

flood SAFE Yolo

Pilot Program

1st Annual Report (2008-2009)



September 2008

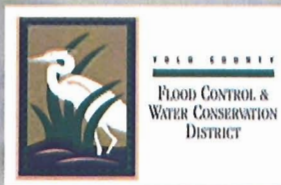
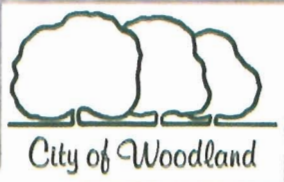


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INTRODUCTION

The lands of Yolo County are subject to flooding—a natural process that both nourishes the land and stresses the landscape. Floods are products of the landscape. The mountains and foothills act as catchments, collecting rainfall and concentrating runoff into creeks and sloughs. The valley lands carry that water in channels during small events. When large storms occur water flows out of the channels and across the surface of the land. How, when, and where floodwaters flow is, in part, an outcome of how we treat the land. We have the option of letting water flow where it will, or, to a limited degree, we can manage our landscape to direct where and how it flows.

Keeping people from harm's way and limiting property damage during flooding is a fundamental responsibility of local government and the public at large. Government agencies can analyze flooding potential and, with the public, design solutions that address needs of the community. The agencies can serve as leaders in implementing projects that reduce flood risks, while the public can act in ways to limit their exposure to harmful floods. Acting as a community, the dangers of flooding can be avoided or minimized while benefits of flooding can be realized.

This document is the 1st Annual Report of the **floodSAFE Yolo Pilot Program** (Pilot Program). The Pilot Program is an effort to achieve these dual goals of avoiding flood dangers while realizing flood benefits. The Pilot Program is sponsored by the City of Woodland, the County of Yolo, and the Yolo County Flood Control & Water Conservation District (Partners) and is being carried out as a step in implementing parts of the Yolo County Integrated Regional Water Management Plan.

The Pilot Program is charged with developing solutions for reducing flood risks and establishing the administrative infrastructure to implement an ongoing program in flood management. Currently in Yolo County, the responsibilities for responding to floods and for planning and managing the risks associated with flooding are fragmented, lack continuity, and are distributed across several entities including individual landowners or operators. This fragmentation and lack of continuity creates added risk for the public and reduces the effectiveness of agency efforts. The Pilot Program was initiated to find a better way to do business, a way that provides lower risk to the community and one that creates a sustainable effort that enhances community assets, improves our safety, and ensures the quality of our environment.

In November 2007, bond measures and Proposition 1E and Proposition 84 were passed by the voters of California, which provided \$4 billion statewide to improve flood protection for public safety, reduce the risk of damage to property, and integrate flood management solutions with other community needs. In October 2007, a few months after the Partners executed the MOU, Governor Schwarzenegger approved a package of flood-related legislation that became law on January 1, 2008. The legislation imposes additional mandates for local agencies aimed at making more informed land use decisions. One reason for the legislation is the need for local entities to work hand in hand with state and federal flood managers to ensure reasonable protections and to share costs. The state will be revising its flood management program in the form of a Central Valley Flood Protection Plan (CVFPP). The California Department of Water Resources (DWR) will be responsible for formulating this plan; however, it behooves local agencies to be proactive in defining the flood management plans that it desires to have incorporated into the CVFPP. According to the legislative mandate, DWR is to have a draft of the CVFPP completed by January 1, 2012, and the Central Valley Flood Protection Board is to adopt the plan by July 1, 2012. We will have the opportunity to work with DWR and other flood managers throughout the Central Valley to incorporate elements of the Pilot Program as the plan emerges. We will also be applying for grants made available through the bond initiatives.

WHAT IS THE FLOOD MANAGEMENT CONCEPT?

There are many uncertainties in predicting flooding: How big will the storm be? When will it come? Where will the water go? Who will be involved? How long will it last? For all these questions, the answers are moving targets, dependent upon conditions just before the storm, how far in the future the flooding occurs, what time of year, the impacts of climate change, and how we act between now and that moment in the future. Nevertheless, there are a few strategies that can be employed that can help us manage our risks. For instance, we know that:

- Deep floodwaters are more damaging than shallow floodwaters.
- Fast-moving floodwaters are more destructive and threatening to public safety than those that move slowly.
- Streams, sloughs, and canals are not large enough to hold the waters of larger storm events, but with care can handle small to medium storms.

- Streams and canals that overflow will follow the lowest, least resistant path.
- At some point in the future, we are likely to see a storm event larger than what we have experienced previously.

