Balancing Life Safety with Ecological Health and Economic Sustainability:

Challenging the Status Quo in the Sacramento River Valley and Delta

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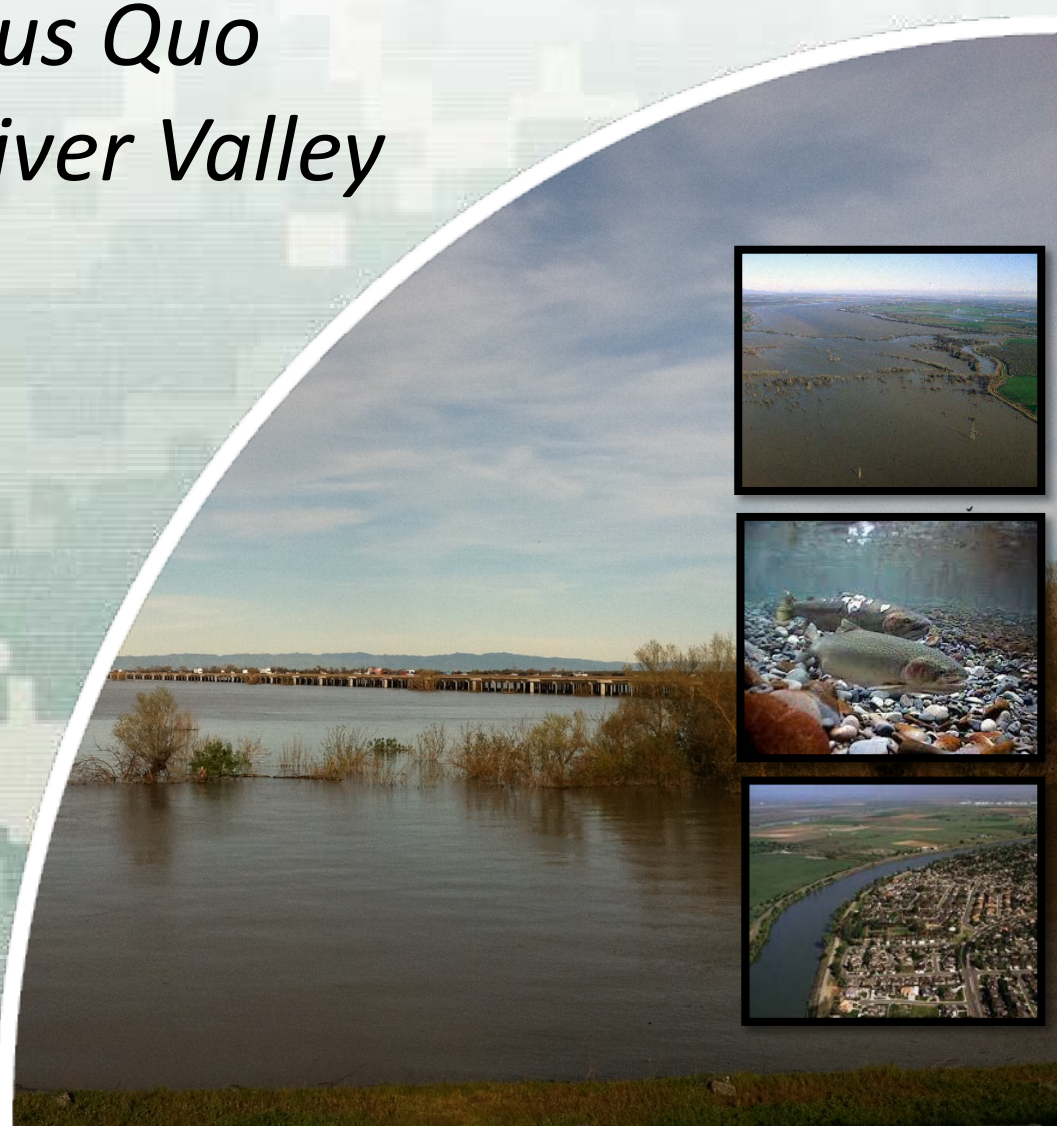


US Army Corps of Engineers
BUILDING STRONG®

Sacramento River Watershed

- City of Sacramento one of most at risk cities for flooding
- Major losses of riparian and wetland habitat in region

Differing Regulatory Frameworks

- Flood Management System established prior to ESA and other Environmental Laws
- The decline in native species has resulted in more stringent environmental requirements
- Flood and Environmental regulatory frameworks developed independently largely without determining whether they can work together
- Conflicting requirements make operation of flood management system and establishment of new habitat problematic

Sacramento River

General Reevaluation Report (GRR)

- Study to investigate the existing flood management system
- Evaluate re-operating, modifying, or improving the system for both flood risk management and ecosystem restoration

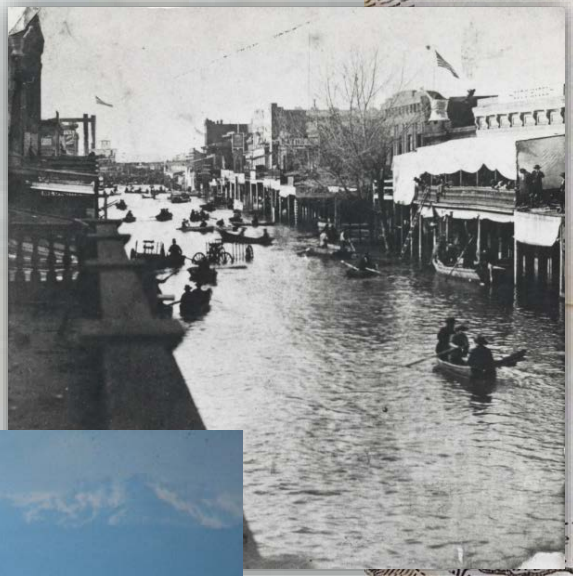
Guidance

Engineering Circular (EC) 1105-2-404

Planning Civil Works Projects under the Environmental Operating Principles.

