

2012

INSPECTION AND LOCAL MAINTAINING AGENCY REPORT OF THE CENTRAL VALLEY STATE-FEDERAL FLOOD PROTECTION SYSTEM

Code of Federal Regulations, Title 33, Section 208.10

California Water Code Sections 9140 - 9141

Draft Report

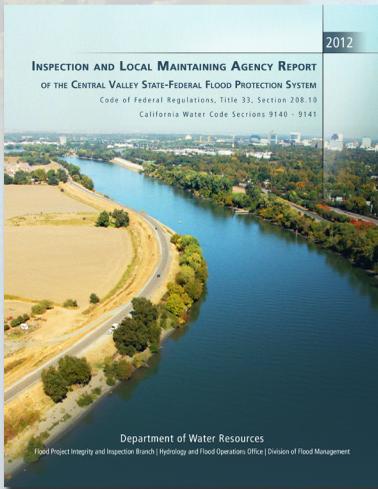
Department of Water Resources

Flood Project Integrity and Inspection Branch | Hydrology and Flood Operations Office | Division of Flood Management



Prepared and printed by
California Department of Water Resources

FLOOD
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Acknowledgments

Successful completion of this annual report would not be possible without dedicated efforts and assistance from the Department of Water Resources (DWR) Inspection and Local Maintaining Agency staff. DWR's Flood Project Integrity and Inspection Branch (FPIIB) would like to acknowledge the contributions of the following:

- Inspectors of DWR's Flood Project Integrity and Inspection Branch
- Local Maintaining Agencies, consulting firms, and their representatives, who participated in meetings and workshops
- DWR Printing Production for their support

Reader's Guide

This report is a compilation of data collected by various programs but primarily gathered by DWR's FPIIB. It includes information from DWR inspections, DWR summary of Local Maintaining Agency (LMA) annual reporting derived from Assembly Bill 156 (2007), United States Army Corps of Engineers (USACE) Periodic Inspections (PI) of the State-Federal Flood Control System, DWR Erosion Survey in the San Joaquin River, and the USACE's Sacramento Bank Project erosion data along with other relevant information. Since the report covers many programs and activities, this Reader's Guide has been provided to help the reader navigate the report.

The report begins with a text portion followed by twelve Appendices (Appendix A through Appendix L). Appendices A through E are included in hard copy format while Appendices F through L are included in electronic format (CD). A CD is attached in the back of the report.

Appendices A and B cover LMA summary profiles for Sacramento and San Joaquin River Flood Control Systems. Each individual LMA summary profile contains a cover page with LMA contact information, aerial map of the levee segment, levee information, results of inspection and erosion, USACE PI results and current eligibility in the Rehabilitation and Inspection Program (RIP), and LMA summary reporting. The contact information presented in this report is for the highest authority within an LMA jurisdiction. Directory of Flood Officials uses this contact information in their Annual Directory. A generic threat assessment and recommendation for each LMA has also been developed by DWR. Each of these Appendices is preceded by System Maps showing the boundaries of LMAs within the Sacramento and San Joaquin Basin.

Appendix C covers other basins which do not belong to either Sacramento or San Joaquin River Flood Control System. Non-Project levee reporting on maintenance from an LMA are also included in this section.

Appendix D covers relevant correspondence primarily for the LMA reporting program.

Appendix E covers supplemental figures and tables with results from the inspection program.

Appendices F through L are self explanatory. The description of each Appendix can be found in the List of Appendices section of the Table of Contents.

It may be helpful for the reader to refer to the document titled *State Plan of Flood Control Descriptive Document* (November, 2012) as part of the *2012 Central Valley Flood Protection Plan* (July, 2012). The information included in the State Plan of Flood Control Descriptive Document is complimentary to this document. Section 7.6 has more information regarding this.

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Appendix C: Miscellaneous Summary Reports

Appendix D: Relevant Correspondence for the LMA Reporting Program

Appendix E: Supplemental Figures and Tables for the Inspection Program

Appendix F: Maintenance Requirements and Responsibilities—Included on the enclosed CD

Appendix G: Inspection Category Rating Descriptions—Included on the enclosed CD

Appendix H: Fall 2012 Levee Maintenance Inspection Summary Reports—Included on the enclosed CD

Appendix I: 2012 Channel Maintenance Inspection Summary Reports—Included on the enclosed CD

Appendix J: 2012 Structure Maintenance Inspection Summary Reports—Included on the enclosed CD

Appendix K: 2012 Pumping Plant Maintenance Inspection Summary Reports—Included on the enclosed CD

Appendix L: 2012 Supplemental Erosion Survey of the San Joaquin River System Detailed Reports—Included on the enclosed CD

Abbreviations and Acronyms

AB	Assembly Bill
CDEC	California Data Exchange Center
CO	Completely Obstructing
CVFMP	Central Valley Flood Management Planning
CFR	Code of Federal Regulations
CVFPB	Central Valley Flood Protection Board
CVFPP	Central Valley Flood Protection Plan
CVRWQCB	Central Valley Regional Water Quality Control Board
CWC	California Water Code
DFG	Department of Fish and Game
DWR or Department	Department of Water Resources
FCC	Federal Communications Commission
FCSSR	Flood Control System Status Report
FCWCA	Flood Control and Water Conservation Agency
FEMA	Federal Emergency Management Agency
FloodSAFE	California's comprehensive program to improve public safety through integrated flood management
FOC	State-federal Flood Operations Center
FPIIB	Flood Project Integrity and Inspection Branch
IRWMP	Integrated Regional Water Management Planning
LB	Left Bank
LD	Levee Districts
LM	Levee Mile
LMA/LMAs	Local Maintaining Agency/Agencies
LMR	Levee Mile Reports
LOM	Library of Models
MA	Maintenance Areas
NA	Named Areas
NEMDC	Natomas East Main Drainage Canal
NLIP	Natomas Levee Improvement Program
NULE	Non-Urban Levee Evaluation
O&M	Operation & Maintenance
OMRRR	Operation, Maintenance, Repair, Rehabilitation and Replacement
PI	USACE Periodic Inspection
PL 84-99	Public Law that defines federal rehabilitation assistance for flood control works
PO	Partially Obstructing
RB	Right Bank
RIP	Rehabilitation and Inspection Program
RD	Reclamation Districts
RM	River Mile
RS	Rock Site
SAFCA	Sacramento Area Flood Control Agency
SJAFCA	San Joaquin Area Flood Control Agency
SJRFCS	San Joaquin River Flood Control System
SPFC	State Plan of Flood Control
SPRR	Southern Pacific Railroad
ST	State Maintained Area
UCIP	Utility Crossing Inventory Program
USACE	U.S. Army Corps of Engineers

1 INTRODUCTION

This report is the first in the journey of combining the results of the California Department of Water Resources' (DWR) 2012 inspections and the Local Maintaining Agencies (LMA) annual reporting program of the State-federal flood protection system in California's Central Valley.

1.1 Purpose and Scope of Inspection Program

Federal Flood Control Regulations (Title 33 of the Code of Federal Regulations, Section 208.10 (33 CFR 208.10)) require that federal flood protection facilities be inspected at least four times a year — immediately prior to the beginning of the flood season, immediately following each major high water period, and otherwise at intervals not exceeding 90 days. In addition, inspections at intermediate times may be necessary. These periodic inspections are specifically needed to ensure that maintenance measures for project facilities are being effectively carried out, not to determine other inherent problems (geotechnical, flow capacity, etc.) with the project facilities.

This *2012 Inspection and Local Maintaining Agency Report of the Central Valley State-federal Flood Control System* is the annual report on the effectiveness of facility maintenance activities of the maintaining agencies. It serves as the report titled *Status of Project Levee Maintenance* referenced in some documents. This report covers levees, channels, and structures, including pumping plants. Deficiencies are noted and each agency receives a rating for the facilities within its maintenance responsibilities based on the fall inspections. The report is based primarily on DWR's inspections conducted during the summer and fall of 2012 and includes information submitted by Local Maintaining Agencies pursuant to California Water Code (CWC) Section 9141.

This annual report is intended for use by the U.S. Army Corps of Engineers (USACE), DWR, the Central Valley Flood Protection Board (CVFPB), LMA, and other interested parties.

DWR's Flood Project Integrity and Inspection Branch (FPIIB) conducts two comprehensive levee inspections and one channel and structure inspection each year. FPIIB also conducts erosion inspections in the San Joaquin River system; results can be found in section 5 of this report. DWR completed spring inspections in May 2012, documenting the location, size, type, and rating of maintenance deficiencies while working with the LMAs to assist in planning maintenance activities prior to the flood season. DWR completed annual fall inspections in December 2012, verifying the status of previously noted as well as any additional deficiencies that should be corrected to help ensure adequate performance during the flood season. LMAs conduct inspections in the winter and summer, completing the requirement to conduct four inspections each year. Since project facilities are inspected at least four times each year, there are other inspection reports for different uses (see side bar, Page 1). DWR will report to the CVFPB on inspection activities as requested.

The USACE conducts two inspection programs, Continuing Eligibility Inspections and Periodic Inspections (PI). Both of these inspections look at the condition of the levee less frequently than DWR conducts inspections, but the USACE is able to take more time and do a more thorough inspection. The USACE determines overall ratings differently than DWR. More information can be found in the appendices. The USACE uses the overall ratings from these inspections to determine eligibility in its Rehabilitation and Inspection Program (RIP), known by some as PL 84-99. The USACE inspects and rates areas in an organization determined by the area they protect called systems. This report includes the ratings and eligibility in the RIP for systems that contain portions of each LMA within.

Maintenance Inspection Reporting

2012 Inspection and Local Maintaining Agency Report of the Central Valley State-Federal Flood Protection System. Annual report prepared by DWR based on DWR's fall and summer inspections and information submitted by the LMA - this report. This is the first in its series of combined reports.

San Joaquin River Flood System Erosion Report. Annual report prepared by DWR based on supplemental inspections conducted by FPIIB personnel-this report.

Levee Mile Report. Reports generated from inspections detailing maintenance deficiencies found during the inspection. A Levee Mile Report is generated for each unit and includes photos of some issues noted. These reports are available on the Flood System Inspection page on the California Data Exchange Center's webpage.

Reports to the CVFPB. Verbal presentations by FPIIB outlining inspection activities.

1.2 Purpose and Scope of LMA Reporting Program

Since 2008, LMAs have been reporting to DWR on their maintenance of their Project Levees. DWR prepares the summary results for the CVFPB to meet the requirements of CWC, Section 9141. For the past four years, the program developed annual reports covering only this activity. However, from this year on, this report is combined with inspection program and other reporting programs as per the recommendation of the CVFPB (March 2012 Board meeting).

LMAs submit specific information to DWR by September 30 of each year regarding the levees they operate and maintain. DWR summarizes the information submitted by LMAs in a report format and provides the report to the CVFPB by December 31 of each year. Submissions of information by LMAs include levee conditions and operation and maintenance activities. This information is (1) essential for a comprehensive understanding of the flood protection system in the Central Valley and (2) critical to flood control system evaluation, assessment, and emergency response.

The LMA report is currently being implemented as part of DWR's Flood Emergency Response Program by the Division of Flood Management. California's multi-faceted program, 'FloodSAFE California' is a strategic initiative designed to improve public safety through integrated flood management. FloodSAFE California has identified the Flood Emergency Response Program as a way to manage residual flood risks and reduce the loss of lives and properties when flooding occurs.

1.3 Highlights of Inspection Program for 2012

DWR applied similar inspection criteria and overall rating methodology used in inspections since 2007. Overall the system showed continued maintenance improvements between 2007 and 2010 but more deficiencies were noted in 2011 and 2012 compared to 2010.

- All inspections were completed in 2012. The Inspections Program again overcame continued resourcing challenges resulting from budget restrictions, including the elimination of overtime and flextime.
- The results of the 2012 levee inspections show 41 of the 106 Areas receiving Unacceptable ratings, increasing from 37 in 2011. The number of Areas receiving Acceptable ratings increased from 45 in 2011 to 47 in 2012. The number of Areas receiving Minimally Acceptable ratings decreased from 24 in 2011 to 18 in 2012.
- There was a significant increase in the overall length of deficiencies in 2012 compared to 2011. The overall length of issues increased most significantly in the San Joaquin River Basin, but also in the Sacramento River Basin. The overall increase can be attributed to the significant increase in the lengths of vegetation deficiencies but also crown surface and some animal control deficiencies. Most other categories had lengths similar to last year or slightly decreased. DWR continues to follow USACE inspection criteria for most categories, but uses the Levee Vegetation Management Strategy described in the *2012 Central Valley Flood Protection Plan* and the Urban Levee Design Criteria for vegetation issues.
- The 2012 inspection yielded 17 channels, 40 structures and 11 pumping plants rated as Acceptable; 8 channels and 3 structures rated as Minimally Acceptable; and 1 channel and 1 pumping plant rated as Unacceptable.
- In 2012 the understanding of the responsibilities of the CVFPB and LMAs continues to evolve. As there is no maintaining agency identified for Paradise Dam and NA0006-Eastern Honcut Creek, they are currently unassigned pending a decision by the CVFPB. Other State Plan of Flood Control (SPFC) levees and structures continue to be adjusted and refined through discussions between DWR, the USACE, and the CVFPB.
- Inspection criteria were revised in 2012 to further align with the USACE's current Checklist and Flowchart criteria in many areas. DWR also removed the Partially Obstructing (PO) and Completely Obstructing (CO) ratings previously used and instituted Issue Types of Maintenance, Enforcement, and Design & System Obsolescence. Only issues with Maintenance Types assigned to them will detract from an LMA's overall rating. Issues previously rated PO and CO are now rated as M and U, respectively. For more detailed information regarding the inspection criteria, please see Appendices F and G.
- Inspectors also inspect Central Valley Flood Protection Board permits for compliance with regulations. Inspectors closed 21 permits in 2012.

- In 2012 LMAs were encouraged to use the online LMA Reporting Application to report findings from their summer and winter inspections. Any notes added to issues that DWR inspectors noted are now seen by DWR inspectors in the next inspection cycle and are flagged to call their attention to the information.
- In 2012 DWR added criteria similar to prior years requiring LMAs to have copies of the Operations and Maintenance (O&M) Manual, maintain a supply of Emergency Supplies and Equipment, and be trained and prepared in the event of a high water issue.

In this report detailed analyses of inspection results are included as appendices. Background discussion of the State-federal flood protection system—including relationships between federal, state, and local agencies, and responsibilities outlined in Project O&M Manuals—are also included as an appendix.

Additional FPIIB 2012 highlights:

- FPIIB continued monthly coordination meetings with the USACE to answer questions that both groups have regarding inspections, maintenance practices and recently enacted regulations. The CVFPB and DWR's Flood Maintenance Office continued their significant participation in these meetings during 2012.
- FPIIB staff continued to coordinate with and support the State-federal Flood Operations Center (FOC) in conducting and preparing emergency exercises, assisting in the Flood Fight Methods training, and general preparedness in responding to any flood emergency.
- In 2012 the USACE and its contractors continued to conduct Periodic Inspections. FPIIB coordinated with the LMAs, the CVFPB, and the USACE and its contractors throughout the Periodic Inspection process, primarily in facilitating communication between these entities.
- FPIIB staff assisted during the activation of the FOC for the Winter Storm Event of November/December 2012. Staff assisted in the FOC and in the field.
- FPIIB provided information for the development of the Regional Plans derived from the 2012 Central Valley Flood Protection Plan.

DWR continues to improve its inspection program, undergo activities detailing the maintenance condition of features, and work with the LMAs to help ensure a functional flood protection system.

A copy of this annual report and other related reports have been published on-line at <http://cdec.water.ca.gov/fsir.html>, <http://cdec.water.ca.gov/lma.html> and <http://cvfpb.ca.gov>.

1.4 Highlights of LMA Reporting Program for 2012

LMA reporting program includes a compilation of information received from LMAs on the Project Levees and certain Non-Project Levees they maintain in the Sacramento and San Joaquin river basins. DWR identified 89 LMAs that are required to submit information to DWR pursuant to California Water Code (CWC) Sections 9140 and 9141. These 89 LMAs encompass 110 unique geographical areas (called **Areas** hereafter).

