CENTRAL VALLEY FLOOD PROTECTION PLAN

Progress Report

January 2011

California
Department of
Water Resources

CENTRAL VALLEY
FLOOD MANAGEMENT
PLANNING PROGRAM

FloodSAFE
CALIFORNIA

Cover Photo:

Sacramento River, City of Sacramento

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INTRODUCTION

This *Central Valley Flood Protection Plan Progress Report* (Progress Report) has been prepared in response to California Water Code Section 9610(c), which requires the California Department of Water Resources (DWR) to report on the progress and development of the *Central Valley Flood Protection Plan* (CVFPP or Plan) on or before December 31, 2010. Legislation requires this Progress Report to be posted on the Central Valley Flood Protection Board's (Board) Web site[1] and made available to the public. The Progress Report summarizes progress-to-date in developing the 2012 CVFPP; the anticipated content of, and uses for, the 2012 CVFPP; and its connections to other major projects and programs.

DWR is required to prepare the CVFPP by January 1, 2012, for adoption by the Board by July 1, 2012. The Plan will be updated every 5 years thereafter (in years ending in 7 and 2). As the first edition of this long-term planning document, the 2012 CVFPP will describe a broadly supported vision for improving integrated flood management in the Sacramento-San Joaquin Valley. It is being produced in coordination with federal, tribal, regional, and local entities, and other interested parties, and will guide many subsequent implementation activities.

Urban development along the Sacramento River

[1] *http://www.cvfpb.ca.gov*

The Central Valley Flood Management Planning (CVFMP) Program is one of several programs managed by DWR under FloodSAFE California (FloodSAFE), a multifaceted initiative launched in 2006 to improve integrated flood management in the State of California (State). The CVFMP Program addresses flood management planning activities within the Central Valley that require State leadership and participation. Several documents are being prepared under the CVFMP Program to collectively meet requirements of the Central Valley Flood Protection Act of 2008, and related flood legislation passed in 2007 (Figure 1). In addition, DWR is coordinating with the U.S. Army Corps of Engineers (USACE) on its companion effort, the Central Valley Integrated Flood Management Study.

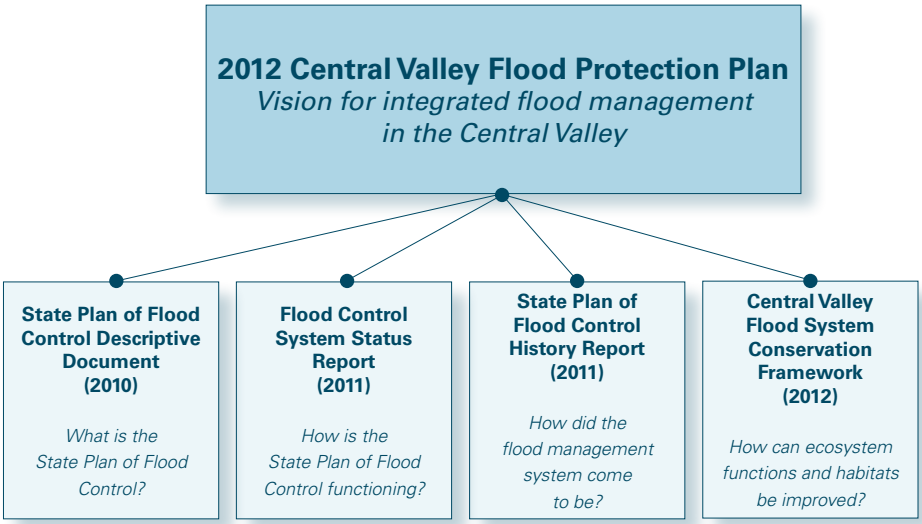


Figure 1 – Various efforts under the Central Valley Flood Management Planning Program will collectively meet the intent and requirements of the Central Valley Flood Protection Act of 2008

CENTRAL VALLEY FLOOD PROTECTION PLAN

The Central Valley of California has experienced some of the State's largest and most damaging floods. The existing flood management system in the Central Valley consists of a number of projects individually constructed over the last 150 years, including dams and reservoirs, levees, channels, weirs, bypasses, and other features that provide varying levels of flood protection. This system provides public safety, has prevented billions of dollars in flood damages in the Central Valley, and its multiple benefits have supported a vibrant California economy.

But today, much of this legacy system is characterized by aging infrastructure constructed using outdated techniques, and it is being relied on to provide benefits that were not envisioned when its elements were first constructed. Along many reaches of river in the system, ecosystem functions and natural habitats have been severely degraded over time. As currently configured, the system is prone to erosive river forces, is easily distressed from high water, and does not support healthy ecosystem functions and natural floodplain habitats. Further, because of limited funding and other constraints, State and local agencies have found it increasingly difficult to carry out adequate maintenance programs. At the same time, escalating development in Central Valley floodplains has increased the population at risk and the potential for flood damages to homes, businesses, communities, and critical statewide infrastructure.

A combination of recent events, including flooding related to Hurricane Katrina in New Orleans, has highlighted the vulnerability of the Central Valley to catastrophic floods, the potential consequences to life and property (particularly in deep floodplains), and impacts to the financial stability of the State. In 2008, DWR embarked on the CVFMP Program, a long-term planning effort to improve **integrated flood management** within the Central Valley, and carry out direction from the California Legislature. A major component of the CVFMP Program, the CVFPP will be a sustainable, integrated flood management plan that describes existing flood risk and guides State, federal, and local actions for improving flood management in this vital region of the State.[2]

Integrated flood management

is an approach to flood risk that recognizes the interconnection of flood management actions within broader water resources management and land use planning; the value of coordinating across geographic and agency boundaries; the need to evaluate opportunities and potential impacts from a system perspective; the integration of environmental stewardship; and the promotion of sustainability.

River rescue along the Cosumnes River in 1997

For the 2012 CVFPP, goals (Figure 2) have been identified and principles and objectives will be developed, all of which are important in the planning process. It will recommend actions that can be taken to reduce flood risks, and describe a framework for implementing future improvements. The integrated, multi-benefit approach to creating the 2012 CVFPP includes developing environmental conservation strategies and actions that can improve long-term flood system sustainability while providing options for addressing long-term compliance with environmental regulations associated with operations and maintenance. In addition, the 2012 CVFPP will identify potential modifications to the State Plan of Flood Control (SPFC) that should be studied further for consideration in the 2017 CVFPP update.

[2] See the *2007 California Flood Legislation SUMMARY* and *2007 California Flood Legislation COMPANION REFERENCE* for information on legislative guidance (*http://www.water.ca.gov/legislation/*).

Primary Goal

- **Improve Flood Risk Management** – Reduce the chance of flooding, and damages once flooding occurs, and improve public safety, preparedness, and emergency response through the following:
  - » *Identifying, recommending, and implementing structural and nonstructural projects and actions that benefit lands currently receiving protection from facilities of the SPFC.*
  - » *Formulating standards, criteria, and guidelines to facilitate implementation of structural and nonstructural actions for protecting urban areas and other lands of the Sacramento and San Joaquin river basins and the Delta.*

Supporting Goals

- **Improve Operations and Maintenance** – Reduce systemwide maintenance and repair requirements by modifying the flood management systems in ways that are compatible with natural processes, and adjust, coordinate, and streamline regulatory and institutional standards, funding, and practices for operations and maintenance, including significant repairs.
- **Promote Ecosystem Functions** – Integrate the recovery and restoration of key physical processes, self-sustaining ecological functions, native habitats, and species into flood management system improvements.
- **Improve Institutional Support** – Develop stable institutional structures, coordination protocols, and financial frameworks that enable effective and adaptive integrated flood management (designs, operations and maintenance, permitting, preparedness, response, recovery, and land use and development planning).
- **Promote Multi-Benefit Projects** – Describe flood management projects and actions that also contribute to broader integrated water management objectives identified through other programs.