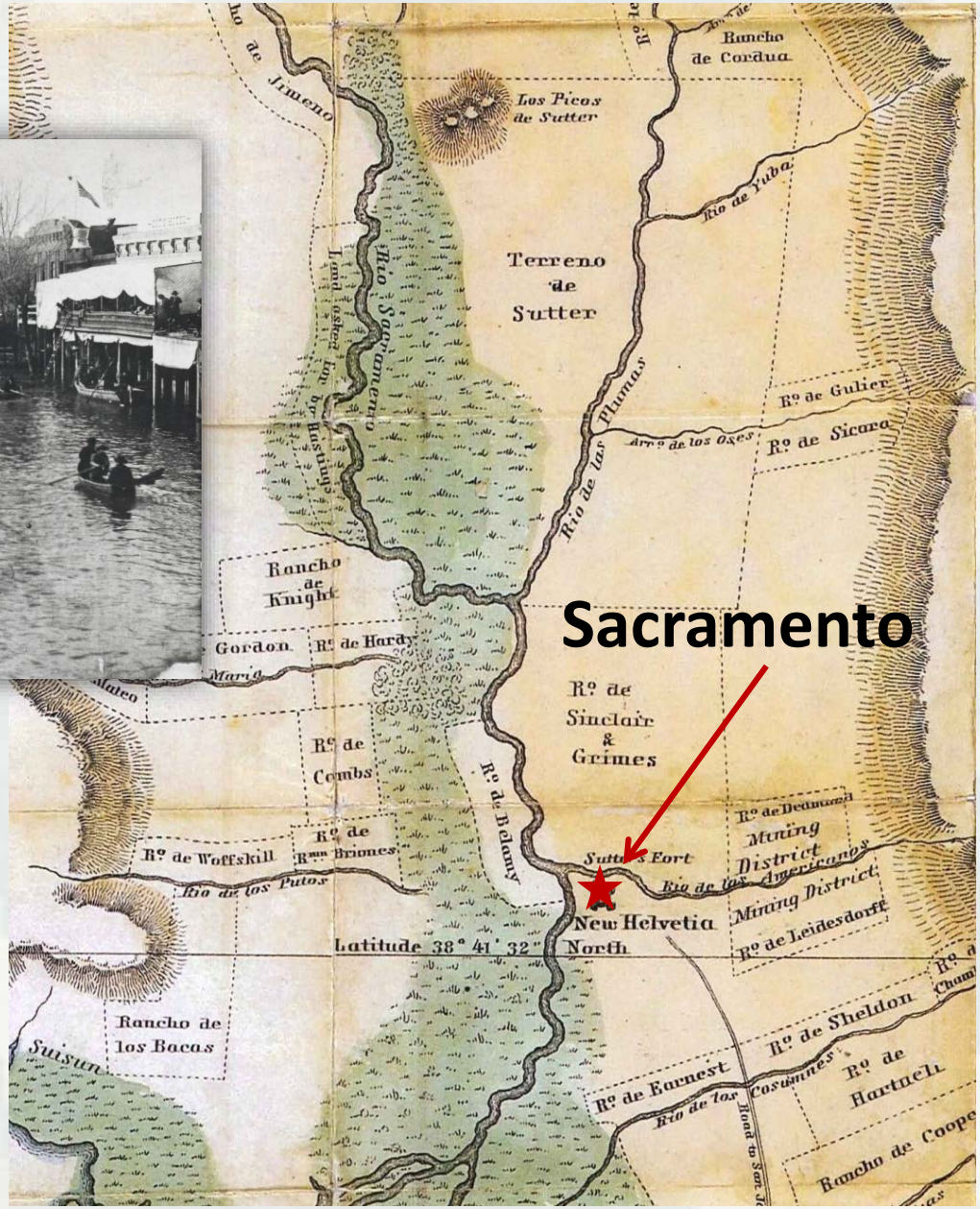
- Allows for multipurpose project planning
- "Synergistic process whereby environmental and economic considerations are effectively balanced…"
- "…strive to achieve the appropriate balance between the economic (Flood Risk Management) and environmental benefits provided by a project.