Appendices A and B include individual LMA summary profiles who maintain Project Levees along the Sacramento River and San Joaquin River, respectively. Other miscellaneous summary profiles for LMAs that do not maintain Project Levees are located in Appendix C. These profiles include maintenance activities summary reports (known as five part reporting) in addition to other program results like inspection/erosion etc. DWR will use this information to develop critical data to evaluate levees, monitor levee conditions throughout the system, and provide threat assessments (if applicable) to individual LMAs. The information will also be used as an input to its comprehensive FloodSAFE California initiative to improve public safety and manage residual flood risk. The highlights of LMA Reporting Program for 2012 are:

- In this fifth year of required reporting, 91 percent of LMAs representing 93 percent area complied with the reporting requirement. This represents a slight increase of one percent over last year of reporting. LMAs with at least a partial response were considered to have provided reports.

- Only one out of 26 (3.8 percent) areas from San Joaquin System and seven out of 81 (8.6 percent) areas from Sacramento System did not report this year. Further detail on reporting statistics is given in Figure 6-2.
- Since 2008, DWR has been facilitating electronic submission and strongly encouraging LMAs to use LMA Reporting Website. In 2012 about 68 percent of reporting LMAs reported electronically, which is a 16 percent increase over that in 2011. Details of DWR outreach activities for electronic submission and others are provided Figure 6-6.
- Ninety Areas from 78 LMAs reported their maintenance activities for the previous fiscal year, 2011-12. Key reported maintenance activities are vegetation control, rodent/animal control, levee crown grading/access road maintenance, encroachment control, gate or signage maintenance, and seepage control.
- Eighty eight Areas from 78 LMAs reported a summary of their maintenance activities for the current fiscal year, 2012-13. Key reported maintenance activities are vegetation control, Rodent/animal control, levee crown grading/access road maintenance, encroachment control, gate or signage maintenance, and seepage control.
- A number of LMAs provided information on the levee conditions. Key reported issues in terms of total number of reporting Areas who reported the activities are encroachment, erosion/ channel migration/ revetment, in-channel/other vegetation issues, seepage/ sand boil, levee compaction/ settlement/ freeboard; and sedimentation.
- To minimize LMAs burden on reporting, DWR is continuously enhancing and updating the web application. The two programs, inspection and LMA reporting have been integrated for online users. Part 3 of LMA reporting not only allows LMAs to report on this part but also to report on inspection issues that need corrective actions. This enhanced feature is an improvement aimed to reduce LMAs burden on reporting. DWR inspectors see this feedback on the next inspection cycle. Part 3 of individual summary profiles of Appendix A, B, and C highlights LMA's corrected and ongoing corrective actions (wherever available).
- The level of compliance by the LMAs with information submission for this report is less than 100 percent. The quality of reporting for some LMAs are also unsatisfactory. DWR is looking at different measures on how to improve the compliance and the quality of reporting. The LMA Reporting Program is being integrated with other programs in particular the grant programs administered by DWR to improve compliance with the reporting requirement. The grant programs may bring in cost share eligibility criteria that will depend on the performance of the LMAs with the quality of this report submission.
- RD2074 (Sargent-Barnhart Tract) continued to report on their Non-Project Levee in San Joaquin County. The summary of information reported in 2012 is provided in Appendix C.
- Honcut Creek Eastern Area: Due to the absence of a responsible agency, the maintenance of 1.5 miles of Project Levee is not currently assigned to any LMA pending a decision by the CVFPB.

Table 1-1: Summary of Information Reported by LMAs

Table 1-1 provides a summary of the information received by DWR:

Reporting Categories	Reporting Measurement Type	Number of Occurrences
Reporting	LMA's subject to reporting requirements	89
	LMA's submitted reports	78
	Geographical areas subject to reporting requirements	110
	Reports received on geographical areas	102
	Areas reporting information relevant to condition or performance	87
	Areas reporting conditions that might compromise level of flood protection	73
	Areas reporting summary of activities during the previous fiscal year	92
	Areas reporting summary of activities for the current fiscal year	89
	Areas reporting estimate for the current fiscal year	85
	Areas reporting any other readily available information	71
	Maintenance Reported	Areas reporting routine annual vegetation maintenance activities
Areas reporting rodent/animal control activities		62
Areas reporting seepage control activities		4
Areas reporting gate and/or signage maintenance		25
Areas reporting levee crown grading/access road maintenance		51
Areas reporting encroachment control activities		46
Repairs Performed	Areas reporting levee repairs (hole grouting/erosion repair/revetment/rip-rap/slope repair)	24
	Areas reporting minor structure repairs/replacement	24
Levee Conditions Reported	Areas reporting encroachment issues	27
	Areas reporting levee compaction, settlement, or freeboard issues	10
	Areas reporting seepage and sand boil issues	11
	Areas reporting erosion, channel migration, or revetment issues	19
	Areas reporting sedimentation issues	5
	Areas reporting in-channel and other vegetation issues	17

Table 1-2: Non-reporting Local Maintaining Agencies

Although submission of annual reporting to DWR is required by law, several LMAs have not responded to this requirement. Below is a list of non-reporting LMAs in 2012:

Levee District No. 3	Reclamation District No. 556 (Upper Andrus)
Honcut Creek Eastern Area	Reclamation District No. 765 (Glide)
Yolo County Public Works	Reclamation District No. 2031 (Elliot)
Reclamation District No. 369 (Libby McNeil)	Reclamation District No. 2035 (Conaway)

2 2012 LEVEE MAINTENANCE INSPECTION RESULTS

The results of the 2012 levee maintenance inspections show that number of Areas whose ratings changed was small overall, but more LMAs received worse ratings in 2012 than in 2011 than received better ratings. The length of deficiencies noted increased significantly compared to 2011 and 2010. This change may be attributable to the extended rainy season and financial challenges. FPIIB continues to improve the accuracy and usability of its tools and data to inspect and rate Areas. Each Area received one of three possible ratings based on the state of its levees:

- **Acceptable (A)** – No immediate work required, other than routine maintenance. The flood protection project will function as designed and intended with a high degree of reliability, and necessary cyclic maintenance is being performed adequately.
- **Minimally Acceptable (M)** – One or more deficient conditions exist in the flood protection project that needs to be improved or corrected. However, the project will essentially function as designed with a lesser degree of reliability than what the project could provide.
- **Unacceptable (U)** – One or more deficient conditions exist that may prevent the project from functioning as designed, intended, or required.

In 2010 FPIIB introduced an additional rating used to identify individual issues noted during inspections, Acceptable but Monitor and Maintain (A/W). This rating is used to identify issues that are not yet severe enough to be rated as M or U but that should be monitored and maintained to prevent a future deficiency. Issues rated A/W do not impact overall ratings for Areas. The use of this rating is an example of FPIIB's efforts to work with the LMAs to improve the overall maintenance of the system. Appendix F further describes the rating criteria and methodology used for levees.

Table 2-1 and Figure 2-1 show the numbers of Areas receiving each rating for 2007 through 2012. The length of vegetation deficiencies increased significantly compared to 2011, most notably in the San Joaquin River system. There was a significant increase in crown surface issues and a moderate increase in animal control issues. Other categories did not change significantly. Many of the LMAs have expressed limitations due to financial and environmental issues. Some LMAs are severely limited in what money they have been able to collect from residents to perform maintenance. Weather patterns that are different than prior years may also play a factor in the increase in deficiencies.

Table 2-1: Summary of Levee Maintenance Ratings for 2007 through 2012

	2007	2008	2009	2010	2011	2012
A=Acceptable	24	42	51	49	45	47
M=Minimally Acceptable	18	25	25	19	24	18
U=Unacceptable	64	39	30	38	37	41

Ratings for each Area are included in Table 2-2. The number of Areas receiving Unacceptable ratings increased by four, the number of Areas receiving Acceptable ratings increased by two, and the number of Areas receiving Minimally Acceptable

ratings decreased by five.

Despite higher than normal water in some areas during the winter of 2011/2012, the amount of erosion found throughout the system was similar to prior years. DWR is working to implement programs to help allow for and facilitate the repair of these types of issues. DWR also continues to develop and distribute information on how the Sutter and Sacramento Yards are addressing rodent control. DWR and other agencies continue to conduct research into both the potential harm and usefulness of woody vegetation on the levees but are also conducting research into various issues related to rodents in and near levees.

Figure 2-2 shows the number of agencies that received better, unchanged, or worse ratings in 2012 compared with 2011, 2010, 2009, 2008, and 2007. The number of Areas receiving Acceptable ratings increased by two. However the number of Areas rated as Unacceptable increased by 4. The number of Areas rated as Minimally acceptable decreased by six. This is likely due to fluctuations in maintenance and funding as well as the way DWR determines overall ratings. More information can be found in the detailed Levee Mile Reports (LMR) and an explanation of threshold percentages and the determination of overall ratings is located in Appendix F. Despite these changes, Areas continue to generally receive better ratings than in 2007 and 2008.

Vegetation deficiencies make up the majority of deficient levee miles for 2012, followed by a significant amount of crown surface issues. The remainder of deficient miles comes from animal control and other items. Appendix E provides supplemental figures showing further analysis for the two basins and types of deficiencies, including comparisons of the lengths of levee with deficiencies of each category compared each year since 2007.

LMAs may not be able to address some encroachments due to limitations in resources and relationships with the landowners. Inspectors document some of these encroachments and assign an Issue Type of Enforcement to them. This has replaced the method of rating them as PO or CO used in the past. In 2012, 21.62 miles of Unacceptable and 135.27 miles of Minimally Acceptable issues typed as Enforcement were identified. The vast majority of these issues are encroachments with some vegetation. If an issue is the result of how the structure was originally designed and constructed or for other reasons beyond maintenance responsibilities an Issue Type of Design/System Obsolescence may be assigned. In 2012, 0.01 miles of Unacceptable issues and 19.56 miles of Minimally Acceptable issues typed as Design/System Obsolescence were noted. The vast majority of these issues were erosion, mostly along one channel. Issue Types are explained further in Appendix F.

In 2012 DWR brought back several inspection criteria used in the past. These include O&M Manuals, Emergency Supplies and Equipment, and Flood Preparedness and Training. LMAs are required to maintain copies of applicable O&M manuals. DWR has made a collection of these manuals and other applicable documents available to stakeholders at http://cdec4gov.water.ca.gov/public_systems_docs.html. This site has limited access; to request access please contact webmaster@flood.water.ca.gov. LMAs are required to maintain a supply of materials to sustain the initial days of a flood fight. LMAs are encouraged to work with neighboring LMAs to maintain this supply in a central location that serves multiple LMAs. LMAs are also required to have a written, specific flood response plan and an understanding of how to respond during a flood. DWR is working on tools to assist LMAs in the creation of this plan. LMA staff and local residents should also be training in Flood Fight Methods. To schedule this training, please contact Rick Burnett with DWR at (916) 574-1203. More details on these criteria can be found in Appendix G.

A summary report showing the length of maintenance deficiencies noted in 2011 and 2012 for each Area can be found in Appendix H. This report also shows the change in threshold percentage for each of these maintenance deficiency categories. Detailed reports showing the inspections for each Area, including photos, can be found at <http://cdec.water.ca.gov/fsir.html>.

Appendices contain more detailed information on project background, inspection methodology, and inspection results.

