

Lower San Joaquin River Flood Bypass

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September 11, 2014

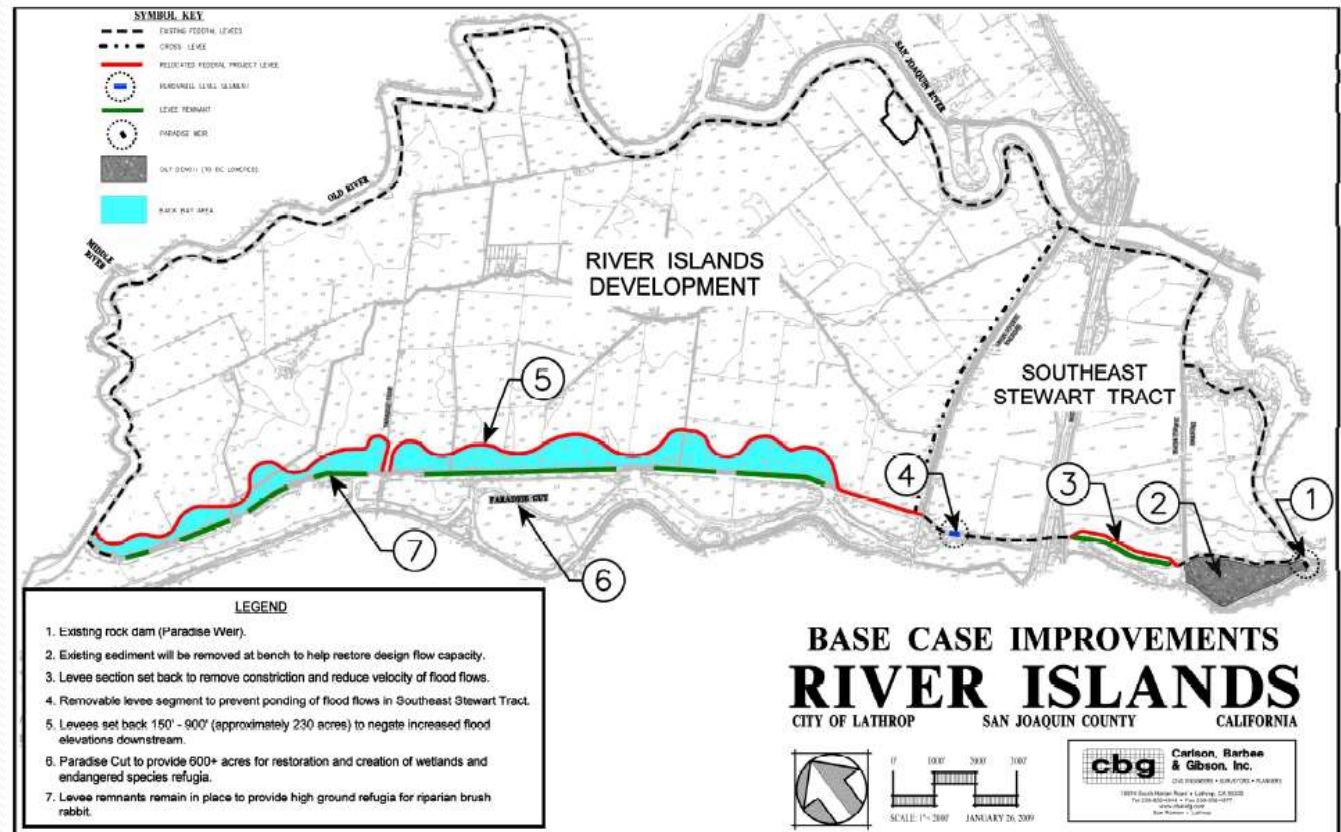
Rationale for Lower San Joaquin River Bypass

- Areas along the main river are planned for urban development
- Expanding Paradise Cut would divert water away from the urbanized reach
- Two Projects Proposed: Base Case and Southern Improvements