Historical Setting

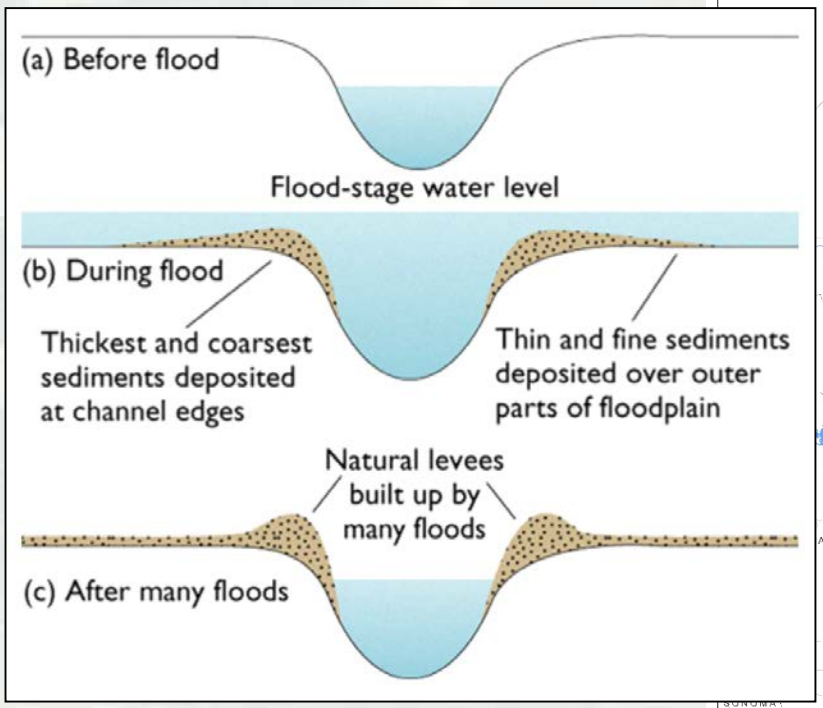


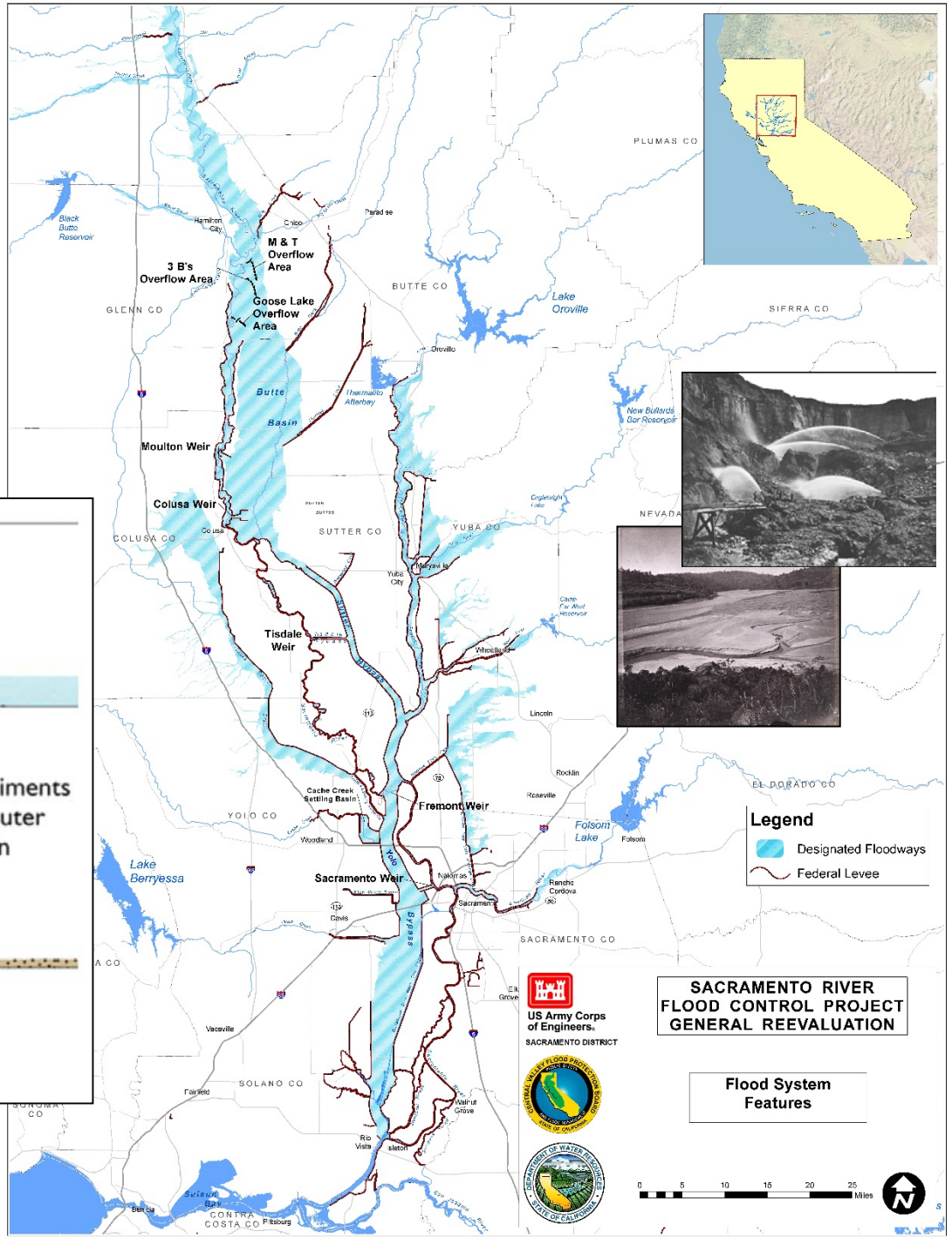
Flooding in Sacramento in the 1800's

Present day Sacramento with Yolo Bypass in foreground



Sacramento River Flood Management System





Study Area

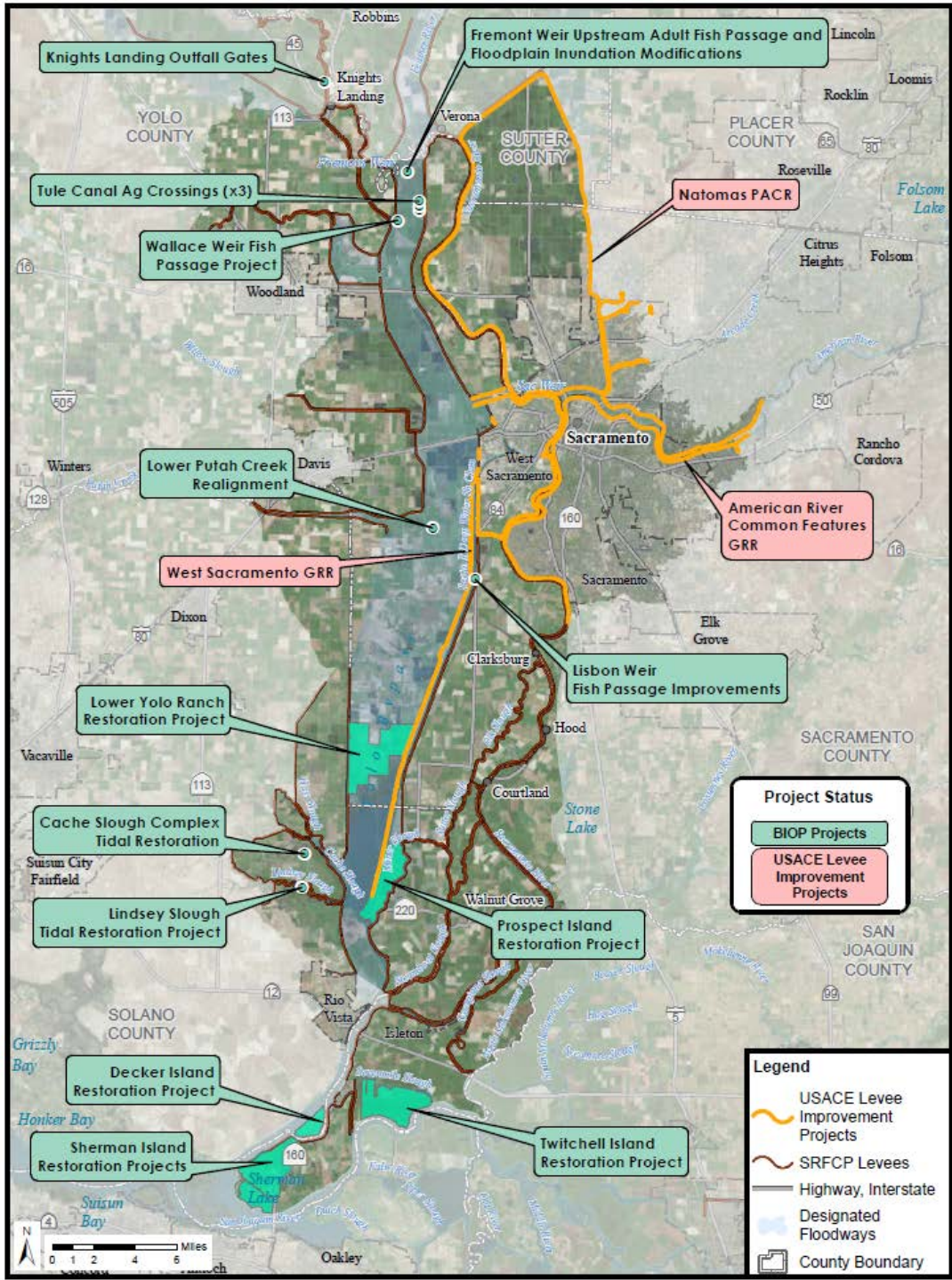
- Specifically focused on the Flood Management System from Knight's Landing to Collinsville
- USACE missions focused on Flood Risk Management and Ecosystem Restoration
- Seeking to improve the Flood Risk Management System for both purposes

Problems

- High risk of flooding threatens public safety, property and critical infrastructure
- Riparian and aquatic ecosystem has been degraded and habitat connectivity has been lost
- Restricted fish passage
- Existing regulatory framework for flood and environmental resources do not support long term integrated management of dynamic systems

Future Without Project Conditions

- Assumptions on what studies and projects would be implemented in the near term
- Becomes the baseline to which we compare our alternatives



Fish and Wildlife Resources

- **Institutional Significance**
  - 50 listed species
  - Within Pacific Flyway
- **Technical Significance**
  - ESA listings based on scientific and technical research
- **Public Significance**
  - Organizations formed to support resources
    - Yolo Basin Foundation
    - 2 State Wildlife Areas

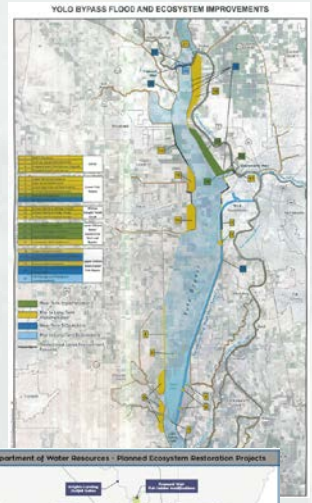