Figure 2-1: Summary of Area Maintenance Ratings for 2007 through 2012

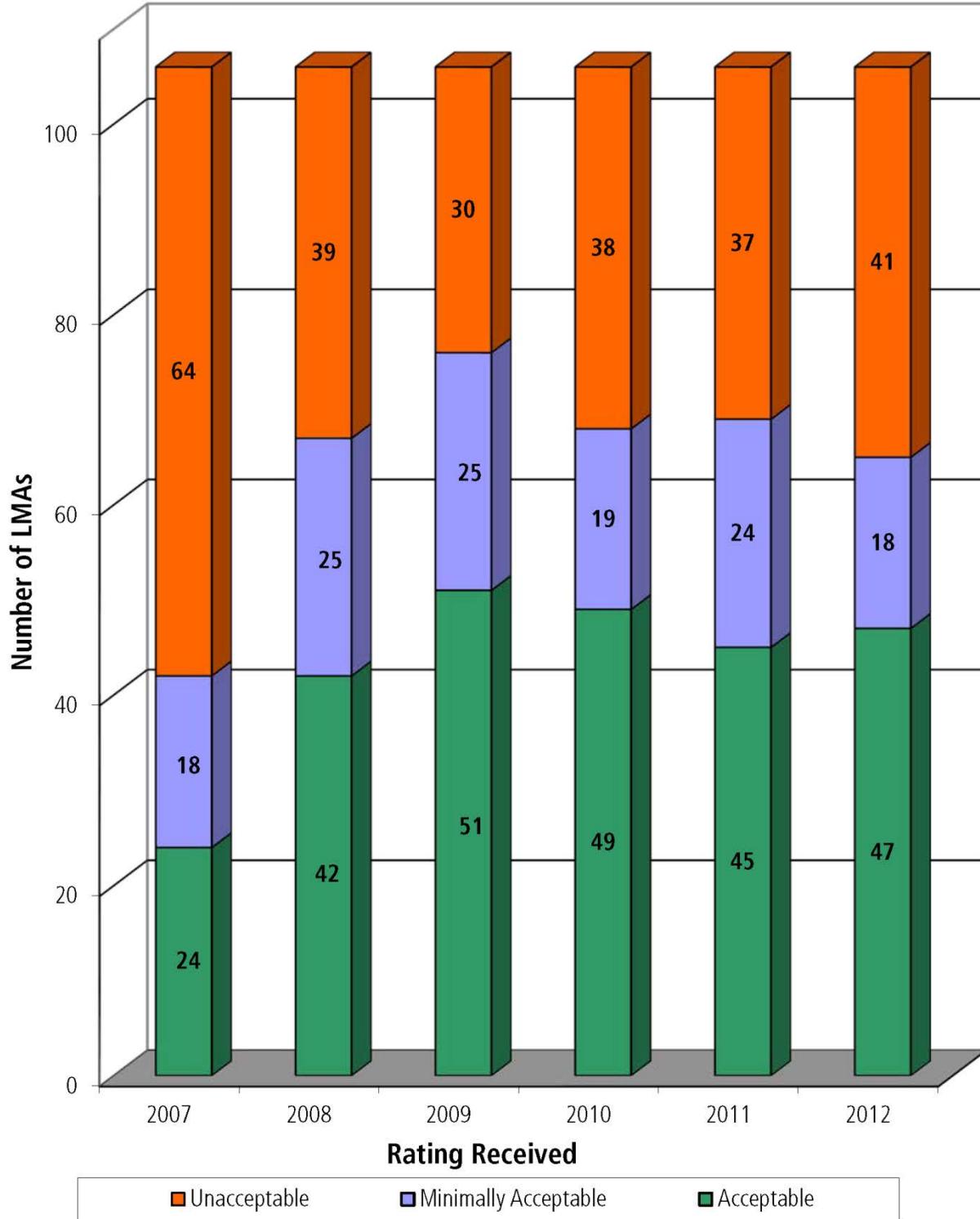


Figure 2-2: Area Maintenance Rating Changes from Fall 2007 to Fall 2012

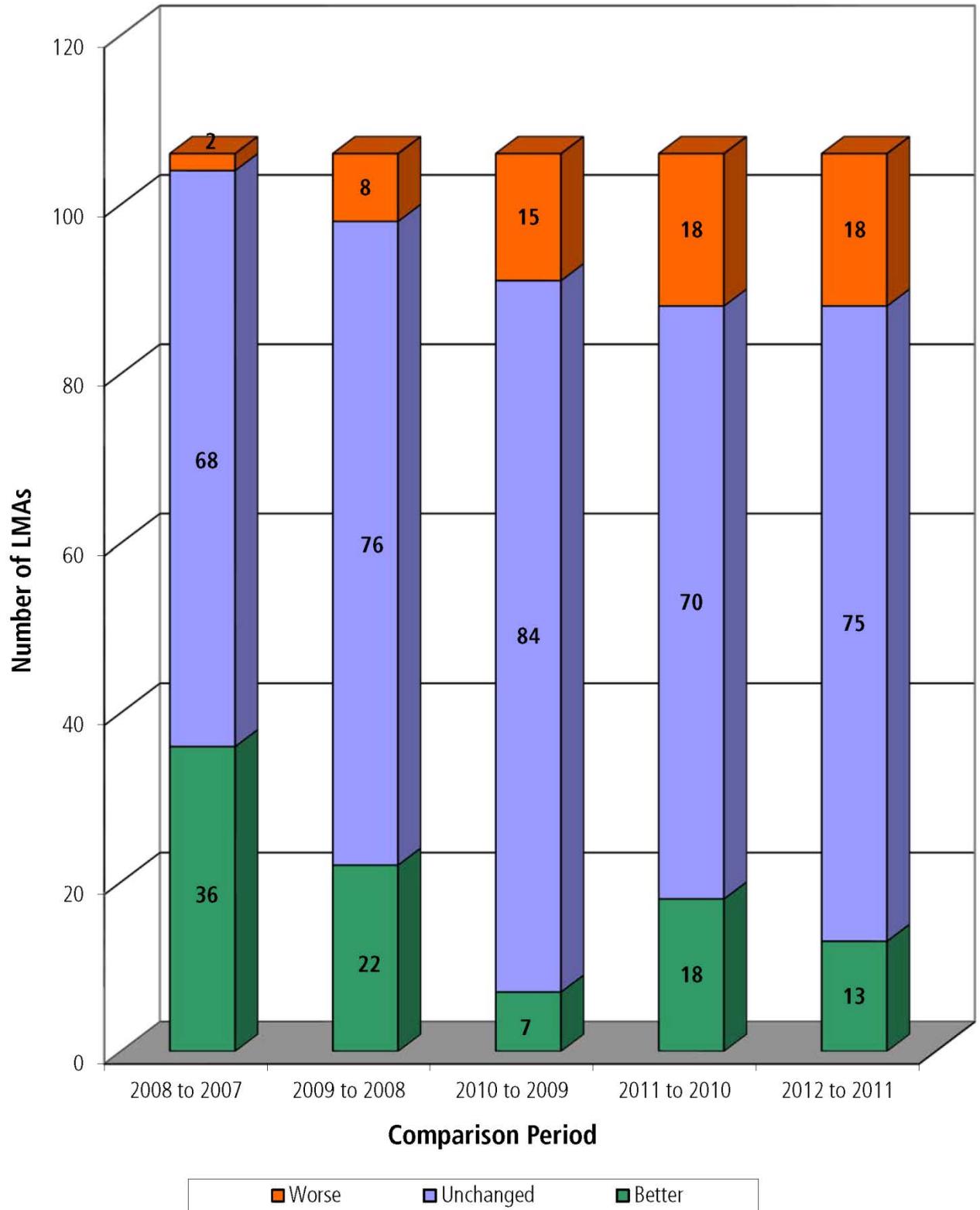


Table 2-2: Overall Maintenance Rating by Geographical Area for 2007 through 2012

Area Short Name	Area Name	2007 Overall Rating	2008 Overall Rating	2009 Overall Rating	2010 Overall Rating	2011 Overall Rating	2012 Overall Rating
LD0001G	Levee District No. 0001G (Glenn County)	U	M	M	U	M	A
LD0001S	Levee District No. 0001S (Sutter County)	M	A	A	M*	A	A
LD0002	Levee District No. 0002	A	A	A	A	A	A
LD0003	Levee District No. 0003	A	A	A	U	U	M
LD0009	Levee District No. 0009	A	A	U	A	A	A
MA0001	Maintenance Area 0001	M	M	A	A†	A	A
MA0003	Maintenance Area 0003	A	A	A	A	A	A
MA0004	Maintenance Area 0004	A	A	A	A	A	A
MA0005	Maintenance Area 0005	M	M*	M*	M*	A	A
MA0007	Maintenance Area 0007	U	A	A	A	A	A
MA0009	Maintenance Area 0009	M	M*	M	M	M	A
MA0012	Maintenance Area 0012	A	A	A	A†	A	A
MA0013	Maintenance Area 0013	A	M*	M*	M*	A	A
MA0016	Maintenance Area 0016	M	M	A	M	M*	A
MA0017	Maintenance Area 0017	U	U	U	U	U	U
NA0001	American River Flood Control District	M	A	A	A	A	A
NA0002	Brannan Andrus Levee Maintenance District	U	U	A	A†	M	M
NA0003	Butte County Public Works	A	A	A	A†	A	A
NA0004	Marysville Levee Commission	M	A	A	A	A	M
NA0005	City of Sacramento	U	A	A	A	A	A
NA0006	Eastern Honcut Creek	U	U	U	U	U	U
NA0008	Knights Landing Ridge Drainage District	U	M	U	A	A	A
NA0009	Lake County Watershed Protection District	M	A	A	A†	A	A
NA0010	Lower San Joaquin Levee District	M	M*	M*	M*	M	U
NA0011	Madera County FCWCA	U	U	U	U	U	U
NA0012	Solano County Public Works (Mellin Levee)	U	U	M	U	A	A
NA0013	Merced Streams Group	U	U	U	U	U	U
NA0014	Murphy Slough at M&T Ranch	U	U	U	U	U	U

Area Short Name	Area Name	2007 Overall Rating	2008 Overall Rating	2009 Overall Rating	2010 Overall Rating	2011 Overall Rating	2012 Overall Rating
NA0015	Plumas County	U	A	A	A†	U	U
NA0016	Sacramento River West Side Levee District	U	M*	M*	M*	A	A
NA0017	San Joaquin County Flood Control and Water Conservation District	U	M*	M	U	M	M
NA0018	California Department of Fish and Game	A	A	A	A†	U	U
NA0019	Tehama County Flood Control and Water Conservation District	U	M	M	A	M	M
NA0020	East-West Interceptor Canal	U	U	U	U	U	U
NA0021	Yolo County Public Works	U	M	U	U	U	U
NA0022	Yolo County Service Area 6	U	M	A	A†	U	U
RD0001	Reclamation District No. 0001	M	A	M	U	A	M*
RD0003	Reclamation District No. 0003	U	U	M*	M*	M*	M*
RD0010	Reclamation District No. 0010	U	U	A	A†	U	M
RD0017	Reclamation District No. 0017	U	U	M*	A	A	M*
RD0070	Reclamation District No. 0070	M	A	A	A†	A	A
RD0108	Reclamation District No. 0108	A	A	A	A†	A	A
RD0150	Reclamation District No. 0150	U	M*	M	M*	A	A
RD0307	Reclamation District No. 0307	U	U	U	U	M	U
RD0341	Reclamation District No. 0341	U	U	A	A†	M*	U
RD0349	Reclamation District No. 0349	U	U	U	U	U	U
RD0369	Reclamation District No. 0369	U	U	A	A	M	U
RD0404	Reclamation District No. 0404	U	U	U	U	M	U
RD0501	Reclamation District No. 0501	U	U	U	U	U	U
RD0524	Reclamation District No. 0524	U	U	U	U	U	U
RD0536	Reclamation District No. 0536	U	U	U	U	U	U
RD0537	Reclamation District No. 0537	U	A	M	U	A	M*
RD0544	Reclamation District No. 0544	U	U	M	U	U	U
RD0551	Reclamation District No. 0551	U	U	A	A†	A	M*
RD0554	Reclamation District No. 0554	U	U	U	U	M	M
RD0556	Reclamation District No. 0556	U	U	U	U	U	U
RD0563	Reclamation District No. 0563	U	U	U	U	U	U
RD0755	Reclamation District No. 0755	U	U	A	U	U	U
RD0765	Reclamation District No. 0765	U	U	U	U	U	U
RD0784	Reclamation District No. 0784	M	A	A	A†	A	M

Area Short Name	Area Name	2007 Overall Rating	2008 Overall Rating	2009 Overall Rating	2010 Overall Rating	2011 Overall Rating	2012 Overall Rating
RD0785	Reclamation District No. 0785	U	A	M	U	U	U
RD0787	Reclamation District No. 0787	A	A	A	A†	A	A
RD0817	Reclamation District No. 0817	U	A	A	A†	M	U
RD0827	Reclamation District No. 0827	U	M	A	U	U	A
RD0900	Reclamation District No. 0900	U	U	M	M	M	U
RD0999	Reclamation District No. 0999	U	U	U	U	U	U
RD1000	Reclamation District No. 1000	A	A	A	A	A	A
RD1001	Reclamation District No. 1001	U	M	M*	M*	M	U
RD1500	Reclamation District No. 1500	M	M*	M*	M*	A	M
RD1600	Reclamation District No. 1600	U	M	A	U	U	U
RD1601	Reclamation District No. 1601	A	A	A	A†	A	A
RD1602	Reclamation District No. 1602	U	U	U	M	U	U
RD1660	Reclamation District No. 1660	A	A	A	A†	A	A
RD2031	Reclamation District No. 2031	U	M*	M*	A	M*	M
RD2035	Reclamation District No. 2035	U	A	A	A†	U	M
RD2058	Reclamation District No. 2058	U	U	U	U	U	A
RD2060	Reclamation District No. 2060	U	M	A	A†	A	A
RD2062	Reclamation District No. 2062	U	M*	U	U	U	U
RD2063	Reclamation District No. 2063	U	U	U	U	U	U
RD2064	Reclamation District No. 2064	U	M	A	A	U	A
RD2068	Reclamation District No. 2068	A	A	A	A†	M	A
RD2075	Reclamation District No. 2075	U	U	M*	M*	M	U
RD2085	Reclamation District No. 2085	U	U	M	U	U	U
RD2089	Reclamation District No. 2089	U	U	U	U	U	U
RD2091	Reclamation District No. 2091	A	A	A	A†	M*	A
RD2092	Reclamation District No. 2092	A	A	A	A†	M*	A
RD2094	Reclamation District No. 2094	U	A	A	A	A	A
RD2095	Reclamation District No. 2095	U	U	M	M*	M*	M
RD2096	Reclamation District No. 2096	A	A	U	M	A	U
RD2098	Reclamation District No. 2098	M	A	A	A†	U	A
RD2101	Reclamation District No. 2101	U	U	U	U	U	U
RD2103	Reclamation District No. 2103	A	M*	A	A†	A	A
RD2104	Reclamation District No. 2104	U	U	U	U	U	U
RD2107	Reclamation District No. 2107	M	A	A	A	A	A

Area Short Name	Area Name	2007 Overall Rating	2008 Overall Rating	2009 Overall Rating	2010 Overall Rating	2011 Overall Rating	2012 Overall Rating
ST0001	Cache Creek	M	M*	M*	M*	M*	M*
ST0002	East Levee Sutter Bypass	M	A	A	A	A	A
ST0003	East Levee Sacramento River	A	A	A	A†	A	A
ST0004	East Levee Yolo Bypass	U	A	A	A†	A	A
ST0005	Hamilton Bend	U	U	U	A	A	A
ST0006	Nelson Bend	U	U	U	U	U	U
ST0007	Putah Creek	M	A	A	A†	M	U
ST0008	Sacramento Bypass	A	A	A	A	A	A
ST0009	Tisdale Bypass	A	A	A	A†	A	A
ST0010	Wadsworth Canal	A	A	A	A	A	A
ST0011	West Levee Yolo Bypass	U	M*	M*	M*	A	A
ST0012	Willow Slough Bypass	A	A	A	A†	A	A

* Overall unit threshold percentage is less than 10.00%; however, U rated miles are present, so the overall unit rating is M instead of A.

† Due to resourcing challenges, this Area did not have inspections completed this year. The rating was assumed to be Acceptable based on the fall 2009 Inspection for the purposes of this report and comparisons to previous years.

3 2012 CHANNEL MAINTENANCE INSPECTION RESULTS

The annual channel maintenance inspections rely upon a qualitative rating system based on the USACE O&M manuals. Existing channel capacities are not evaluated in this report. A single overall rating is assigned to each channel by DWR. The rating designations (A, M, and U) described in Section 2 are also used for channel ratings.

The method for determining overall ratings is described in Appendix B. Table 3-1 and Figure 3-1 show the numbers of each rating for the years 2007 through 2012.

Table 3-1: Summary of Channel Maintenance Ratings for 2007 through 2012

	2007	2008	2009	2010	2011	2012
A=Acceptable	10	24	19	16	16	17
M=Minimally Acceptable	14	1	7	3	9	8
U=Unacceptable	1	0	0	1	1	1
Not Inspected	0	0	0	6	0	0

The number of channels rated as Unacceptable remained at one in 2012 and the number of Minimally Acceptable channels was similar to 2011 at eight. This shows the similarity of maintenance found during inspection in 2012 as prior years. Figure 3-1 shows the progression of maintenance ratings from 2007 through 2012.

Table 3-2 shows individual channel ratings for each LMA.

To see locations of the channels inspected, see Figure 7-1.

A summary of the ratings for each channel, grouped by LMA and including the rated categories for each, can be found in Appendix I. More detailed reports including photos for each channel can be found at <http://cdec.water.ca.gov/fsir.html>.

Figure 3-1: Channel Overall Ratings Comparison 2007 through 2012

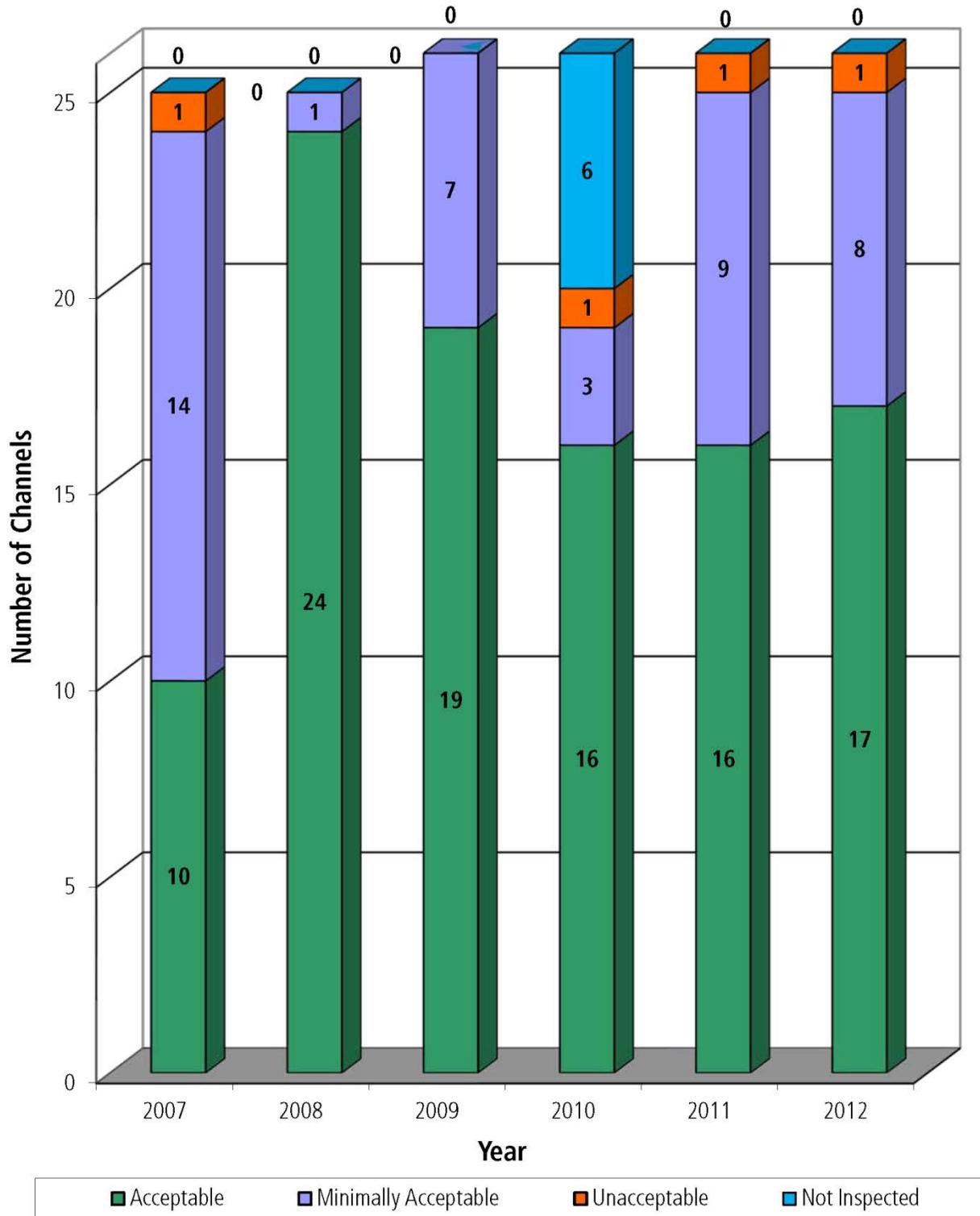


Table 3-2: Overall Channel Maintenance Ratings for 2007 through 2012

Channel	LMA Name	2007 Overall Rating	2008 Overall Rating	2009 Overall Rating	2010 Overall Rating	2011 Overall Rating	2012 Overall Rating
Sacramento River Basin							
Ash Creek	Adin Community Services District	A	A	A	A	A	A
Dry Creek	Adin Community Services District	A	A	A	A	A	A
McClure Creek	Tehama County	M	A	A	A	A	A
Salt Creek	Tehama County	U	A	M	A	A	A
Big Chico Creek	Sutter Maintenance Yard	M	A	M	M	M*	A
Lindo Channel and Sandy Gulch	Sutter Maintenance Yard	M	A	A	A	A	A
Little Chico Creek	Sutter Maintenance Yard	M	A	A	A	M*	A
San Joaquin River Basin							
Bear Creek	Merced Streams Group	M	M	M*	M*	M	M
Black Rascal Creek	Merced Streams Group	M	A	M*	M*	M	M
Burns Creek	Merced Streams Group	A	A	A	U	A	A
Mariposa Creek	Merced Streams Group	M	A	A	A	M	M
Miles Creek	Merced Streams Group	M	A	A	N†	A	A
Owens Creek	Merced Streams Group	M	A	A	N†	A	M
Ash Slough	Madera County FCWCA	M	A	M	N†	A	A
Berenda Slough	Madera County FCWCA	M	A	M	N†	U	U
Chowchilla River	Madera County FCWCA	M	A	M	N†	A	A
Fresno River	Madera County FCWCA	M	A	A	N†	M	M
North Littlejohn Creek	San Joaquin County Flood Control and Water Conservation District	M	A	A	A	A	M
Duck Creek Diversion	San Joaquin County Flood Control and Water Conservation District	A	A	A	A	A	A

