

7.0 Programs and Plans Related to State Plan of Flood Control

This section provides information on programs and plans related to the SPFC, which include State and federal oversight and management of the flood system. Ongoing State-federal projects, the Early Implementation Program (EIP), and Section 221 of the Flood Control Act of 1970 (Section 221) are described as plans and programs related to the SPFC. Ongoing State-federal projects in the Sacramento and San Joaquin River watersheds are expected to become part of the SPFC after completion and turn over to the State. While projects being completed through the EIP and Section 221 are also not part of the SPFC, they may become part of the SPFC in the future after undergoing the process to become incorporated into the SPFC. As additional programs and plans related to the SPFC are developed in the future, information will be incorporated into updates to the FCSSR as necessary.

7.1 Summary

DWR, the Board, and USACE are the main partners in SPFC oversight and management. Programs and plans related to the SPFC are both historical and ongoing. Historical documents include the following:

- Federal legislation for authorizing specific projects and setting partnership requirements for project development
- State legislation establishing the roles and responsibilities of the Board and DWR regarding flood control
- State legislation for authorizing specific projects and establishing requirements for partnering with the federal government and local entities for project development
- Partnership agreements with USACE and LMAs
- As-constructed project documents
- O&M manuals
- Master Plan for Flood Control in the Butte Basin (1964)



The Bear River Setback Levee was constructed under the Early Implementation Program

- Interim Plan of Flood Control for the Sacramento River from the Butte County Line to Chico Landing (1984) and Butte Basin Plan of Flood Control (1986)

Ongoing programs and plans include the following:

- The FloodSAFE California (FloodSAFE) initiative, California Levees Roundtable (Roundtable), FCSSR, CVFPP, and California Water Plan
- Ongoing projects that have been federally and State-authorized, as plans related to the SPFC
- The EIP and Section 221, as programs related to the SPFC

7.2 State Oversight and Management of State Plan of Flood Control

The Board is the State agency responsible for the OMRR&R of existing facilities, and for working with USACE to develop flood damage reduction projects. DWR assists the Board with project development, inspections, and operation of the flood center. Other State agencies assist the Board and DWR. Following is a summary of State agencies whose responsibilities at least in part include flood management in the Central Valley.

7.2.1 Central Valley Flood Protection Board

Following is the mission of the Board²:

- To control flooding along the Sacramento and San Joaquin rivers and their tributaries in cooperation with USACE.
- To cooperate with various agencies of local, State, and federal governments in establishing, planning, constructing, operating, and maintaining flood control works.
- To maintain the integrity of the existing flood control system and designated floodways through the Board's regulatory authority by issuing permits for encroachments.

The Board requires permits for any project that may affect how the existing flood system functions. A permit is required for any project or plan of work that meets the following criteria:

- Is within federal flood control project levees and within a Board easement.
- May have an effect on the flood control functions of project levees.
- Is within a Board-designated floodway.
- Is within regulated Central Valley streams listed in Table 8.1, Title 23, CCR.

These projects include any project proposed for a regulated stream, in a designated floodway on federal flood management project levee slopes, within 10 feet of a levee toe, or in a location that may have an effect on flood control facilities. Examples of activities might include, but are not limited to, boat docks, ramps, bridges, sand and gravel mining, placement of fill, fences, and landscaping and irrigation facilities. Streams regulated by the Board are listed in Table 8.1, Title 23, CCR.

With this responsibility, the Board reviews encroachment permit applications and approves permits when encroachment will not affect O&M of the flood management system. The Board also approves or adopts the flood-related technical work prepared by DWR or other agencies.

7.2.2 California Department of Water Resources

DWR's Division of Flood Management provides staff support to the Board and is responsible for managing a variety of programs related to flood management. Other DWR divisions, such as the Division of Engineering and Division of Safety of Dams, may provide technical support. Examples of work performed by the Division of Flood Management include the following:

- Development and maintenance of the CLD
- Emergency preparedness, and emergency response and participation in post-emergency recovery
- O&M of some of the facilities
- Inspections
- Floodplain management, planning, and delineation
- Flood project funding and grant administration

The intention of DWR's FloodSAFE initiative is to guide improvements of the flood management system in the Sacramento and San Joaquin watersheds and the remaining State over the next 20-plus years.