With this knowledge in mind we can state a few key strategies:

1. When floodwaters begin to flow over banks, we want to ensure that they remain slow moving and shallow.
2. We can consider the benefits and costs of various management options, but we need to always consider the risk (residual risk) that remains outside of our designed system.
3. We can seek alternatives that reduce the exposure of people and property to damage while providing the ecological benefits of flooding.

floodSAFE YOLO PILOT PROGRAM

The Pilot Program was established in June 2007, when the Partners entered into a Memorandum of Understanding (MOU) to set up a sustainable program – institutional and funding – to manage flood-related issues. The MOU provides for implementing two integrated projects identified in the Yolo County Integrated Water Management Plan (IRWMP). The IRWMP was adopted in 2007 by the nine member agencies of the Water Resources Association of Yolo County (WRA) and its Board of Directors. The two integrated projects are the Cache Creek Integrated Project (Flood Element) and the Yolo County Sloughs, Canals, and Creeks Management Program. The lands covered by the Pilot Program include the Cache Creek watershed and Westside watersheds tributary to the Colusa Basin Drain and Yolo Bypass, as illustrated on Figure 1.

ORGANIZATION

The Pilot Program is being run as a collaborative effort among the Partners. The District is the administrative lead and is supported by a Program Advisory Committee (PAC) made up of staff from the District, the City of Woodland, and Yolo County, and receives clerical services from WRA staff. The PAC meets monthly to plan, coordinate, and review work being performed for the Pilot Program. A Program Manager has been hired and works closely with the District and WRA staff to implement the program.

The general organizational structure established for the Pilot Program is presented on Figure 2.

Information on the Pilot Program can be found on the District's Website at:

<http://www.ycfwcd.org/floodsafeyolo.html>.

The agendas and notes from the PAC meetings are also posted on this Website.

MISSION

The mission of the Pilot Program is:

“Minimize the risk from flooding in Yolo County while enhancing water supply, ecosystem functionality, recreation, and community values.”

Guidelines established for the Pilot Program are as follows:

- Provide the leadership and direction necessary to develop acceptable flood management strategies consistent with, environmental, agricultural, and open space policies for all lands of Yolo County west of the Yolo Bypass and Colusa Basin Drain.
- Work collaboratively with the agricultural, environmental, local government, and regulatory agency stakeholders to develop solutions that reduce the risks associated with localized and regional flooding.
- Develop performance measures and report periodically to stakeholders and the public regarding the progress made in developing acceptable solutions.
- Become aware of relevant federal, state, and regional flood and environmental policies and transmit our understanding of these policies and their impacts to stakeholders.
- Use the most appropriate technology available to forecast impacts associated with flood and environmental management policies.
- Work with the community to recommend actions that reflect the values of Yolo County citizens.

- Be sensitive to the costs associated with environmental and flood management policies that could become a burden to property owners, local governments, and other stakeholders.
- Pursue the work in a collaborative, cost-effective, and efficient manner.

SOLUTION PRINCIPLES

The philosophy for the Pilot Program is to accomplish its mission with solutions guided by the following principles:

Resilient to Events Greater than Design – Solutions of necessity will be designed for a particular size of storm based upon adopted criteria. With the growing evidence of climate change, our future hydrology is uncertain and not predictable. Accordingly, solutions must be sought that avoid catastrophic consequences when subject to an event greater than the design.

Low Maintenance – Maintaining the system as designed is essential to ensuring public safety. Hard financial times often lead to deferred maintenance. To avoid exposing people to danger in these times, solutions will be sought that minimize the need for maintenance.

Minimize Structural Features – Structural features cannot be avoided; however, solutions will be sought that incorporate natural processes to the maximum extent practicable.

Enhance Public and Environmental Values – Public and environmental values will be incorporated into projects due to their contribution to the community. These values will not be treated solely as mitigation measures, as is typically done. Mitigation will be undertaken where adverse impacts are unavoidable.

PILOT PROGRAM ELEMENTS

Six program elements have been established for the Pilot Program. These are:

- Program Management
- Public Outreach

- Watershed Assessment
- Flood Hazard Mitigation Projects Planning and Development
- Projects Implementation and Maintenance
- Program Administration and Funding

Work is being conducted in all six elements. Implementation and maintenance work is currently underway; however, this time it only deals with maintaining existing canals and channels. As more comprehensive solutions emerge, this work will include new projects.

WORK PLAN

A Work Plan has been developed that describes current work efforts. Placeholders are outlined for future anticipated work. As tasks in the Work Plan become more current, details will be added to clarify the scope of each activity.

Certain tasks of the Work Plan were determined to be “foundational” thus were given priority for implementation and work is proceeding accordingly. These tasks include the following:

1. Update the Cache Creek Hydrology

During the feasibility study conducted by the U.S. Army Corps of Engineers (USACE) to investigate alternatives for managing the flood hazards related to the Lower Cache Creek system, the community expressed concern about the hydrology that was being applied. The City of Woodland, in respecting the expressed concern of the community, initiated work to revisit the hydrology and update it so as to have this issue resolved before actively pursuing solutions to the flood problems. The completion of this work is being performed as part of the Pilot Program and is planned to be completed in November 2008.

2. Obtain Regional Topographic Mapping

Except for isolated areas, the topographic data available for planning within Yolo County is from USGS quadrangle maps, which is from the 1950's. A great deal of change in land form and waterways has occurred since then. DWR, under its Central Valley Floodplain Evaluation and Delineation Program, has captured LiDAR based topographic data for a large part of the valley portion of Yolo

County. As part of the Pilot Program, the PAC agreed to “piggyback” on the work of DWR and acquire additional data (approximately 186 square miles) in order that new topographic data would be available for the entire valley portion of the county, including Capay Valley. The data acquired by the PAC will be available in October 2008. The timing for processing the data acquired by DWR is uncertain at this time.

