	do.	21.0	5.14	500	
	do.	20.9	5.23	1,200	Unit No. 10
	do.	20.7	5.46	475	Unit No. 10
	do.	20.0	6.05	1,600	Unit No. 10
	do.	19.6	6.55	500	
	do.	19.3	6.80	2,700	Unit No. 10
	do.	18.2	8.09	300	
do.	18.0	8.15	2,000	Unit No. 10	
do.	17.6	8.59	500	Unit No. 10	

Stream and bank	Maintaining agency	River mile mid-point	Levee mile mid-point	Length in feet	Tentative reconstruction unit no
Steamboat Slough Left Bank	R.D. No. 3	17.4	8.73	525	Unit No. 10
	do.	17.3	8.87	200	Unit No. 10
	do.	16.7	9.58	1,300	Unit No. 10
	do.	15.9	10.16	800	
	do.	15.5	10.55	1,200	
Sutter Slough Right Bank	R.D. No. 150	28.1	0.18	1,250	Unit No. 9
	R.D. No. 999	26.2	2.07	100	
	do.	26.0	2.05	800	
	do.	25.3	1.12	200	
	do.	25.1	2.15	200	
	R.D. No. 501	23.7	0.52	4,650	
	do.	23.2	0.93	400	Unit No. 9
	do.	23.1	1.04	325	
	do.	22.5	1.60	2,500	
	do.	22.2	1.99	800	Unit No. 9
	do.	22.0	2.14	800	
Sutter Slough Left Bank	R.D. No. 349	26.9	5.14	675	
	do.	26.7	4.95	575	Completed 1964
	do.	25.9	4.10	800	
	do.	25.5	3.73	300	Unit No. 9
	do.	24.0	2.19	600	Unit No. 9
	do.	23.8	1.97	1,375	
	do.	23.7	1.88	800	
	do.	23.6	1.77	400	Unit No. 9
	do.	23.5	1.62	1,100	

