

San Joaquin Waterside Erosion Surveys



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Division of Flood Management
Flood Project Integrity and Inspection Branch**



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Summary of San Joaquin Waterside Erosion Surveys by Boat & Land

In September 2006, the Flood Project Integrity and Inspection Branch began erosion surveys of the San Joaquin River flood control system project levees. The surveys were conducted as closely as possible to Ayres Associates criteria for the Sacramento River system. Surveys were completed by boat in the areas that were navigable. In areas that were not navigable or where wide berms obstructed visibility, surveys were completed by land. Inspection sheets from Fall 2006 were reviewed to determine districts where erosion was noted. Due to time constraints, land surveys were prioritized and completed based on this previously noted erosion.

Four days of boat surveys (over 57 miles) were completed using a 21 foot boat from the Delta Field Division. Due to the size of the boat, surveys along French Camp Slough in R.D. 404 and R.D. 17 could not be completed. Six days of land surveys were completed (over 320 miles). In the Lower San Joaquin Levee District, only spot checks were conducted rather than a complete survey. The other land surveys were completed by driving the entire district. Several project features in the San Joaquin system are channels or canals. These areas were not surveyed, considering that this survey was limited to levee erosion.

Navigation in the San Joaquin system is rather limited. None of the creeks and rivers in San Joaquin County Flood Control District is navigable except for the mouth of the Calaveras River. Paradise Cut is not practically navigable. The Lower San Joaquin Levee District contains many bypasses which are dry most of the year. If a smaller boat were used, a few additional sloughs could have been surveyed. In addition, in areas on the San Joaquin River that were navigable, wide berms obstructed visibility of the levees. This is apparent in districts such as R.D. 2095, R.D. 2085, R.D. 2094, R.D. 2075, and many others. Several challenges also exist with land surveys. In districts where the channel is wide (such as Paradise Cut), visibility is obstructed by trees and other vegetation. Some banks can only be viewed by driving along the near bank. However, this can be challenging in districts such as R.D. 2062 along Paradise Cut. The slopes are steep and covered with vegetation, making visibility extremely limited.

Districts that were surveyed by boat were not notified about the erosion survey. Districts that were surveyed by land were notified or accessed with the help of a DWR inspector in most cases. Some districts that were notified were very interested and rode along during the survey. Logistics could be difficult during land surveys. If a DWR inspector was unavailable or the district had not been notified, it was found that locks on the gates had been changed. In the future, all land based inspections would be attempted with the assistance of a DWR inspector or district representative to make sure proper access was obtained.

Some sites in this survey have additional pictures included which were taken during the joint PL 84-99 reconnaissance inspection with the Corps. These sites were re-inspected during this survey to incorporate the additional necessary information.

The following table gives a listing of the districts which were surveyed (at least partially) by boat or by land as of March 15, 2007.

Table 1: Erosion surveys by Boat or by Land.

Local Maintaining Agency	Total Damaged Sites Identified	PL 84-99 Submittal	New Sites Identified	Miles Surveyed*
Sites Surveyed by Boat				
RD 1	2	None	2	1.15
RD 17	39	36	3	14.37
RD 404	9	None	9	2.38
RD 524	50	50	None	6.26
RD 544	43	43		10.33
RD 2062	9	None	9	8.28
RD 2085	None	-	-	6.18
RD 2089	9	None	9	2.90
RD 2095	4	None	4	3.38
RD 2107	None	-	-	2.37
Sites Surveyed by Land				
Lower San Joaquin Levee District	2	None	2	191.40
San Joaquin County Flood Control District	32	None	32	127.99
RD 2058	4	None	4	3
RD 2095	4	None	4	1.45