Channel	LMA Name	2007 Overall Rating	2008 Overall Rating	2009 Overall Rating	2010 Overall Rating	2011 Overall Rating	2012 Overall Rating
South Littlejohn Creek	San Joaquin County Flood Control and Water Conservation District	A	A	A	A	A	A
South Littlejohn Creek, North Branch	San Joaquin County Flood Control and Water Conservation District	A	A	A	A	A	A
Miscellaneous Basins							
Truckee River	Placer County	A	A	A	A	A	A
Ledgewood Creek	Fairfield-Suisun Sewer District	N/A	N/A	A	A	M*	M
McCoy Creek	Fairfield-Suisun Sewer District	A	A	A	A	M	M*
Laurel Creek	Fairfield-Suisun Sewer District	A	A	A	A	M	A
Union Avenue Diversion	Fairfield-Suisun Sewer District	A	A	A	A	A	A

* Overall channel rating average is less than 0.2; however, U rated issues are present, so the overall rating is M instead of A.

† Due to resourcing challenges, this channel did not have inspections completed in 2010.

4 2012 STRUCTURE MAINTENANCE INSPECTION RESULTS

The types of project structures included in the inspections include fixed crest diversion weirs, controllable diversion structures, outfall structures, drop structures, and interior drainage pumping plants. The rating designations (A, M, and U) described in Section 2 are also used for structure ratings.

Similar to the channel inspections, the method for determining overall ratings is described in Appendix F. Table 4-1 show the numbers of each rating for the years 2007-2012 for all structures. Figure 4-1 and Table 4-2 show ratings for each structure. Figure 4-2 and Table 4-3 show ratings for each pumping plants. The LMAs have generally improved structure maintenance since 2007.

Table 4-1: Overall Structure Maintenance Ratings for 2007 through 2012

	2007	2008	2009	2010	2011	2012
Structures Ratings						
A=Acceptable	32	37	36	36	41	40
M=Minimally Acceptable	9	5	7	7	2	3
U=Unacceptable	1	0	0	0	0	0
Not Inspected	0	0	0	0	0	0
Pumping Plant Ratings						
A=Acceptable	12	12	7	8	12	11
M=Minimally Acceptable	1	1	6	4	0	1
U=Unacceptable	0	0	0	0	1	1
Not Inspected	0	0	0	1	0	0

Most of the structures were found to be in a similar state of maintenance as in 2011 with minor changes observed compared to last year. One of the pumping plants received an Unacceptable rating largely because the pumping plant was not fully accessible for inspection again. The Sutter Bypass Pumping Plants are currently undergoing major improvements. The Knights Landing Outfall is also undergoing major repairs while Sutter Bypass (East Borrow Pit) Weir #2 is being replaced with a new structure.

Tables 4-2 and 4-3 show individual structure ratings for each LMA.

Locations of the structures inspected can be found on Figure 7-1.

A summary of the ratings for each structure, grouped by LMA and including the rated categories for each, can be found in Appendix J. A similar report for pumping plants can be found in Appendix K. More detailed reports, including photos for each structure, can be found at <http://cdec.water.ca.gov/fsir.html>.

Figure 4-1: Comparison of Overall Structure Ratings from 2007 through 2012

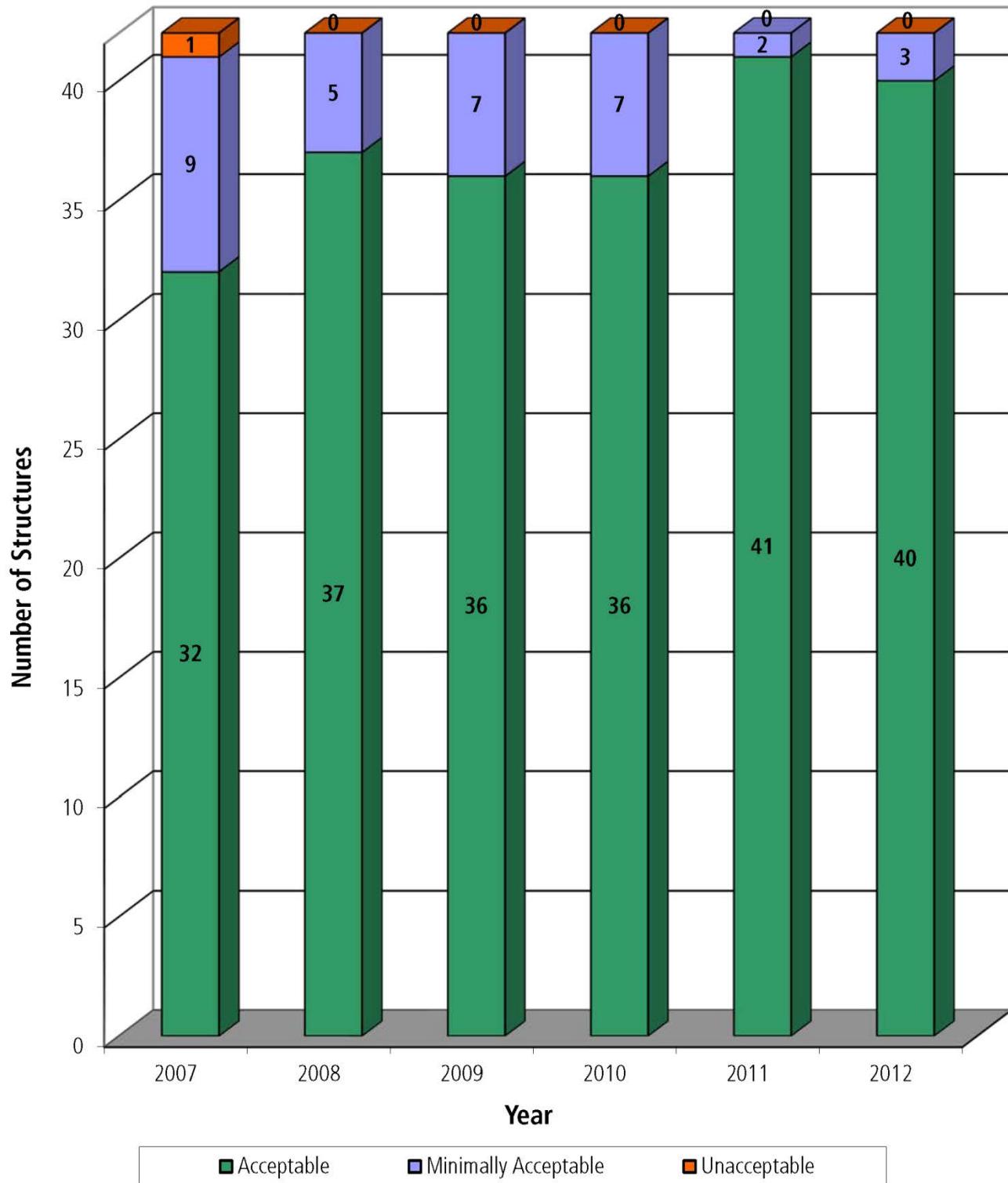


Figure 4-2: Comparison of Overall Pump Plant Ratings from 2007 through 2012

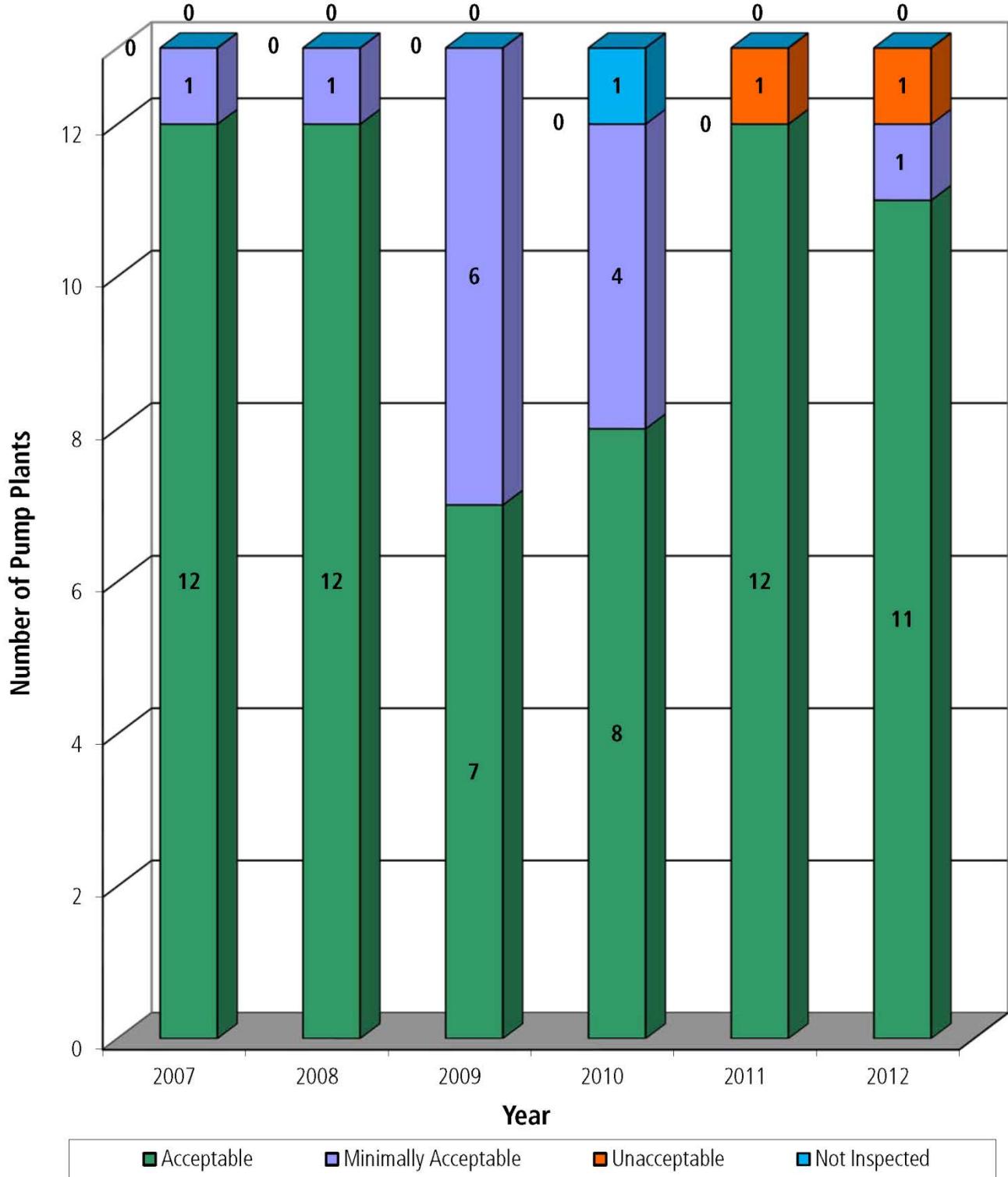


Table 4-2: Overall Structure Ratings for 2007 through 2012

Structure	LMA Name	2007 Overall Rating	2008 Overall Rating	2009 Overall Rating	2010 Overall Rating	2011 Overall Rating	2012 Overall Rating
Sacramento River Basin							
Big Chico Creek Control Structure	Butte County Public Works	A	A	A	A	A	A
Lindo Channel Control Structure	Sutter Maintenance Yard	M	A	A	A	A	A
Lindo Channel Diversion Weir	Sutter Maintenance Yard	M	A	A	A	A	A
El Camino Bridge	City of Sacramento	N/A	N/A	A	A	A	A
North Fork Feather River Diversion Channel Drop Structures (1 thru 7)	Plumas County	A	A	A	A	A	M
North Fork Feather River Diversion Structure	Plumas County	A	A	A	A	A	A
Elk Slough Inlet Structure	Reclamation District 999	A	A	A	A	A	A
Cache Creek Settling Basin Weir & Drainage Structure	Sacramento Maintenance Yard	A	A	A	A	A	A
Fremont Weir	Sacramento Maintenance Yard	A	A	A	A	A	A
Knights Landing Outfall Structure	Sacramento Maintenance Yard	A	A	A	A	A	A
Sacramento Weir	Sacramento Maintenance Yard	A	A	A	A	A	A
Butte Slough Drainage Structure	Sutter Maintenance Yard	M	M	A	A	A	A
Butte Slough Outfall Structure	Sutter Maintenance Yard	A	A	A	A	A	A
Colusa Weir	Sutter Maintenance Yard	A	A	A	A	A	A
Little Chico Creek Control & Weir Structure	Sutter Maintenance Yard	A	A	A	A	A	A
Moulton Weir	Sutter Maintenance Yard	A	A	A	A	A	A
Nelson Bend (Rock Quarry Weir)	Sutter Maintenance Yard	A	A	A	A	A	A
Sutter Bypass (East Borrow Pit) Weir #2	Sutter Maintenance Yard	A	A	A	A	A	A

Structure	LMA Name	2007 Overall Rating	2008 Overall Rating	2009 Overall Rating	2010 Overall Rating	2011 Overall Rating	2012 Overall Rating
Tisdale Weir	Sutter Maintenance Yard	A	A	A	A	A	A
Wadsworth Canal Weir # 4	Sutter Maintenance Yard	A	A	A	A	A	A
Clover Creek Diversion Structure	Lake County Watershed Protection District	U	M	M	M	M	A
Highland Canal Diversion Weir & Drainage Structure	Lake County Watershed Protection District	M	A	A	A	A	A
San Joaquin River Basin							
Ash Slough Drop Structure #1	Lower San Joaquin Levee District	A	A	A	A	A	A
Ash Slough Drop Structure #2	Lower San Joaquin Levee District	A	A	A	A	A	A
Ash Slough Drop Structure #3	Lower San Joaquin Levee District	M	A	A	A	A	A
Ash Slough Drop Structure #4	Lower San Joaquin Levee District	A	A	M	M	A	A
Bear Creek Diversion Structure	Lower San Joaquin Levee District	A	A	A	A	A	A
Eastside Bypass Control Structure	Lower San Joaquin Levee District	A	A	A	A	A	A
Eastside Bypass Drop Structure #1	Lower San Joaquin Levee District	A	A	A	A	A	A
Eastside Bypass Drop Structure #2	Lower San Joaquin Levee District	A	A	A	A	A	A
Fresno River Drainage Structure	Lower San Joaquin Levee District	M	A	A	A	A	A
Mariposa Bypass Control Structure	Lower San Joaquin Levee District	A	A	A	A	A	A
Mariposa Bypass Drop Structure	Lower San Joaquin Levee District	A	A	A	A	A	A
Owens Creek Control Structure	Lower San Joaquin Levee District	M	A	M	M	M	A
Owens Creek Overflow Structure	Lower San Joaquin Levee District	A	A	A	A	A	A
San Joaquin River & Chowchilla Canal Bypass Control Structure	Lower San Joaquin Levee District	A	A	A	A	A	A

Structure	LMA Name	2007 Overall Rating	2008 Overall Rating	2009 Overall Rating	2010 Overall Rating	2011 Overall Rating	2012 Overall Rating
San Joaquin River Structure & Sand Slough Structure	Lower San Joaquin Levee District	A	A	M	M	A	A
Ash & Berenda Slough Control Structure	Madera County FCWCA	A	A	A	A	A	A
Fresno River Diversion Weir	Madera County FCWCA	A	M	A	A	A	A
Black Rascal Creek Drop Structure	Merced Streams Group	A	A	M	M	A	A
Owens Creek Siphon Structure	Merced Streams Group	M	M	M	M	M*	M
Paradise Dam	Sacramento Maintenance Yard	M	M	M	M	M	M
Duck Creek Diversion Weir & Control Structure	San Joaquin County Flood Control and Water Conservation District	A	A	A	A	A	A

* Overall structure rating average is less than 0.2; however, U rated issues are present, so the overall rating is M instead of A.