Figure 2 – Central Valley Flood Protection Plan Goals

Geographic Scope

For planning and analysis purposes, and consistent with legislative direction, two geographical planning areas are important for developing the CVFPP (Figure 3):

- **SPFC Planning Area** – This area is defined as lands currently receiving protection from facilities of the SPFC. The State's flood management responsibility in the Central Valley is limited to this area.
- **Systemwide Planning Area** – This area includes lands that receive protection from the current facilities and operation of the Sacramento-San Joaquin River Flood Management System.[3] This area includes facilities that provide significant systemwide benefits (such as reservoirs on major tributaries) or that protect urban areas within the Sacramento-San Joaquin Valley. The SPFC Planning Area is contained within the Systemwide Planning Area.

Within the Systemwide Planning Area, the CVFPP will describe flood management facilities, evaluate flood problems and needs, and develop potential solutions. The Plan will focus on SPFC facilities and the lands currently receiving protection; consequently, more detailed analyses will be conducted within the SPFC Planning Area. However, management actions[4] could be considered anywhere within the watersheds tributary to the Sacramento and San Joaquin rivers to achieve CVFPP goals within the Systemwide Planning Area.

[3] The Sacramento-San Joaquin River Flood Management System includes facilities of the SPFC and other flood management facilities that provide significant systemwide benefits for managing flood risks, or that protect urban areas, within the Sacramento-San Joaquin Valley (California Water Code, Section 9611).

[4] Management actions are individual strategies, actions, or tactics that can address one or more of the CVFPP goals.

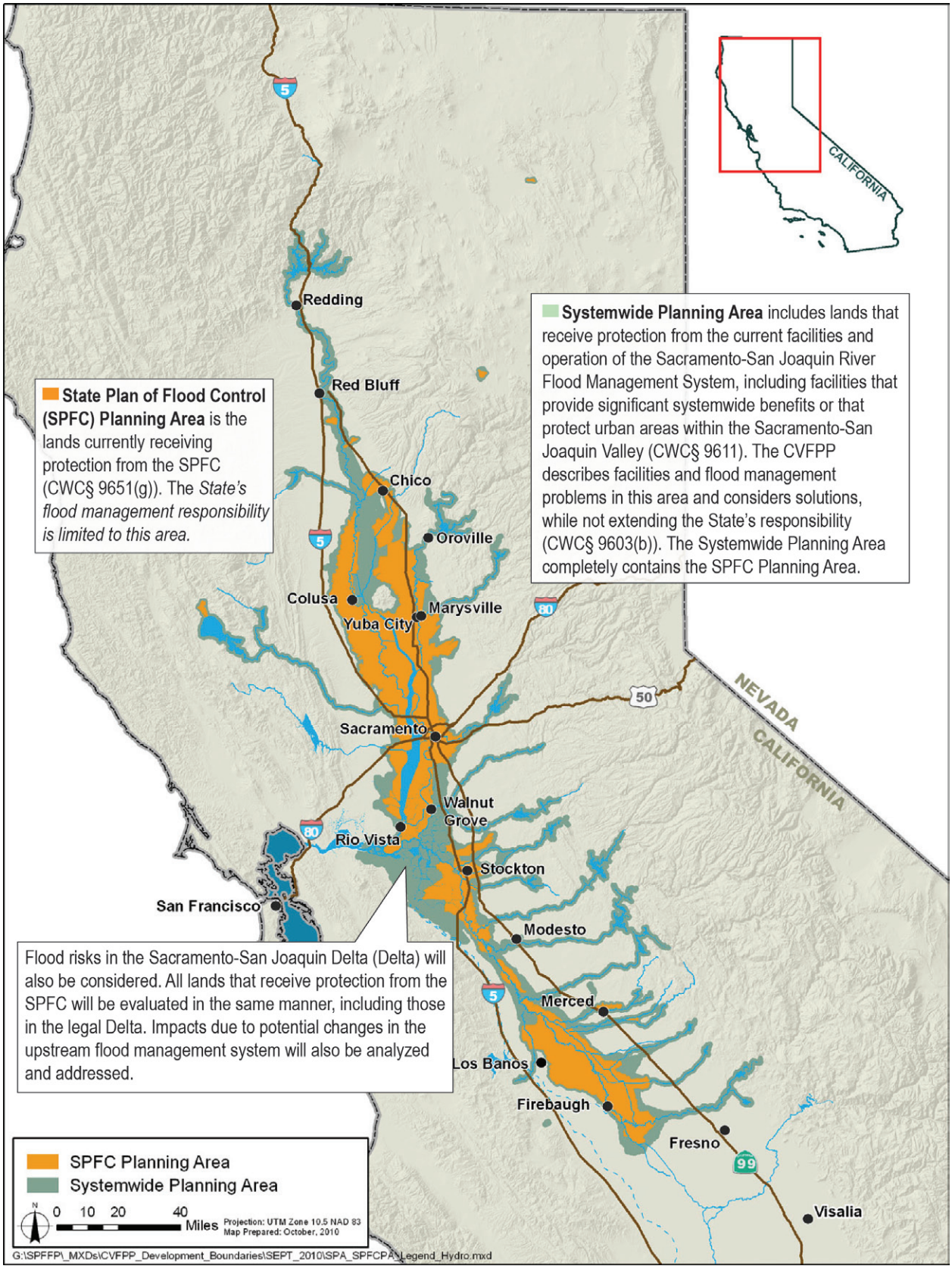


Figure 3 – Geographic Scope of the Central Valley Flood Protection Plan

Content of the 2012 Central Valley Flood Protection Plan

The 2012 CVFPP will have three primary elements: a vision for flood management in the Central Valley, a framework for implementing future projects to achieve this vision, and initial recommendations for improvements.

Vision for Flood Management

The guiding vision for the 2012 CVFPP is to provide the foundation for risk-informed State decision making. It will acknowledge the need to improve public safety, recognize the value of natural systems in managing floods, integrate broader water resources and environmental benefits, and incorporate resiliency to manage changing conditions. The vision will also reflect the varied perspectives on flood management that exist throughout the Central Valley, communicated through DWR's ongoing engagement effort for CVFPP development.

To achieve this long-term vision, DWR will consider a range of potential approaches to improve Central Valley flood management, on a systemwide scale. By comparing these approaches, decision makers and the public can better understand the costs, benefits, implementation time frames, and associated tradeoffs.