7.2.3 California Department of Fish and Game

The California Department of Fish and Game (DFG) assists DWR in its environmental stewardship responsibilities, including the following:

- Provides input on mitigation strategies, including banking opportunities and possible partnerships
- Identifies specific habitat and species restoration and enhancement opportunities
- Provides input on modeling for impact assessment
- Provides input on and reviewing environmental documentation under the California Environmental Quality Act (CEQA)
- Permits under California Endangered Species Act and DFG Code 1600 for implementation of FloodSAFE projects

²The Central Valley Flood Protection Board was formerly known as The Reclamation Board. Correspondence, O&M manuals, and other documents prepared before mid-2007 are cited as from The Reclamation Board.

7.2.4 Other Assisting State Agencies

Several other State agencies assist the Board and DWR in their management and oversight of the SPFC:

- California Emergency Management Agency (CALEMA)
- California Building Standards Commission
- State Lands Commission
- State Historic Preservation Office
- Office of the Attorney General
- Department of Finance

7.3 Federal Oversight and Management of State Plan of Flood Control

Federal agencies are partners with State agencies in oversight and management of the SPFC.

7.3.1 U.S. Army Corps of Engineers

USACE is the nation's flood control agency. The USACE Sacramento District is the district directly involved with the SPFC, and partners with the Board in developing new flood management projects in the Sacramento and San Joaquin River watersheds. USACE has prepared O&M manuals that guide O&M of the various SPFC units.

Part of the assurances of nonfederal cooperation that the Board provided to the federal government for the SPFC is that the State will maintain and operate all works after completion in accordance with regulations prescribed by the Secretary of the Army. Title 33 CFR, Chapter II Corps of Engineers, Part 208, prescribes flood control regulations that the SPFC must follow. USACE headquarters in Washington, D.C., prepares, and periodically updates, policies, standards, and guidance documents on special flood-related subjects.

DWR inspects levees maintained by many separate local agencies, and then reports findings of the inspections to USACE, which performs quality assurance work. From the inspection information submitted, USACE may choose to conduct follow-up inspections in certain areas. USACE uses its own follow-up inspections and the State's inspection findings to make Public Law 84-99 eligibility determinations for each local agency.

USACE provides the following other assistance to the State in support of project planning and implementation:

- Assists in statewide and regional planning efforts
- Partners with the Board in project development, and plans, designs, and constructs flood damage reduction facilities
- Funds the federal share of costs of project development (up-front funds, credits, and reimbursements)
- Permits project modifications
- Manages Public Law 84-99 programs, including floodfight and rehabilitation assistance
- Funds the federal share of Public Law 84-99 program
- Inspects and coordinates inspection of completed works and rehabilitation for compliance with regulations and O&M manual requirements to maintain Active status for Public Law 84-99
- Regulates projects with regard to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act

PUBLIC LAW 84-99 REHABILITATION ASSISTANCE OF FLOOD CONTROL WORKS

Federal and nonfederal flood control works in the Rehabilitation and Inspection Program (RIP) damaged by floods may be repaired at up to 100 percent of federal cost for federal projects. For nonfederal projects, the repairs are cost-shared at 80 percent federal and 20 percent nonfederal sponsor. To be eligible for these repairs, the projects must be in "Active" status, and the assistance is limited to restoration of predisaster condition and level of protection. Any deferred maintenance is the responsibility of the sponsor. The intent of the program is to make the damaged flood control works operationally effective before the next flood season. See ER 500-1-1 and EP 500-1-1 for details.

Eligible projects must have an overall system rating of Acceptable or Minimally Acceptable. A Minimally Acceptable project must have deficiencies corrected within 2 years. An Unacceptable system has an Inactive status in the RIP, and the eligibility status will remain Inactive until the sponsor submits proof that all items rated Unacceptable have been corrected. Inactive systems are ineligible for rehabilitation assistance.

