San Joaquin River System Waterside Erosion Surveys – Phase II

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Keith Swanson…….……..……..…Acting Division Chief
Gary Bardini……...……Chief, Hydrology and Flood Operations

This report was prepared under the direction of

Jeremy Arrich……..…..Chief, Flood Project Integrity and Inspection Branch

By

Genny Schrader…….……Engineer, W.R.

Assisted by

Amy Bindra……..……..……..…..…Senior Engineer, W.R.
Shahid Anwar……..……..…..…… Engineer, W.R.
Michal Koller……..……..……..…… Engineer, W.R.
Daniel Meyersohn……..…….……..Engineer, W.R.
Robert Trang……..…….……..Engineer, W.R.
Jon Yego……..…….……Engineer, W.R.
Herman Phillips…..……..Water Resources Engineering Associate
Mark Soto……..……. Water Resources Technician II
Richard Willoughby…..……..Water Resources Technician II

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Summary of San Joaquin Waterside Erosion Surveys by Land – Phase II

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.

Considering that time was limited, a complete survey of the entire system was not finished at the time of the April 2007 "San Joaquin Waterside Erosion Surveys" report. This report summarizes the completion of the Phase II erosion surveys of the San Joaquin system. The remaining surveys were completed by land, considering that navigation on the San Joaquin system is rather limited. As noted in the previous report, wide berms on the San Joaquin River block visibility on some of the navigable stretches. Some smaller creeks and sloughs may be navigable, but only by using a small or flat bottom boat.

Land surveys were challenging in some cases during the Phase II surveys due to visibility issues. In many districts, the slopes could not be seen from the opposite bank due to vegetation in the channel. Slopes had to be surveyed in many cases from the near side bank. While some districts had cleared vegetation, vegetation on the slopes prevented staff from observing the levee slope adequately in other districts. Visibility was extremely poor in R.D. 2063, R.D. 2101, the Stanislaus River portion of R.D. 2031, and R.D. 2058. Staff conducted portions of the surveys by foot, since navigation was impractical and visibility was extremely poor by vehicle.

Access through locked gates was an obstacle during the Phase I surveys. Access proved to be an issue again during the Phase II surveys. Locks had frequently been changed since the previous spring maintenance inspections. Also, a few stretches in the San Joaquin system have safety issues when gun ranges are active. About 1 ½ miles were not surveyed in R.D. 2091 due to gun range activity. The area is marked with signs warning not to pass when the red flag is out. This range is a distance away from the levee. However, R.D. 2064 has a gun range with targets on the landside levee toe that was active during the survey. This area is not marked with signs. Another safety issue concerns a stretch along R.D. 2031 and Highway 132. Visibility from a vehicle is extremely poor, so it was necessary to walk this stretch. Highway 132 is a high traffic area with numerous trucks, while the levee slope is difficult to walk along due to large amounts of vegetation. This stretch may be more safely surveyed by a small boat in the future, although the river meanders away from the levee at the halfway point.