3. Develop City/County Drainage Manual

Currently, the criteria and approach of the cities and county for handling storm drainage are not consistent and in some cases the criteria in relation to design rainfall is outdated. It is critical, especially for newly planned or urbanizing areas, to develop criteria to guide the development community rather than reacting to what the development community judges to be suitable. With the passage of the flood-related legislation in 2007, the cities and county must amend their general plans by July 2015, to provide for 200-year level of flood protection and have facilities in place to provide that protection by 2025. This City/County Drainage Manual will be completed by the end of December 2008.

4. Update the YCFCWCD Willow Slough Hydrologic Model

The District’s existing hydrologic model for the Willow Slough watershed, including the Covell Drain watershed in the vicinity of Davis, was developed in 1992. It has been used extensively for floodplain mapping by FEMA, the preparation of storm drainage master plans, and floodplain analyses particularly in the vicinity of Davis, Winters, the Yolo County Airport, and the communities of Esparto and Madison. This tool is even more important today to address flood management issues in this study area; however, the model needs to be updated using rainfall and storm designs consistent with that adopted for the City/County Drainage Manual. This updated model is anticipated to be completed in January 2009.

ACCOMPLISHMENTS

Notable accomplishments of the Pilot Program during this report period are highlighted below:

- Establishing an effective working relationship within the PAC.
- Developing a Work Plan outline with tasks for implementing each element of the Pilot Program
- Establishing a partnership with DWR and USACE for investigating the feasibility of measures to manage flood flows and sediment from Cache Creek.
- Coordinating with DWR's Central Valley Floodplain Evaluation and Delineation Program to update floodplains in the County.
- Coordinating with DWR's efforts for the State Plan of Flood Control and the CVFPP to incorporate a flood management plan for the program study area.
- Developing collaboration efforts with WRA member agencies and other local agencies.
- Outlining preliminary components of a conceptual flood management program (Figure 3).
- Executing important "foundational" tasks as noted above.

2008/2009 PRIORITIES

The latter part of this first year has demonstrated the benefit of developing the Pilot Program in a deliberate and thoughtful manner, while being mindful of the urgency associated with some of the issues and the reality of the processes and other potentially collaborative effort in progress as well. The priorities for work for 2008/2009, the second year of the Pilot Program, are extensive but achievable. These include the following tasks or activities to further implement the Work Plan.

- Continue to coordinate with DWR's flood-related programs:
- Central Valley Floodplain Evaluation and Delineation

- Central Valley Floodplain Protection Plan and State Plan of Flood Control
- Central Valley Urban Levees Geotechnical Investigation
- Declared Emergency Bank Protection
- Complete the foundational tasks that are being implemented.
- Continue to coordinate activities with parties involved in other Integrated Projects of the Yolo County IRWMP.
- Finalize a scope of work for the USACE's Program Management Plan for the Cache Creek feasibility investigation and execute a cost-sharing agreement.
- Formulate and implement a Public Outreach Program.
- Update hazard/floodplain maps north and south of Cache Creek for flooding from Cache Creek. Presented on Figure 4 and Figure 5 are floodplain maps that were prepared by DWR, which document historic flooding in the vicinity of Lower Cache Creek in 1937-1938 and 1940. The most recent update of the floodplain delineation for the Pilot Program is presented on Figure 6, which shows the extent of flooding for a 100-year storm event based upon existing hydrology and topographic mapping. These will be refined with the updated hydrology and more detailed mapping both of which are being developed at this time.
- Characterize the impact of the Cache Creek Settling Basin on local flooding.
- Identify and evaluate alternatives for resolving the flood issues related to Cache Creek and collaborate with the community to arrive at a locally preferred solution.
- Engage Caltrans in discussions regarding the impact of the state highway and interstate system on flooding and consideration on the integrity of the highway system from a security and commerce standpoint.
- Determine the most effective institutional structure for handling flood management for the study area.

- Determine the most effective means for funding the Pilot Program on an ongoing basis and funding the implementation of capital projects and their operations and maintenance.
- Determine the principal elements of a flood management plan for the study area.
- Pursue funding opportunities to assist in formulating the flood management plan and investigating potential projects for enhancing public safety and reducing damage to property.

BUDGET STATUS

Through the MOU, the Partners agreed to participate in the Pilot Program with funding in the amount of \$100,000 each, for two years, for a total of \$600,000. Summarized below is the status of the budget through June 2008, in terms of monies expended and monies committed but not yet expended for implementing particular Work Plan tasks.

