

# Central Valley Integrated Flood Management Watershed Study (CVIFMS) Informational Briefing

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US Army Corps of Engineers  
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# Outline

- Recent Activities
- Current Activities
- Planning Goals
- Array of Measures
- Opportunity Areas
- Qualitative Screening
- Conceptual Alternatives
- Early “Off-shoot” Study
- Draft Proposed “Spin-off” and “Off-shoot” Studies
- Schedule



# What is CVIFMS?

- Federal companion document to Central Valley Flood Protection Plan, Regional Flood Management Plans and Integrated Regional Watershed Management Plans



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# What is CVIFMS?

- A watershed study focused on Sacramento River Basin to develop a comprehensive basin-wide management plan to:
  - ▶ Assess watershed characteristics and conditions
  - ▶ Identify watershed issues/problems
  - ▶ Develop, evaluate and prioritize conceptual alternatives, including structural and non-structural measures for flood risk management, ecosystem restoration and water supply/conservation
  - ▶ Incorporate public input and involvement
  - ▶ Identify potential “spin-off” studies under Federal, State and/or local authorities
- San Joaquin Basin – next phase





# Vision Statement

The Federal and State governments share a vision for an integrated flood management system in the Central Valley to provide for safe, healthy and thriving communities while protecting and restoring the environment. The problem is so overwhelming that achievement of this shared vision can only be through pursuit of mutual priorities. The State's flood risk management priorities of public safety, environmental stewardship and economic stability match the Federal administration's priorities of protecting the American people, restoring and protecting the environment and improving the nation's economy.



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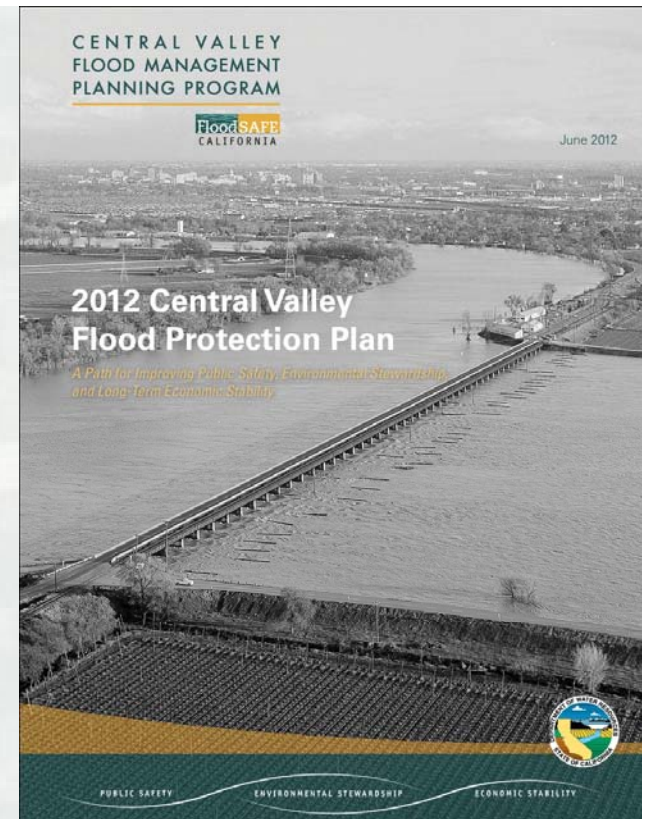


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# Ongoing Efforts

Leveraged existing information and models from State and USACE projects, including, but not limited to:

- Central Valley Flood Protection Plan
- Basin-wide feasibility studies
- Bay Delta Conservation Plan
- Regional Plans
- Sutter Basin Project
- Yuba River General Reevaluation Project
- Yuba River Ecosystem Restoration Study
- West Sacramento General Reevaluation Study
- American River Watershed Program: Common Features and Folsom Dam Joint Federal Project
- American River Common Features General Reevaluation Study
- Sacramento River Bank Protection Project
- Cache Creek Feasibility Study
- Delta Islands and Levees Feasibility Study
- Sacramento-San Joaquin Comprehensive Study