- Reviews and, as necessary, modifies reservoir water control manuals for improved flood management, including consideration of climate change
- Maintains current O&M manuals for completed works
- Assists in interpreting federal laws, regulations, policies

7.3.2 Federal Emergency Management Agency

The Federal Emergency Management Agency (FEMA) assists DWR with floodplain issues in the following ways:

- Produces digital flood hazard data, provides access to flood hazard data and maps via the Internet, and leads the Map Modernization Program. DWR is a FEMA Cooperating Technical Partner for floodplain mapping.
- Continues partnership with DWR to provide accurate flood hazard maps, develops and maintains a GIS database of California levees and flood management structures, provides technical outreach to communities and citizens on floodplain management issues, and supports the National Flood Insurance Program (NFIP).
- Provides other services, including levee accreditation.

7.3.3 National Weather Service

NWS and the River Forecast Center work with DWR on technical studies, flood forecasting and warning, and related activities. NWS is a colead agency with DWR in the FOC.

7.3.4 Other Assisting Federal Agencies

Several other federal agencies assist the Board and DWR in their management and oversight of the SPFC:

- U.S. Department of the Interior, Bureau of Reclamation (Reclamation)
- U.S. Fish and Wildlife Service (USFWS)
- National Marine Fisheries Service (NMFS)

7.4 As-Constructed Drawings

As-constructed drawings are on file with the USACE Sacramento District for each unit of the SPFC, but some O&M manuals include as-constructed drawings. In general, these are large-sized drawings that are physically detached from the O&M manuals. These include original drawings prepared when a unit was accepted into a project and modifications, repairs, and other changes made since originally constructed. The drawings often include profiles along the project reach. The State has collected copies of the as-constructed drawings for preparation of electronic copies for its records.

In many cases within the SRFCP, levees and other facilities were originally constructed by local interests before a federally authorized project. In some cases, facilities met or exceeded project standards and were made part of the project by USACE without modification. In other cases, USACE repaired, enlarged, or otherwise modified these existing facilities to bring them to project standards at the time of construction, or USACE constructed new facilities.

7.5 Authorizing Legislation

The State and federal authorizing legislation and supporting USACE Chief of Engineers reports for each of the projects in the SPFC are summarized in Section 2.2. Authorized projects that are completed are considered “facilities” of the SPFC, and authorized projects that are not completed are considered plans related to the SPFC.

7.6 Ongoing State-Federal Projects

State and federally authorized flood projects in the Sacramento and San Joaquin River watersheds that have not been completed are not yet considered part of the SPFC. After execution of project participation agreement by the State, and upon completion of a flood project by the USACE, the projects are turned over to the State and become facilities (or accepted modifications to facilities) of the SPFC. The current status of ongoing State-federal projects is included in the FCSSR, and will be included in updates to that document. At the time of this report, ongoing State-federal projects (or elements of State-federal projects that have not been completed) are described in Section 2.3.

7.7 Early Implementation Program

The EIP is a State program related to the SPFC, created to fund high priority projects to restore or improve flood protection in advance of the 2012 CVFPP. Projects designed and constructed under the EIP in urban areas generally provide, or are consistent with providing, flood protection to at least the 200-year level of protection required for urban areas. While projects being completed under the EIP are not part of the SPFC because the projects are not federally and State authorized at the onset, many of these projects are likely to become part of the SPFC after completion.

The EIP was created as a result of the passage of the Disaster Preparedness and Flood Prevention Bond Act of 2006 (Proposition 1E) and the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 (Proposition 84). These propositions authorized DWR to make funds available to local agencies for, among other purposes, flood protection work. These funds may be used for (1) repair, rehabilitation, reconstruction or replacement of levees, weirs, bypasses and facilities of the SPFC and (2) improving or adding facilities to the SPFC to increase levels of flood protection for urban areas. This program applies only to certain portions of the Central Valley and adjacent areas. Ongoing EIP projects at the time of this report include the following:

- LD 1 Setback Levee at Star Bend (Feather River)
- RD 17 100-Year Levee Seepage Project
- RD 2103 Bear River North Levee Rehabilitation Project
- SAFCA Natomas Levee Improvement Project (NLIP) (RD 1000)
- TRLIA (RD 784) Feather River Levee Improvement Project
- TRLIA (RD 784) Upper Yuba Levee Improvement Project
- West Sacramento Area Flood Control Agency (WSAFCA) West Sacramento Levee Improvement Project

To become part of the SPFC, projects under the EIP must complete the following process:

- After construction is complete, the project finishes the close-out phase.
- USACE prepares a Chief of Engineers Report to recommend to Congress that the completed works be incorporated into the federal project.
- Once the project has been authorized by both the State and federal governments, a State agency executes a project participation or similar agreement, and the project becomes part of the SPFC.