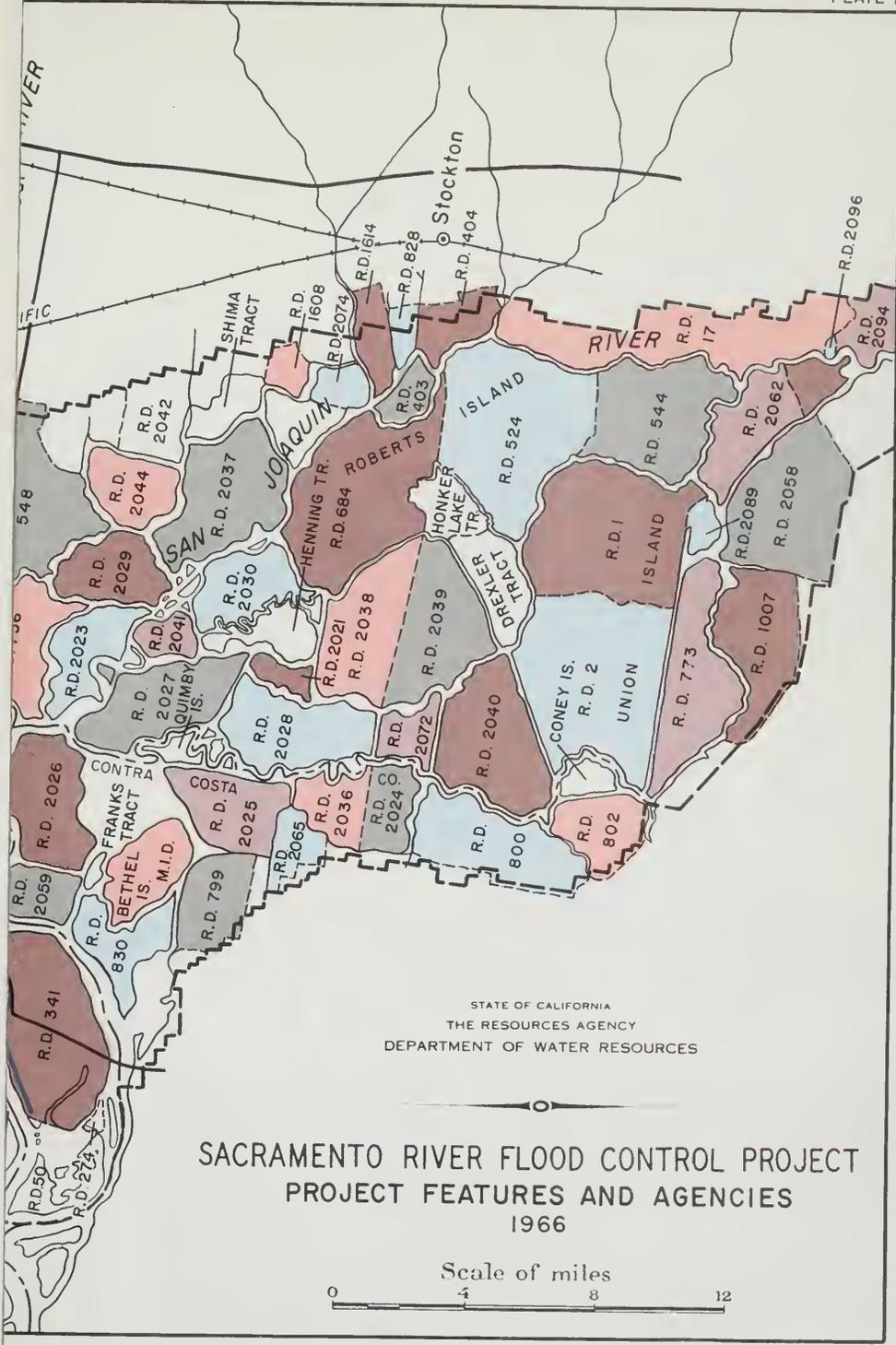
Stream and bank	Maintaining agency	River mile mid-point	Levee mile mid-point	Length in feet	Tentative reconstruction unit no.	
Sutter Slough Left Bank	R.D. No. 349	23.1	1.25	850	Unit No. 9	
	do.	22.6	0.76	325		
	do.	22.3	0.46	1,900		
	do.	22.0	0.14	200		
Miner Slough Right Bank	R.D. No. 999	6.6	1.26	300		
Miner Slough Left Bank	R.D. No. 501	0.6	0.61	425		
	do.	1.1	1.21	1,850		
	do.	1.4	1.63	800		Unit No. 9
	do.	1.6	1.79	525		
	do.	2.0	2.15	1,600		Unit No. 9
	do.	2.4	2.60	525		
	do.	2.7	2.86	1,300	Unit No. 9	
	do.	3.0	3.28	1,900	Unit No. 9	
	do.	3.7	4.00	500	Unit No. 9	
	do.	4.0	4.23	500	Unit No. 9	
	do.	4.7	4.97	900	Unit No. 9	
	do.	5.2	5.50	500	Unit No. 9	
Threemile Slough Left Bank	R.D. No. 1601	"A"	0.74	525	Completed 1964	
	do.	"B"	1.07	575	Completed 1964	
Georgiana Slough Right Bank	R.D. No. 556	11.5	0.75	475		
	do.	11.3	1.02	275		
	do.	11.1	1.14	900		
	do.	10.9	1.34	475		
	do.	9.9	2.32	375		
	do.	9.6	2.73	500	Unit No. 15	

Stream and bank	Maintaining agency	River mile mid-point	Levee mile mid-point	Length in feet	Tentative reconstruction unit no.