# Recent Activities

- Received funding to complete study June 2015
- Completed draft determination of federal interest
- Held two-day stakeholder workshop, 24-25 August 2015
- Completed first draft watershed plan, November 2015
- Completed sponsor and District Quality Control reviews
- Sent draft Plan to Agency Technical Review, South Pacific Division and to public for concurrent review, December 2015



# Current Activities

- Concurrent Review Period December 2015 – January 2016:
  - Agency Technical Review
  - South Pacific Division Planning and Policy review
  - Informal public review





# Planning Goals

## Flood Risk Management

- Reduce the risk to public safety from flooding in the Sacramento River Basin;
- Reduce the risk of damages to residential, agricultural and commercial/industrial areas, and roads and other critical infrastructure due to flooding;

## Ecosystem Restoration

- Restore aquatic habitat for the Sacramento River ecosystem;
- Restore natural stream processes in the Sacramento River;
- and

## Water Supply/Conservation

- Improve water supply reliability and availability



# Array of Flood Risk Management Management Measures

- |  |   |
|--|---|
| <ol style="list-style-type: none"><li>1. Widen bypasses</li><li>2. Create new bypasses</li><li>3. Modify weirs</li><li>4. Optimize operation of weirs</li><li>5. Automate weir operations</li><li>6. Remove/modify obstructions</li><li>7. Raise/strengthen existing levees</li><li>8. New levees</li><li>9. Setback levees</li><li>10. Coordinated emergency response plans</li></ol> | <ol style="list-style-type: none"><li>11. Flood recovery plan</li><li>12. Floodplain management plan</li><li>13. Create/enlarge floodplain storage</li><li>14. Purchase flowage easements</li><li>15. Re-operate/optimize reservoirs</li><li>16. Raise/upgrade existing dams</li><li>17. Forecast-based reservoir operations</li><li>18. Re-allocate storage in reservoirs</li><li>19. Construct new dams</li></ol> |
|--|---|



# Array of Ecosystem Restoration Management Measures

- |   |   |
|---|---|
| <ol style="list-style-type: none"><li>1. Increase shaded riverine aquatic habitat</li><li>2. Increase riverine aquatic habitat</li><li>3. Increase riparian habitat</li><li>4. Increase perennial marsh habitat</li><li>5. Impoundments for wetlands</li><li>6. Restore natural bank habitat</li><li>7. Re-create channel meanders</li><li>8. Remove barriers to channel migration</li><li>9. Lay-back banks to connect with floodplain</li><li>10. Terrace floodplains</li></ol> | <ol style="list-style-type: none"><li>11. Re-contour floodway</li><li>12. Remove barriers to fish passage</li><li>13. Screen pump diversions</li><li>14. Extend floodplains/expand floodway</li><li>15. Set back levees</li><li>16. Notch weirs</li><li>17. Remove non-native species</li><li>18. Reservoir re-operation</li><li>19. Low flow channel in bypasses</li></ol> |
|---|---|