Process to Develop Preliminary Alternatives

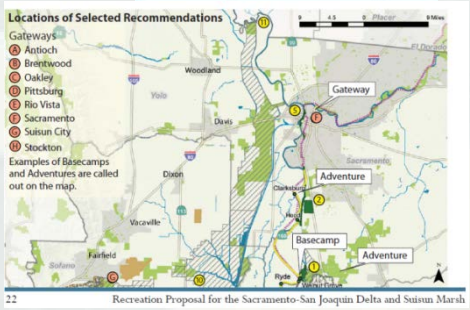
- Followed the federal planning process with input from a team Charette, public scoping meetings and other stakeholder meetings:
  - Identified the problems in the study area, the study objectives, the opportunities available, and the planning constraints.
  - Developed measures to address problems and objectives.
  - Developed an initial array of alternatives by combining measures.
  - Formulated Ecosystem Restoration (ER), Flood Risk Management (FRM), and Joint Flood Risk Management & Ecosystem (FRM &ER) Alternatives

Sacramento Bypass

Process to Develop Preliminary Alternatives

- Initial Ecosystem Restoration (ER) only Alternatives
  - Locations with significant potential for ecosystem restoration
  - Gathered info from current projects/proposals/agency plans
  - Alternatives developed incrementally from small to large
- Initial Flood Risk Management (FRM) only Alternatives
  - Incremental approach to flood risk reduction while
  - Leveraging current projects/proposals/agency plans
- Initial Combined FRM &ER Alternatives
  - Focused on measures that would provide both FRM and ER benefits
    - Weir modifications
    - Setback/removal of levees
    - Multi-purpose ring levees around small communities
  - Supplemented with additional FRM only and ER only measures from current projects/proposals/agency plans
  - Included 2 locally developed plans