The process to closeout a completed project and incorporate into the SPFC may take 3 or more years.

7.8 Section 221 of the Flood Control Act of 1970

Local flood management agencies may implement flood management projects without State and federal authorization, and apply for cost-share credit under Section 221 of the Flood Control Act of 1970, as amended (42 U.S.C. 1962d-5b). These criteria for projects to be completed and eligible for cost-share credit are detailed in Section 221 cited above, including a written partnership agreement with the Secretary of the Army (unless the administrative costs associated with negotiating, executing, or administering the agreement would exceed the amount of the contribution required from the non-federal interest and are less than \$25,000).

Although projects completed under Section 221 are not part of the SPFC because the projects are not federally and State-authorized at the onset, many of these projects may become part of the SPFC after completion by following the process outlined in Section 7.7.

This page left blank intentionally.

8.0 State Plan of Flood Control Updates

This SPFC Descriptive Document includes a description of what the SPFC is at a given time. It is not a plan for future modifications. However, as the ongoing FloodSAFE initiative makes changes in the SPFC, updates to this SPFC Descriptive Document will be necessary. DWR will prepare future updates when requested by the Board.

This section describes the ongoing FloodSAFE initiatives.

8.1 Summary

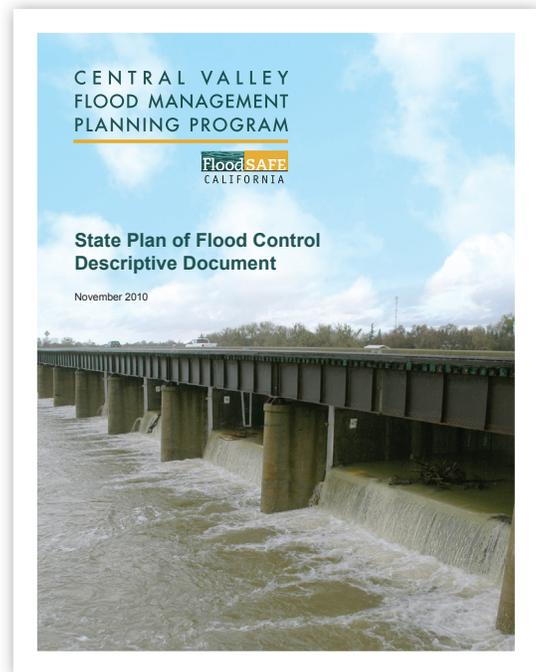
Several ongoing activities will likely lead to making improvements to existing SPFC facilities, and either add new facilities or modify existing facilities of the SPFC.

FloodSAFE is DWR's overall initiative for integrated flood management throughout California. The FloodSAFE Implementation Plan describes the work that needs to be accomplished to make flood system improvements (DWR, 2010). The SPFC is a major focus of this work.

DWR's management works closely with managers from other local, State, and federal agencies. The Roundtable provides a venue for agencies to cooperatively address the multiagency issues facing the flood management system.

The FCSSR provides information on physical deficiencies, and recommendations for improving performance of the flood management system, including the SPFC, in the Sacramento and San Joaquin river watersheds.

The CVFPP, which will cover the entire flood system, including the SPFC, will be a sustainable, integrated flood management plan describing existing flood risk in the Central Valley, and will recommend actions to reduce the probability and consequences of flooding. The CVFPP will rely on information from the FCSSR and from ongoing evaluations. The first issue of the CVFPP is scheduled for 2012, with updates every 5 years.



The SPFC Descriptive Document will be updated when requested by the Board

8.2 FloodSAFE Implementation Plan

FloodSAFE, a statewide multifaceted initiative to improve public safety through integrated flood management, builds on the State's ongoing flood management work.