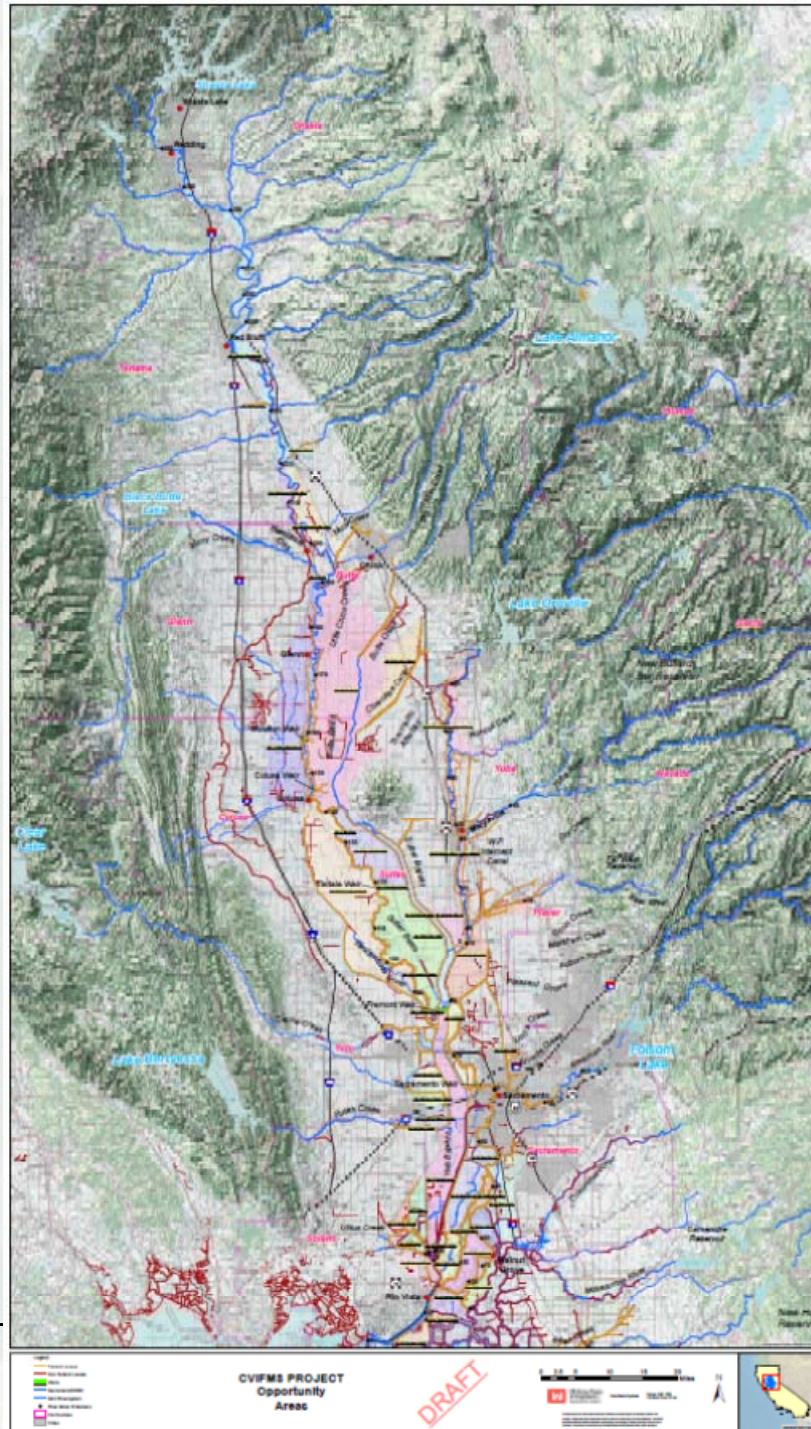
# Array of Water Supply Management Measures

1. New dams that include water supply purpose
2. Re-operate existing dams to conserve more water
3. Enhance/increase groundwater percolation
4. Re-allocate storage in reservoirs
5. Improve existing water conveyance system





# Watershed divided into 50 Opportunity Areas



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# Array of Measures Applied as Appropriate to each Opportunity Area