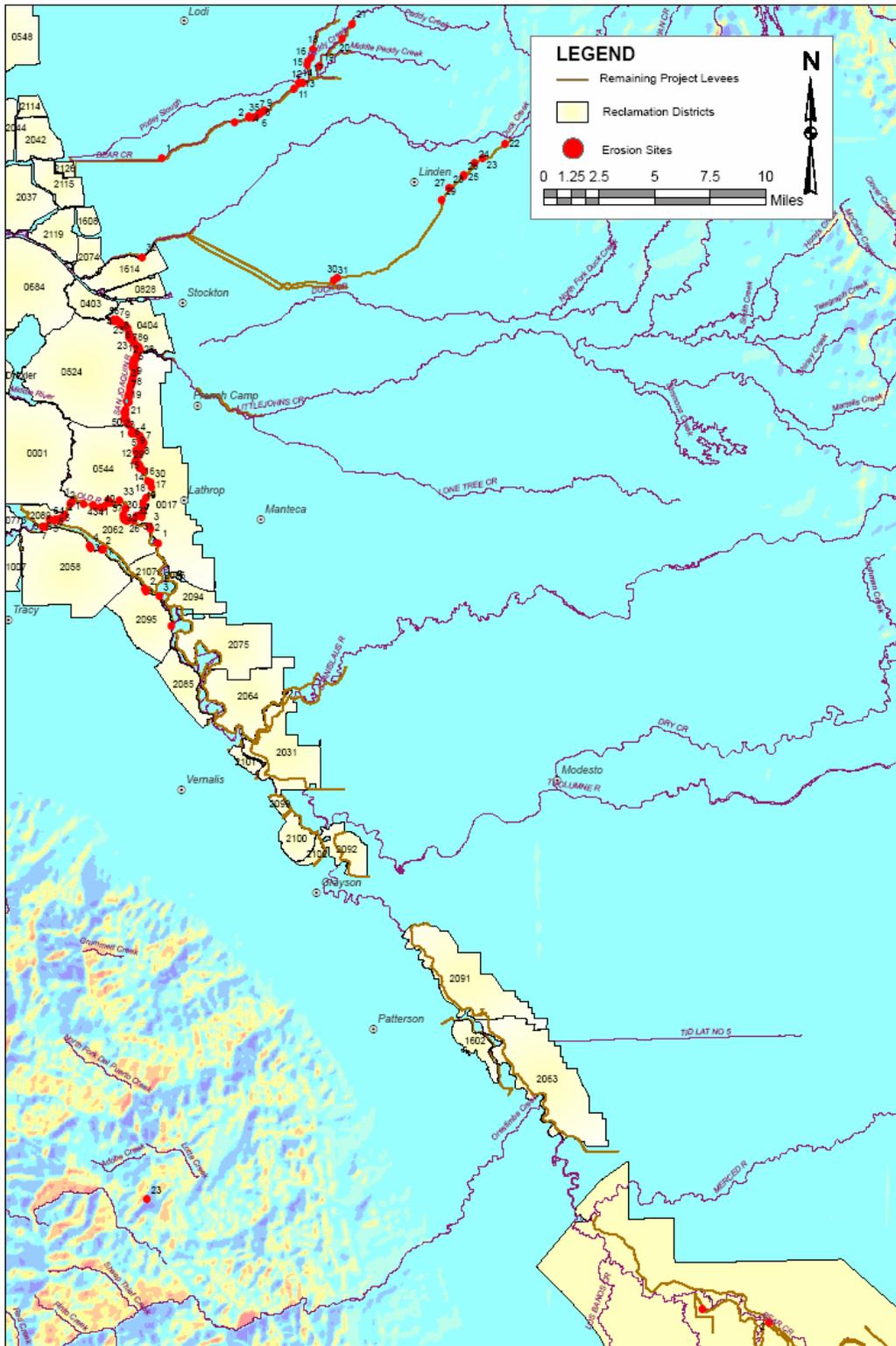
*Miles surveyed in the Lower San Joaquin Levee District and San Joaquin County Flood Control District include channels and canals. These channels and canals were either not surveyed or removed from the list, since they do not meet the criteria for this levee erosion survey. The mileage was included in this table to account for total district project miles.

The following districts have not been surveyed by boat or land:

Table 2: Districts that have not been surveyed

Reason for Not Surveying		Miles Not Surveyed
RD 17	French Camp Slough only –Can be navigated by small boat	1.81
RD 404	French Camp Slough only –Can be navigated by small boat	1.76
RD 1602	Navigable, but large berms block visibility	6.29
RD 2031	Navigable on San Joaquin, but large berms block visibility; Navigation on Stanislaus River unknown	13.19
RD 2058	West of Paradise Road – Not practically navigable	3
RD 2062	Paradise Cut only – Not practically navigable; levee slopes are steep and covered with vegetation; visibility is very limited; cannot see from opposite bank	4.03
RD 2063	Navigable, but large berms block visibility; levee slopes not maintained by District, no visibility by land	10.63
RD 2064	Navigable on San Joaquin, but large berms block visibility; Navigation on Stanislaus River unknown	11.9
RD 2075	Navigable, but large berms block visibility	7.52
RD 2091	Navigable, but large berms block visibility	7.92
RD 2092	Navigable, but large berms block visibility	3.76
RD 2094	Navigable, but large berms block visibility	3.28
RD 2096	-	0.17
RD 2101	Navigable	3.5
RD 2107	Paradise Cut only – Not practically navigable	1.84
Madera County	-	26.65
Merced Stream Group	-	6.30

Figure 1: Location of Erosion Sites



Highlights:

- Of the 28 LMAs, 10 were surveyed by boat (at least partially).
- Of the over 490 total project levee miles, over 57 were surveyed by boat.
- Over 380 miles of erosion surveys have been completed.
- About 113 miles remain which have not been surveyed by boat or land.
- Erosion sites have not yet been prioritized or ranked for severity.

Erosion Criteria:

A site may be included in this erosion survey if it meets with one of the following three criteria:

- a) Bank erosion into the projection of the levee slope.
- b) Berm width of less than 35 feet.
- c) The site was submitted by the local maintaining agency for PL 84-99 assistance from the April 2006 high water.

Several of the creeks or sloughs in the San Joaquin system include stretches where one bank is on high ground. The high ground could be an orchard or golf course that is filled to the height of the levee crown. Also, some stretches are oversized levees that have landside stability berms built up to levee crown elevation. The stability berm might be thirty or more feet wide. Erosion on these stretches is not noted in this survey. While erosion certainly has occurred, it is assumed to be 'natural meandering of the channel' and not true levee erosion.

This survey was conducted to collect similar data to that of the Ayres Associates erosion surveys conducted in the Sacramento River basin. However, the item 'Erosion Mechanism' was not included in this survey, because the team did not have the expertise in river morphology to make that judgment.

Specific data collected at each site includes:

1. Approximate river mile as per 1984 Corps Aerial Atlas
2. Right or left bank
3. Levee mile start/end (optional)
4. Local maintaining agency
5. GPS begin/end
6. Estimated height of erosion (ft)
7. Estimated site length (ft)
8. Erosion location on the bank (toe, mid bank, upper slope, etc.)
9. Existing revetment type, if any
10. Proximity of erosion to the levee slope
11. Remaining berm width
12. Any comments or field notes
13. Photo of site