8.2.1 FloodSAFE Definition

FloodSAFE is an initiative to improve integrated flood management in California through a systemwide approach, while reducing flood risk at the local and regional level. Flood management improvements will, therefore, be achieved through three processes:

1. Improve basic flood management functions, including flood emergency response, O&M of flood management facilities, management of floodplains, and assistance with local projects.
2. Implement regional projects to reduce flood risks, including "early implementation projects" and implementation of USACE projects.

3. Implement a systemwide approach in which broad system evaluation is conducted (i.e., map floodplains and evaluate levee conditions throughout the system) to determine flood system deficiencies and define feasible projects/programs to remedy system deficiencies by developing a comprehensive systemwide flood protection plan for the Central Valley (i.e., CVFPP).

8.2.2 Implementation Plan

The FloodSAFE *Implementation Plan* (DWR, 2010) defines authorities, responsibilities, timelines, budgets, priorities, and expected outcomes of flood management programs as they are currently known. The implementation plan was prepared at a strategic level of detail to describe the overall objectives of the FloodSAFE initiative and how the work will be accomplished in seven functional areas to achieve these objectives. The seven functional areas describe the type of work being done, rather than organizational structure within DWR's Division of Flood Management.

The implementation plan focuses on flood management work required over approximately the next 5 years, but also provides long-term direction to 2025 and beyond. Much of this work is directly related to improving the SPFC. The seven functional areas are as follows:

- Flood emergency response
- O&M and environmental stewardship
- Floodplain risk management
- Flood protection projects and project grants
- Evaluation and engineering
- Flood management planning and conservation strategy
- Legislation, budget, and communication

8.3 California Levees Roundtable

The Roundtable was created through an effort by officials at the Board following the successful Levee Vegetation Science Conference organized by SAFCA, DWR, and USACE in August 2007. The Roundtable comprises senior-level officials representing USACE from Headquarters, the South Pacific Division, and the Sacramento District, and the Board, DWR,

NMFS, USFWS, DFG, RD 2068, and SAFCA. The Roundtable agencies worked together to prepare a short-term framework, the *California Central Valley Flood System Improvement Framework* (California Levees Roundtable, 2009), for flood system improvements that are already underway or will be initiated before a comprehensive plan is ready in 2012. The report was adopted by the Board.

The Roundtable continues to meet at the management level to cooperatively address the multiagency issues facing the flood management system.

8.4 Flood Control System Status Report

In 2007, the State Legislature authorized DWR, in Section 9120 of the CWC, to prepare an FCSSR for the SPFC, which is to provide a complete description and analysis of the SPFC, identification of evident deficiencies, and recommendations for improving the performance of the system.

In part, Section 9120 of the CWC states the following:

§9120. (a) The department shall prepare and the board shall adopt a flood control system status report for the State Plan of Flood Control. This status report shall be updated periodically, as determined by the board. For the purpose of preparing the report, the department shall inspect the project levees and review available information to ascertain whether there are evident deficiencies.

(b) The status report shall include identification and description of each facility, an estimate of the risk of levee failure, a discussion of the inspection and review undertaken pursuant to subdivision (a), and appropriate recommendations regarding the levees and future work activities.

The FCSSR contains information on the current status of the SPFC.

8.5 Central Valley Flood Protection Plan

The CVFPP will be a sustainable, integrated flood management plan describing existing flood risk in the Sacramento and San Joaquin River watersheds, and recommending actions to reduce the probability and consequences of flooding. The CVFPP

will include the entire flood management system, of which the SPFC is a part. The CVFPP will also identify mutual goals, objectives, and constraints important in the planning process; distinguish plan elements that address mutual flood risks; and recommend improvements to the State-federal flood management system.