Sample from CVIFMS features table

Elder Creek Opportunity Area
Non-native removal/management
Floodplain Management Plan
Flood Recovery Plan
Restore habitat within the Sacramento River floodway
Reduce/remove piece of levee to restore habitat in Sac River Refuge area
Deer Creek Opportunity Area
Non-native removal/management
Floodplain Management Plan
Flood Recovery Plan
Restore habitat within the Sacramento River floodway
Improve Fish Passage (Lower Deer Creek)
Levee Setback (Lower Deer Creek)
O&M Manual change (ER)
Raise/strengthen existing levees
Woodson Bridge West Opportunity Area
Non-native removal/management
Remove barriers to channel migration
Restore Natural Bank Habitat
Floodplain Management Plan
Flood Recovery Plan
Restore habitat within the Sacramento River floodway
Woodson Bridge East Opportunity Area
Non-native removal/management
Set back levees - multipurpose
Reduce/remove levees East
Reduce/remove levees on eastern side of the river adjacent to Hamilton City
Restore habitat within the Sacramento River floodway
Extend or improve spawning habitat
Floodplain Management Plan
Flood Recovery Plan
Restore riparian habitat
Sediment removal at Lindo Creek
Capay Opportunity Area
Non-native removal/management
Create connectivity between Hamilton City project, federal protected lands and TNC lands
Restore riparian habitat
Restore habitat within the Sacramento River floodway
Chico Area (Lindo Channel/Sandy Gulch) Opportunity Area
Non-native removal/management
Improve connectivity to Stone Ridge Ecological Reserve and/or Bidwell Park
Floodplain Management Plan
Flood Recovery Plan



# Qualitative Screening

## Flood Risk Management Benefits

- How well the feature could reduce risks to life safety from flooding
- How well the feature could reduce the consequences associated with flood risk (with an emphasis on improving system resiliency and increasing the integrity of the flood system)
- How well the feature could reduce risks to critical infrastructure from flooding
- How well the feature could encourage wise use of the floodplain

## Water Supply Benefits

- How well the feature could increase the availability and reliability of water supply (groundwater and surface water)

## Ecosystem Restoration Benefits

- How well the feature could increase the area, quality, connectivity and diversity of significant native aquatic and related habitats
- How well the feature could reduce barriers to fish passage
- How well the feature could increase natural dynamic hydrologic and geomorphic processes
- Which types of species the feature could benefit: 1) aquatic, 2) avian, 3) terrestrial or 4) all types (zero = no benefit; low = one type could benefit; medium = two types could benefit; high = all types could benefit)



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# Qualitative Screening Continued

- FRM, ER and WS Costs
  - ▶ The order of magnitude of costs for the feature
  - ▶ The order of magnitude of mitigation that could be required for the feature
- Features that were infeasible, non-policy compliant or that scored zero or less were screened out



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# Conceptual Alternatives

The remaining features were combined into seven conceptual alternatives as follows:

- (0) No Action Alternative
- (1) Non-Structural Flood Risk Management (FRM) Alternative
- (2) Ecosystem Restoration (ER) Alternative
- (3) Flood Risk Management Alternative
- (4) Ecosystem Restoration and Flood Risk Management Alternative
- (4a) Locally developed plan - Central Valley Flood Protection Plan and the draft Conservation Strategy
- (5) FRM and Water Supply (WS) Alternative
- (6) FRM, ER and WS Alternative



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# Early “Off-shoot” Study

- Sacramento River GRR – recently initiated study to revision Sacramento River flood control system for flood risk management and ecosystem restoration



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# Draft Proposed “Spin-off” and “Off-shoot” Studies

## Near-term recommended studies include:

- Climate Change Assessment under USACE Floodplain Management Services
  - ▶ USACE, State, IWR, potentially other Districts in region and climate change experts
  - ▶ Develop standard approach for assessing impact of inland climate change on decision criteria in future studies in this region
- San Joaquin River Watershed Study (CVIFMS Part II) under General Investigations
  - ▶ Originally included in this study, but during a re-scoping, San Joaquin River Watershed was recommended to be assessed in a second phase
  - ▶ To address remaining portion of Central Valley, consistent with CVFPP and draft Conservation Strategy



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# Draft Proposed “Spin-off” and “Off-shoot” Studies Cont’d

- Central Valley Reservoir Reoperation Study under General/Special Investigations –
  - ▶ Operate system in a coordinated manner to optimize benefits
  - ▶ Comprehensive investigation of reservoirs within both Sacramento and San Joaquin River Basins (USACE, State, USBR) to optimize operations for FRM, ER and WS across system of reservoirs, incorporating weather forecasts and climate change analysis.
  - ▶ Logical and necessary next step to DWR’s Phase I and II reoperation studies ([http://www.water.ca.gov/system\\_reop/](http://www.water.ca.gov/system_reop/))
  - ▶ System reoperation has potential to produce benefits with little to no construction costs