Monies Expended

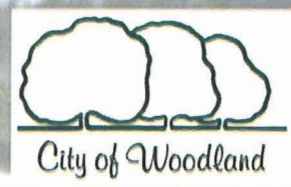
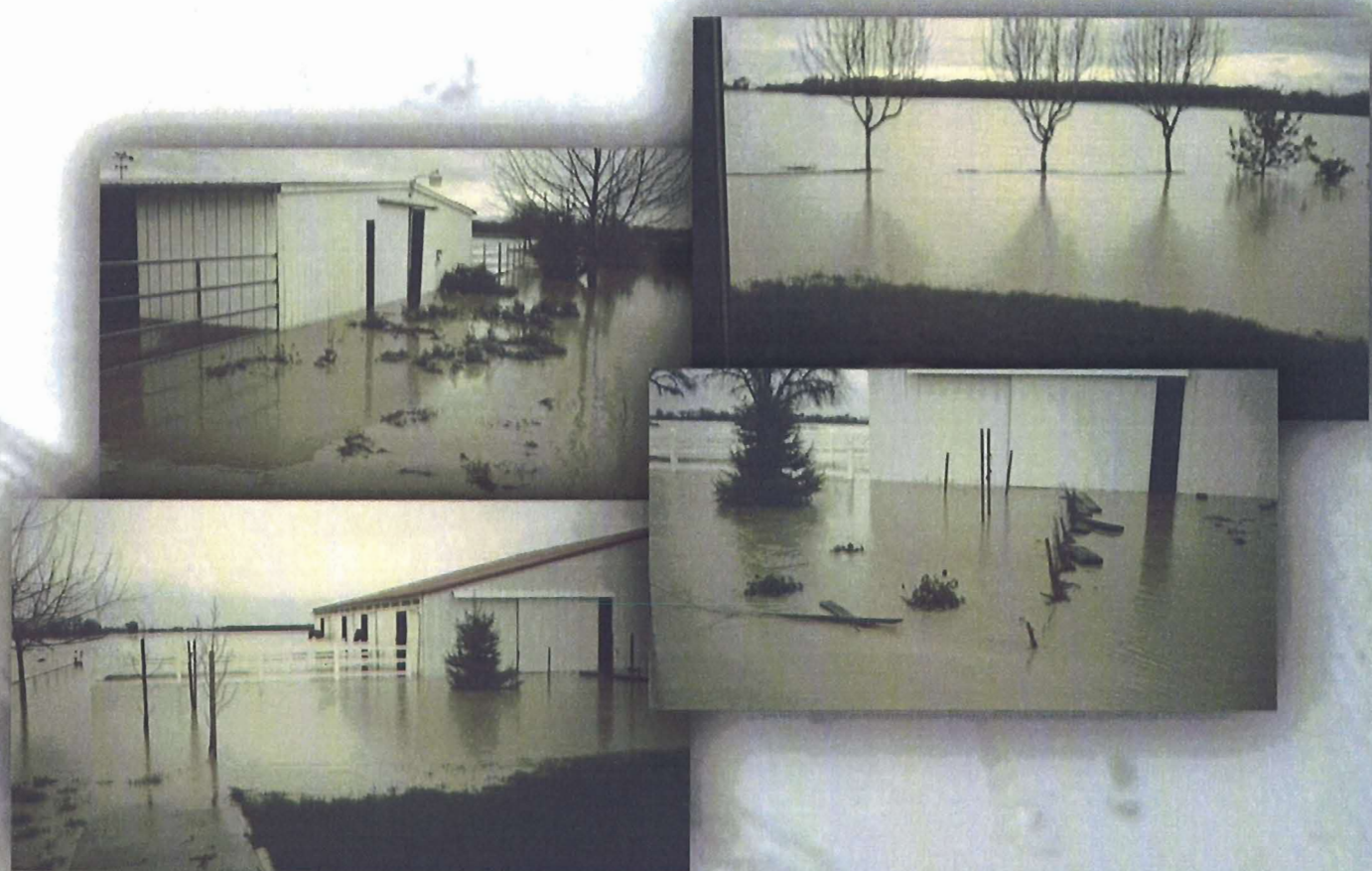
Program Management and Administration	\$ 87,000
Obtain Regional Topographic Mapping	<u>18,622</u>
Subtotal	\$105,622

Monies Committed

Update the Cache Creek Hydrology	\$ 82,550
Obtain Regional Topographic Mapping	56,378
Develop City/County Drainage Manual	94,900
Update YCFCWCD Willow Slough Hydrologic Model	<u>50,000</u>
Subtotal	\$283,828
TOTAL	\$389,450
BALANCE REMAINING	\$210,550