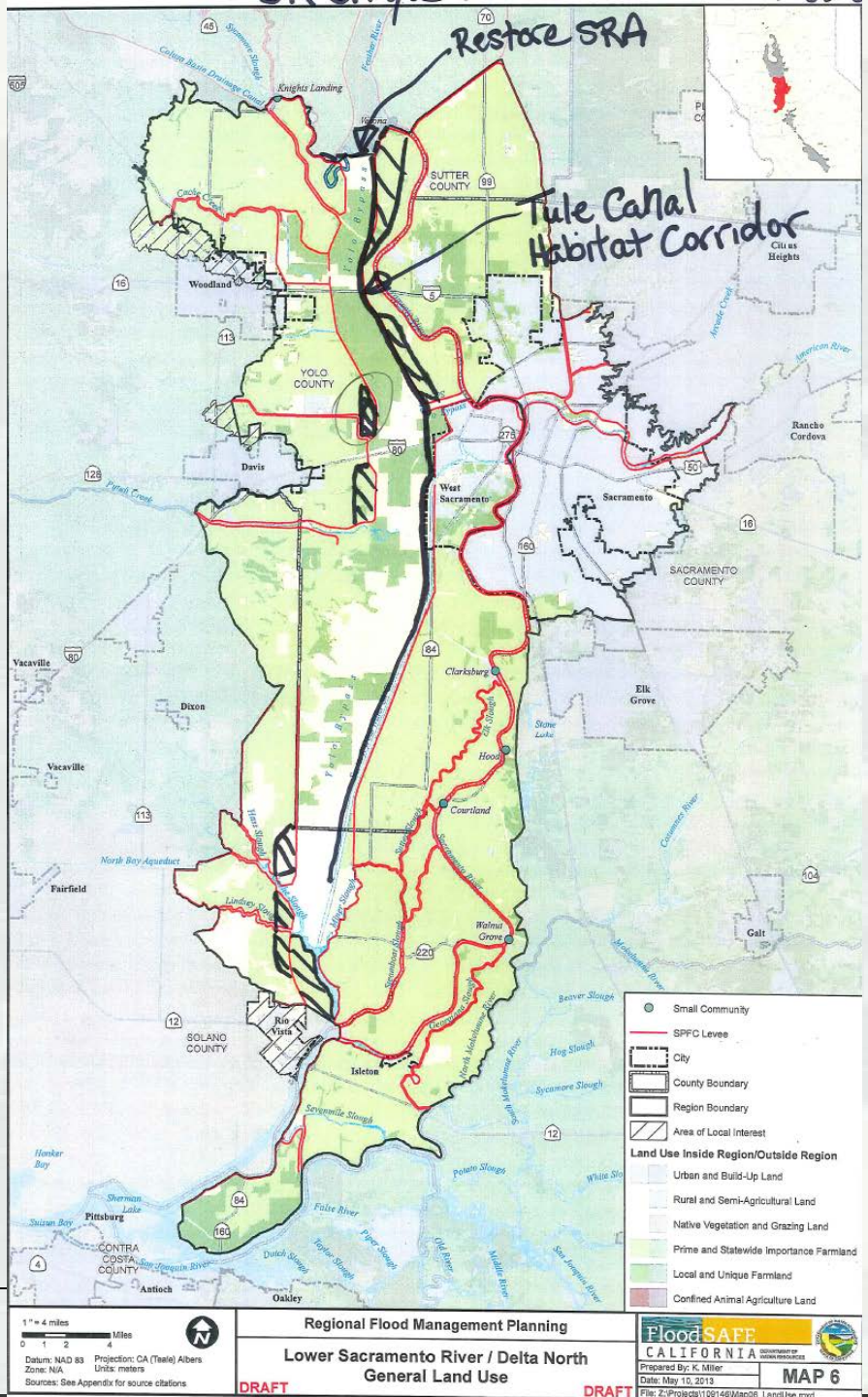




Preliminary
Initial Array of Alternatives

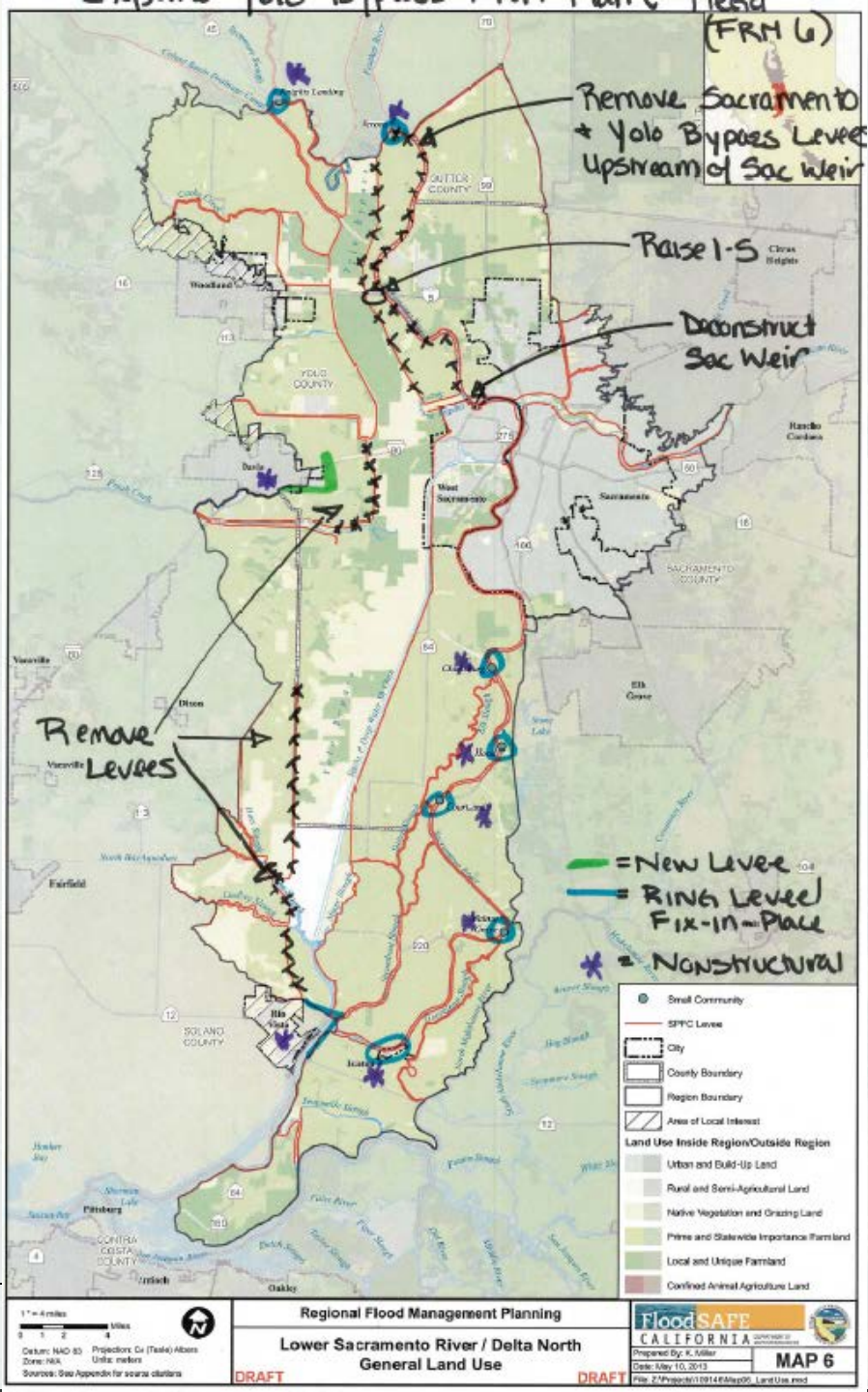
Ecosystem Restoration Alternative 2a

- Restore Shaded Riverine Aquatic habitat
- Improve habitat along the Tule Canal
- Restore and reconnect areas to the floodplain through setback levees