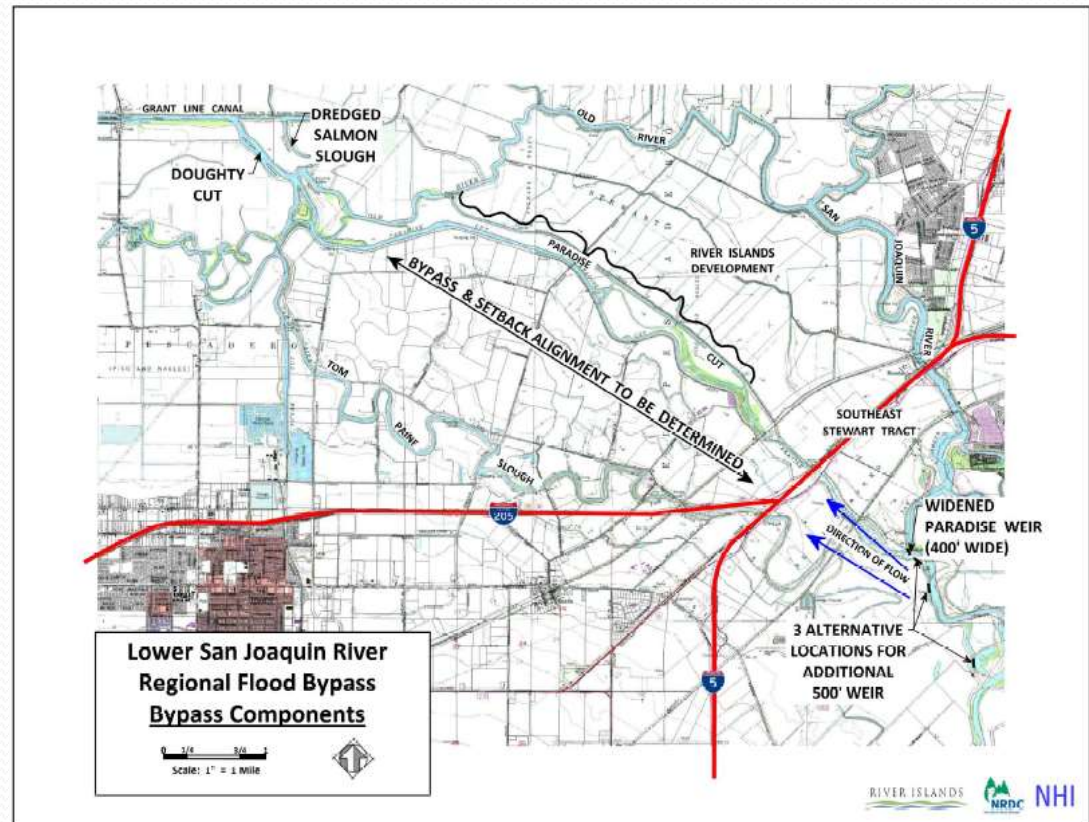
“Base Case” Improvements

Levee set-back to the north on Stewart Tract



Southern Improvements

- Resulted from legal settlement between River Islands, State Reclamation Board, NRDC, and NHI.
- Builds on Base Case Improvements.