Primary authorization for the CVFPP originates in SB 5, also known as the Central Valley Flood Protection Act of 2008, resulting in specific requirements described in Division 5, Part 6 in the CWC Sections 9600 through 9625. According to the legislation, DWR is to prepare the CVFPP by January 1, 2012, for adoption by the Board. The Board is to hold public hearings and adopt the CVFPP by July 2012 (CWC Section 9612(b)). The CVFPP is to be updated every 5 years thereafter. At the time of this report, the 2012 CVFPP is being prepared as a long-term planning document, to accomplish the following:

- Create a broadly supported plan for improving integrated flood management in Central Valley
- Promote understanding related to integrated flood management from State, federal, local, regional, tribal and other perspectives
- Develop new data and information that can be shared for many purposes

The CVFPP will support and guide many implementation activities by local, State, and federal agencies for subsequent feasibility studies, environmental compliance, design, and construction. Development of the CVFPP will be coordinated closely with USACE's *Central Valley Integrated Flood Management Study*.

The 2012 CVFPP is to be a descriptive document and reflect a systemwide approach to protecting areas of the Sacramento and San Joaquin River watersheds currently receiving protection from flooding by existing facilities of the SPFC. In addition, the CVFPP will include a prioritized list, schedule of implementation, and recommendations on both structural and nonstructural means for improving performance and eliminating deficiencies of flood management facilities, and addressing ecosystem and other water-related objectives.

8.6 Ongoing Evaluations, Projects, and Repairs

As part of DWR's FloodSAFE initiative, work is underway by DWR's Division of Flood Management on evaluation and engineering assessments of existing flood management facilities to identify deficiencies and needed improvements. Ongoing evaluations, projects, and repairs are detailed in the FCSSR, and updates to the SPFC related to that work will be included in updates to the FCSSR.

8.6.1 Urban Levee Evaluations

One of the highest priorities of the FloodSAFE initiative is the evaluation of levees protecting urban areas with populations greater than 10,000 residents. The Urban Levee Evaluations (ULE) Project is performing a geotechnical evaluation on approximately 350 miles of the State-federal levee system of the Sacramento and San Joaquin Flood Control Projects (project levees), focusing on levees protecting the approximate urban areas of Sutter Basin, Marysville, RD 784, Woodland, Natomas, West Sacramento, Davis, San Joaquin Area Flood Control Agency, RD 404, and RD 17. As part of a systemwide approach, ULE is also performing the same evaluation of about 120 miles of nonproject levees that protect the same urban areas. This project consists of geotechnical exploration, testing, and analysis required to evaluate the performance and safety of existing urban project and nonproject levees, and prefeasibility-level designs and cost estimates for potential levee repairs where deficiencies are noted.

8.6.2 Non-Urban Levee Evaluations

DWR's Non-Urban Levee Evaluations (NULE) Project is evaluating more than 1,200 miles of nonurban State-federal project levees and approximately 400 miles of appurtenant nonurban, nonproject levees to determine if they meet defined geotechnical criteria and, where needed, to identify remedial measures and develop corresponding cost estimates to meet those criteria.

8.6.3 Systemwide Modeling

DWR and USACE are evaluating hydrologic and hydraulic information throughout the system to determine flood flows and elevations during different frequency flood events. A variety of other system evaluations will assist work to prepare the CVFPP.

8.6.4 Levee Repairs

Existing levees can have critical problems that could lead to failure during high-water events. Repair of these sites is needed regardless of other planned system improvements. Repairs can be made if the benefit/cost ratio is greater than 1. The Critical Levee Repair Program was established by DWR to carry out critical levee repair work authorized by the 2006 Disaster Preparedness and Flood Prevention Bond Act. Certain levees have already been identified as needing repair as a result of existing inspection programs and problems encountered during recent high-water events. Completed repairs are expected to correct deficiencies, including, but not limited to, underseepage, insufficient freeboard, unchecked erosion, and instability. This work will complete levee and erosion repairs begun under AB 142

funding, and correct deficient levees identified by other programs. The current status of levee repairs to address identified deficiencies is included in the FCSSR.