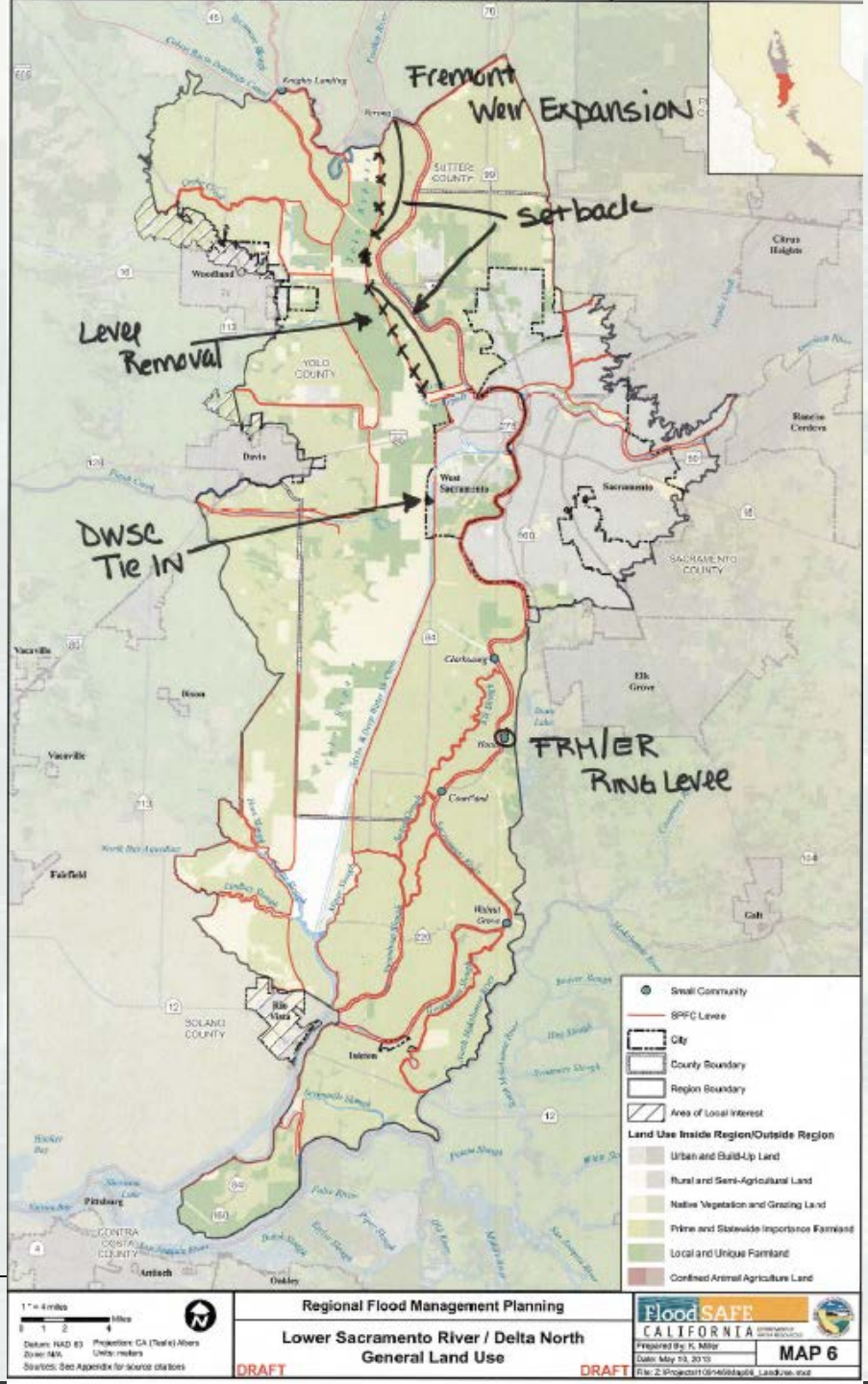
Flood Risk Management Alternative 6

- Expand Bypass – by removing levees
- Deconstruct the Sacramento Weir
- Construct new levee to protect established urban area
- Construct Ring Levees to protect small communities
- Promote non-structural risk reduction measures