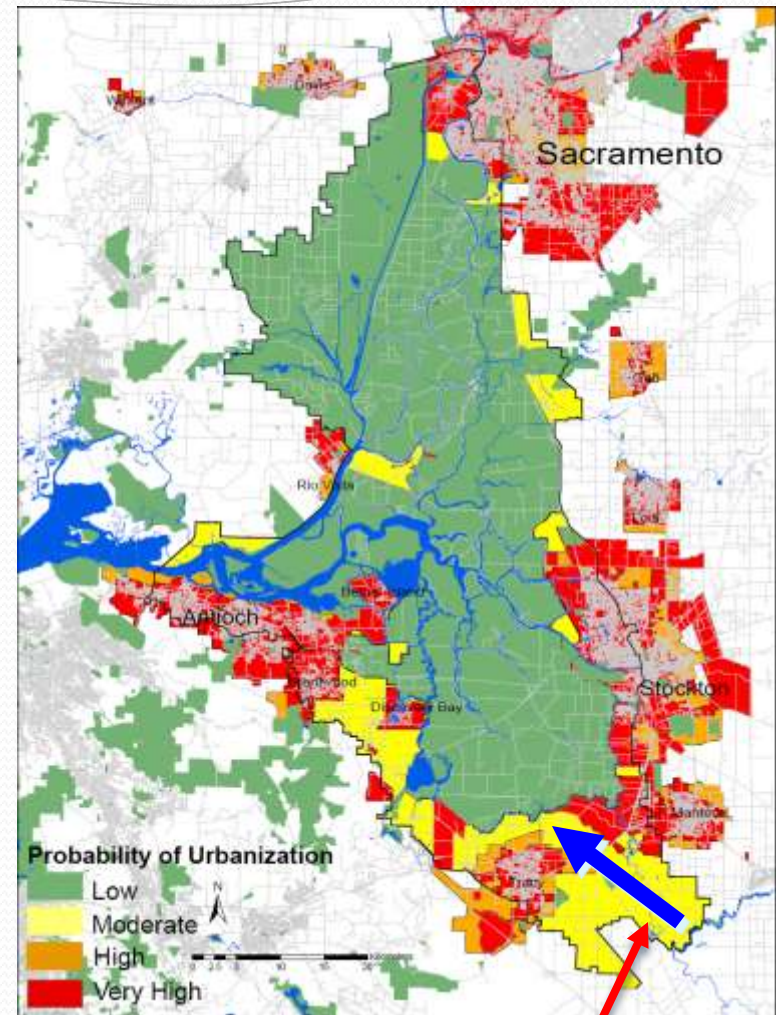


Modeling Benefits of Lower San Joaquin River Bypass

- Modeling predicts a 20 inch stage reduction for the 50 year flood event.
- Minimum stage increases downstream.
- Could provide rationale for needed levee improvements downstream.
- Could provide additional habitat depending on landowner willingness.

Environmental Benefits

- Paradise Cut will provide flexibility for future flood management.
- Reduce long-term conflict between flood management and the environment.
- Protect and conserve agricultural land.
- Provide major habitat benefits for riparian rabbit and Swainson's hawk
- Increase the area of floodplain habitat for fish.



Planned Urbanization

Proposed bypass
Location

Questions?

State Plans and Legislation

- SB 5 directed DWR and CVFPB to evaluate “feasibility of potential bypasses or floodways that would significantly reduce flood stage in the San Joaquin River Watershed, upstream and south of Paradise Cut.”
- Delta Plan recommends implementation of LSJRB and prohibits encroachments in the LSJRB planning area.
- 2012 Central Valley Flood Protection Plan proposes Lower San Joaquin River Flood Bypass.

In the foreword to the 1998 addition of Battling the Inland Sea, David Kennedy, the longest serving director of DWR wrote:

“A latter-day version of the bypass debate is now unfolding on the San Joaquin River, after the 1997 flood . . . Further, consideration is being given to opening up some form of bypass through the south Delta to relieve pressure on the levees as the San Joaquin River flows into the Delta. *It is hoped these issues will be resolved and changes will be made before the next flood.*”

Partial Summary of Previous Studies

Over Ten Previous Studies of Paradise Cut Expansion over the last 20 years.

- 1998 Flood Evaluation Action Team (FEAT)
- 1999 CALFED
- 2002 Comprehensive Study
- 2004 South Delta Water Agency Flood Plan
- 2005 River Islands Paradise Cut Improvement Plan
- 2007 River Island, NRDC, NHI, CVFBP settlement analysis
- 2010 DWR analysis for 2012 CVFPP
- 2012 DWR's BDCP analysis
- 2012 American Rivers analysis
- 2013 DWR analysis
- 2013 USACE Lower San Joaquin Feasibility Study analysis

Overview of Previous Studies

- Six recent studies utilized different modeling approaches and hydrologic assumptions to evaluate a range of different scenarios. None of the studies utilized climate change hydrology.
- Expanding Paradise Cut would lower flood stage in the main river near River Islands and RD17 by 20 inches or more under a broad range of hydrologic events.
- Would increase flood stage by six inches or less along Old River or Grant Line Canal.
- DWR and USACE studies preliminarily determined that the project would not be cost effective because it would not obviate the need for costly improvements to the RD 17 levees.

Overview of Previous Studies

- Significant benefits for terrestrial species particularly Riparian Brush Rabbit, Swainson's Hawk, and migratory birds.
- Uncertain benefits (or impacts) for juvenile salmon and other fish.
- An expanded Paradise Cut would only carry flood flows during the wettest 20% of years.

Questions?