Implementation Elements

Improving flood management in the Central Valley is an ongoing, long-term endeavor, and achieving the vision of systemwide improvements will take many years. An important focus of the 2012 CVFPP will be developing a framework for implementing future changes to the flood management system, including the following:

- **Process for updating the CVFPP every 5 years** – The 2012 CVFPP will describe the anticipated process for updating the Plan, consistent with legislative direction.
- **Description of State, federal, and local agency roles and responsibilities** – Improvements to the flood management system may be initiated and/or led by State, federal, or local interests, depending on geographic scale, magnitude and extent of benefits, types of benefits achieved, and existing agency authorities. The Plan will describe the basis for determining these roles and responsibilities, which could range from leadership to financial assistance during implementation.
- **State cost-sharing approach** – The 2012 CVFPP will present a systemwide benefits analysis approach, forming the basis for State financial participation in future flood management projects in the Central Valley. Individual flood management improvement projects may provide local, regional, and/or systemwide benefits, depending on their scope, scale, and configuration. Further, projects may provide different types of benefits, such as flood risk reduction, environmental restoration, or water supply. A systemwide approach to cost-sharing will support equitable distribution of project costs among beneficiaries, encourage projects that provide benefits outside their immediate locales, and help achieve multiple benefits, when feasible.
- **Sustainable financing** – Successful implementation of the CVFPP will require sustainable funding for both improvement projects and operations and maintenance. To be prepared upon adoption of the 2012 CVFPP, a financing strategy will recognize the need to balance a variety of State, federal, and local funding mechanisms, including, but not limited to, assessments, bonds, fees, federal appropriations, and public-private partnerships.
- **Guidance for cities and counties** – Legislation passed in 2007 requires local jurisdictions to consider flood risk and flood management in local land use planning practices concurrent with development of the 2012 CVFPP, and after its adoption by the Board. The 2012 CVFPP will provide guidance on how cities and counties can demonstrate consistency with the CVFPP and legislated flood protection requirements, pursuant to California Government Code Sections 65302.9 and 65860.1.
- **Conservation Framework** – A Central Valley Flood System Conservation Strategy is being developed by DWR to meet the environmental objectives of the Central Valley Flood Protection Act of 2008 and provide systemwide environmental support for implementing the CVFPP (see description on page 8). The 2012 CVFPP will describe a framework for this broader conservation strategy, and its relationship to future improvements to the flood management system.

Initial Recommendations

The CVFPP will evolve over time and become more specific as new information is developed, detailed feasibility studies are conducted, and updates are completed. The 2012 CVFPP will include a prioritized list of recommended actions to meet the CVFPP goals. The 2017 CVFPP update is expected to include additional recommendations for long-term improvements to the system.

Recommendations made in the 2012 CVFPP will include policy and institutional changes to facilitate long-term flood management improvements, such as changes to permitting processes, educational programs, or the way revenues are generated for improvement projects and operations and maintenance activities (such as vegetation management). Other recommendations will likely call for detailed studies of potential improvements that have shown strong potential to provide measurable systemwide benefits.

Similar to DWR's current Early Implementation Program (initiated in 2007), additional locally developed projects may be identified before the 2017 update. If consistent with the goals, principles, and objectives of the 2012 CVFPP, these projects may move forward with State support as Plan-based implementation projects. These projects would be developed and implemented by local or regional entities, USACE, and/or the State.

Environmental Review Under the California Environmental Quality Act

A recently initiated *Program Environmental Impact Report* under the California Environmental Quality Act (CEQA) will be prepared to facilitate Board adoption of the 2012 CVFPP. The report will analyze the broad, potential impacts associated with adopting the CVFPP, at a program scale. Subsequent implementation actions stemming from adoption of the CVFPP will likely require project-level environmental review for CEQA compliance. Per agreement with the Board, DWR will act as lead agency and be responsible for compliance with CEQA requirements and guidelines, and for certifying the *Program Environmental Impact Report*. As a responsible agency, the Board will independently consider the findings in the *Program Environmental Impact Report*, and reach its own conclusions related to adoption of the CVFPP.

Setback levee constructed along the Feather River in 2009

Development Process

The 2012 CVFPP is being developed using an iterative planning process, shown in Figure 4. Extensive public engagement occurred as part of Phases 1 and 2, which are now complete. Originally outlined in four phases, the concluding phases of CVFPP development (Phases 3 and 4) have been redefined and streamlined based on input from partners and interested parties. Engagement for this final phase will be initiated in early 2011.

The CVFPP is a long-term planning effort, and systemwide planning in the Central Valley will continue after the 2012 Plan is adopted. Planning for the 2017 CVFPP update will support identifying a more detailed set of management actions to satisfy all CVFPP goals. DWR is coordinating with existing flood protection programs so that ongoing projects and projects implemented between now and 2017 will be consistent with CVFPP goals, principles, and objectives. New information and implemented projects will be incorporated into future CVFPP updates.

Central Valley Flood System Conservation Strategy

As mentioned, the Central Valley Flood System Conservation Strategy is being developed by DWR, with broad State/federal agency and stakeholder participation, to meet the environmental objectives of the Central Valley Flood Protection Act of 2008. These objectives include the following:

- Promoting natural dynamic, hydrologic, and geomorphic processes
- Increasing and improving habitat quantity, diversity, and connectivity
- Promoting the recovery and stability of native species populations

The strategy is a coordinated, systemwide approach that will provide environmental support for both the 2012 CVFPP and future updates. It will include streamlined regional regulatory approaches to support integrated flood management projects, help reduce long-term operations and maintenance costs, and incorporate environmental solutions as part of project design to provide greater environmental benefits and restore natural ecosystem processes. The Central Valley Flood System Conservation Strategy will evaluate the use of regional permitting processes, such as Habitat Conservation Plans/Natural Commu-

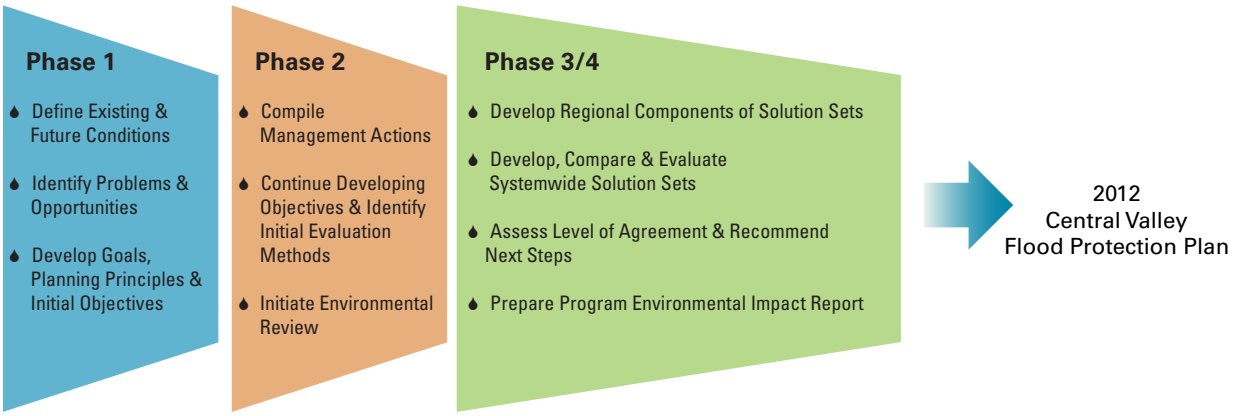


Figure 4 – Planning Process for 2012 Central Valley Flood Protection Plan Development

nity Conservation Plans, to provide California Endangered Species Act and federal Endangered Species Act coverage for implementing projects under the CVFPP, and ongoing flood operations and maintenance.

ANTICIPATED USES FOR THE CENTRAL VALLEY FLOOD PROTECTION PLAN

The CVFPP will guide a variety of follow-on studies and planning efforts, environmental reviews, and implementation actions. It may be used differently by State, federal, local, and regional agencies, as described briefly below.

State

The CVFPP will recommend potential State actions to directly or indirectly improve flood management in the Central Valley. Neither development nor adoption of the CVFPP represents a commitment by the State to provide or to maintain any particular level of flood protection (California Water Code Section 9603(a)). State participation in implementation may range from leadership in project development and financial assistance to technical support. State agencies may also pursue recommended changes to policies, standards, or regulations, as appropriate to their existing authorities.