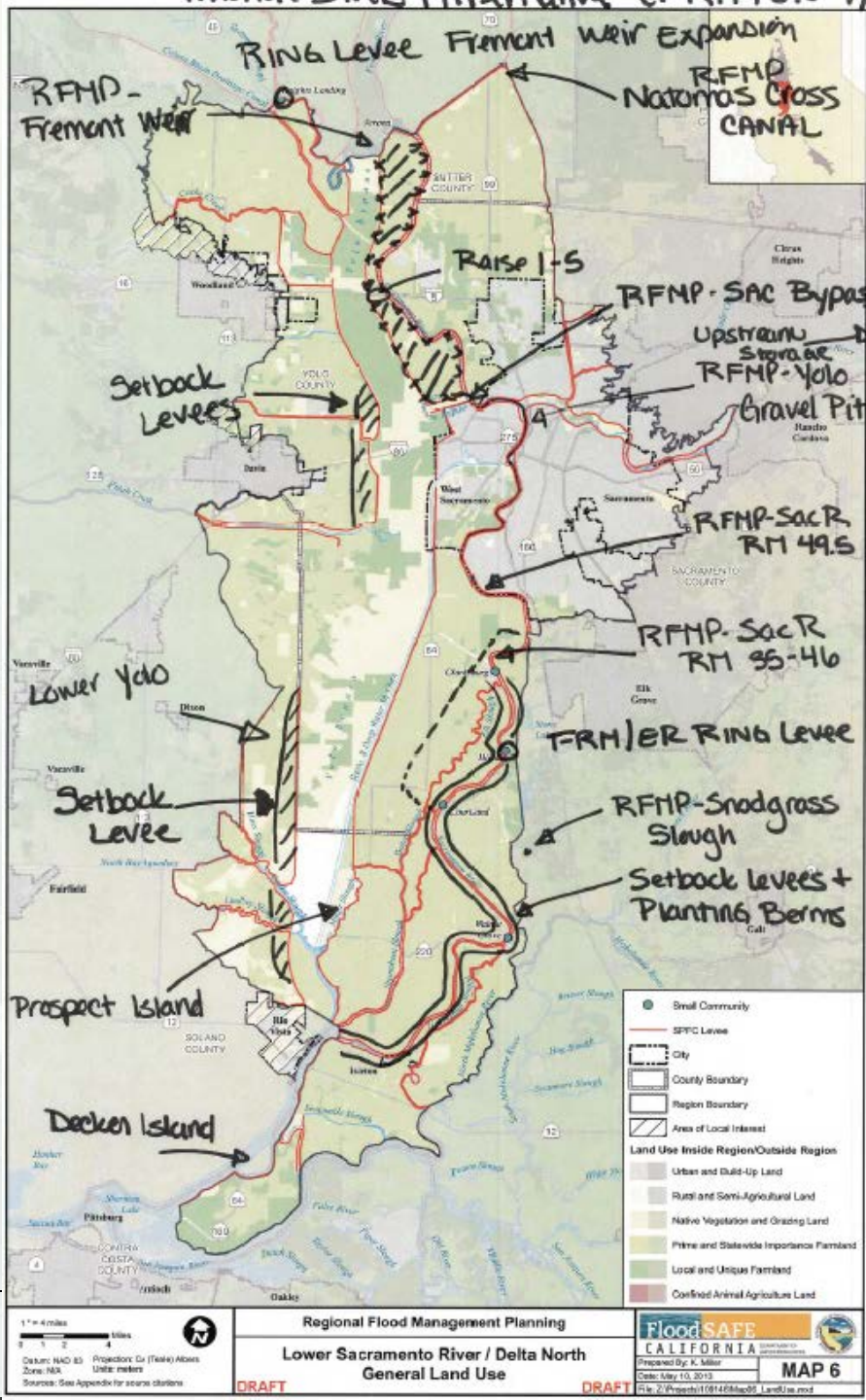
Combined ER and FRM Alternative 1

- Expand Fremont Weir
- Setback levees and restore area reconnected to the floodplain
- Connect to the Deep Water Ship Channel to provide additional flood conveyance
- Construct Ring Levee for the small community of Hood