Summary of Lower San Joaquin River Regional Flood Bypass Hydraulic Analysis

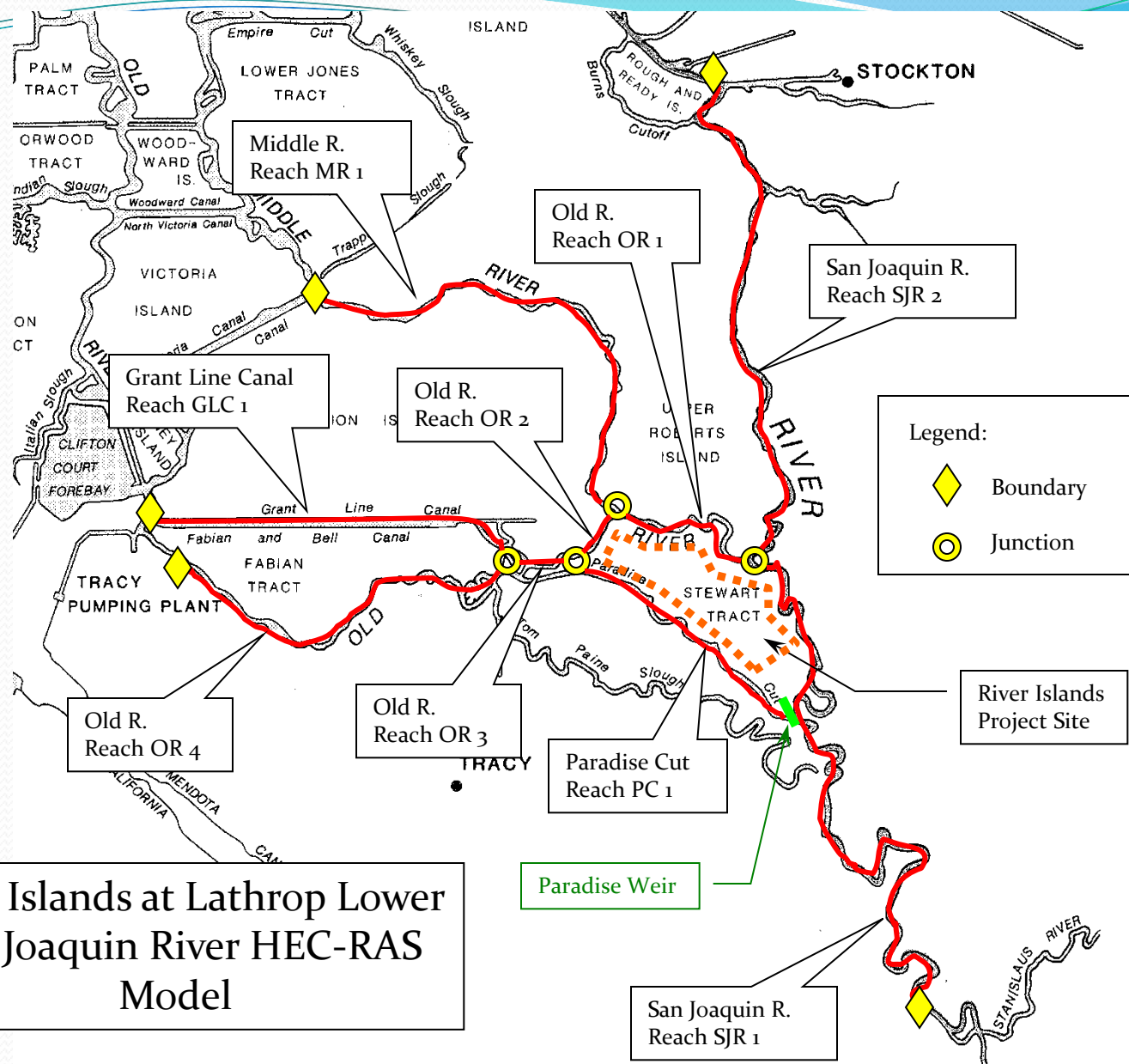
for

River Islands-NRDC Settlement Negotiations, 2008

Presented by
Michael Archer, P.E.