Table 4-3: Overall Pumping Plants Ratings for 2007 through 2012

Pumping Plant	LMA Name	2007 Overall Rating	2008 Overall Rating	2009 Overall Rating	2010 Overall Rating	2011 Overall Rating	2012 Overall Rating
Magpie Creek	City of Sacramento	A	A	A	N†	A	A
Reclamation District 2063 Pumping Plant (Nelson Drain)	Reclamation District 2063	M	A	M	M	U	U
Wetherbee Lake Pumping Plant & Navigation Gate	Reclamation District 2096	A	A	M	A	A	M
American River Pumping Plant #1	Sacramento County	A	A	A	A	A	A
American River Pumping Plant #2	Sacramento County	A	A	A	A	A	A
Mormon Slough #1	San Joaquin County Flood Control and Water Conservation District	A	A	A	A	A	A
Mormon Slough #2	San Joaquin County Flood Control and Water Conservation District	A	A	A	A	A	A
Mormon Slough #3	San Joaquin County Flood Control and Water Conservation District	A	A	A	A	A	A
Middle Creek	Sutter Maintenance Yard	A	M	M	A	A	A
Sutter Bypass #1	Sutter Maintenance Yard	A	A	M	M	A	A
Sutter Bypass #2	Sutter Maintenance Yard	A	A	M	M	A	A
Sutter Bypass #3	Sutter Maintenance Yard	A	A	M	M	A	A
Gomes Lake	Turlock Irrigation District	A	A	A	A	A	A

* Overall structure rating average is less than 0.2; however, U rated issues are present, so the overall rating is M instead of A.

† Due to resourcing challenges, this structure did not have an inspection completed in 2010.

5 SUPPLEMENTAL EROSION SURVEY OF THE SAN JOAQUIN RIVER SYSTEM

5.1 Purpose

Since 2006, the Department of Water Resources' Flood Project Integrity and Inspection Branch has conducted the supplemental erosion survey of the San Joaquin River Flood Control System (SJRFCS) to assist in the documentation and monitoring of erosion sites. The specific purpose of the Supplemental Erosion Surveys of the SJRFCS is to: a) inspect the waterside levee for erosion activity, b) document and report new erosion sites, c) document and report current condition of previously identified erosion sites, and d) rank the severity of erosion sites based upon the findings from the field survey. For the purposes of this report an erosion site is defined as a site where substantial ground loss associated with erosion has been observed and documented and where the integrity of the levee may be at risk of an erosion failure during floods or normal flow conditions.

5.2 Highlights

- In 2012, supplemental erosion surveys show that 37 of the 52 previously identified erosion sites remain unchanged. Three of the existing sites, in RD 2101 at river mile 73.92, RD2085 at river mile 66.50, and in RD404 at river mile 40.86, show significant development in erosion condition. Of the three, erosion site in RD 2101 at river mile 73.92 is in critical condition.
- Among the 52 surveyed existing erosion sites, six sites were repaired prior to the last survey and their performance were evaluated. Seven sites were found to be repaired and are being monitored.
- Forty-five new erosion sites were documented this year, 19 on San Joaquin River, 23 on Mormon Slough, and 3 on Old River. None of these new sites appear to be in a critical condition. All the newly documented sites on Mormon Slough are on the left bank where only high ground exists. These erosions appear to be old sites and are documented this year just for monitoring the inspection accessibility. Most of new sites on San Joaquin River and Old River can be attributed to the weakened levee slope stability or irrigation leaks, instead of being caused by the high flows in the past flooding season.
- FPIIB updated the erosion inventory database by adding survey details.
- FPIIB improved erosion sites ranking criteria and methodology to make them more consistent and comparable. The new set of criteria and methodology is anticipated to be used in supplemental erosion report of 2013.

5.3 Results

The results of the 2012 supplemental erosion survey continue to show that many local agencies have made significant improvements since 2006. Twenty-seven previously identified erosion sites have been repaired and a few more are in the planning stages of repair. Erosion sites unchanged from the previous year or newly documented sites were given one of two possible ratings based on the condition of the site:

- **Minimally Acceptable (M)** – A site that requires annual assessment and monitoring, as it may become a serious levee deficiency in the near future.
- **Unacceptable (U)** – A site that may require immediate attention and corrective action, as it may be a serious levee deficiency that can fail during normal flow or in the next high water event.

Appendix F contains information on the inspection criteria and rating methodology. Table 5-1 shows the numbers of erosion sites receiving each rating in 2012. A summary of the status and ratings, including photos for each erosion site, can be found in Appendix L.

Table 5-1: Summary of Erosion Site Status and Rating for 2012

	Number of Erosion Sites
M=Minimally Acceptable	39
U=Unacceptable	44
Sites Repaired Since 2011	13
Sites Not Rated	2

Table 5-2 shows individual ratings for each erosion site. Most of the erosion sites were in a similar condition as in previous years. Some of these sites are in the process of being addressed within the following years. While the number of erosion sites rated as U remains high, many of the previously identified sites have since been repaired by local agencies and DWR.

Table 5-2: Erosion Site Ratings by LMA for 2012

LMA Short Name	LMA Name	Site ID	Normalized Score	Overall Rating
NA0011	Madera County FCWCA	NA0011U01RM2.57	55	M
NA0011	Madera County FCWCA	NA0011U01RM3.8	55	M
NA0013	Merced Streams Group	NA0013U03RM1	58	M
NA0013	Merced Streams Group	NA0013U03RM1.25	51	M
NA0013	Merced Streams Group	NA0013U04RM0.21	48	M
NA0013	Merced Streams Group	NA0013U04RM0.42	48	M
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U15RM0.86	65	U
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM11.81	62	U
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM12.95	62	U
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM13.53	58	M
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM13.72	62	U
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM13.86	62	U
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM14.48	46	M
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM16.27	70	U
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM17.99	58	M
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM18.69	66	U

LMA Short Name	LMA Name	Site ID	Normalized Score	Overall Rating
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM19.18	53	M
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM19.23	58	M
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM19.28	60	U
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM20	65	U
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM20.62	62	U
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM20.71	59	U
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM21.05	62	U
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM21.94	49	M
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM21.95	57	M
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM22.01	57	M
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM22.15	46	M
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM22.58	55	M
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM22.74	62	U
NA0017	San Joaquin County Flood Control and Water Conservation District	NA0017U16RM23.35	74	U
RD0001	Reclamation District No. 0001	RD0001U01RM31.4	67	U
RD0017	Reclamation District No. 0017	RD0017U02RM44.32	67	U
RD0017	Reclamation District No. 0017	RD0017U02RM45.97	53	M
RD0017	Reclamation District No. 0017	RD0017U02RM46.73	59	U
RD0404	Reclamation District No. 0404	RD0404U01RM40.86	59	U
RD0404	Reclamation District No. 0404	RD0404U01RM41.11	64	U
RD0404	Reclamation District No. 0404	RD0404U01RM41.22	66	U
RD0404	Reclamation District No. 0404	RD0404U01RM41.23	64	U
RD0524	Reclamation District No. 0524	RD0524U01RM40.99	60	U
RD0524	Reclamation District No. 0524	RD0524U01RM41.39	60	U

LMA Short Name	LMA Name	Site ID	Normalized Score	Overall Rating
RD0524	Reclamation District No. 0524	RD0524U01RM41.5	57	M
RD0524	Reclamation District No. 0524	RD0524U01RM41.58	64	U
RD0524	Reclamation District No. 0524	RD0524U01RM41.79	74	U
RD0524	Reclamation District No. 0524	RD0524U01RM41.92	69	U
RD0524	Reclamation District No. 0524	RD0524U01RM42.03	62	U
RD0524	Reclamation District No. 0524	RD0524U01RM42.2	66	U
RD0524	Reclamation District No. 0524	RD0524U01RM42.79	58	M
RD0524	Reclamation District No. 0524	RD0524U01RM42.93	77	U
RD0524	Reclamation District No. 0524	RD0524U01RM43.23	55	M
RD0524	Reclamation District No. 0524	RD0524U01RM43.52	57	M
RD0524	Reclamation District No. 0524	RD0524U01RM44.13	71	U
RD0524	Reclamation District No. 0524	RD0524U01RM45.07	68	U
RD0524	Reclamation District No. 0524	RD0524U01RM45.27	57	M
RD0524	Reclamation District No. 0524	RD0524U01RM46.12	51	M
RD0524	Reclamation District No. 0524	RD0524U01RM46.39	60	U
RD0544	Reclamation District No. 0544	RD0544U01RM48.81	59	U
RD0544	Reclamation District No. 0544	RD0544U01RM49.67	66	U
RD0544	Reclamation District No. 0544	RD0544U02RM32.91	62	U
RD0544	Reclamation District No. 0544	RD0544U02RM33.21	70	U
RD2031	Reclamation District No. 2031	RD2031U01RM0.48	47	M
RD2058	Reclamation District No. 2058	RD2058U01RM1.78	48	M
RD2058	Reclamation District No. 2058	RD2058U01RM3.97	48	M
RD2062	Reclamation District No. 2062	RD2062U01RM54.14	51	M
RD2062	Reclamation District No. 2062	RD2062U02RM1.94	51	M
RD2062	Reclamation District No. 2062	RD2062U02RM2.14	42	M
RD2062	Reclamation District No. 2062	RD2062U03RM29.93	66	U
RD2062	Reclamation District No. 2062	RD2062U03RM30.02	52	M
RD2062	Reclamation District No. 2062	RD2062U03RM30.1	57	M
RD2062	Reclamation District No. 2062	RD2062U03RM30.19	69	U
RD2062	Reclamation District No. 2062	RD2062U03RM30.27	56	M
RD2062	Reclamation District No. 2062	RD2062U03RM30.43	60	U
RD2062	Reclamation District No. 2062	RD2062U03RM31.12	52	M
RD2062	Reclamation District No. 2062	RD2062U03RM31.28	47	M

LMA Short Name	LMA Name	Site ID	Normalized Score	Overall Rating
RD2075	Reclamation District No. 2075	RD2075U01RM64.34	57	M
RD2085	Reclamation District No. 2085	RD2085U01RM66.50	59	U
RD2089	Reclamation District No. 2089	RD2089U01RM29.61	63	U
RD2089	Reclamation District No. 2089	RD2089U01RM29.8	53	M
RD2089	Reclamation District No. 2089	RD2089U02RM28.35	59	U
RD2095	Reclamation District No. 2095	RD2095U01RM6.74	55	M
RD2095	Reclamation District No. 2095	RD2095U01RM6.88	59	U
RD2095	Reclamation District No. 2095	RD2095U02RM60.62	58	M
RD2095	Reclamation District No. 2095	RD2095U02RM60.69	58	M
RD2101	Reclamation District No. 2101	RD2101U01RM73.92	65	U

6 LMA REPORTING REQUIREMENTS (CWC SECTIONS 9140-9141)

Background

California Assembly Bill (AB) 156 (Laird, 2007) Flood Control was introduced in the 2007-2008 Legislative Session. Governor Schwarzenegger signed the bill and Secretary of State Bowen chaptered it on October 10, 2007 (Chapter 368, Statutes of 2007). CWC Sections 9140-9141 include requirements for LMAs to submit an annual report on their operation and maintenance of a Project Levee and for DWR to submit an annual report to summarize the information received from LMAs. By establishing these requirements on LMAs CWC Sections 9140-9141 imposed a state-mandated local program effective July 1, 2008.

Local Maintaining Agency Reports

LMAs (including Sacramento and Sutter Maintenance Yards) are required to submit a report about the O&M of their levees to DWR by September 30 each year. According to CWC Section 9140, the information submitted to DWR shall include all of the following five items:

1. Information known to the LMA that is relevant to the condition or performance of the Project Levee.
2. Information identifying known conditions that might impair or compromise the level of flood protection provided by the Project Levee.
3. A summary of the maintenance performed by the LMA during the previous fiscal year.
4. A statement of work and estimated cost for operation and maintenance of the Project Levee for the current fiscal year, as approved by the LMA.
5. Any other readily available information contained in the records of the LMA relevant to the condition or performance of the Project Levee, as determined by the CVFPB or DWR.

To aid LMAs with the reporting requirements, DWR developed electronic and hard copy reporting forms. Example of hard copy reporting forms are shown in Appendix D.

In some cases Project Levees abut to Non-Project Levees; therefore some Non-Project Levees may also keep flood water out of areas protected by Project Levees. In these cases, CWC Sections 9140-9141 requires that LMAs subject to these requirements include the same information for these Non-Project Levees. Other LMAs of Non-Project Levees may voluntarily submit their operation and maintenance information to DWR for inclusion in the Annual Report. Information received from Non-Project Levee maintainers is included in Appendix C.

Summary Department Report

According to CWC Section 9141, DWR is required to prepare and submit to the CVFPB an annual report on the Project Levees and certain Non-Project Levees operated and maintained by LMAs. This report summarizes information received from LMAs, as well as relevant portions of any of the following documents as determined by DWR:

Where were the AB 156 LMA Reporting requirements added to the CWC?

AB 156 added Chapter 9, commencing with Section 9110, to Part 4 of Division 5 of the CWC. Water Code additions specific to the Local Maintaining Agency Reporting Program are outlined below:

CWC Section	Topic
Chapter 9, Article 1, Section 9110	Selected Definitions
Chapter 9, Article 1, Section 9140	Local Reports

Selected CWC Definitions

"Local Agency" means a local agency responsible for the maintenance of a project levee.

"Maintenance" has the same meaning as that set forth in subdivision (f) of Section 12878

"Project Levee" means any levee that is part of the facilities of the State Plan of Flood Control

"State Plan of Flood Control" means the state and federal flood control works, lands, programs, plans, policies, conditions, and mode of maintenance and operations of the Sacramento River Flood Control Project described in Section 8350, and of flood control projects in the Sacramento River and San Joaquin River watersheds authorized pursuant to Article 2 (commencing with Section 12648) of Chapter 2 of Part 6 of Division 6 for which the board or the department has provided assurances of nonfederal cooperation to the United States, and those facilities identified in Section 8361.

"Fiscal year" has the same meaning as set forth in Section 13290 of the Government Code. The fiscal year shall commence on the first day of July.

1. The SPFC Descriptive Document.
2. The Flood Control System Status Report (FCSSR).
3. The schedule for mapping described in CWC Section 8612.
4. Any correspondence, documentation, or information deemed relevant by DWR.

CWC Sections 9140 - 9141 Reporting Timelines

CWC changes became effective:	July 1, 2008
Local Maintaining Agency reports to DWR:.....	Due September 30 each year
DWR Annual Report to CVFPB:	Due December 31 each year

The following sections provide a status of the other documents, reports, and information mentioned above.