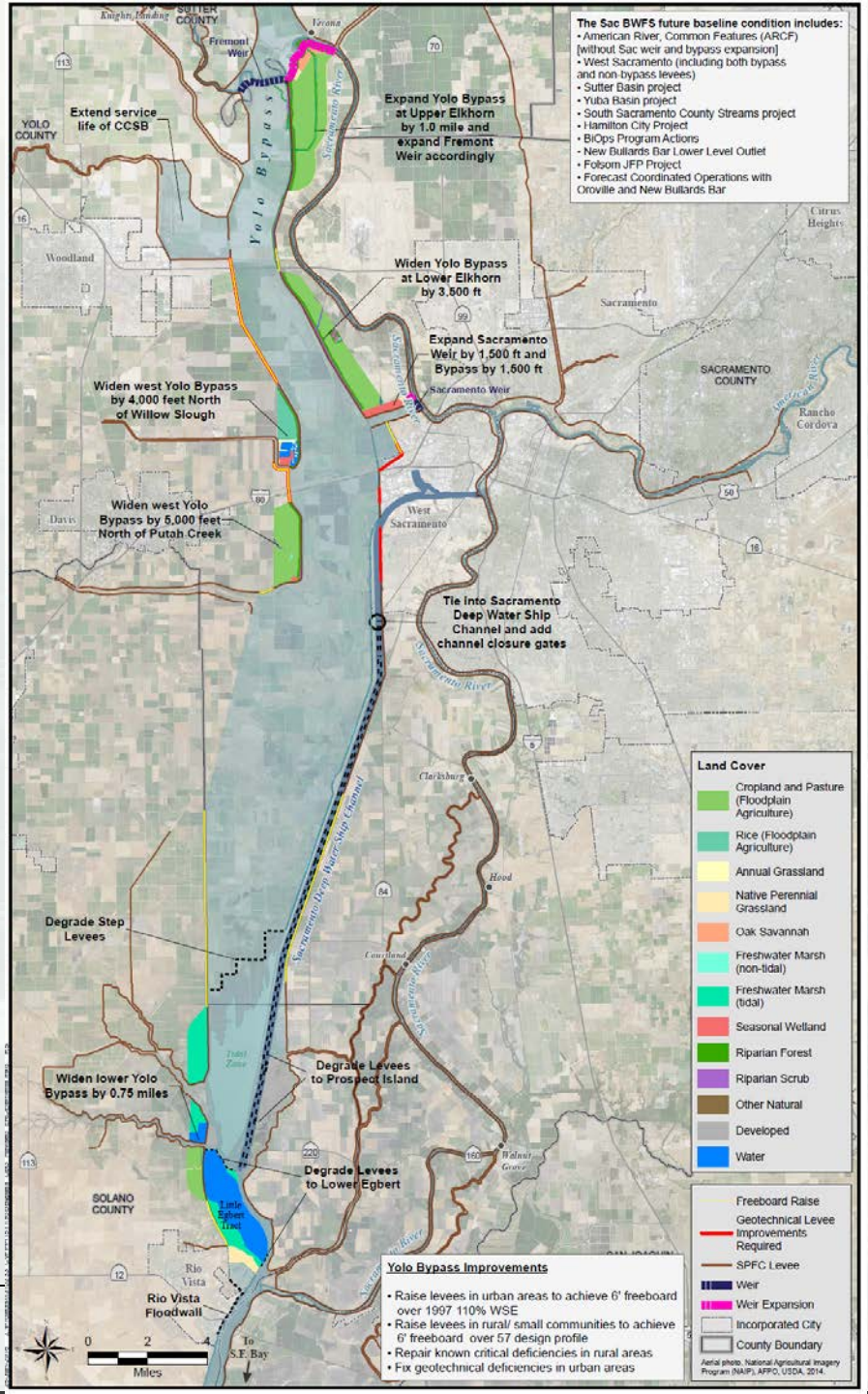
Combined ER and FRM Alternative 9

- Expand the Fremont Weir
- Construct setback levees in the Yolo Bypass and restore the area reconnected to the floodplain
- Construct setback levees along the Sacramento River and establish planting berms
- Construct Ring Levee for the small community of Hood

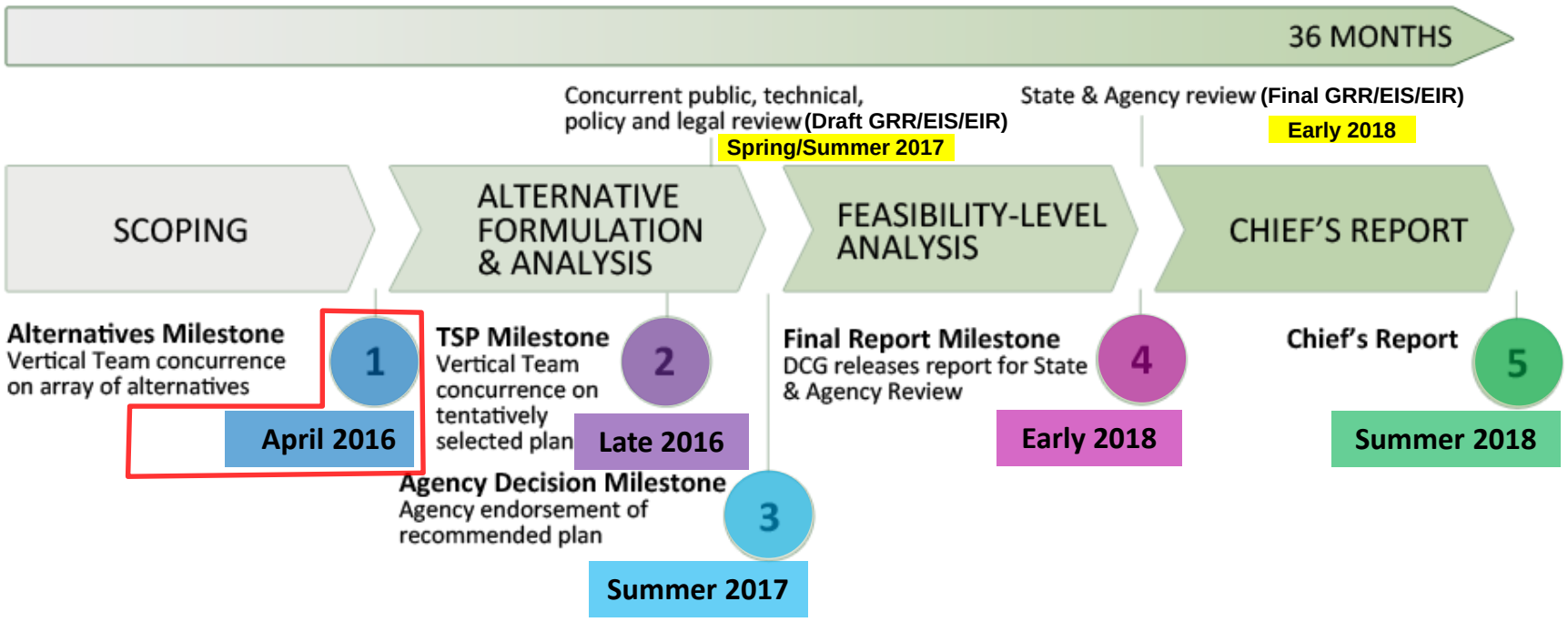


California Department of Water Resources Preferred Alternative

- Locally Developed Plan included in array of Alternatives
- Setback levees for improved conveyance capacity and restoration of habitat
- Widens Fremont Weir and adds capacity in the Ship Channel



Tentative Sacramento River GRR Schedule



Questions?

Fremont Weir - 1963