For example, DWR may participate in recommended follow-on feasibility studies, or pursue improvements to its core flood management functions (such as operations and maintenance or emergency response). The Plan will also help define DWR's role in future improvement projects, including risk assessments, urgent repairs, and local and regional projects. DWR is currently developing criteria for local agencies to use in demonstrating an urban level of protection for urban and urbanizing areas,[5] pursuant to California Water Code Section 9602. After adoption of the Plan, DWR will continue to provide technical assistance to local jurisdictions in applying these criteria and aligning local planning efforts and the CVFPP.

After adoption of the 2012 CVFPP, the Board may choose to take action within its existing jurisdictional and regulatory capacities. Adoption of the Plan by the Board will trigger various existing requirements related to local land use planning and management (see Local and Regional, below).

Other State agencies may also choose to take action within their existing jurisdictional roles and responsibilities based on information in the CVFPP.

Federal

USACE will jointly implement the Central Valley Integrated Flood Management Study with DWR and the Board as the nonfederal sponsors. Scheduled to be completed in 2017, this program-level feasibility study will complement the CVFPP. It will define a long-range flood management program for the Sacramento and San Joaquin river basins and a corresponding level of federal participation. In relation to the CVFPP, the study will also evaluate flood management improvements in the Central Valley from a federal perspective, and help determine federal interest in implementation. USACE intends to coordinate closely on CVFPP development to provide input, review documents, and produce joint data, information, and analytical tools. USACE will also provide technical expertise in the areas of flood hydrology development, reservoir operations analyses, and incorporation of risk-based decision making processes that improve system reliability.

The Central Valley Integrated Flood Management Study may result in Congressional action authorizing or modifying federal participation in projects consistent with the CVFPP. The CVFPP may also influence federal actions or provide information to ongoing or new USACE feasibility studies evaluating site-specific improvements to the flood management system.

[5] Urban areas are defined as developed areas with 10,000 residents or more, and urbanizing areas are those with an anticipated population of greater than 10,000 residents within 10 years.

Ranch land flooded in Wilton in 1997

The CVFPP is unlikely to directly influence current activities of the Federal Emergency Management Agency (FEMA), such as administration of the National Flood Insurance Program. However, the CVFPP may recommend changes to the scope or administration of federal programs related to flood risk management.

Local and Regional

Adoption of the 2012 CVFPP will trigger various requirements related to local land use planning and management. These requirements oblige local jurisdictions to consider flood risk and flood management in their planning and decision making processes (such as general plans, zoning ordinances, development agreements, and other discretionary actions), both concurrent with development of the 2012 CVFPP and after its adoption by the Board.[6] Local jurisdictions may use information or guidance contained in the CVFPP to demonstrate consistency with State urban flood protection requirements, or to guide development of local or regional flood projects consistent with the CVFPP to garner State financial participation.

CONTEXT WITHIN FLOODSAFE CALIFORNIA

As mentioned, the CVFPP is being developed under FloodSAFE, a multifaceted and collaborative statewide initiative to improve public safety through integrated flood management. A long-term initiative, FloodSAFE is focused on the following goals:

- Reduce the chance of flooding
- Reduce the consequences of flooding
- Sustain economic growth
- Protect and enhance ecosystems
- Promote sustainability

FloodSAFE will accomplish these goals through four types of activities (Figure 5): improving emergency response, improving flood management systems, improving operations and maintenance, and informing and assisting the public.

DWR is implementing various aspects of FloodSAFE using funds from the Disaster Preparedness and Flood Prevention Bond Act (Proposition 1E) and the Safe Drinking Water,

Figure 5 – California FloodSAFE Program Activities

[6] For more information on these requirements, refer to *Implementing California Flood Legislation into Local Land Use Planning: A Handbook for Local Communities* (DWR, October 2010) (*http://www.water.ca.gov/floodmgmt/lrafmo/fmb/fas/specialprojects/localfloodriskplanning/*)

Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act (Proposition 84), with direction from the 2007 flood legislation. It is recognized that funding provided by Propositions 1E and 84 will not be sufficient to realize all of the envisioned improvements to flood management in the Central Valley, which will take many years to complete. Successful implementation of FloodSAFE and the CVFPP will require additional, sustainable funding streams for both improvement projects and core flood management functions.

The CVFPP is a central element of long-term FloodSAFE implementation, which includes the following:

- **Core Flood Management Programs** – FloodSAFE encompasses many of DWR's traditional, core flood management functions, including emergency response, operations and maintenance, environmental stewardship, floodplain management, and support for Board functions.
- **Planning** – Systemwide planning, including preparation of the CVFPP and Central Valley Flood System Conservation Strategy, will continue to serve a central role in guiding both core flood management programs and implementation activities into the future. This element also includes coordination with USACE planning, such as the Central Valley Integrated Flood Management Study and other studies.
- **Implementation** – DWR's traditional implementation activities (such as erosion repairs, grants, and special projects) are currently transitioning into regional flood management activities to be guided by the 2012 CVFPP and future updates. These activities will focus on flood risk management, urgent repairs, flood system project improvements, and local community improvements, and will complement federal capital outlay projects for which USACE has identified an interest.

Currently, many programs and functions within DWR are providing information, data, and support to develop the 2012 CVFPP and its recommendations. After adoption of the 2012 CVFPP, and with each subsequent update, DWR programs and functions will in turn be guided and influenced by the Plan's recommendations and implementation framework.

PROGRESS-TO-DATE

Progress-to-date to develop the 2012 CVFPP includes work to achieve various planning milestones, environmental review activities, communication and engagement with partners and interested parties, technical analyses and data collection, and related efforts.

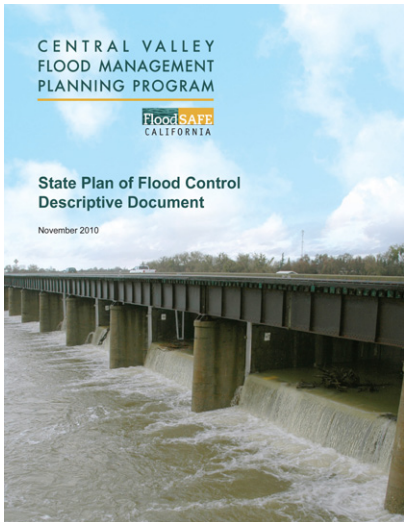
Planning Milestones

The first two phases of CVFPP development have been completed. Progress made toward key planning milestones includes developing documentation related to the SPFC; defining problems and opportunities; identifying CVFPP goals, initial planning principles, and management actions; and performing initial planning for development of the Central Valley Flood System Conservation Strategy.

State Plan of Flood Control Documentation

Several documents are either completed or under preparation to meet the legislative requirements of California Water Code Section 9120. These documents will inform the planning process for the CVFPP. They are separate, but complementary, documents in different phases of development.