Figures

Figures



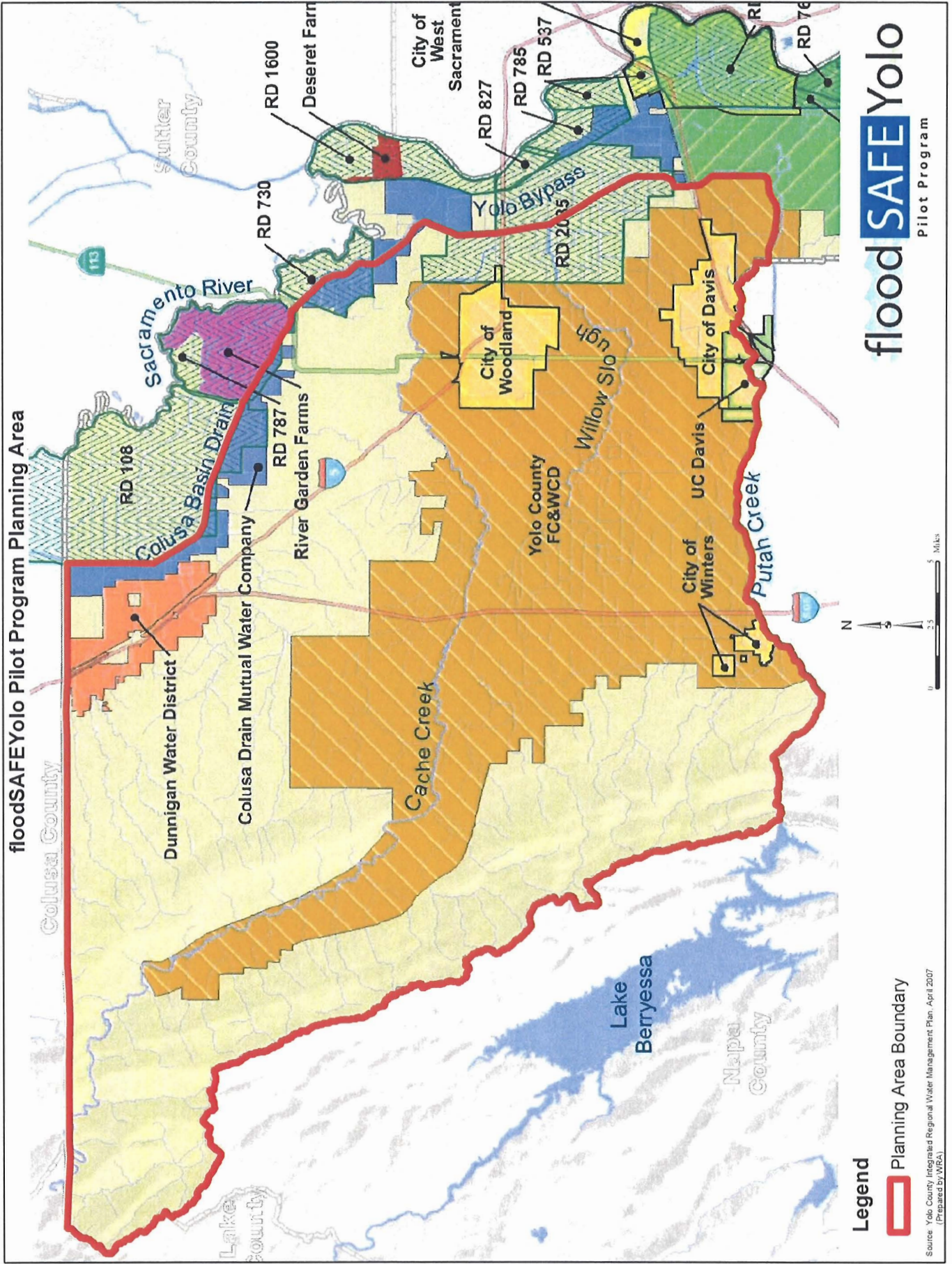
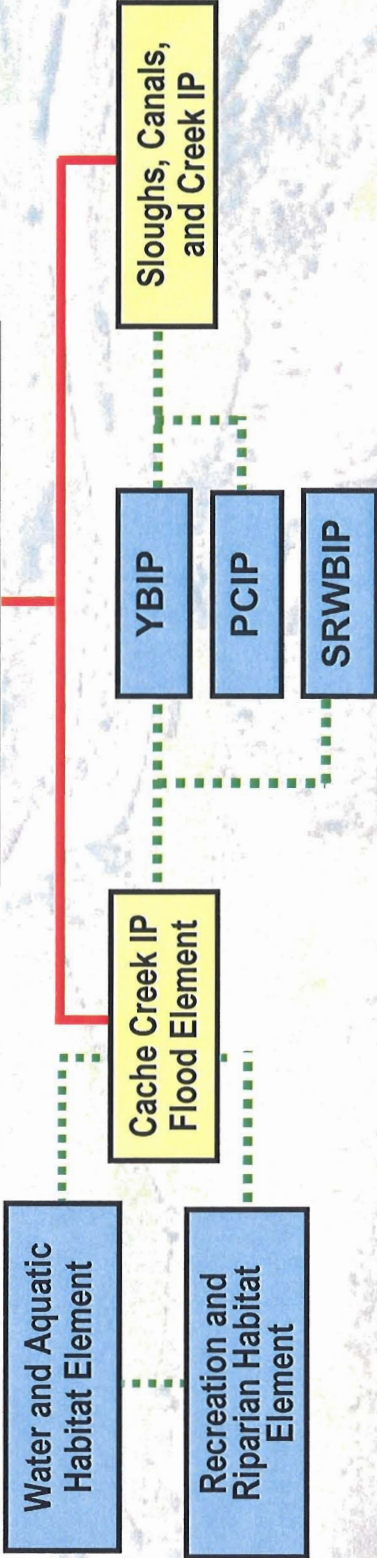