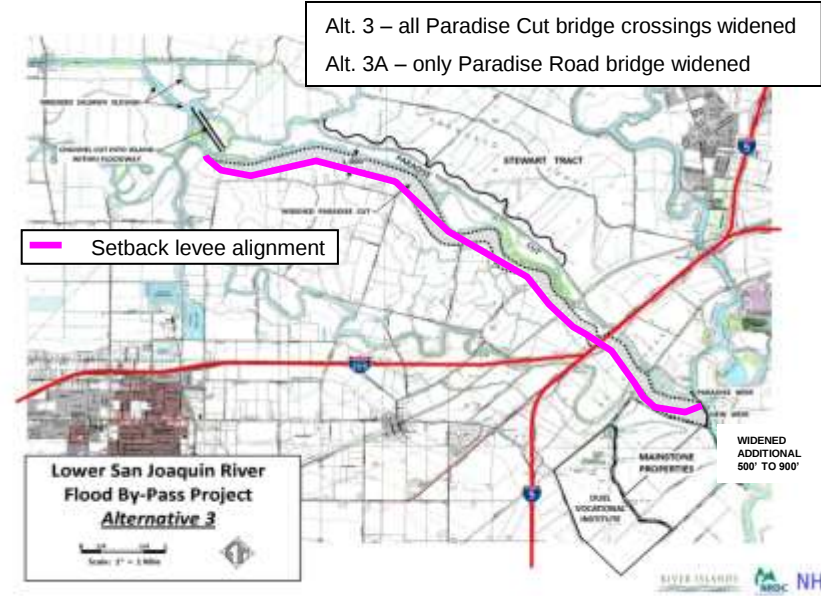
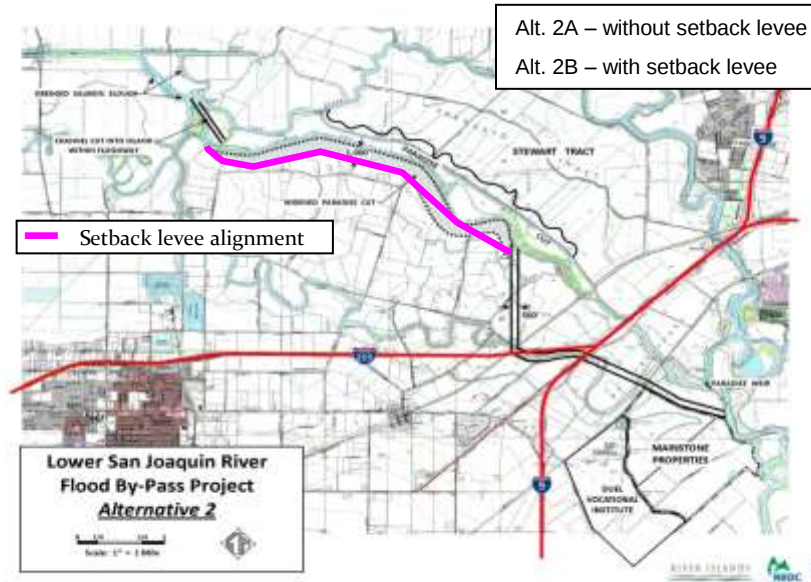
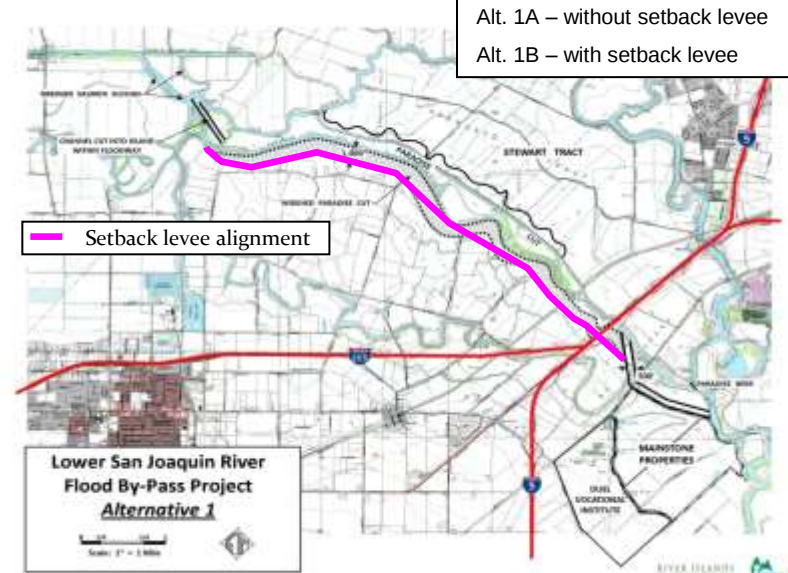
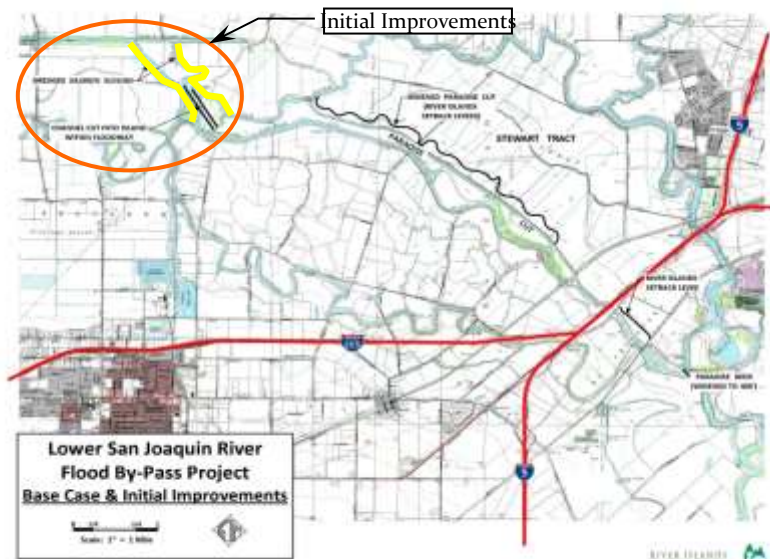
Paradise Cut Symposium II
September 11, 2014