- **State Plan of Flood Control Descriptive Document** – A complete description of the SPFC is fundamental to CVFPP development. The *SPFC Descriptive Document* inventories and describes flood management projects and works (facilities), lands, programs, plans, policies, conditions, and modes of operations and maintenance for the State-federal flood protection system in the Sacramento-San Joaquin Valley. This flood protection system comprises State and federally authorized projects for which the Board or DWR has provided assurances of cooperation to the federal government.[7] These Board- or DWR-provided assurances of cooperation, coupled with State authorization, are an important distinction for what constitutes the SPFC. The *SPFC Descriptive Document* (DWR, November 2010) is available at *http://www.water.ca.gov/cvfmp/documents.cfm.*



- **Flood Control System Status Report** – Per California Water Code Section 9120, DWR is currently preparing a *Flood Control System Status Report* for the SPFC. This report reviews the status of the SPFC, including inspection and review of facilities, and makes recommendations regarding levees and future work activities. Identifying system problems and recommending future work activities are critical to formulating systemwide solutions for the 2012 CVFPP. DWR anticipates releasing a public draft of the *Flood Control System Status Report* in mid-2011.
- **State Plan of Flood Control History Report** – The *SPFC History Report* will be a narrative history of the evolution of the SPFC that will inform development of the CVFPP. The document will describe evolving public perception on the need and desire for a flood management system; development of plans of flood control by individuals, expert commissions, private and government engineers, and others; and eventual State adoption of what became the SPFC. The *SPFC History Report* will also discuss development of policies, technical requirements, and other related actions required to implement the SPFC. DWR anticipates releasing a public draft of the *SPFC History Report* in 2011.

Problems and Opportunities, Goals, and Planning Principles

A key accomplishment of Phase 1 of CVFPP development was describing important resource conditions in the Central Valley, and associated flood management problems and opportunities the CVFPP should try to address. This activity was conducted in coordination with partners and interested parties to reflect a broad range of perspectives and opinions.

Goals for the CVFPP were also developed in Phase 1, to help direct Plan development to meet legislative requirements and address identified problems and opportunities. As stated previously in Figure 2, they include the primary goal of improving flood risk management, and four supporting goals.

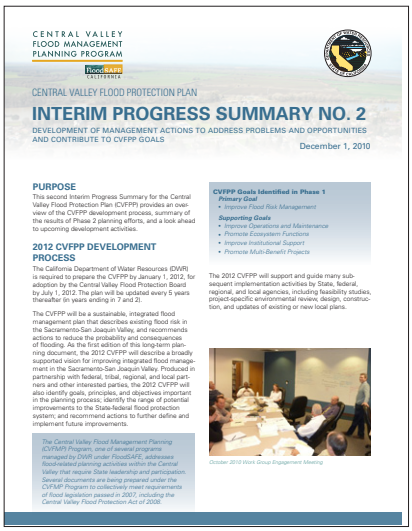
Initial planning principles were developed collaboratively with partners and interested parties and will be refined as Plan development progresses.

Two milestone planning documents were completed in Phase 1 that summarize the development of problems and opportunities, goals, and planning principles: the *Regional Conditions Summary Report – A Working Document* (DWR, March 2010), and the *Interim Progress Summary No. 1* (DWR, April 2010).

[7] The SPFC also includes other features identified in California Water Code Section 8361.

Various collaborative work efforts also resulted in white papers and reports summarizing discussions on key issues or topics, including the following[8]:

- Environmental Stewardship Scope Definition Work Group Summary Report
- Climate Change Scope Definition Work Group Summary Report and Climate Change Threshold Analysis Work Plan
- Operations and Maintenance Scope Definition Work Group Summary Report
- Levee Performance Scope Definition Work Group Summary Report
- Important Considerations for the Central Valley Flood Protection Plan Related to Sacramento-San Joaquin Valley Agriculture
- Interim Levee Design Criteria for Urban and Urbanizing Areas in the Sacramento-San Joaquin Valley (Version 4)



CENTRAL VALLEY FLOOD MANAGEMENT PLANNING PROGRAM

FloodSAFE CALIFORNIA

CENTRAL VALLEY FLOOD PROTECTION PLAN

INTERIM PROGRESS SUMMARY NO. 2

DEVELOPMENT OF MANAGEMENT ACTIONS TO ADDRESS PROBLEMS AND OPPORTUNITIES AND CONTRIBUTE TO CVFPP GOALS

December 1, 2010

PURPOSE

This second Interim Progress Summary for the Central Valley Flood Protection Plan (CVFPP) provides an overview of the CVFPP development process, summary of the results of Phase 2 planning efforts, and a look ahead to upcoming development activities.

2012 CVFPP DEVELOPMENT PROCESS

The California Department of Water Resources (DWR) is required to prepare the CVFPP by January 1, 2012, for adoption by the Central Valley Flood Protection Board by July 1, 2012. The plan will be updated every 5 years thereafter (in years ending in 7 and 2).

The CVFPP will be a sustainable, integrated flood management plan that describes existing flood risk in the Sacramento-San Joaquin Valley, and recommends actions to reduce the probability and consequences of flooding. As the first edition of this long-term planning document, the 2012 CVFPP will describe a broadly supported vision for improving integrated flood management in the Sacramento-San Joaquin Valley. Produced in partnership with federal, tribal, regional, and local partners and other interested parties, the 2012 CVFPP will also identify goals, principles, and objectives important in the planning process; identify the range of potential improvements to the State-federal flood protection system; and recommend actions to further define and implement future improvements.

The Central Valley Flood Management Planning (CVFMP) Program, one of several programs managed by DWR under FloodSAFE, addresses flood-related planning activities within the Central Valley that require State leadership and participation. Several documents are being prepared under the CVFMP Program to collectively meet requirements of flood legislation passed in 2007, including the Central Valley Flood Protection Act of 2008.

CVFPP Goals Identified in Phase 1

Primary Goal

- *Improve Flood Risk Management*

Supporting Goals

- *Improve Operations and Maintenance*
- *Promote Ecosystem Functions*
- *Improve Institutional Support*
- *Promote Multi-Benefit Projects*

The 2012 CVFPP will support and guide many subsequent implementation activities by State, federal, regional, and local agencies, including feasibility studies, project-specific environmental review, design, construction, and updates of existing or new local plans.

October 2010 Work Group Engagement Meeting

Management Actions

Phase 2 of CVFPP development focused on identifying a wide array of individual management actions to address one or more of the CVFPP goals. Management actions are building blocks that can be combined in different ways to form systemwide solutions that collectively address all of the CVFPP goals. Some management actions are place-based or physical actions, such as new levees or bypasses. Others involve changes to policies, regulations, processes, or institutional arrangements, such as streamlined permitting processes or State-mandated flood insurance.

DWR compiled a preliminary list of potential actions from three primary sources: CVFPP partners and interested parties; recommendations in previous regional flood risk reduction studies; and internal submissions from DWR staff. Initial management actions were consolidated and iteratively refined into 94 broad actions, and evaluated based on their economic, environmental, social, and technical characteristics. The management actions vary in level of detail and are not location-specific (e.g., they could be applied in a variety of geographic locations or scales). Depending on the scale and type of an applied management action, benefits could be realized locally, regionally, or even systemwide. Management action development and results were documented in detail in the *Management Actions Report* (DWR, November 2010), and summarized briefly in *Interim Progress Summary No. 2* (DWR, December 2010).[9]

In future phases of CVFPP development, place-based management actions will be assessed for regional and systemwide suitability. Management actions that are not place-based, such as policy and institutional changes, will continue to be refined and developed as potential recommendations.

[8] These documents are available at *http://www.water.ca.gov/cvfmp/documents.cfm* and *http://www.water.ca.gov/floodsafe/docs/ILDC_Version _4_12-15-10_FINAL.pdf.*

[9] This document is available at *http://www.water.ca.gov/cvfmp/documents.cfm.*

Central Valley Flood System Conservation Strategy Development

As part of the Central Valley Flood System Conservation Strategy, DWR has been actively working to improve biological information needed to inform flood management decisions, including the following:

- The first seamless medium-scale vegetation map of the Systemwide Planning Area is approximately one-third complete. This map will present a systemwide view of the distribution of riparian and other habitats. Initial products from this effort are already supporting development of the Lower Feather River Corridor Management Plan.
- More than 350 existing biological wildlife surveys and population studies in the Systemwide Planning Area have been catalogued. When completed, this inventory will contain current information about the distribution of important species.
- Conservation objectives have been compiled from the 12 regional conservation planning efforts that overlap the Systemwide Planning Area. This information will help support coordination and reduce potential conflicts with existing conservation planning efforts.