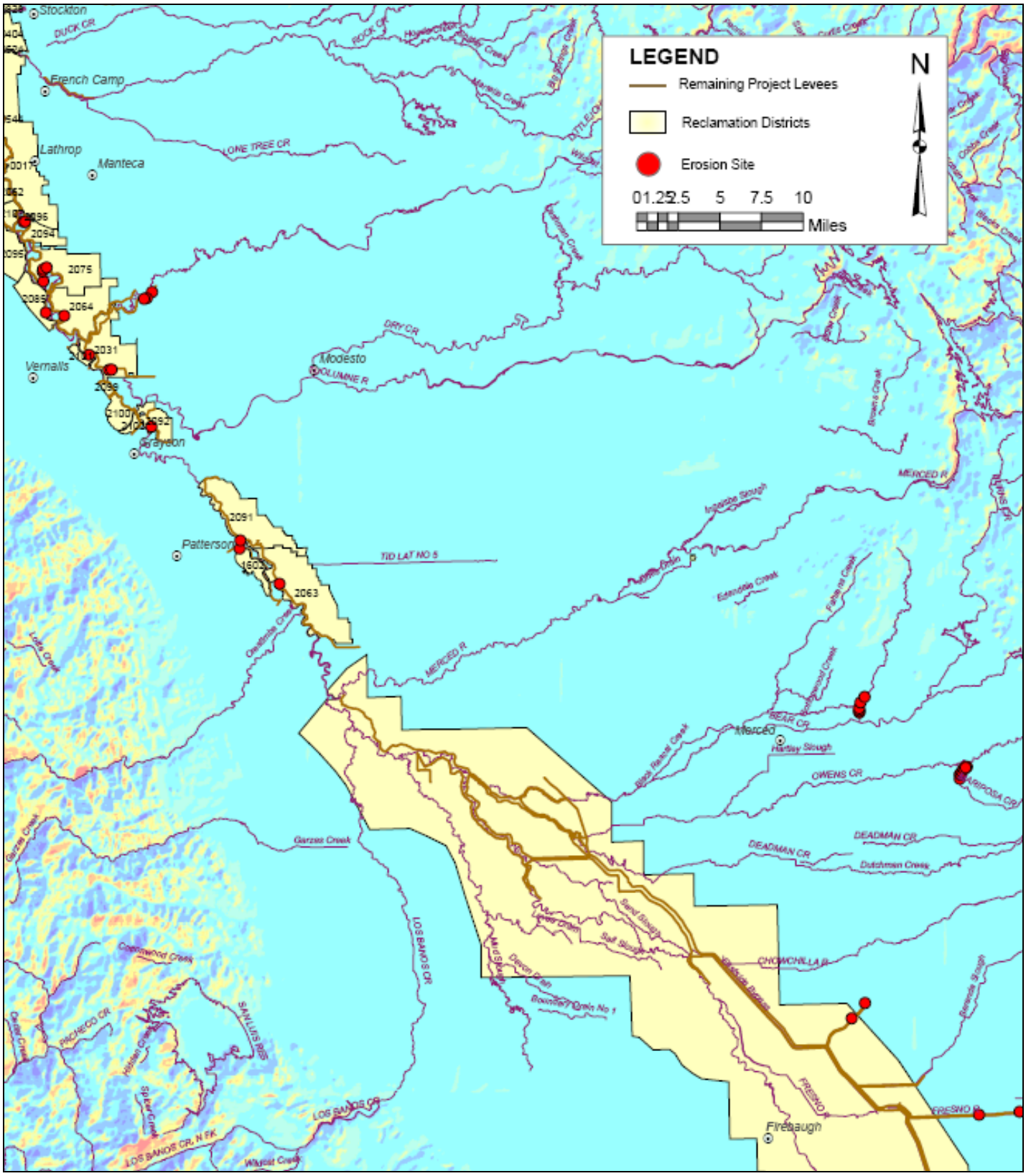
The following table gives a listing of the districts which were surveyed by land as of September 14, 2007.

Table 1: Erosion surveys by Land - Phase II.

Local Maintaining Agency*	Total Damaged Sites Identified	PL 84-99 Submittal	New Sites Identified	Miles Surveyed
RD 2094	2	None	2	3.28
RD 2107	1	None	1	1.84
RD 2075	4	None	4	7.52
RD 2085	1	None	1	Spot checked
RD 2064	1	None	1	11.9
RD 2101	1	None	1	3.5
RD 2031	5	None	5	13.19
RD 2092	1	None	1	3.76
RD 2091	1	None	1	7.92**
RD 1602	1	None	1	6.29
RD 2063	1	None	1	10.63
Merced Co. Stream Group	17	None	17	6.30
Madera County FCWA	4	None	4	26.65
RD 2058 – west of Paradise Road	None	None	None	3
RD 2062- Paradise Cut only	None	None	None	4.03

*Some additional sites in RD 404 and RD 17 are included in the April 2007 report due to a special assignment.
**Approximately 1 ½ miles in this district were not surveyed due to gun range activity.

Figure 1: Location of Erosion Sites



Highlights:

- A total of 246 sites are documented from the San Joaquin erosion surveys (both Phase I and Phase II), 129 of these are PL 84-99 sites.
- Erosion sites have not yet been prioritized or ranked for severity; however, the FPIIB recommends that the site from RD 2101 be included in the short list of sites for immediate repair.

Erosion Criteria:

A site may be included in this erosion survey if it meets 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

The reconnaissance erosion inventory tables following this report list the above data for each site. The sites listed in the tables include both the Phase I and Phase II information. The "San Joaquin Waterside Erosion Surveys" report, dated April 2007, is included as Appendix A. Also, the pictures of each site for the Phase II surveys are attached as Appendices B through K. The San Joaquin Erosion Surveys Aerial Atlas includes a combination of both Phase I and II sites.