Georgiana Slough Right Bank	R.D. No. 556	8.9	3.25	100	
	do.	7.0	5.21	275	
	do.	6.8	5.42	150	
	R.D. No. 407	4.7	2.11	500	Unit No. 15
Georgiana Slough Left Bank	R.D. No. 563	11.6	0.42	200	
	do.	10.9	1.18	150	
	do.	10.0	2.13	425	
	do.	9.6	2.53	475	
	do.	9.1	3.14	200	
	do.	8.6	3.60	150	
	do.	8.5	3.70	1,150	
	do.	8.0	4.24	650	
	do.	7.9	4.35	4,125	
	do.	7.1	4.90	850	
	do.	6.4	5.92	275	
	do.	6.3	6.02	275	
	do.	6.1	6.26	575	
	do.	5.9	6.44	100	
	do.	5.8	6.53	100	
	do.	5.7	6.64	150	
	do.	5.5	6.84	100	
	do.	4.9	7.45	200	
	do.	4.4	8.00	375	
do.	4.2	8.27	475		
do.	4.0	8.45	650	Unit No. 15	

Stream and bank	Maintaining agency	River mile mid-point	Levee mile mid-point	Length in feet	Tentative reconstruction unit no
Georgiana Slough Left Bank	R.D. No. 563	3.1	9.28	1,325	
	do.	2.0	10.48	200	
American Left Bank	A.R.F.C.D. ²	5.84	5.68	1,550	Completed 1965
Elder Creek Right Bank	Tehama Co. Fl. Control Dist.	0.56	0.53	575	Completed 1965
	do.	0.75	0.75	500	Completed 1963
	do.	0.91	0.91	1,500	Unit No. 13
	do.	1.46	1.46	800	Completed 1965
	do.	1.85	1.85	650	Completed 1965
Elder Creek Left Bank	Tehama Co. Fl. Control Dist.	0.83	0.83	300	Unit No. 13
	do.	1.25	1.25	790	Completed 1965