DWR is also making progress in developing a regional advance mitigation approach, in concert with other infrastructure and regulatory agencies. This approach will improve the efficiency and effectiveness of the mitigation process.

As an example, the Lower Feather River Corridor Management Plan is being developed for a 20-mile reach of the Feather River between Yuba City and the Sutter Bypass. This effort is being used as a pilot for a corridor management approach, which is envisioned to be a likely management strategy for the CVFPP and Central Valley Flood System Conservation Strategy. It will include a strategy for future management and maintenance of flood protection facilities, conveyance channels, floodplains, and uplands. It will define a permitting approach and recommend policies for recreation and associated land uses. State, federal, and local agencies, in addition to nongovernmental organizations and landowners, are participating in development of the Lower Feather River Corridor Management Plan.

Environmental Review Activities

A Notice of Preparation was released on October 27, 2010, for a *Program Environmental Impact Report* to facilitate Board adoption of the 2012 CVFPP. Three scoping meetings were conducted in 2010: November 15 in Chico, November 16 in Sacramento, and November 18 in Modesto. Work is underway to prepare a Scoping Report and to describe existing resource conditions.

Communications and Engagement

A comprehensive communications and engagement process with partners and interested parties will continue to be practiced in each phase of development for the 2012 CVFPP. Many different venues have been established to share and solicit information, promote feedback, and obtain input and recommendations from partners and the public. These venues are intended to foster open and transparent communication and provide individuals with opportunities to participate in CVFPP development in a variety of ways, depending on their interests and availability.[10] The venues are under continual review for effectiveness, and will be improved and modified, as needed. Communications and engagement activities to date are shown in Table 1. Outcomes of this engagement process have been captured in publicly available documents and interim products (*http://www.water.ca.gov/cvfmp/meetings/* and *http://www.water.ca.gov/cvfmp/documents.cfm*).

[10] Information on the different venues and specific engagement activities for the CVFPP is included in the *Public Review Draft Communications and Engagement Framework* (DWR, June 2009) (*http://www.water.ca.gov/cvfmp/documents.cfm*).

Table 1 – Summary of Communications and Engagement Activities to Date

Venue	Description	Number of Meetings or Events
Forums	Regional	5
	Valleywide	2
Work Groups and Workshops	5 Regional Conditions Work Groups	40
	5 Regional Management Actions Work Groups	15
	2 Work Group Subcommittees	10
	6 Topic Work Groups	27
Briefings and Coordination	Management Actions Workshops	15
	Native American Tribes and Tribal organizations	18
	Contact with more than 100 Native American Tribes and Tribal organizations, and 1 formal briefing	1
	Briefings with elected officials and local jurisdictions	31
	Coordination with interest-based groups	17
	Briefings of print media reporters	4
	Legislative staff briefings	1
Other Communications	CVFMP Partner Registry, CVFMP Program Web site, environmental justice database and notifications, FloodSAFE Focus newsletters, Webcasts and Webinars, videos, fact sheets, documents, and collateral materials	Multiple

Technical Analysis and Data Collection

Technical analysis for the 2012 CVFPP will rely primarily on existing data and tools, and will occur at a reconnaissance or appraisal level of detail. These analyses include hydrology and reservoir operations, hydraulic modeling of river channels and the Sacramento-San Joaquin Delta (Delta), economic analyses, environmental conservation analyses, and preliminary cost estimates. Meanwhile, various ongoing efforts are developing new data and tools to support the 2017 CVFPP update and future implementation activities.

Progress-to-date on major technical efforts to support the 2012 CVFPP includes the following:

- Updates to existing reservoir operations models to reflect current operating conditions, and use of these models to identify potential operational improvements.
- Updates to existing hydraulic and hydrodynamic models of the Sacramento and San Joaquin rivers, major tributaries, and the Delta; these models are being used to assess existing flood risks and conditions.
- Completion of an economic inventory, and acquisition of a new parcel database for the Central Valley that will be used to update an existing flood damage analysis model; this model will be used to calculate assets at risk in the floodplains and estimate potential economic damages from flooding.
- Development of information on the stability of existing levees, using data from the analysis of 2,100 miles of levees to date, for use in hydraulic and economic analyses.
- Habitat mapping, completed within about one-third of the planning area to date.
- Development of hydrology and key ecosystem functional relationships for assessing ecosystem functions within floodways and floodplains.

Efforts initiated to develop new data and tools, primarily for use after the 2012 CVFPP, include the following:

- **Central Valley Hydrology Study** – Conducted in coordination with USACE, this study is developing new flood hydrology, including climate change considerations.
- **Levee Evaluation Program** – To date under this program, data have been collected and analyzed on the condition of over 2,100 miles of urban and nonurban levees within the Central Valley.
- **Central Valley Floodplain Evaluation and Delineation Program** – Under this program, extensive aerial imagery and topography have been collected and are being used to develop new hydraulic models to simulate floods and delineate floodplains in the Central Valley.

Related Efforts

Other ongoing FloodSAFE projects, programs, and activities are also supporting flood risk management within the Central Valley. Progress and accomplishments important to the CVFPP are highlighted below:

- **Levee Flood Protection Zones** – DWR completed Levee Flood Protection Zone maps in 2009 that illustrate lands receiving protection from project levees. These maps can be found at *http://www.water.ca.gov/floodmgmt/lrafmo/fmb/fes/levee_protection_zones/LFPZ_maps.cfm.*
- **Flood Risk Notifications** – Under State law (Assembly Bill 156) adopted in 2007, DWR is mandated to send a notification each year to owners of properties located behind any State-federal levee and within a levee flood protection zone. Beginning in September 2010, nearly 275,000 Central Valley property owners in 17 counties received the State's first-ever "Flood Risk Notice." More information can be found at *http://www.water.ca.gov/floodmgmt/lrafmo/fmb/fas/risknotification/.*
- **Local Assistance** – DWR is coordinating with and providing assistance to local jurisdictions in addressing flood risk management issues as it seeks to comply with provisions of the 2007 flood legislation. Examples of this assistance include developing the *Implementing California Flood Legislation into Local Land Use Planning: A Handbook for Local Communities* (DWR, October 2010), developing criteria to demonstrate 200-year level of flood protection for urban and urbanizing areas, and supporting formulation of a long-term financing strategy.
- **Updates to the California Building Standards Code** – DWR is currently pursuing changes to the California Building Standards Code (per Health and Safety Code Section 50465), applicable to areas protected by SPFC facilities where flood depths could exceed 3 feet for the 200-year flood event. To date, DWR has successfully proposed voluntary code provisions for single-family residences and residential care facilities with less than six clients that were adopted by the Building Standards Commission in 2010. These initial changes focus on public safety, especially for vulnerable populations. DWR will continue to work on code updates for other occupancy groups and to reduce flood damages.
- **Cost-Sharing Formulas for Flood Programs and Projects** – DWR has developed cost-sharing formulas for funds made available by Propositions 1E and 84 for flood programs and projects in the Sacramento-San Joaquin Valley, as required by California Water Code Section 9625. Draft cost-sharing formulas were posted for public comment in August 2010 and DWR conducted two public workshops in September 2010. The cost-sharing formulas were completed in December 2010 and can be found at *http://www.water.ca.gov/floodsafe/docs/Cost_Sharing_Formula_12-29-10_Final.pdf.*

HIGHLIGHTS ON KEY TOPICS

The CVFPP is addressing numerous challenges and concerns raised by partners and interested parties in the Central Valley. Progress to address these topics in the 2012 CVFPP is described below.