- **Levee Repairs** – Levee repairs can be made when urgent underseepage and slope instability problems exist in an existing levee. The work includes repairs of levee structural problems, exclusive of erosion repairs under the following component. Designs will be developed to repair basic levee deficiencies but not necessarily to increase levels of protection beyond the original levee design. This includes levee stability repairs and work funded by Public Law 84-99, Rehabilitation Assistance.
- **Erosion Control** – Actions to arrest erosion have been taken under the SRBPP and San Joaquin River Erosion Protection Program. Since 2006, DWR has spent \$300 million and USACE has spent \$140 million for a total of 116 critical and 149 proactive noncritical levee erosion sites. Currently, approximately 161 erosion sites have been identified by USACE as needing bank protection.

9.0 Observations

Because this SPFC Descriptive Document is intended as a reference document for the existing SPFC, no recommendations for improvements are provided. However, during compilation of material for the document, some observations could be made to facilitate presentation of SPFC materials.

1. While SPFC property right records are based on physically accessing information about a specific parcel of land, electronic access to that information and electronic representation would make the information more useful.
2. Easements along levee toes appear insufficient. A plan for securing needed easements, including access to various levee reaches, as part of the CVFPP, could improve long-term O&M of the SPFC. The State and LMAs may not have the necessary land rights to operate and maintain SPFC facilities as intended.
3. Some of the bank protection sites along the Red Bluff to Chico Landing reach of the Sacramento River (O&M Manual SAC512) no longer appear to be effective but are still part of the SPFC. These may be candidate features for removal from the SPFC.
4. While some O&M manuals include information on improvements since original construction, other O&M manuals may not be up to date and could benefit from this supplemental information.
5. There may be supplemental O&M manuals that have either not been located or have not been produced.
6. Unpermitted encroachments on SPFC facilities are incompatible with O&M of SPFC facilities and should be removed.
7. Some projects like Salt Creek, McClure Creek, and Dry Creek at Adin currently meet the definition of the SPFC, but clearly perform no significant function regarding the flood control system as a whole along the Sacramento River, and perhaps are candidates for removal from the SPFC.
8. River mile numbers for the 1957 Revised Profile Drawings for the SRFCP and other sources are not consistent (USACE, 1957a).
9. Design flood flows contained in O&M manuals are often different than design flows obtained from the 1957 Revised Profile Drawings. In addition, results from local, State, federal, and agency studies indicate that actual flow capacities at time of project completion do not agree with either the O&M design capacities or 1957 design flood capacities, in many cases.
10. DWR operates SPFC facilities based on the 1957 and 1955 profiles rather than on design flows from the O&M manuals, but it is unknown if the Board officially adopted the profiles for operation.
11. USACE use of uncertainty analysis to characterize the system is inconsistent with the system's characterization in the O&M manuals. Future reconciliation may be required.
12. Channel maintenance responsibilities for much of the San Joaquin River Flood Control System should be more clearly identified.
13. The 1991 Aerial Atlas should be updated as a reference document, and coverage extended to include tributary streams.

This page left blank intentionally.