- **Annual Inspection Report:** The Annual Inspection Report on LMA maintenance is combined in this report.
- **The SPFC Descriptive Document:** The SPFC Descriptive Document was released in November, 2010. The document contains descriptions of flood management facilities, lands, programs, conditions, and mode of O&M for the State-federal flood protection system in the Sacramento River and San Joaquin River watersheds. The report describes the existing system, but it is not a plan for the future. The document is available for download from the CVFMP website: <http://www.water.ca.gov/cvfmp/documents.cfm>.
- **The FCSSR:** The FCSSR was released in December, 2011. This document describes the current status (physical condition) of SPFC facilities at a system-wide level. DWR prepared the FCSSR to meet the legislative requirements of CWC Section 9120, and to contribute to development of the Central Valley Flood Protection Plan (CVFPP). The CVFPP will guide future State investments through projects to address identified problems in the SPFC. The FCSSR was delivered to the CVFPB in December 2011. DWR will periodically update the FCSSR, or following formal request of the CVFPB. The document is available for download from the CVFMP website: <http://www.water.ca.gov/cvfmp/documents.cfm>.
- **The schedule for Mapping:** The mapping initiative as described in CWC Section 8612 is part of DWR's Central Valley Floodplain Evaluation and Delineation Program (CVFED). The CVFED Program works to estimate the frequency, depth, and limits of potential flooding in the Central Valley by providing building blocks in terms of floodplain assessments, standards, methodologies, tools, and analyses supporting multiple applications including FloodSAFE programs and projects and Federal Emergency Management Agency's (FEMA) National Flood Insurance Program. The CVFED Program consists of three interrelated Projects: (1) Central Valley Topography Acquisition Project, (2) Central Valley Hydraulic Evaluation Project, and the (3) Central Valley Floodplain Delineation Project.

Regarding Project (1), CVFED has finalized secondary post-processed LiDAR topography covering the Upper San Joaquin Basin (2,150 sq miles). This completes the final post-processing of LiDAR topography for the entire CVFED study area (5,800 sq miles). These datasets are now available for use by public agencies. Regarding Project (2), Reach and system riverine and overland flow hydraulic models are in development for areas at risk of flooding within the SPFC area of influence, and are expected to be complete in 2012. Regarding Project (3), the CVFED program is currently working to develop the models and tools necessary to produce these informational maps for the Urban Areas identified in the CVFPP State Systemwide Investment Approach by the July 2, 2013 deadline pursuant to Senate Bill 1278, Chaptered September 25, 2012 which amended Section 9610 (d) (1) of the Water Code.

6.1 Agencies Subject to CWC Section 9140 Requirements

Local Maintaining Agencies Subject to the Reporting Requirements

Most Project Levees of the Sacramento and San Joaquin Flood Control Systems are maintained by LMAs and the maintenance activities are funded through assessment of landowner’s properties within LMAs’ boundaries. These LMAs are comprised of **Levee Districts** (LD) and **Reclamation Districts** (RD). A variety of cities, counties, and other public agencies and municipalities also maintain Project Levees; these agencies are identified in this report by the term **Named Areas** (NA).

State-Maintained Levees

CWC Section 8361 identifies levees within the Sacramento River Flood Control System that are a State’s responsibility. Maintenance of these State-maintained levees (ST) is performed by DWR through the Sacramento and Sutter Maintenance Yards. They are comprised mostly of levees made necessary by the discharge from weirs.

More Information on LMAs from the CWC	
Type of Agency Section	CWC
Levee Districts	70000
Reclamation Districts	50000
State Maintained Areas	8361
Maintenance Areas	12878

Maintenance Areas

Under Section 12878 of the CWC, DWR is authorized to create Maintenance Areas (MA) for Project Levees with no identified LMA, or where the LMAs have failed or refused to perform maintenance or have chosen to relinquish maintenance responsibilities of their own volition. There are currently 10 active MAs in the state, all within the jurisdictional boundaries of the CVFPB. Based on their location, levees within MAs are maintained by either the Sacramento or Sutter Maintenance Yards.

6.2 Use of the LMA Reporting by DWR

The information collected for the LMA Report shares a local understanding of system performance, as well as operation and maintenance practices. This important information contributes to an annual assessment of vulnerability of the flood control system prior to flood season and can be shared with emergency response partners to make sure that appropriate steps are taken for resource monitoring efforts and emergency operations. Providing detailed information about the location and extent of critical levee distresses is essential to the flood preparedness activities that ensure timely and appropriate response for flood emergencies.

The information submitted in Parts 1 and 2 of the five part reporting program provides critical information for emergency response before flood season to better prepare the first responders. Part 3 provides an opportunity for DWR to assess the current maintenance practices by LMAs throughout the year, in particular during summer and winter. Part 4 provides information on LMAs’ planned budgets for the next fiscal year. This information particularly helps DWR to evaluate LMAs’ operation and maintenance costs per levee mile.

Finally, the LMAs provide valuable information about the current conditions of the levees in flood control system. DWR uses this information to develop critical data to evaluate levees, monitor levee conditions, and provide input to emergency response programs to improve public safety. The level of compliance with this report may be used to determine cost share eligibility criteria between the State and LMAs for new and future grant programs by DWR. DWR continues to provide information to the LMAs about this concept.

Reporting Statistics

There is an increasing trend (Figure 6.1) of reporting compliance by LMAs since the program started in 2008. Systemwide comparison of reporting compliance (Figure 6.2) shows about 90% LMAs belonging to SAC System and 96% belonging to SJ system have reported in last two years. In the overall, about 93% of LMA Areas submitted their report this year. An increasing trend of electronic reporting is apparent in Figure 6-3. This year about 68% LMA Areas submitted report through DWR’s Web-based LMA Reporting tool. This represents about 16% increase over last year’s electronic reporting. This could

be attributed to continuous outreach activities and continuous enhancement of reporting infrastructure development since the inception of the Program.

Figure 6-1 Annual Reporting Compliance by LMAs

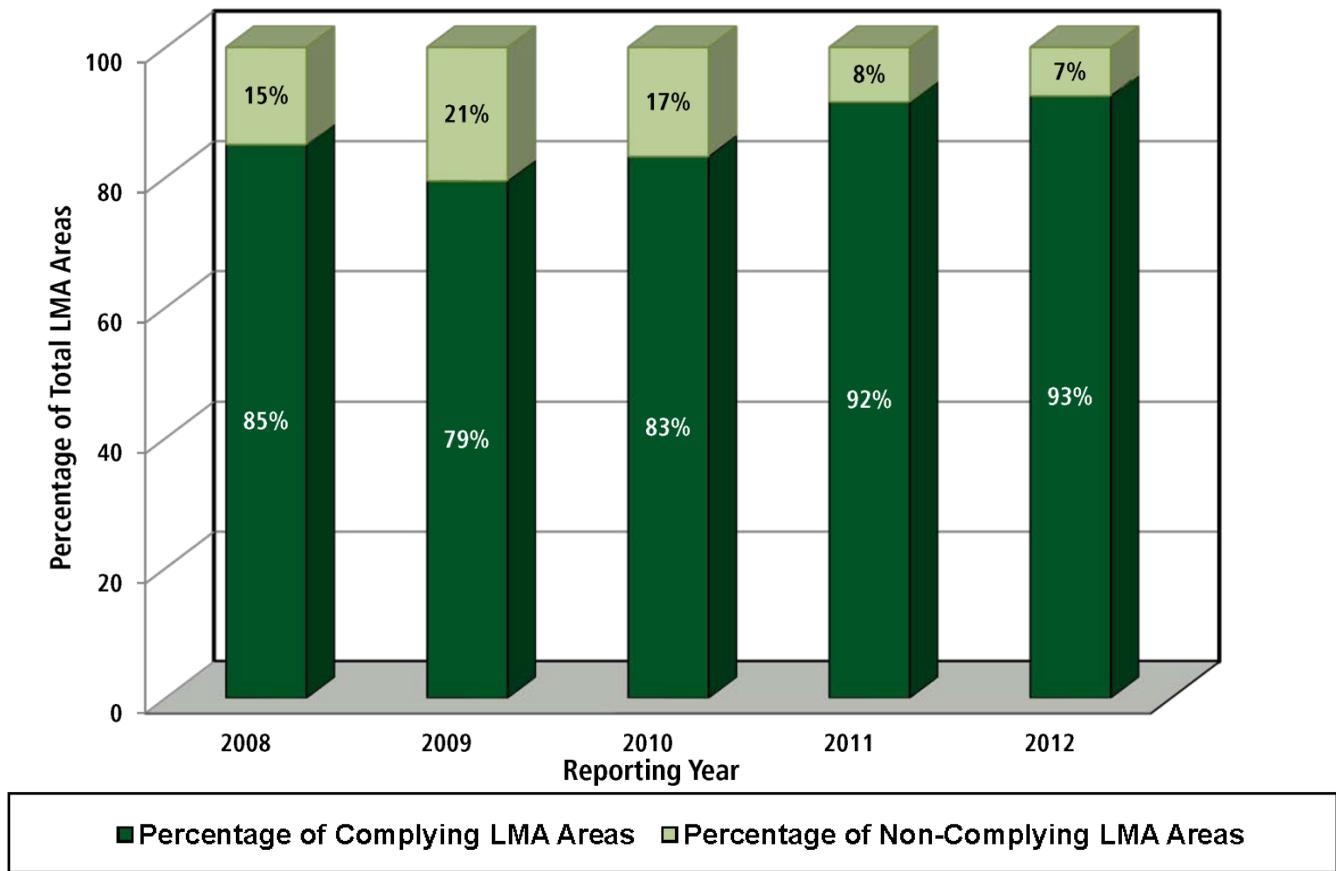


Figure 6-2 Systemwide Comparison of Reporting Compliance by LMAs

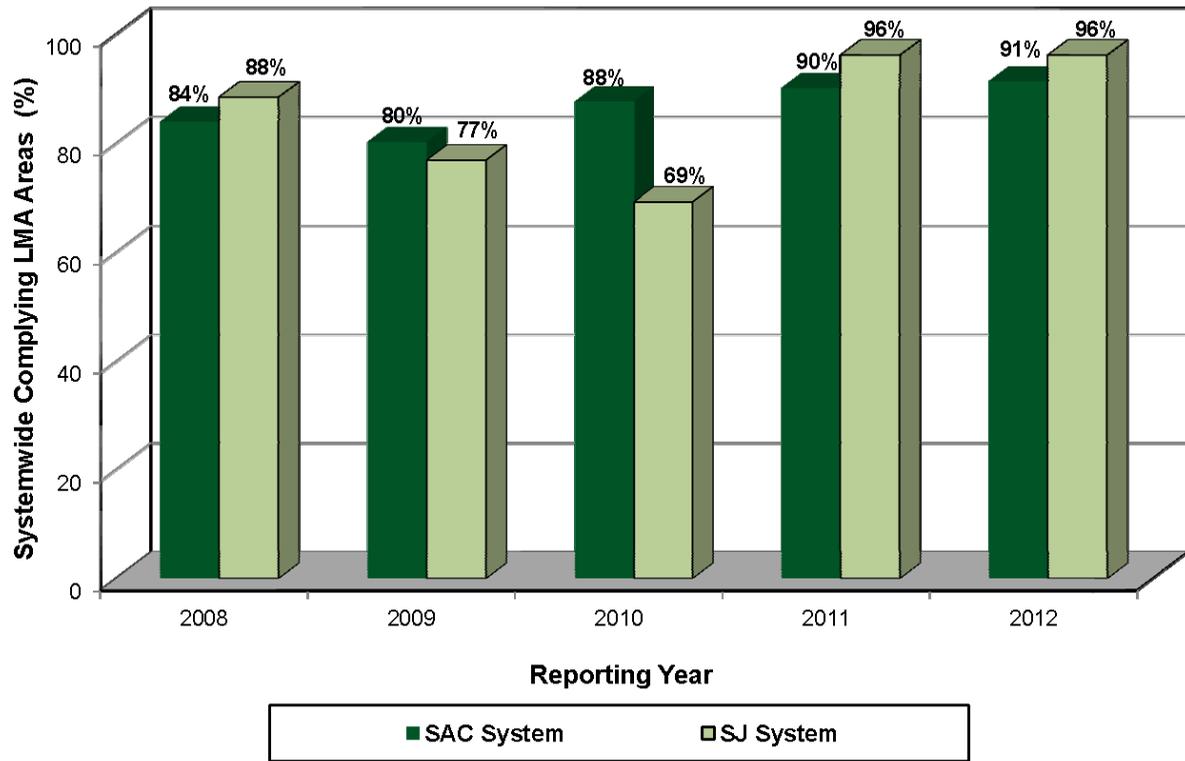
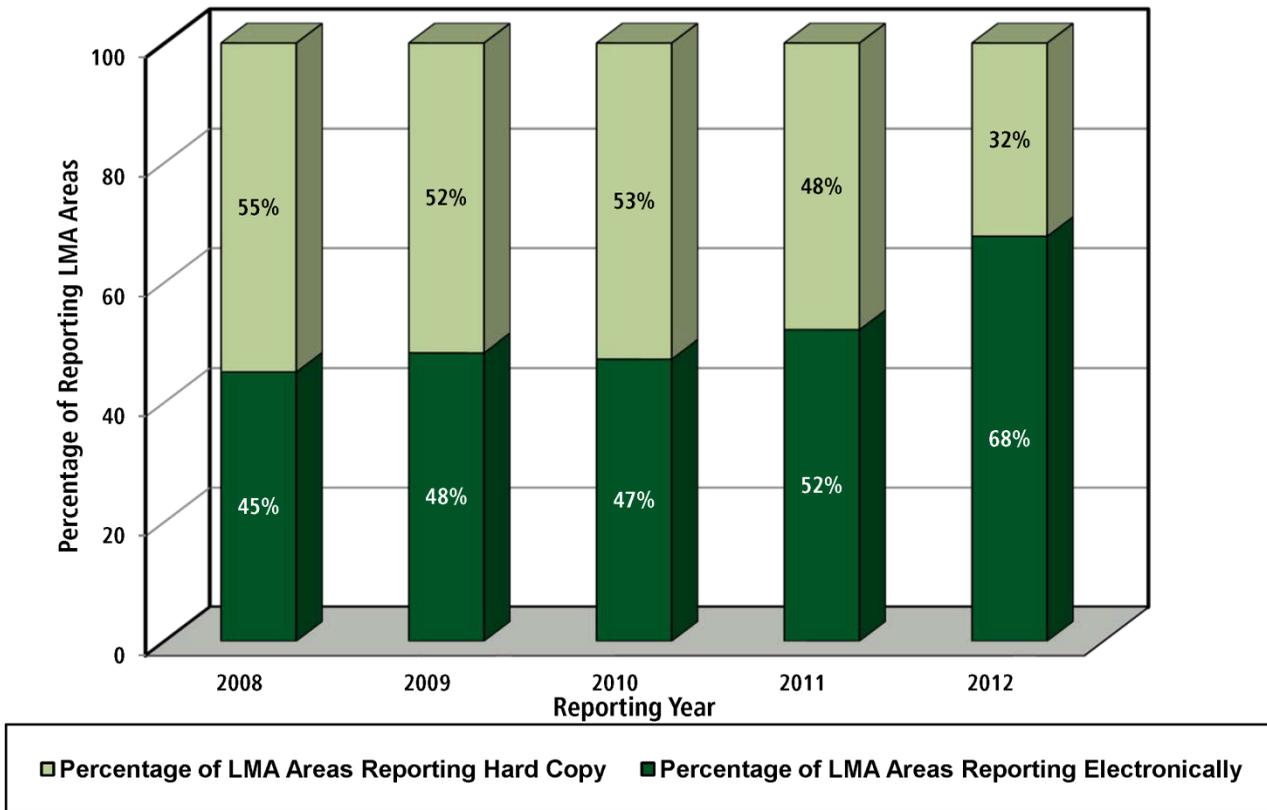


Figure 6-3 Reporting Mode Adopted by LMAs



Reported Key Maintenance Activities

About 90% of reporting LMA Areas provided information on the summary of maintenance activities. As in previous years, routine vegetation maintenance activities (burning, slope dragging, cutting, trimming, spraying), rodent control, levee crown grading, roadway maintenance and encroachment (Figure 6.4) dominated reported LMA maintenance activities for fiscal year 2011-12. Other reported key activities include gate/signage maintenance, minor structural repairs, and minor levee repairs. Some LMAs also reported levee patrolling and other planning activities such as preparation of five year maintenance plans.

A similar percent of reporting LMA Areas also provided information on the summary of maintenance activities for the current fiscal year. The reported planned activities also reflect LMAs' similar maintenance priorities (Figure 6.5) in the current fiscal year also.