Climate Change

The current flood management system was not designed to accommodate potential climate change impacts. Increased temperatures from climate change may alter precipitation and runoff patterns and could result in sea level rise. DWR is currently assessing the likely

extent of climate change over the foreseeable future, and potential changes to regional and statewide water resources conditions.

The CVFPP will be the first major policy-level study with broad applications that addresses climate change for flood management in California. Flood management requires consideration of extreme precipitation and runoff events, which are difficult to project. Through extensive engagement with the public and the climate change research community, it is clear that a unique methodology for addressing climate change in the CVFPP will be required, and work is ongoing to solidify this methodology.[11]

Vegetation Management

Conflicting expectations and requirements related to levee system vegetation management have made it difficult for responsible maintaining agencies to conduct maintenance activities efficiently. One of the more significant conflicts stems from the April 2009 USACE Engineering Technical Letter 1110-2-571, *Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures* and the USACE proposed Policy Guidance Letter, *Variation from Vegetation Standards for Levees and Floodwalls*. While these standards and proposed policy are intended to improve levee safety (by facilitating inspection and flood fighting, eliminating the risk of uprooted trees exposing the levee soils to erosion, and eliminating the risk of seepage along decaying roots), there is considerable debate regarding the technical and scientific basis for the assumptions about risks posed by vegetation on levees. Riparian vegetation provides critically important habitat and benefits, helps limit erosion, and contributes to soil stability, and research is being conducted to provide better information about the positive and negative effects of levee vegetation.

Eastside Bypass Control Structure

From the State's perspective, the USACE standards and proposed variance policy are in conflict with current vegetation management practices and related policies of California and other federal agencies. If complied with, the new standards and policy will have devastating environmental impacts to listed species, and will have unintended public safety impacts by diverting limited resources away from addressing more critical levee risk factors.

DWR, in coordination with USACE and the resource agencies, has developed interim levee vegetation management criteria for visibility and accessibility to allow for inspections and flood fighting. These criteria were included in California's Central Valley Flood System Improvement Framework (March 2009), jointly prepared by the California Levees Roundtable, a collaborative partnership of federal, State, and local agencies. These interim criteria will be implemented until adoption of the CVFPP in 2012. A variety of levee vegetation management strategies will be articulated in the CVFPP as management actions, and will focus on enforcing visibility and accessibility criteria, developing life-cycle monitoring and maintenance for vegetation, and, where feasible, separating the flood system from the river-

[11] A preliminary sketch of this methodology is outlined in the draft *Climate Change Threshold Analysis Work Plan* (DWR, September 2010) (*http://www.water.ca.gov/cvfmp/documents.cfm*).

bank and its attendant riparian vegetation (e.g., using new levee setbacks). New levees will be distinguished from "legacy levees" (those existing levees that were incorporated into the system in an as-is, vegetated condition). Going forward, the parallel but complementary effort of preparing interim levee design criteria will be closely coordinated with CVFPP development to retain a unified message and consistent approach to vegetation management.

In the long term, the State will seek to conserve and enhance riparian habitat on the waterside of levees through the use of improved maintenance inspections, phased vegetation management practices, regional variances, and other management tools, and will be consistent with the Central Valley Flood System Conservation Strategy being developed. Ongoing research will inform future vegetation policies.

Floodwaters in the Sutter Bypass in 1997

Level of Flood Protection Definition and Criteria

One of the most effective ways to reduce vulnerability to potential flood damage is through careful land use planning that is fully informed by applicable flood management information and practices. The 2007 flood legislation linked systemwide flood management planning to local land use planning in a direct manner, requiring local jurisdictions to demonstrate an urban level of flood protection before approving new development in urban and urbanizing areas. "Urban level of flood protection" means the level of protection necessary to withstand flooding that has a 1-in-200 chance of occurring in any given year (California Government Code Section 65007). DWR is developing criteria to guide local jurisdiction compliance with new requirements, including the following:

- Definition, standards, and protocols that can be used to establish (1) applicability of the requirements, and (2) compliance with the requirements
- Scope of land use decisions and permit actions affected
- Effective period of determination and associated periodic review process (to allow a stable land use planning environment in light of potential changes to flood frequency over time)

In addition to developing criteria to help local jurisdictions in their land use planning, DWR is preparing criteria for use in the design of levees protecting urban and urbanizing areas. These criteria for levees and floodwalls in urban areas, which are based on information used by USACE and FEMA, are considered to be applicable on an interim basis, until further guidance can be developed as part of the CVFPP. Version 4 of the *Interim Levee Design Criteria for Urban and Urbanizing Areas of the Sacramento-San Joaquin Valley* was developed through a collaborative stakeholder engagement process and released in December 2010. DWR will continue the engagement process in 2011 to develop Version 5.

DWR will also be working with local partners to develop guidance related to nonurban flood protection levels.

Financing and Revenue

Successful implementation of the CVFPP will require sustainable funding, for both improvement projects and operations and maintenance, through development of a long-term financing strategy. This financing strategy will need to balance a variety of State, federal, and local funding mechanisms, and should support an equitable cost-sharing framework. The first part of this effort, development of cost-sharing formulas that consider the ability of local governments to pay their share, was completed in December 2010.

In developing a long-term financing strategy for the CVFPP, DWR is evaluating previous attempts to develop "beneficiary pays" financial structures, and is considering changes to the ways revenues are generated and allocated to flood management activities. Past studies have shown that such structures should strive to be fair and equitable, produce adequate funds, be politically acceptable, provide incentives for efficient funding, and rely on more than just temporary bond funding. The greatest challenges to creating a long-term financial strategy will be balancing the concerns of assessed beneficiaries, and gaining support across multiple jurisdictions, sectors, and interests.

The CVFPP will support reforms to federal crediting rules in the Sacramento-San Joaquin Valley, improving the leverage of early State and local investments, and planning for application of new federal crediting rules in system-wide improvements.

Engagement

DWR is committed to continuing to engage partners and interested parties, and to capturing varied perspectives in the Central Valley. The participation of many organizations and individuals is essential to crafting a viable, sustainable CVFPP. Input on engagement was formally solicited from representatives of a variety of interests and communities throughout the Central Valley. More than 100 interviews were conducted in early 2009. This allowed the CVFPP initial engagement process to reflect the ideas, needs, and concerns of people who should be involved. As a result of this input, the CVFMP Program includes many options and venues for participation.

To continually improve communication and engagement for the CVFPP, assessments are being conducted at major milestones in the plan development process. These assessments help identify the views and concerns of partners and interested parties, and solicit their suggestions for improvement. DWR's assessment of Phase 1 received largely positive feedback, but with several recommendations and reservations related to the time commit-

Sacramento River and skyline

ment of work group members, aggressive schedule, and rapid turnaround for material reviews.[12] These findings were used to modify engagement activities in Phase 2. A similar assessment of the Phase 2 engagement process is underway and is scheduled to be released in early 2011.

NEXT STEPS FOR COMPLETING THE 2012 CENTRAL VALLEY FLOOD PROTECTION PLAN

Work is underway on the concluding phase of 2012 CVFPP development, as shown in Figure 6. Building from the management actions identified in Phase 2, the focus of this phase is on formulating and comparing different combinations of potential actions to achieve CVFPP goals, articulating a preferred set of actions the State can pursue, and developing a phased implementation approach for the 2012 CVFPP recommendations.