10.0 Acronyms and Abbreviations

1955 Profile San Joaquin River and Tributaries Project, California, Levee Profiles

1957 Revised Profile Drawings Sacramento River Flood Control Project, California, Levee and Channel Profiles

AB Assembly Bill

Board The Reclamation Board or Central Valley Flood Protection Board

CALEMA California Emergency Management Agency

CCC California Civil Code

CCR California Code of Regulations

CDEC California Data Exchange Center

CEQA California Environmental Quality Act

CFR Code of Federal Regulations

cfs cubic feet per second

CLD California Levee Database

CVFPP Central Valley Flood Protection Plan

CWC California Water Code

Delta Sacramento-San Joaquin Delta

DFG California Department of Fish and Game

DVD digital versatile disc

DWR California Department of Water Resources

EIP Early Implementation Program

EM Engineering Manual

ETL Engineering Technical Letter

facilities flood control projects and works

FCSSR Flood Control System Status Report

FEMA Federal Emergency Management Agency

FloodSAFE FloodSAFE California initiative

FOC Flood Operations Center

FRS Flood Relief Structure

GIS geographic information system

HD U.S. House document

LCA Local Cooperation Agreement

LMA local maintaining agency

LPCA Local Project Cooperation Agreement

LPPA Local Project Partnership Agreement

MA maintenance area

MOU Memorandum of Understanding

NFIP National Flood Insurance Program

NGVD National Geodetic Vertical Datum

NLIP Natomas Levee Improvement Project

State Plan of Flood Control Descriptive Document

NMFS	National Marine Fisheries Services
NULE	Non-Urban Levee Evaluations
NWS	National Weather Service
O&M	operations and maintenance
OMRR&R	operation, maintenance, repair, replacement, and rehabilitation
PCA	Project Cooperation Agreement
PPA	Project Partnership Agreement
Proposition 1E	Disaster Preparedness and Flood Prevention Act of 2006
RD	Reclamation District
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
RIP	Rehabilitation and Inspection Program
Roundtable	California Levees Roundtable
SAFCA	Sacramento Area Flood Control Agency
SD	U.S. Senate document
SPFC	State Plan of Flood Control
SRBPP	Sacramento River Bank Protection Project
SRFCP	Sacramento River Flood Control Project
SSJDD	Sacramento-San Joaquin Drainage District
State	State of California
TRLIA	Three Rivers Levee Improvement Authority
ULE	Urban Levee Evaluations
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WPRR	Western Pacific Railroad
WRDA	Water Resources Development Act
WSAFCA	West Sacramento Area Flood Control Agency

11.0 References

California Department of Water Resources (DWR). 2009. AB 156, Local Agency Annual Report 2009 for Project Levees of the State Plan of Flood Control.

———.2009a. Draft Technical Memorandum, Historical Reference Document for the State Plan of Flood Control. May.

———.2010. FloodSAFE Implementation Plan (Internal Draft). California. March.

California Levees Roundtable. 2009. California's Central Valley Flood System Improvement Framework. February 27.

Central Valley Flood Protection Board (Board). 1986. Environmental Impact Report for the Butte Basin Overflow Area. Prepared for The Reclamation Board by Woodward-Clyde Consultants. December.

———.1986. December 19, 1986. Meeting Minutes of the Reclamation Board. Concurrent approval of EIR and adoption of Butte Basin Plan of Flood Control.

Flood Emergency Action Team (FEAT). 1997. Final Report.

Kelley, Robert. 1989. Battling the Inland Sea: Floods, Public Policy, and the Sacramento Valley, 1850-1986.

Resources Agency et al., 1964. Master Plan for Flood Control in the Butte Basin.

U.S. Army Corps of Engineers (USACE). 1955a. San Joaquin River and Tributaries Project, California, Levee Profiles. December 23.

———. 1955b. Design Memorandum No. 1, San Joaquin River Levees, Lower San Joaquin River and Tributaries Project, California, General Design. December 23.

———. 1957a. Sacramento River Flood Control Project, California, Levee and Channel Profiles. March 15. Revised August 1969. Created 2006.

———. 1957b. Cache Creek Basin California, Middle Creek Project, Stream Profiles. February 20.

———. 1959. Sacramento District. Standard Operation and Maintenance Manual for the Lower San Joaquin River and Tributaries Project, California. April.

———. 1965. Mormon Slough Project, San Joaquin County, Plan of Improvement, Profile and Flood Plane. November 19.

———. 1969. Sacramento District. Form letter from A. Gomez to The Reclamation Board regarding Sacramento River Flood Control System, Project Design Flows.

———. 1988. Final Supplement III to Final Environmental Impact Statement and Final Environmental Impact Report Butte Basin Reach, Sacramento River Bank Protection Project. Sacramento District. January

———. 1997. Water Management Sacramento District Projects California (Sacramento, Truckee, San Joaquin, and Tulare Basins). Sacramento District.

———. 1999. Sacramento-San Joaquin River Basins Comprehensive Study Phase I Documentation Report. March.

———. 2000. Guidelines for Landscape Planting at Floodwalls, Levees & Embankment Dams. January 1.

———. 2006. USCAE Construction-Operations Division. Letter from Ronald Light, District Engineer, to The Reclamation Board regarding allowable vegetation within floodways.

———. 2007. Treatment of Vegetation Within Local Flood Damage Reduction Systems. April.

———. 2009. Engineering and Design: Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures. April 10.

USACE and The Reclamation Board. 1953. 1953 Memorandum of Understanding, and Supplements.