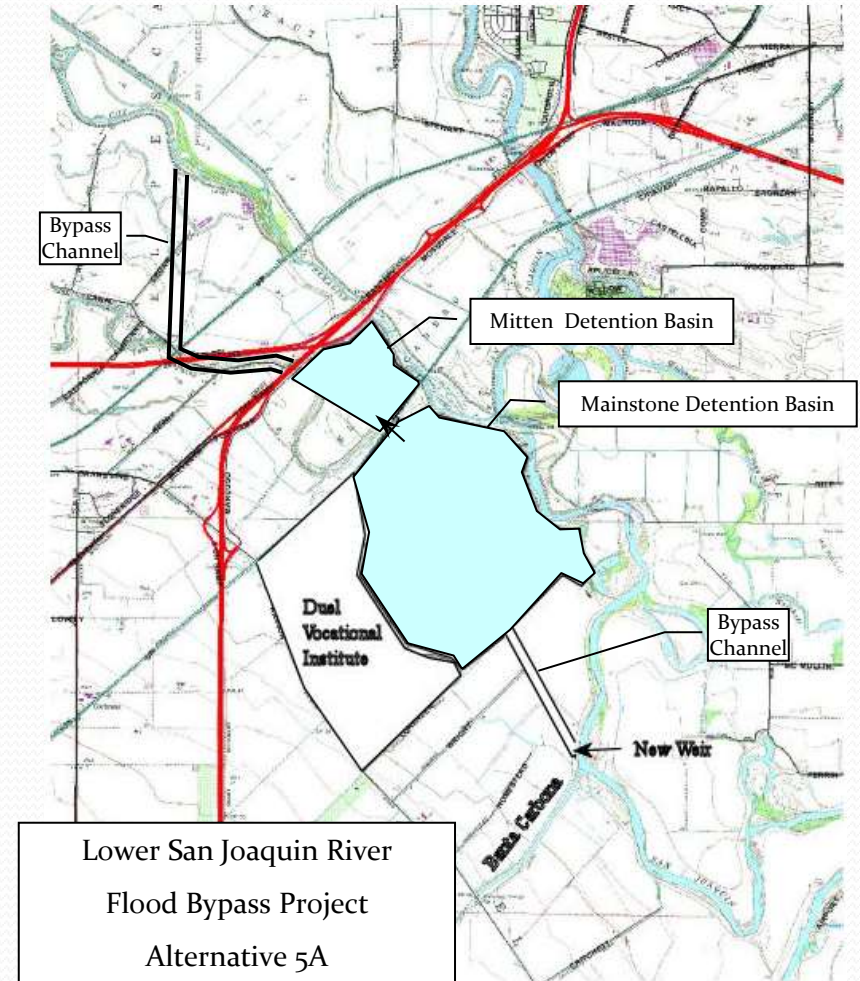
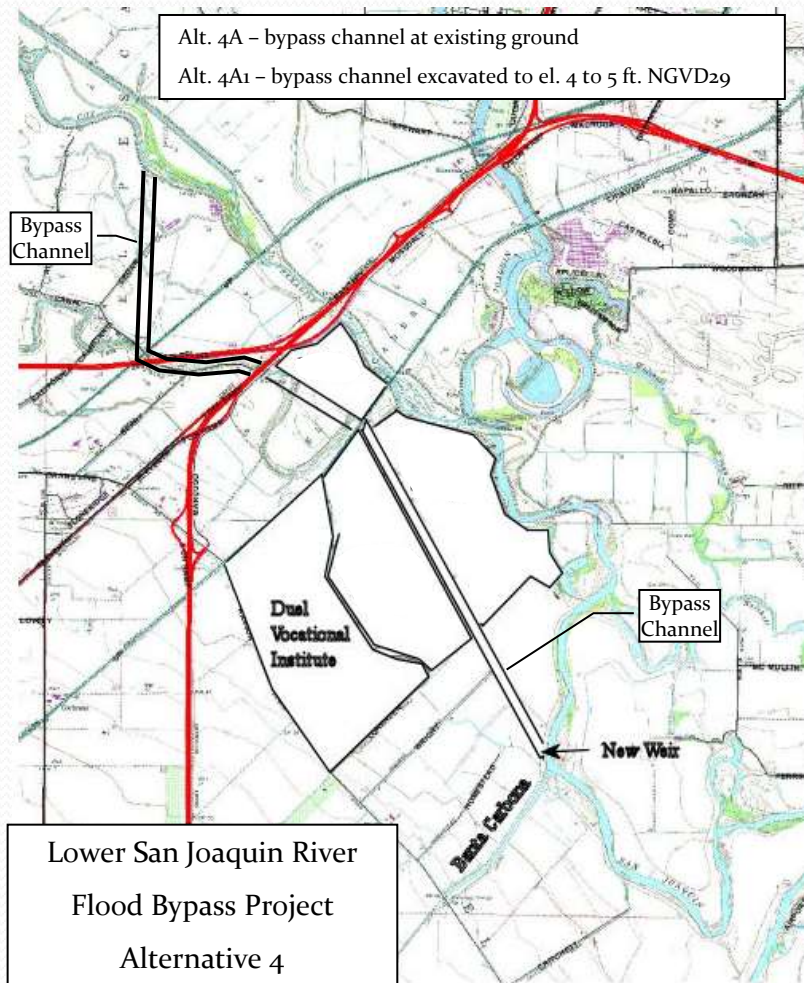
Lower San Joaquin River Flood Bypass Alternatives