	do.	1.56	1.56	300	Unit No. 13

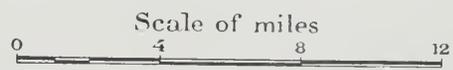
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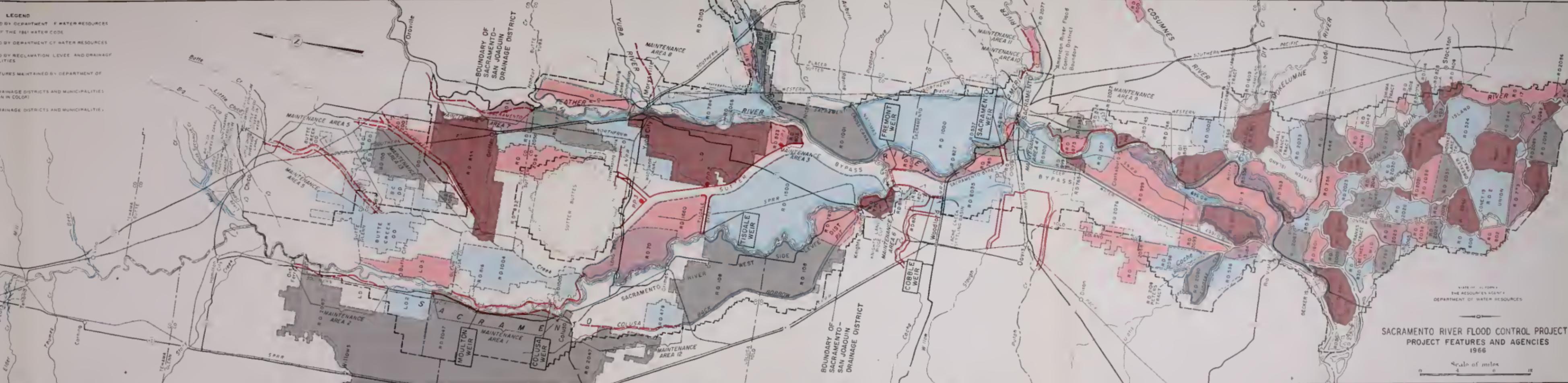
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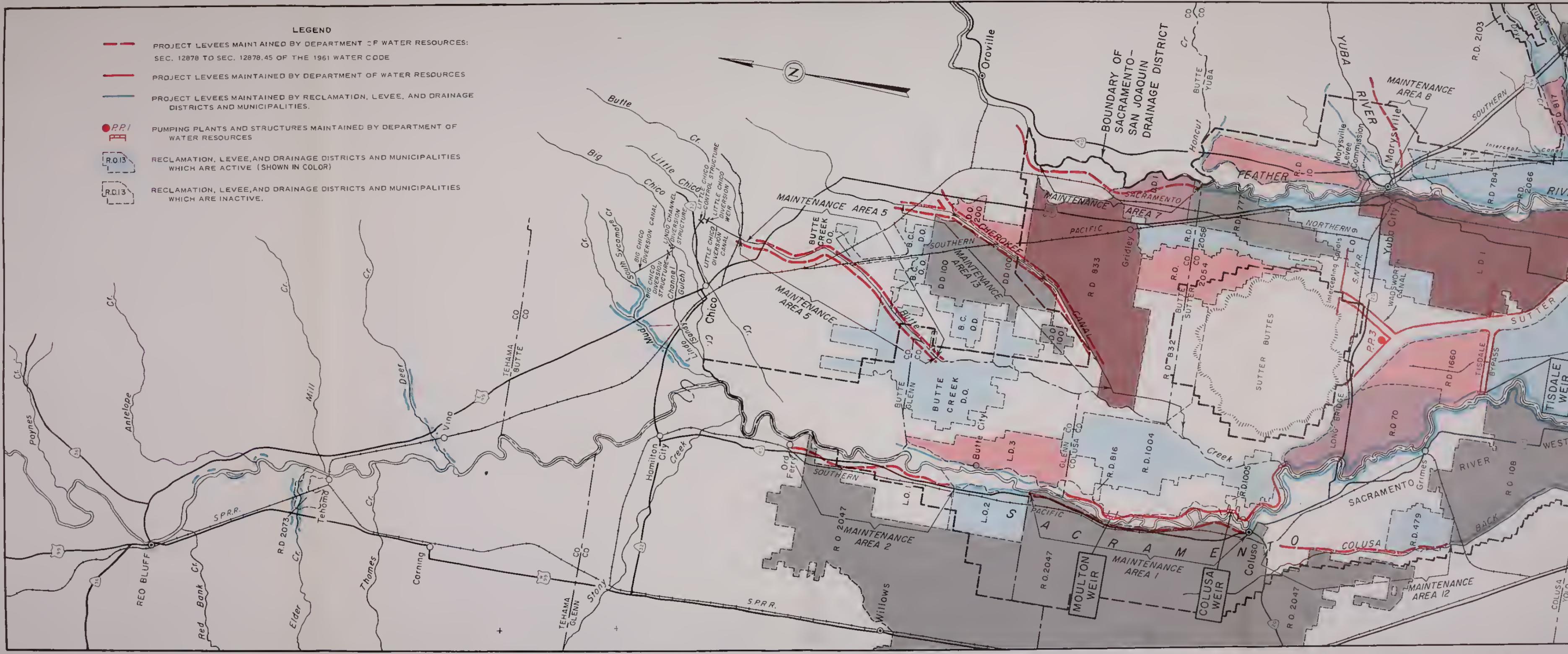
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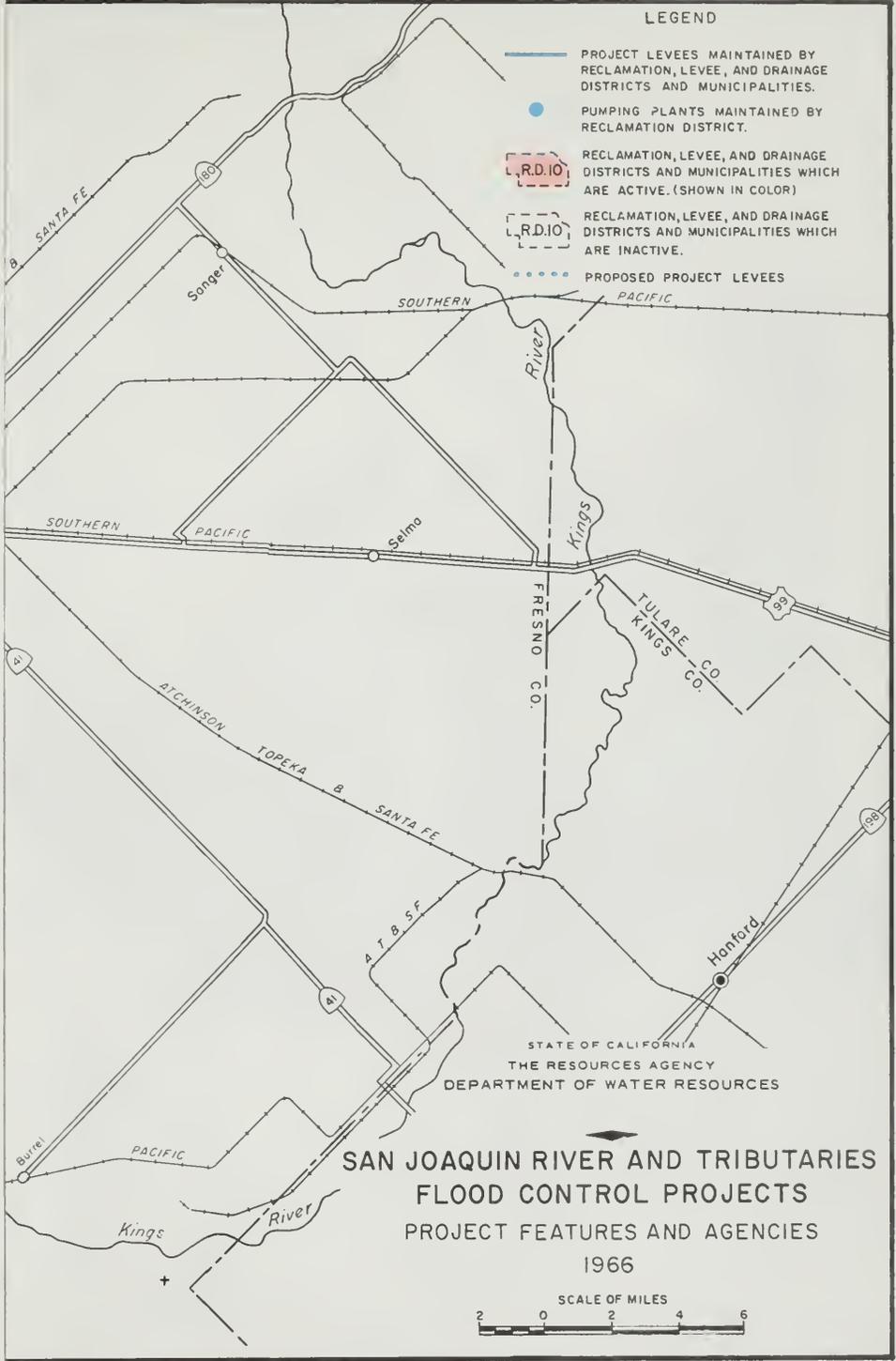
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-  PROJECT LEVEES MAINTAINED BY RECLAMATION, LEVEE, AND DRAINAGE DISTRICTS AND MUNICIPALITIES.
-  PUMPING PLANTS AND STRUCTURES MAINTAINED BY DEPARTMENT OF WATER RESOURCES