Figure 6-4 Reported Key Activities for Fiscal Year 2011-2012

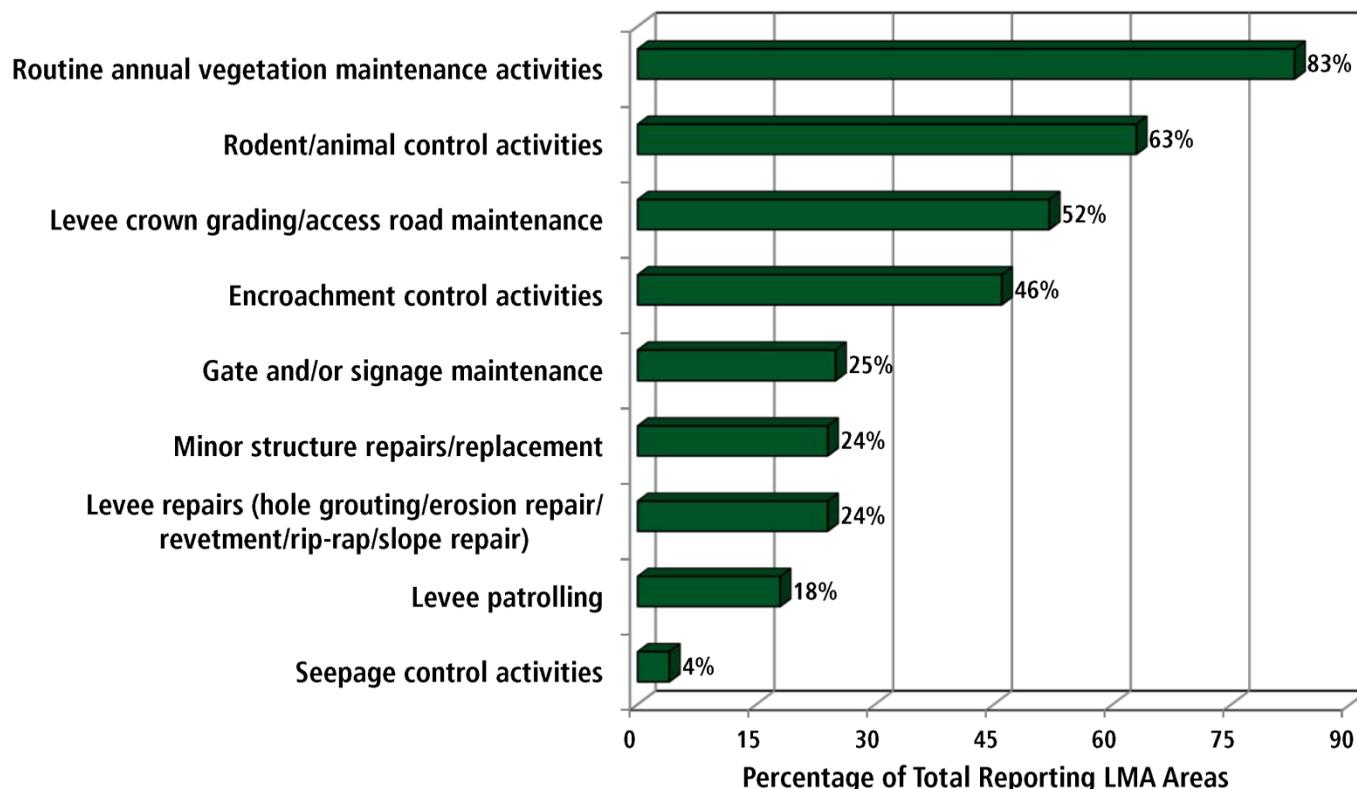
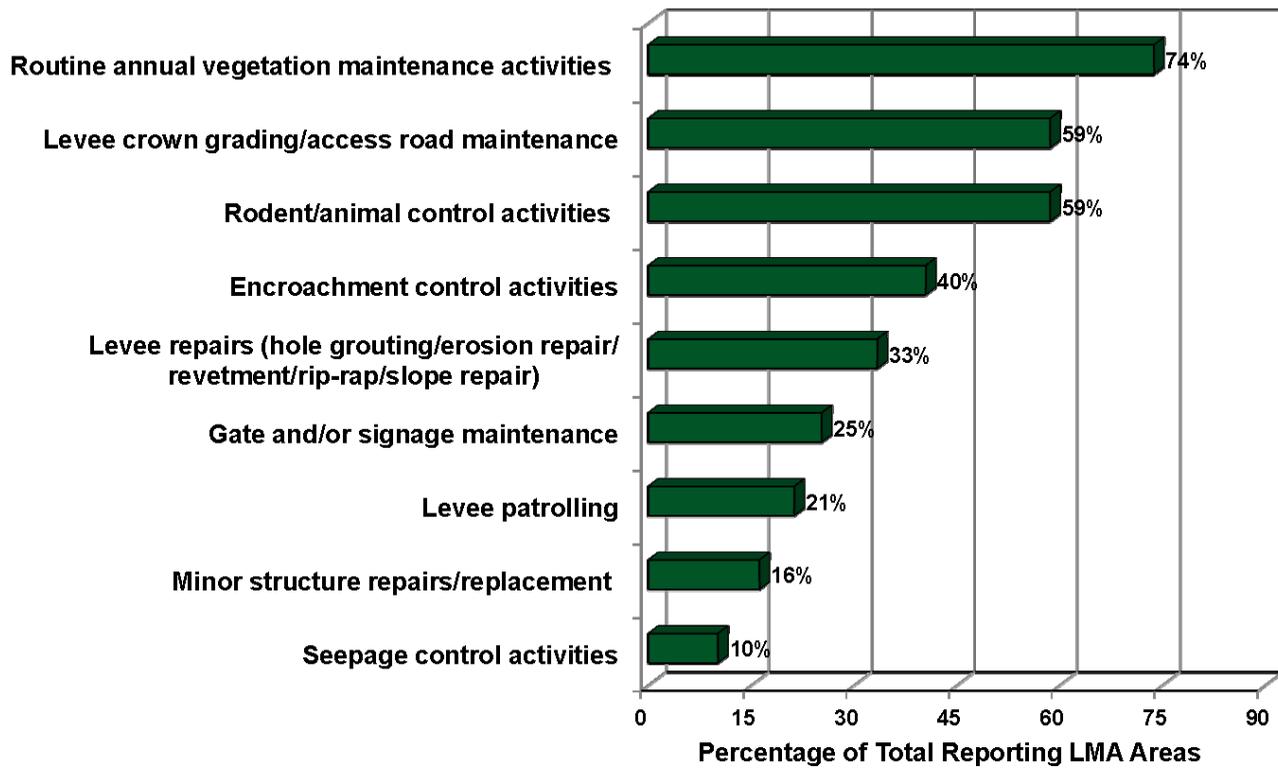


Figure 6-5 Reported Key Planned Activities for Fiscal Year 2012-2013



Issues Reported

Key issues raised by the LMAs this year include, encroachment, erosion and sedimentation, freeboard and other levee geometry deficiencies, in-channel and levee vegetation, seepage and sand boils. Some LMAs also reported State and federal regulations are posing constraints on complying with vegetation maintenance criteria. All this information are summarized in Appendices A to C and also shared with relevant agencies.

6.3 Communication and Outreach

DWR recognizes that the requirements of CWC Section 9140 placed a new reporting burden on LMAs. To help make reporting easier, DWR developed an outreach program and reporting tools to assist LMAs. DWR notified LMAs of the new reporting requirements, developed electronic and hard copy reporting options, and held a series of presentations and workshops. The process continues today, with DWR soliciting feedback from LMAs to improve the program. The following subsections and Figure 6-6 describe the chronology of the outreach process for 2012.

Local Maintaining Agency Reporting Workshops

A workshop announcement was distributed to LMAs in July to provide information on LMA reporting. Two half-day workshops were held on August 14 and 15, 2012, in DWR’s Flood Operations Center. They provided a forum for staff to demonstrate the electronic reporting web application, receive comments and suggestions for program improvement, and discuss reporting procedures. A copy of the workshop flyer is included in Appendix D.

User Guide

A web application User Guide has been developed for the electronic users to facilitate reporting. The guide can be used to answer frequently asked questions. The guide will be subjected to change as functionalities and features will be updated. The guide can be accessed from the LMA website ☺

http://cdec.water.ca.gov/cgi-progs/products/LMA_Web_Application_User_Guide.pdf

Fact Sheet

A program fact sheet has been revised to describe changes to the program and reporting requirements. It is posted on the LMA website at <http://cdec.water.ca.gov/lma.html>. A copy of the fact sheet is Included in Appendix D.

Local Maintaining Agency Meetings

As part of our outreach component, DWR staff met with three LMAs on the following dates in 2012:

Agency	Date
Reclamation District 10	September 11, 2012
Sutter Yard	September 20, 2012
Reclamation District 827	October 12, 2012

Submittal to Libraries

DVDs of the 2011 Annual Reports were submitted to 49 libraries within the jurisdictional areas of the LMAs as directed by the code. A copy of the letter to the libraries is included in Appendix D.

Submittal to Cities/Counties

DVDs of the 2011 Annual Reports were submitted to 17 cities and counties within the jurisdictional areas of the LMAs as directed by the code. This is an improvement added to the program for the first time. Of the 20 cities/counties within the jurisdictional areas, seventeen responded to receive a copy of the DVD. The counties included are Butte, Plumas, Glenn, Colusa, Tehama, Placer, Sutter, Yolo, Lake, Sacramento, Solano, San Joaquin, Stanislaus, Madera, Merced, Fresno. A copy of the letter to the libraries is included in Appendix D.

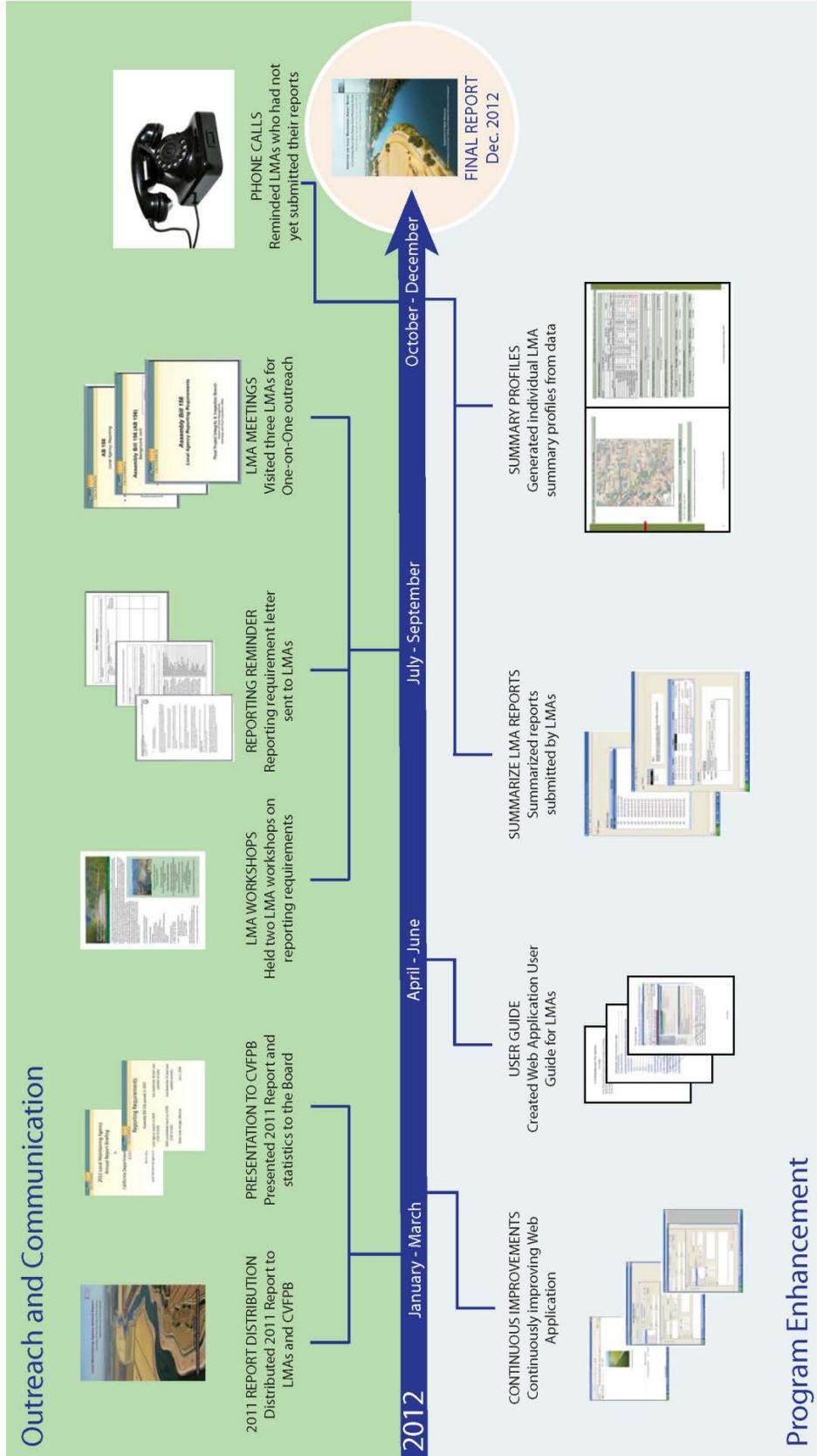
Reporting Requirements Letter

On August 30, 2012, a reporting requirements letter was mailed to all LMAs with instructions and the deadline. A copy of the letter is included in Appendix D.

Phone Calls

DWR contacted all LMAs for updated contact information in September through November, 2012.

Figure 6-6: Program Activities



Website and Electronic Reporting - Web Application Development

The graphical user interface was developed in 2008 with assistance from the California Data Exchange Center (CDEC) staff for reporting and information sharing. The current information about the program can be downloaded as well as access the electronic reporting from <http://cdec.water.ca.gov/lma.html> website.

The application allows LMAs to establish an individual user account, access certain Division of Flood Management flood system information, and submit required information electronically.

This web application is continually improved and enhanced with features and functionalities to benefit LMAs in their reporting requirements. To aid LMAs with reporting requirements, two examples of good reporting were posted on our website. To access the example, please click on the "Reporting Example" link under the Local Agency program website.

The integration between the Inspection and LMA reporting program through the web application has been improved to the next level. LMAs are highly encouraged to use the electronic program to submit information for above mentioned both programs at one place. The response has been positive to date; the 2012 electronic reporting shows higher percentage than hard copy reporting.

7 OTHER BRANCH ACTIVITIES AND ACCOMPLISHMENTS

The FPIIB supports flood operations by inspecting, evaluating and assessing the integrity of the Sacramento and San Joaquin Flood Control Project levee systems through a variety of activities. FPIIB is involved in collecting and managing flood control system information to assist in flood operations efforts. This information includes data on historical levee distress issues, as well as historical flood control system improvements, O&M agreements, O&M standards and practices, and general information related to flood control system facilities.

FPIIB inspects the maintenance of flood control facilities and notifies local maintenance agencies of system deficiencies, monitors levee and channel erosion, monitors use of designated floodways, conducts regulatory inspections of CVFPB authorized encroachments, conducts flood fight training, has first-response capability during high-water events, and conducts high-water staking.

The following sections provide more detail on key Branch activities and accomplishments.

7.1 Inspection and Reporting for Project Facilities

FPIIB conducts maintenance inspections for Project Levees, channels, and structures—the main subject of this report. Improvements in 2012 inspections and reporting include:

- Continued inspector training and use of more consistent methodology to reduce subjectivity
- More timely reporting and communication of deficiencies to LMAs
- Continued refinements to inspection database program, allowing efficient documentation of system conditions and compatibility with USACE National Levee Database reporting requirements

DWR expects to implement additional changes to the inspection program as existing USACE policies are clarified over time, new policies are developed, and other levee management issues arise.

7.2 High Water Staking

FPIIB developed documentation for high water staking in Project Levees. They are:

- High Water Staking Field Guidebook
- High Water Event Documentation Program Report

The field guidebook is designed to assist field crews with staking procedures. It describes pre-staking checklist in addition to how to stake, where to stake and what to stake. The High Water Event Documentation Program Report describes issues and

concern about current staking program and recommended improvements. An outreach flyer has been developed to identify partners and stakeholders for this program. DWR is planning to make these documents available to CDEC for public use. High water data gathered from this program will also be available in CDEC.