FIGURE 1

Organizational Structure

Program Advisory Committee (PAC)
 YFCWCWD, City of Woodland, Yolo County

YFCWCWD
 Administrative Lead

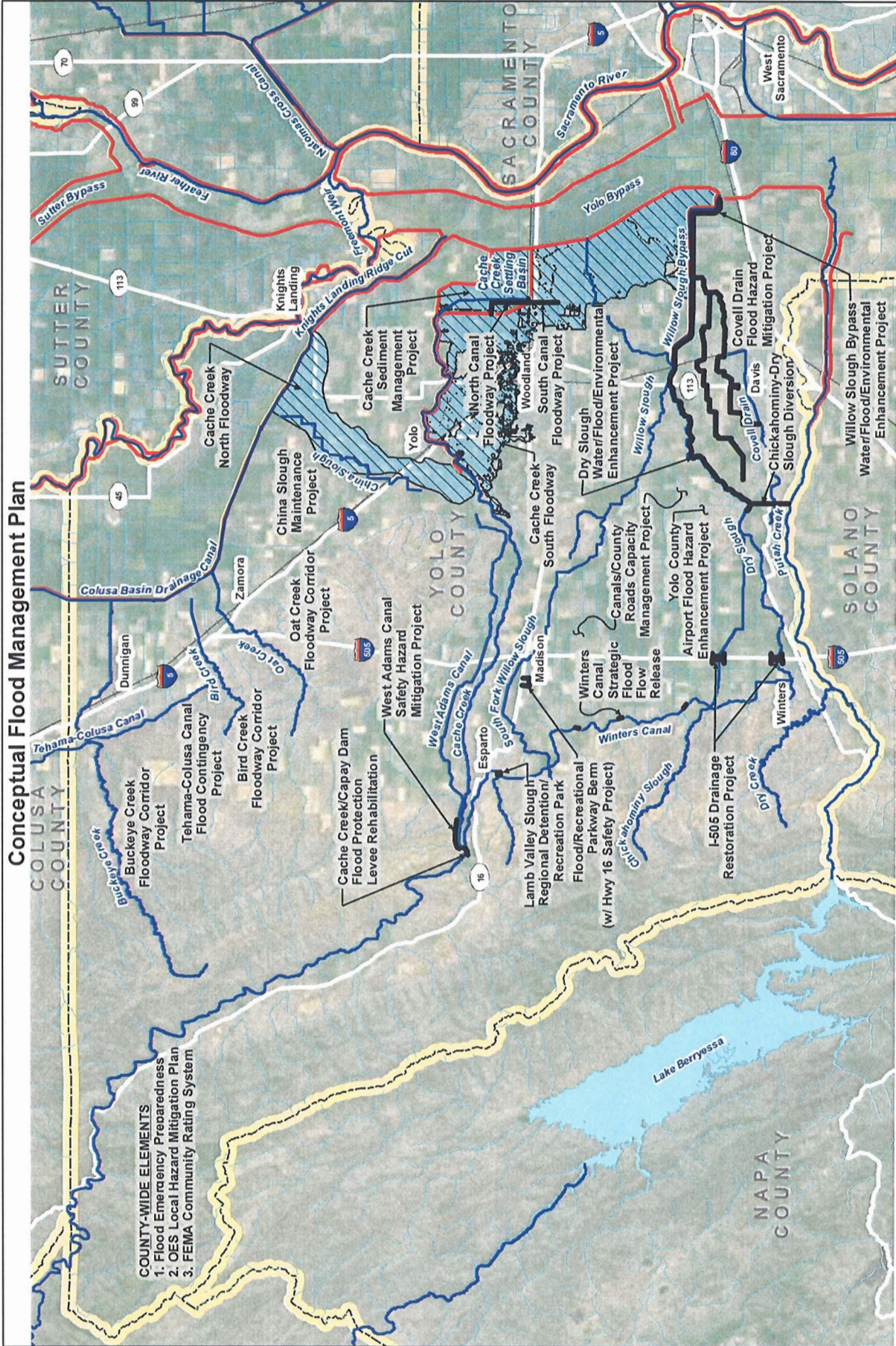


— Management Function
 Coordination Function

CCIP Cache Creek Integrated Project
 SCCIP Sloughs, Canals, and Creeks Integrated Project
 YBIP Yolo Bypass Integrated Project

PCIP Putah Creek Integrated Project
 SRWBIP Sacramento River West Bank Integrated Project

Conceptual Flood Management Plan



- COUNTY-WIDE ELEMENTS**
1. Flood Emergency Preparedness
 2. OES Local Hazard Mitigation Plan
 3. FEMA Community Rating System