-  RECLAMATION, LEVEE, AND DRAINAGE DISTRICTS AND MUNICIPALITIES WHICH ARE ACTIVE (SHOWN IN COLOR)
-  RECLAMATION, LEVEE, AND DRAINAGE DISTRICTS AND MUNICIPALITIES WHICH ARE INACTIVE.





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-  PROJECT LEVEES MAINTAINED BY RECLAMATION, LEVEE, AND DRAINAGE DISTRICTS AND MUNICIPALITIES.
-  PUMPING PLANTS MAINTAINED BY RECLAMATION DISTRICT.
-  RECLAMATION, LEVEE, AND DRAINAGE DISTRICTS AND MUNICIPALITIES WHICH ARE ACTIVE. (SHOWN IN COLOR)
-  RECLAMATION, LEVEE, AND DRAINAGE DISTRICTS AND MUNICIPALITIES WHICH ARE INACTIVE.
-  PROPOSED PROJECT LEVEES

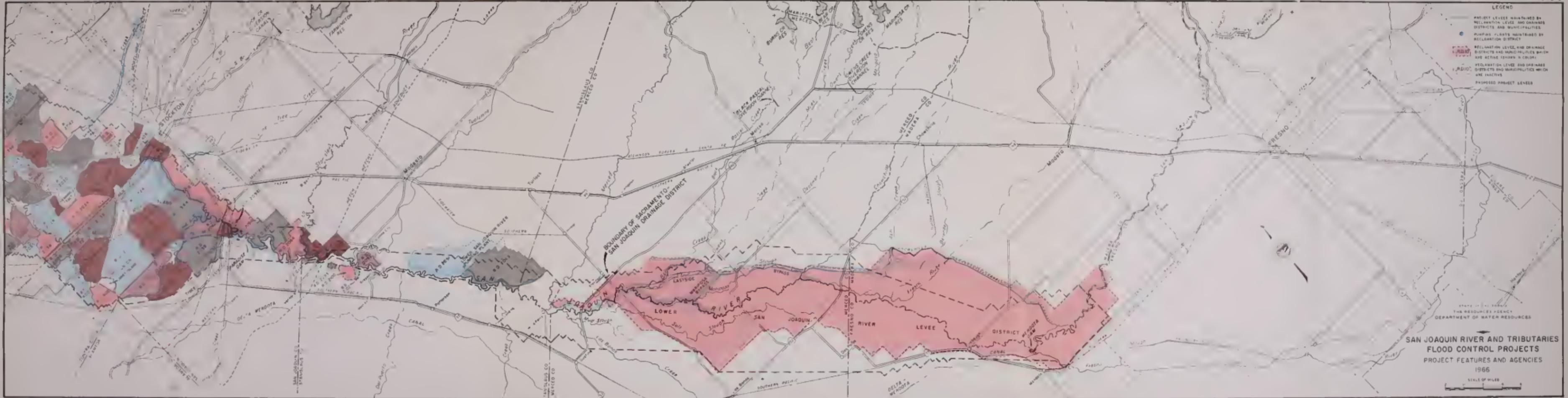


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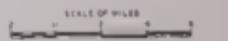


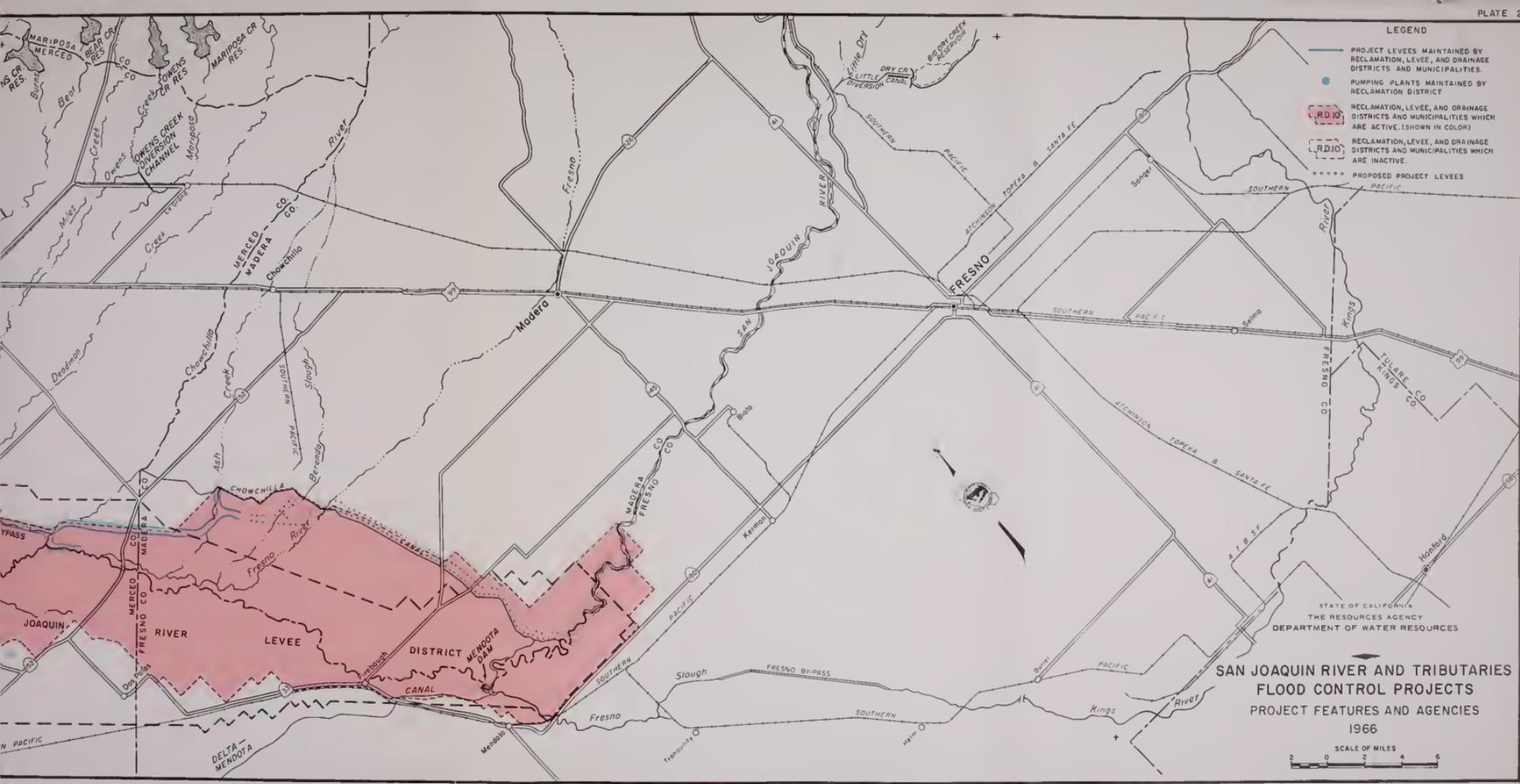
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- PUMP PLANTS MAINTAINED BY RECLAMATION DISTRICT
- RECLAMATION LEVEE AND DRAINAGE DISTRICTS AND MUNICIPALITIES WHICH ARE ACTIVE (SHOWN IN COLOR)
- RECLAMATION LEVEE AND DRAINAGE DISTRICTS AND MUNICIPALITIES WHICH ARE INACTIVE
- PROPOSED PROJECT LEVEES

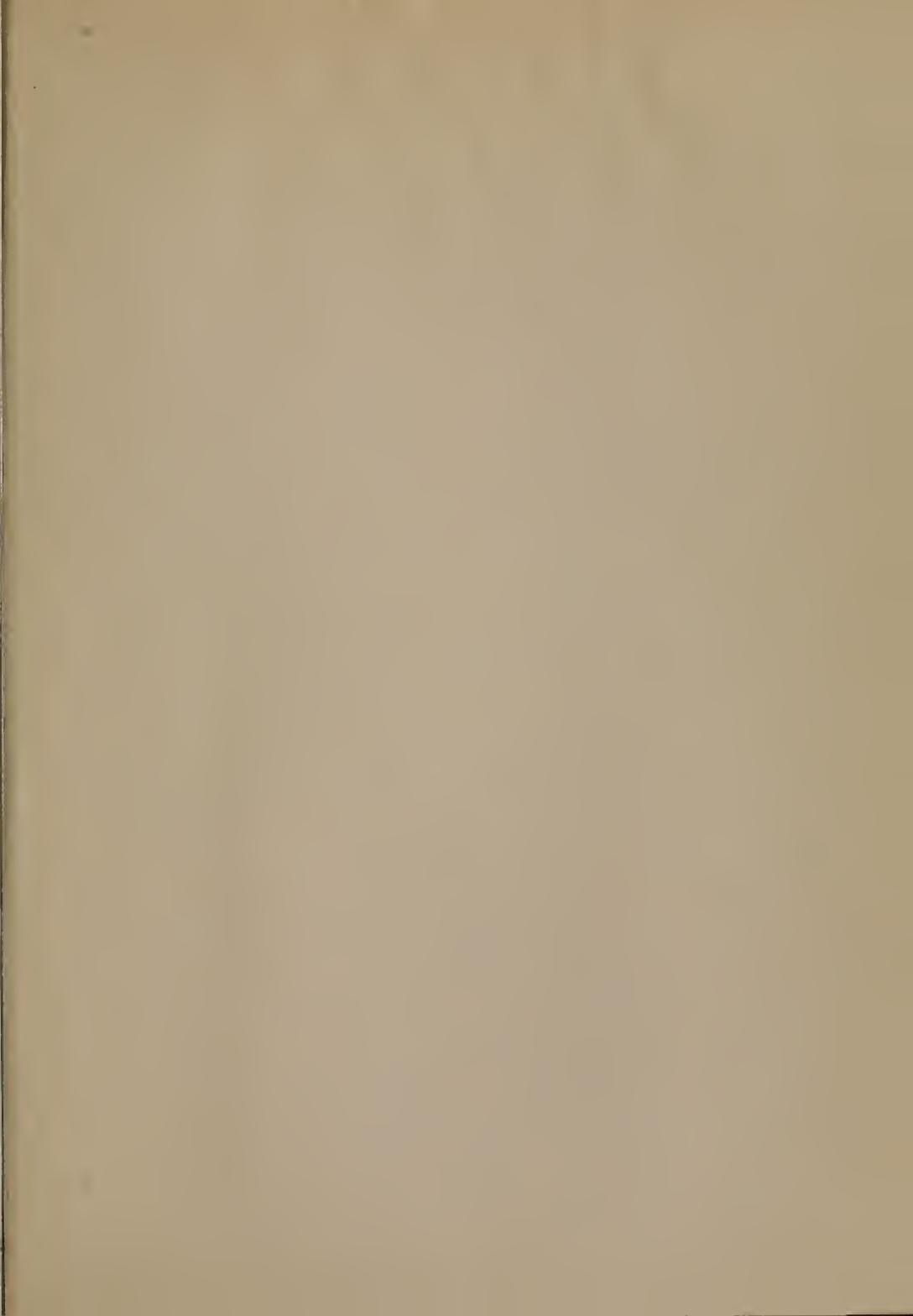
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