Base	River Islands project plus PCIP
Initial Improvements	Base plus: • dredged Salmon Slough/Doughty Cut • Paradise Weir widened from 180 ft. to 400 ft. • channel cut in island between Salmon Slough and Doughty Cut
Alt. 1A	• Short bypass: San Joaquin River RM 58.8 to Paradise Cut Sta. 255 (u/s of I-5) • Initial Improvements
Alt. 1B	• Short bypass: San Joaquin River RM 58.8 to Paradise Cut Sta. 255 (u/s of I-5) • Paradise Cut south levee setback downstream of bypass • Initial Improvements
Alt. 2A	• Medium bypass: San Joaquin River RM 58.8 to Paradise Cut Sta. 155 (d/s of UPRR[SP]) • Initial Improvements
Alt. 2B	• Medium bypass: San Joaquin River RM 58.8 to Paradise Cut Sta. 155 (d/s of UPRR[SP]) • Paradise Cut south levee setback downstream of bypass • Initial Improvements
Alt. 3	• Paradise weir widened to 900 ft. • Paradise Cut south levee setback for entire length • All bridge crossings (UPRR, I-205, I-5, Manthey Rd., UPRR[SP], Paradise Rd) widened • Initial Improvements
Alt. 3A	• Paradise weir widened to 900 ft. • Paradise Cut south levee setback for entire length • Only Paradise Rd. bridge widened • Initial Improvements
Alt. 4A	• Long bypass: San Joaquin R. RM 61.5 (near Banta-Carbona Canal) to Paradise Cut Sta. 155 (d/s of UPRR[SP]) • Initial Improvements
Alt. 4A1	• Long bypass: San Joaquin R. RM 61.5 (near Banta-Carbona Canal) to Paradise Cut Sta. 155 (d/s of UPRR[SP]) • Bypass channel excavated 4 to 5 feet • Initial Improvements
Alt. 5A	• Long bypass: San Joaquin R. RM 61.5 (near Banta-Carbona Canal) to Paradise Cut Sta. 155 (d/s of UPRR[SP]) • Mainstone and Mitten properties detention storage • Initial Improvements