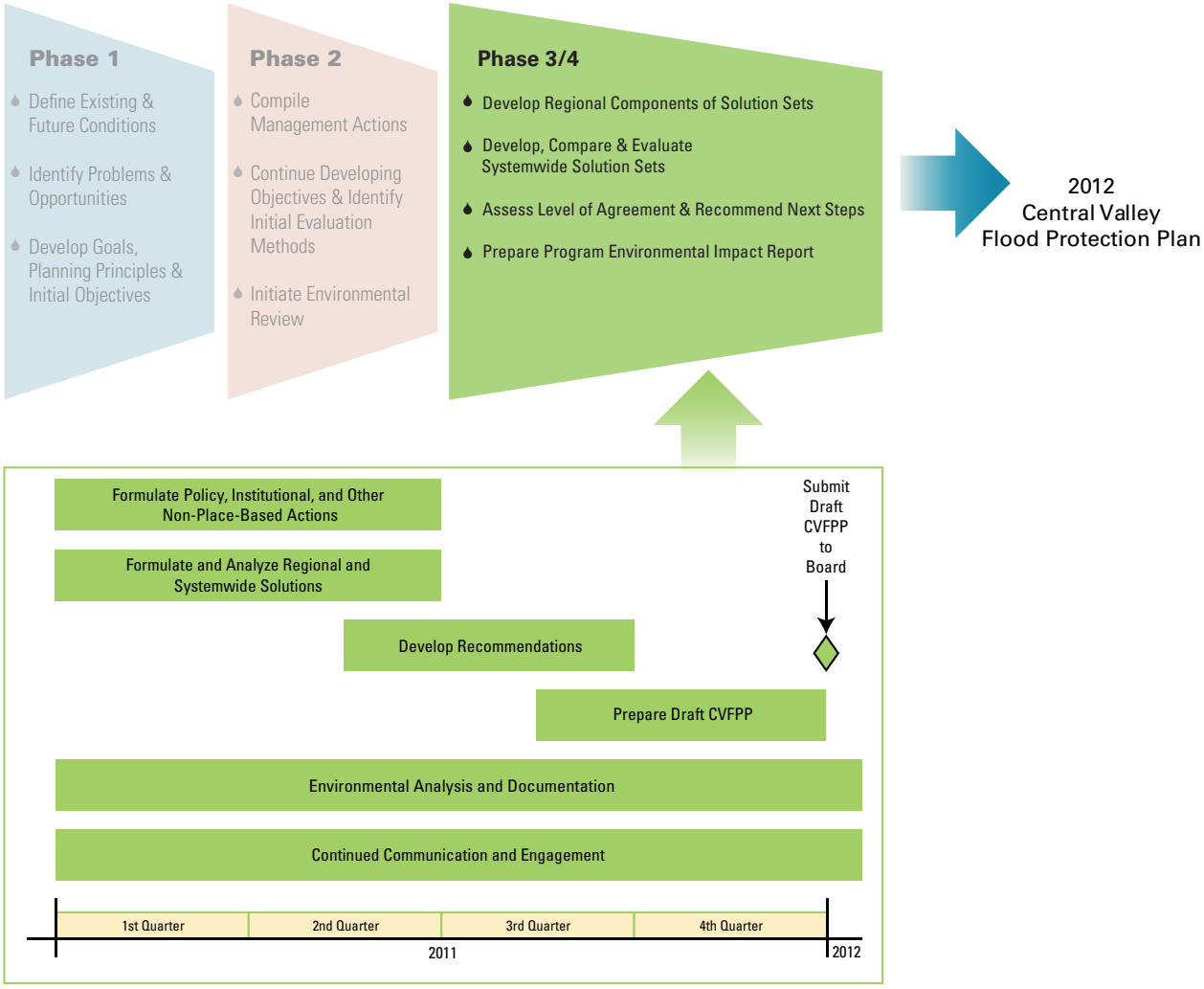


Figure 6 – Next Steps in 2012 Central Valley Flood Protection Plan Development

[12] See *CVFPP Phase 1 – External Communication and Engagement Assessment* (DWR, September 2010) (*http://www.water.ca.gov/cvfmp/documents.cfm*).

A combination of potential actions will be presented in the 2012 CVFPP as several distinct solution sets (or alternatives). Using readily available information, while reflecting input and project concepts received from stakeholders, DWR will conduct a primarily qualitative analysis of the solution sets. This analysis will focus on identifying reasonable, broadly supported, and technically sound management actions that will be incorporated into a solution set that represents the State's preference. The State's preference will be those "preferred components" needed for long-term improvements to the flood management system in the Central Valley. Additional technical analyses will be performed to support formulation of the State's preferred components and recommendations in the 2012 CVFPP, including systemwide hydraulic analyses, ecosystem function evaluations, and reconnaissance-level cost estimates and benefit analyses.

DWR will consider various factors when analyzing the solution sets to achieve the CVFPP goals and select the State's preferred components. These factors include, but are not limited to, the cost and time for implementation; reduction in risks to life and property; long-term operations and maintenance cost; environmental benefits; land use implications; social and socioeconomic implications; opportunities for other water resources benefits; and resiliency under future, uncertain conditions.

A flood-damaged levee on the Feather River was repaired in 1998

For the State's preferred components, the 2012 CVFPP will develop and describe a recommended implementation approach. This approach will consider the sequential implementation phasing of the State's preferred components. Sequential phasing will allow an initial focus on the most urgent flood system needs, provide the time necessary to develop a firm foundation to further develop and implement actions in subsequent phases, and allow for development of a sound funding strategy to pursue future additions to effective flood management in the Central Valley. The 2012 CVFPP is intended to be a comprehensive plan. Accordingly, this implementation approach will also consider other programs and projects under FloodSAFE in the Central Valley.

DWR will continue to advance and share findings on key topics, including climate change, vegetation management, criteria for providing an urban level of flood protection and guidance for nonurban areas, and financing and revenue. Work is also progressing on other documents and efforts related to the CVFPP, including preparation of the Flood Control System Status Report, and development of the Central Valley Flood System Conservation Strategy.

DWR intends to deliver the draft CVFPP in January 2012 for Board consideration. Adhering to this ambitious schedule will require the continued involvement and dedication of DWR and its partners and interested parties, and close coordination with related State, federal, local, and regional efforts. The various engagement venues from Phases 1 and 2 will continue to be used to solicit input and comment.

In addition, while completing the 2012 CVFPP, DWR will continue to progress technical tools, analyses, and planning efforts in support of the 2017 CVFPP update.

ABBREVIATIONS AND ACRONYMS

Board	Central Valley Flood Protection Board
CEQA	California Environmental Quality Act
CVFMP	Central Valley Flood Management Planning
CVFPP or Plan	Central Valley Flood Protection Plan
Delta	Sacramento-San Joaquin Delta
DWR	California Department of Water Resources
FEMA	Federal Emergency Management Agency
FloodSAFE	FloodSAFE California
Progress Report	Central Valley Flood Protection Plan Progress Report
Proposition 1E	Disaster Preparedness and Flood Prevention Bond Act
Proposition 84	Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act
SPFC	State Plan of Flood Control
State	State of California
USACE	U.S. Army Corps of Engineers

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The Central Valley Flood Management Planning Program is being implemented by DWR's Division of Flood Management, Central Valley Flood Planning Office. For more information, please contact the office or visit the program Web site:

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Department of Water Resources

The Natural Resources Agency

State of California