Legend

- Conceptual Flood Management Facilities/Programs
- State/Federal Project Levees

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Pilot Program

FIGURE 3

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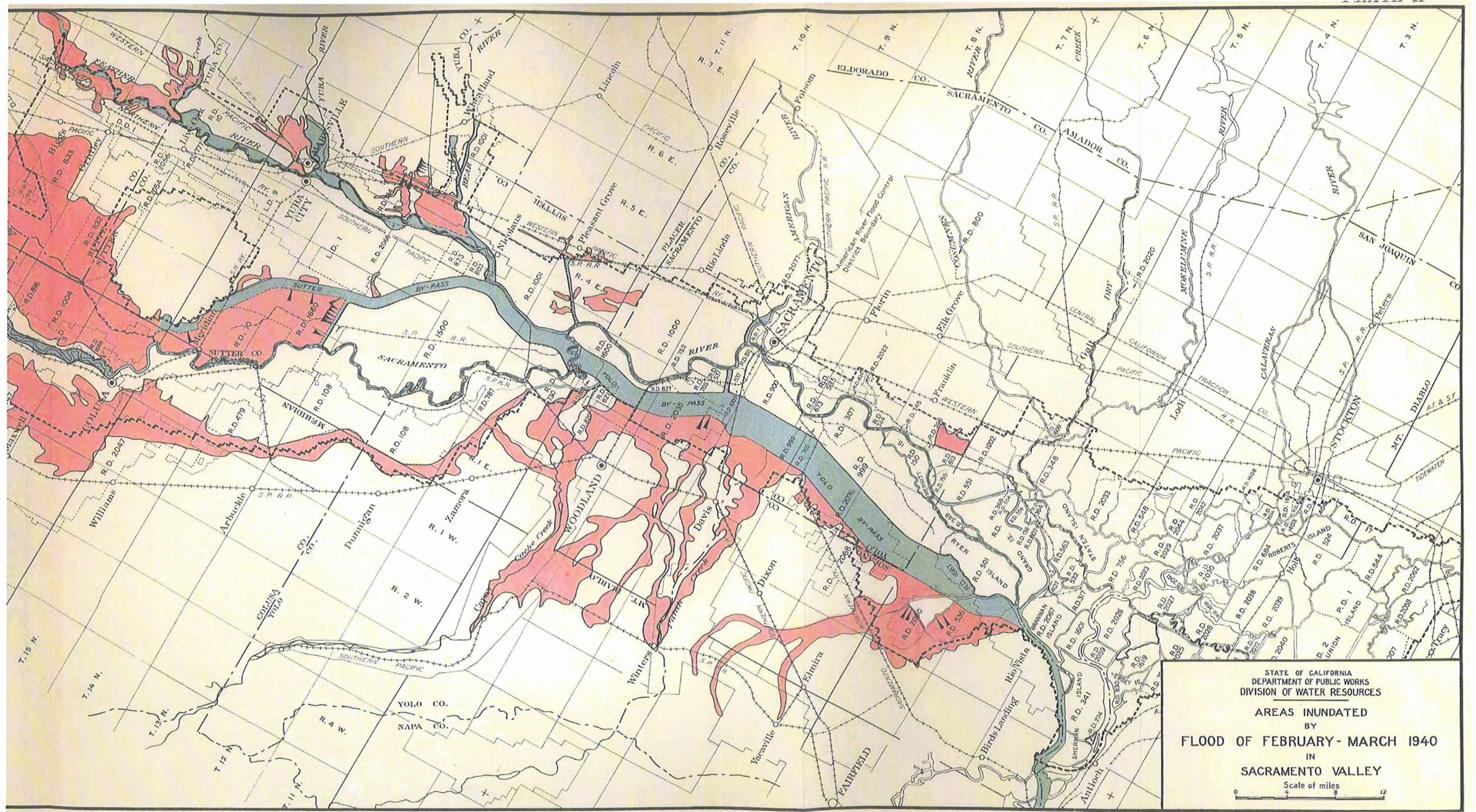
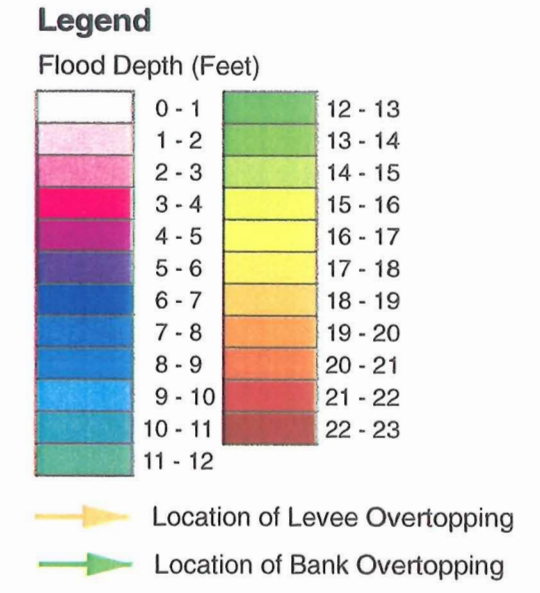
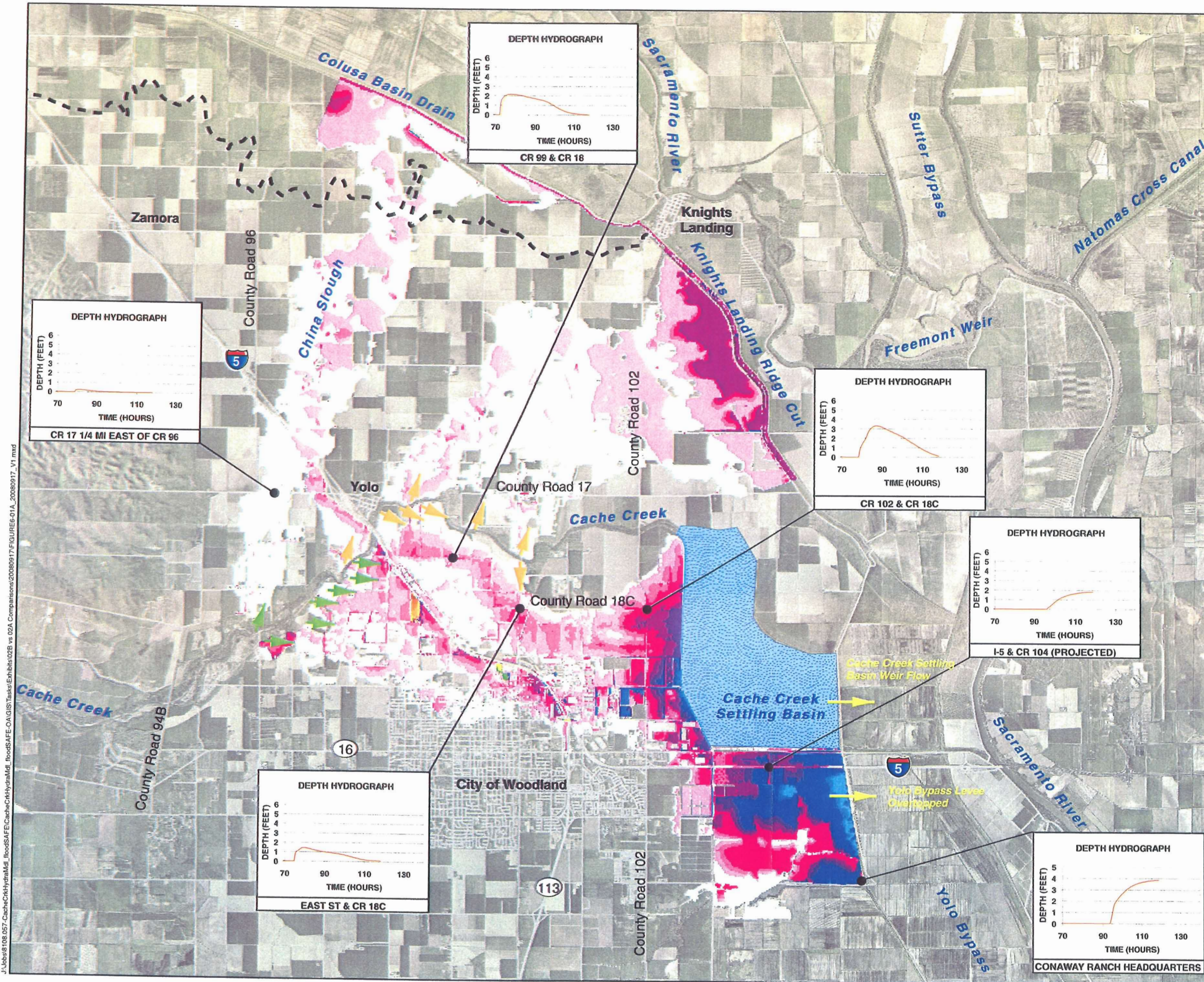
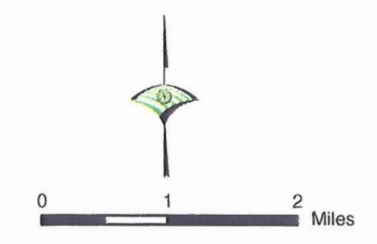


FIGURE 5



Note:
Analysis assumes overbank flooding and levee overtopping, but no levee failure.

- Sources:
1. Based upon the Effective Hydrology developed by US Army Corps of Engineers, "Cache Creek Feasibility Study", 2000.
 2. US Army Corps of Engineers, "Cache Creek Feasibility Study", 2000. Vertical datum is North American Vertical Datum of 1988 (NAVD 88).
 3. Intermap Technologies Inc. Digital Terrain Model, 2008.
 4. AerialsExpress, 2005.
 5. PBS&J, 2008.



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**CACHE CREEK 100-YEAR FLOODPLAIN
OVERBANK FLOODING WITH LEVEE
OVERTOPPING SCENARIO
MAXIMUM FLOOD DEPTHS**



FIGURE 6