FPIIB coordinated a high water staking effort with Floodplain Evaluation Branch, Hydrology Branch, and Regional Projects Assessment Branch of DFM, and Geodetic Branch of the Division of Engineering (DOE) in 2011. DWR collected 243 high water surface elevations over approximately 200 miles of the San Joaquin River Flood System. The data can be used to better understand the performance of the levees, characterize a historical high water event, guide future flood control system improvements, and improve hydraulic modeling of flood control systems.

7.3 Levee Waterside Erosion Surveys

The USACE, with DWR sponsorship, has contracted for waterside erosion surveys of the Sacramento River system since 1998. FPIIB began conducting waterside erosion surveys of the San Joaquin River portion of the State-federal flood protection system project levees in September of 2006. The primary purpose of these surveys is to: (a) monitor and document the condition of previously identified erosion sites; (b) inventory any new erosion sites; and (c) identify erosion sites that appear to be an imminent threat to the structural integrity of the State-federal flood protection system.

Beginning in 2010, the results from DWR's Supplemental Erosion Survey of the San Joaquin River System are presented in this report in Section 5. Inspection criteria and rating methodology are described in Appendix F.

The USACE and its contractors generate the report on erosion found in the Sacramento River system; FPIIB staffs supplement the reports they generate with this data as it becomes available. In 2012, data was received in time to include the latest information on erosion sites from the USACE in this report and the LMRs.

DWR and other State, federal, and local entities are working to develop an erosion repair strategy that addresses environmental concerns from erosion maintenance and assigns responsibility for repair of different scales of erosion in the flood protection system.

Working together with USACE FPIIB has improved erosion site ranking criteria and methodology to be more consistent and comparable.

7.4 Utility Crossing Inventory Surveys

Levee penetrations are recognized as hazard elements affecting the integrity of project levees. Heavily corroded, leaking, collapsed, or otherwise compromised pipes affect the structural integrity of levee embankment by creating mechanisms of internal erosion. Identification of the precise location of these crossings and documentation of their external conditions constitute important and relevant information used to assess levee vulnerability.

Currently, the Department does not have a complete inventory of all utility pipes crossing Project levees and as a result any potential threat is unknown. The main goal of the Utility Crossing Inventory Program (UCIP) is to develop an inventory of utility crossings penetrating State-federal flood project levees. The inventory will include detailed desk studies to identify location and characteristic of documented pipes crossing project levees and field surveys to document external conditions of the crossing structures and levee embankment.

While the majority of utilities penetrating project levees are irrigation or drainage discharge pipes, there are many other types of utilities cross levees such as pressurized gas pipelines, storm drains, sewer lines, and communication conduits.

The utility crossing inventory program will:

- Identify location and characteristics of all pipes penetrating through levees by auditing historical information such as CVFPB encroachment permits, DWR Levee Logs, LMA's records, and USACE O&M Manuals.
- Perform field surveys to measure location and document existing conditions of the crossing and levee embankment based on observed external appearance.
- Document and update status of the crossing (found, indicators found, or not found).

- Assess utility crossing based on visual evidence of deterioration of the pipe, inlet or outlet structure and identify maintenance needs (Urgent, Non-Urgent, or No Action Needed).
- Share utility crossing information with LMAs to assist in the coordination of Operation of Public and Private Facilities during flood fighting.
- Promote the use of the Local Maintaining Agency Annual Report (Web Application) tool to log the operation and maintenance of the levee sections where utility crossings are present.
- Provide training to LMAs on how to update utility crossing information using the web application.

The information collected through this program will be used by inspectors to clarify maintenance issues with the different levee maintaining agencies, and by engineers for vulnerability assessments.

UCIP Online Application

An online application has been developed that allows the LMAs keep a record of all utility crossings within their jurisdiction. This tool also allows the LMAs to record the actions taken to address the issues related to penetrations.

The UCIP online application will:

- Provide a tool that can provide current inventory and condition of all utility crossing penetrating through the flood project works by local maintaining agency.
- Provide an enhanced reporting method through the Local Maintaining Agency Annual Report (Web Application) for LMAs.
- Provide detailed summary sheets of utility crossings and information identifying known conditions that might impair or compromise the level of the project levee,
- Help LMAs gather information needed for coordination flood fight related to operation of public and private facilities located within their jurisdiction
- Provide an annual assessment of the utility crossing based on field surveys. This tool also allows for LMAs to document which utility crossings based on visual inspection pose a threat to the integrity of the flood control system.
- Allow LMAs to record all the steps taken to rectify unauthorized or non-compliant issues with regards to utility crossings.

7.5 Other Key Activities

Additional FPIIB activities supporting the assessment of the integrity of the Sacramento and San Joaquin Flood Control Project levee system include:

- CVFPB Permit Inspection: FPIIB's team of flood project inspectors visually inspects the construction and installation of permitted encroachments for adherence to Board conditions. The number of permits requiring inspection continued to increase in 2012.
- Other CVFPB/FOC Inspections: In addition to the issuance of formal permits, the CVFPB authorizes activities on levees and structures in the system. During 2012 there were again a high number of these activities requiring inspection, most notably in the repair and replacement of penetrations through levees and repairs resulting from issues noted in the USACE's Periodic Inspections. FPIIB also conducted investigations into a variety of matters as requested by the CVFPB and the FOC.
- DWR and USACE Inspection Program Working Group: FPIIB, USACE's Sacramento District, CVFPB staff, and DWR meet monthly to coordinate ongoing DWR and USACE inspection program and maintenance activities. The primary focus is to establish a consistent understanding of inspection criteria and to establish consistent guidelines for developing system ratings.

- DWR also meets with a number of LMAs on a quarterly basis to discuss issues affecting them and to help them as much as possible.
- Internal and External Coordination: FPIIB participated in coordination with others groups within DWR as well as a variety of other agencies in the Interagency Flood Management Collaborative Program Management Group.
- Central Valley Flood Protection Plan: FPIIB participated in the preparation of the Central Valley Flood Protection Plan through the data that the Branch generates as well as reviewing and commenting on the draft documents.
- Periodic Inspections: The USACE and its contractors conducted multiple Periodic Inspections throughout 2012. FPIIB staff participated heavily in coordination with the LMAs, USACE, and CVFPB. These inspections are more detailed inspections intended to be conducted once every five years for each levee systems. FPIIB staff is helping to ensure that information is properly and completely exchanged between the entities to the greatest extent possible. As the LMAs complete maintenance on areas of concern noted in the Periodic Inspections, FPIIB inspectors work with the CVFPB to verify that the work is completed before the USACE is notified and a re-inspection is requested.
- Levee Log Update: FPIIB completed the digitization of historical levee logs and is working to field verify this data. FPIIB is coordinating these efforts with other agencies and consultants.
- Database Management: Compilation of known maintenance deficiencies and historical information into a geo-referenced database provides quick and detailed background information regarding distressed locations for initial analysis during high water events and in assessing system reliability. This database continues to be enhanced through CDEC programming.
- Flood Fight Training: Inspectors assist the Flood Fight Specialist teaching flood fight methods to over 1,000 people per year throughout the state. Inspectors also assisted in many of the Preseason Meetings held by the FOC.
- System Documentation: FPIIB is responsible for collecting, evaluating and summarizing historical and existing data in regard to flood emergency response. The data is being converted from hard copy to GIS-based data (geo-referenced) wherever possible. In 2012 FPIIB staff added more documentation to CDEC and made it available to stakeholders.
- Emergency Exercises: FPIIB assisted the FOC to prepare and conduct past and future emergency response exercises and will continue to do so. FPIIB staff participated in a simulation for the Forecast-Coordinated Operations (F-CO) group in October 2012 and an exercise with the California Conservation Corps in December 2012.
- Library of Models Project: FPIIB is assisting in the development of a Library of Models (LOM) to house models being developed under FloodSAFE programs. The LOM will be beneficial to other DWR offices and partner agencies. These models will be publically accessible.
- A pilot study is being conducted to evaluate the feasibility of an instrumentation network (fully-grouted piezometers) along the project levees to obtain real-time data pertaining to levee behavior during a flood event. The real-time information will allow DWR to assess seepage conditions through the levee during high water events and enhance its Emergency Preparedness and Response Plan. The instruments have been placed and are being monitored. As part of this pilot study, an instrumentation network of piezometers and data logger system was installed to provide direct, real-time measurement of levee through seepage and under-seepage conditions during medium and high-water events. Data download from the piezometers began after the completion of installation in October, 2011. Of the 36 saturated piezometers, three appear to be providing values outside the expected range. Seepage models were constructed to represent subsurface conditions based on geotechnical borings. Piezometric data recorded from the site was used to calibrate the seepage models.
- A Field Investigation Reporting System is being developed that includes enhancements to the database that is used to gather, track, and manage information collected during field visits to the flood control system regarding integrity issues. The system will be flexible in reporting the type of investigation, and will have the capability to be integrated with CDEC systems and accessible to stakeholders.

- Scoring and Rating Methodology Development for San Joaquin River Erosion Sites: Working together with consultants, FPIIB is reviewing existing database and erosion severity methodology, developing improved ranking criteria and classification methodology. The outcomes of the project will make the evaluation of levee erosion more reasonable and effective. It will also provide more objective judgment and information for the flood preparedness and response.
- Levee Monitoring System Pilot Study: In order to evaluate the feasibility of a multi-site, large scale instrumentation network, a pilot project is being evaluated. For the pilot study, an existing erosion site, where erosion will most likely occur during the following flood season, will be selected, and a cluster of instruments (beacon, a float-out device) will be installed. The pilot study will provide real-time information which will be used to assess the feasibility of the proposed levee erosion monitoring network and provide answers to critical questions related to costs, benefits, installation and maintenance

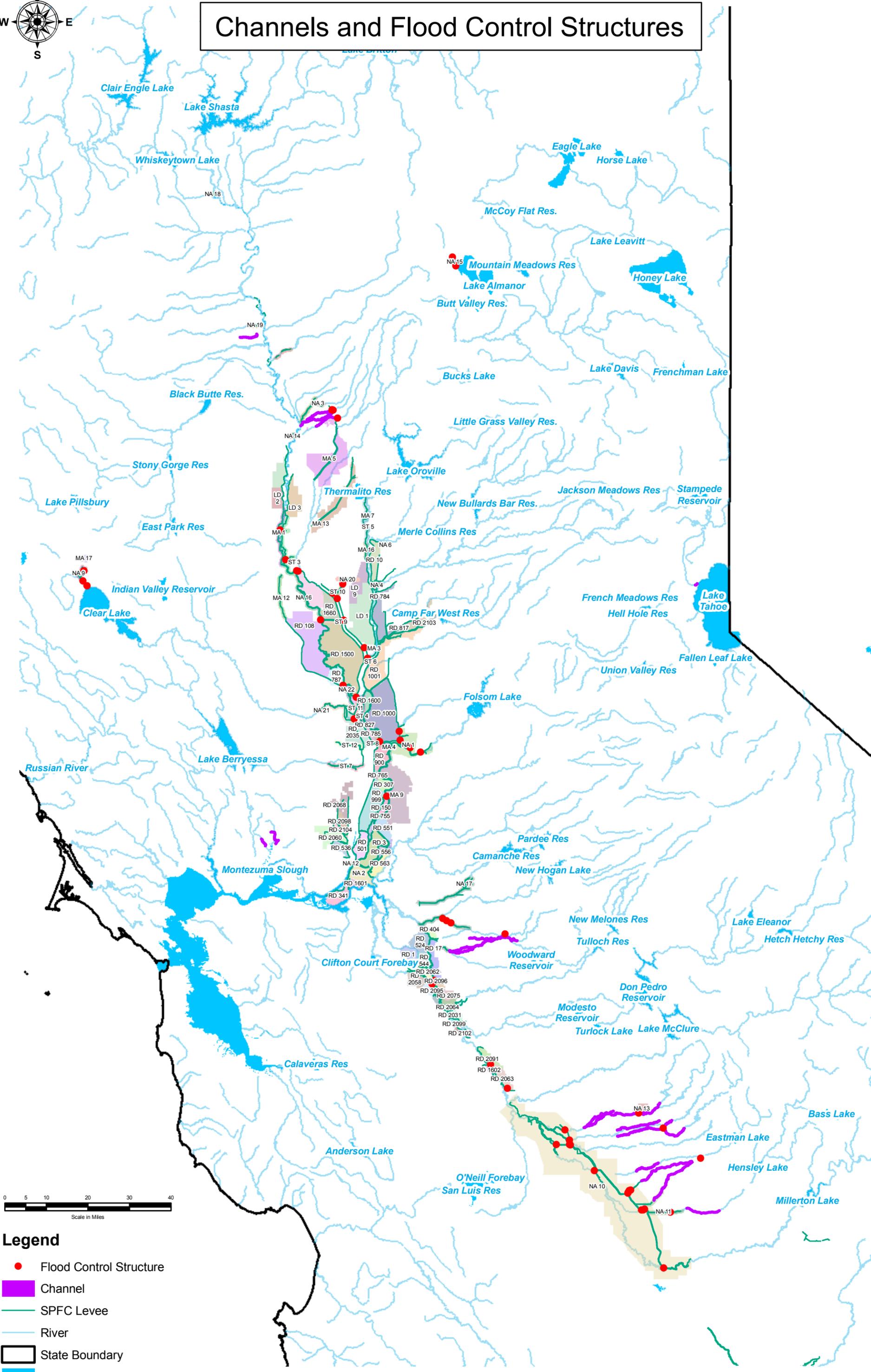
7.6 Central Valley Flood Management Planning

The Central Valley Flood Management Planning (CVFMP) Program is an effort to improve flood management for areas protected by facilities of the State-federal flood protection system in the Central Valley in an Integrated and sustainable way. FPIIB staff participated in this effort in various ways including contributing data and reviewing the documents. The CVFMP Program is documenting and assessing current performance of the State-federal flood protection system and providing assistance to locals to meet new planning requirements related to flood risk management through Program's development, and periodic update, of four important documents listed below.

- **Central Valley Flood Protection Plan (CVFPP):** This document describes a sustainable, integrated flood management plan that reflects a system-wide approach to areas of the Central Valley currently receiving protection from facilities of the State Plan of Flood Control. DWR was required to prepare the first public draft CVFPP by January 1, 2012, for adoption by the CVFPB by July 1, 2012. The Public Draft of the CVFPP was released on December 30, 2011. Legislation requires DWR to update the CVFPP every five years (years ending in 2 and 7).
- **SPFC Descriptive Document:** In November 2010, DWR released the final Descriptive Document, which contains descriptions of flood management facilities, lands, programs, conditions, and mode of O&M for the State-federal flood protection system in the Sacramento River and San Joaquin River watersheds. The report describes the existing system, but it is not a plan for the future. It is available for download from the CVFMP website: <http://www.water.ca.gov/cvfmp/documents.cfm>.
- **Flood Control System Status Report (FCSSR):** This document describes the current status (physical condition) of SPFC facilities at a system-wide level. DWR prepared the FCSSR to meet the legislative requirements of California Water Code Section 9120, and to contribute to development of the Central Valley Flood Protection Plan (CVFPP). The CVFPP will guide future State investments through projects to address identified problems in the SPFC. The FCSSR was delivered to the CVFPB in December 2011. DWR will periodically update the FCSSR, or following formal request of the CVFPB. The document is available for download from the CVFMP website: <http://www.water.ca.gov/cvfmp/documents.cfm>.

CVFPP Program Environmental Impact Report: The CVFPP Program Environmental Impact Report (PEIR) informs DWR and the CVFPB about potential program-level environmental effects and mitigation measures from implementation of some or all components of the CVFPP. A PEIR was produced because the CVFPP includes geographically related actions that may have similar environmental effects, but are not sufficiently well-defined regarding specific locations, project-level details, or implementation strategies to support a project-level EIR. DWR and the Board can use the PEIR for future planning and feasibility studies pursuant to California Environmental Quality Act Guidelines Section 15051(d)), DWR is the lead agency and the CVFPB is a responsible agency. The Draft PEIR was submitted to the CVFPB in March 2012.

Channels and Flood Control Structures



- Legend**
- Flood Control Structure
 - Channel
 - SPFC Levee
 - River
 - State Boundary
 - Water Body