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# Draft Proposed “Spin-off” and “Off-shoot” Studies Cont’d

- Middle and Upper Sacramento River Basin Comprehensive Study under General Investigations
  - ▶ Multi-purpose ER, FRM and water supply study
  - ▶ Study will consider sites located within middle and upper Sacramento River Watershed
  - ▶ Study would complement Middle and Upper Sacramento and Feather River Regional Plans and provide an opportunity to partner with both State and regional groups
  - ▶ Study area would include Sacramento and Feather Rivers and their tributaries
    - Lower Sacramento River-Delta North area is *not* included in this recommendation



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# Draft Proposed “Spin-off” and “Off-shoot” Studies Cont’d

## Mid- to Long-Term “Spin-off” and “Off-shoot” Studies Include:

- Non-Structural Floodplain Management Services
  - ▶ Small-scale, non-structural projects that can provide floodplain mapping, floodplain management plans, emergency plans and flood recovery plans
  - ▶ Could provide significant benefits to effected areas for low cost and effort
  - ▶ May be critical for small communities, agricultural areas and Tribal communities
- Upper American River and Tributaries
  - ▶ Multi-purpose FRM, WS and ER study along American River and its tributaries (above Folsom Dam and Reservoir).
- Ecosystem Restoration Studies under Continuing Authorities Program/General Investigations/Tribal Partnership Program
  - ▶ Restore ecosystem in more localized areas, including on Tribal lands
  - ▶ Areas such as Clear Lake/Upper Cache Creek, Elder Creek, Deer Creek and Stoney Creek among others



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# Draft Proposed “Spin-off” and “Off-shoot” Studies Cont’d

- Inter-Agency Support

- ▶ Support to sister federal agencies to assist with water resource projects for which USACE has an expertise

- Planning Assistance to States

- ▶ USACE can provide states, local governments, other non-Federal entities and eligible Tribes assistance in preparation of comprehensive plans for development, utilization and conservation of water and related land resources.
- ▶ Studies could include: water supply/demand, water conservation, water quality, ecosystem restoration and dam safety/failure.



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# Other Considerations

- Strategic Watershed Governance
- Regional Permitting
- O&M Challenges
- Timing of State and Local Actions  
(Basin-Wide Feasibility Studies / Regional Flood Management Plans / Near-term Implementation)



# DRAFT SCHEDULE

Activity	Start Date	Finish
<b>CONCURRENT REVIEW (initiation thru completion)</b>	<b>30-Nov-15</b>	<b>22-Jan-15</b>
Submit draft Watershed Report to SPD*		8-Dec-15
Concurrent Review (SPD, ATR)	30-Nov-15	22-Jan-15
Comments submitted in Dr Checks by the ATRT	30-Nov-15	11-Dec-15
ATR Kick-off Meeting		1-Dec-15
Informal Public Meeting (Marysville, CA)*		16-Dec-15
Evaluations in Dr Checks by PDT	11-Dec-15	18-Dec-15
Revised Documents by PDT for back checks by ATRT on Dr Checks and Elmo link	18-Dec-15	8-Jan-16
Close-out all ATR and SPD Comments	11-Jan-16	15-Jan-16
Review Report complete and signed by ATR Lead, RMO POC and District POC	18-Jan-16	22-Jan-16
<b>FINALIZE WATERSHED REPORT</b>	<b>25-Jan-16</b>	<b>12-Feb-16</b>
Incorporate comments into Final Watershed Report	20-Jan-16	5-Feb-16
Circulate Package for SPK signatures (i.e. chop)	9-Feb-16	12-Feb-16
Submit Final Watershed Report for approval*		12-Feb-16
<b>REPORT APPROVAL</b>	<b>16-Feb-16</b>	<b>16-Mar-16</b>





# Questions/Discussion



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