Lower San Joaquin River Flood Bypass Alternatives

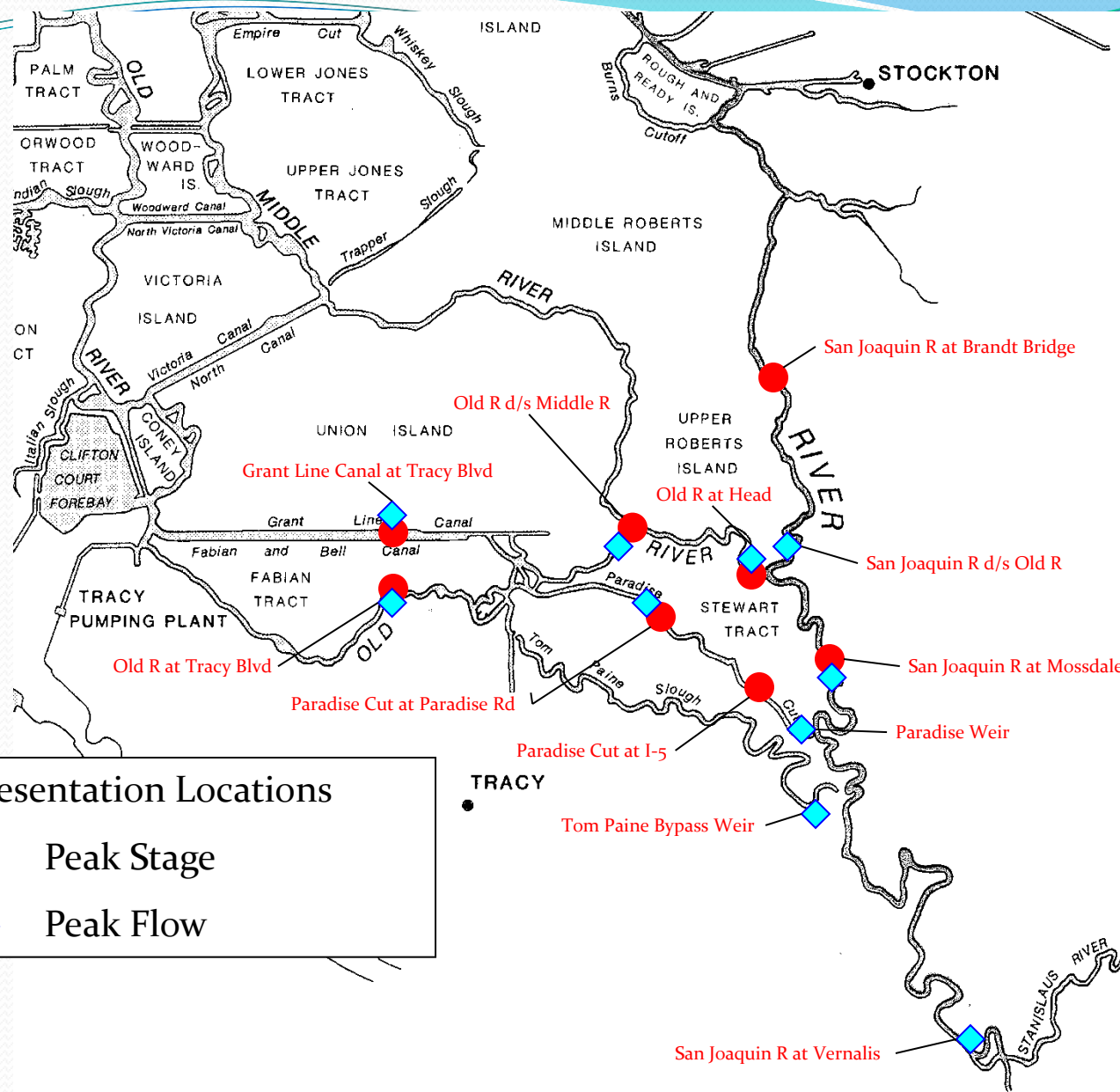


Lower San Joaquin River Flood Bypass Alternatives



Results

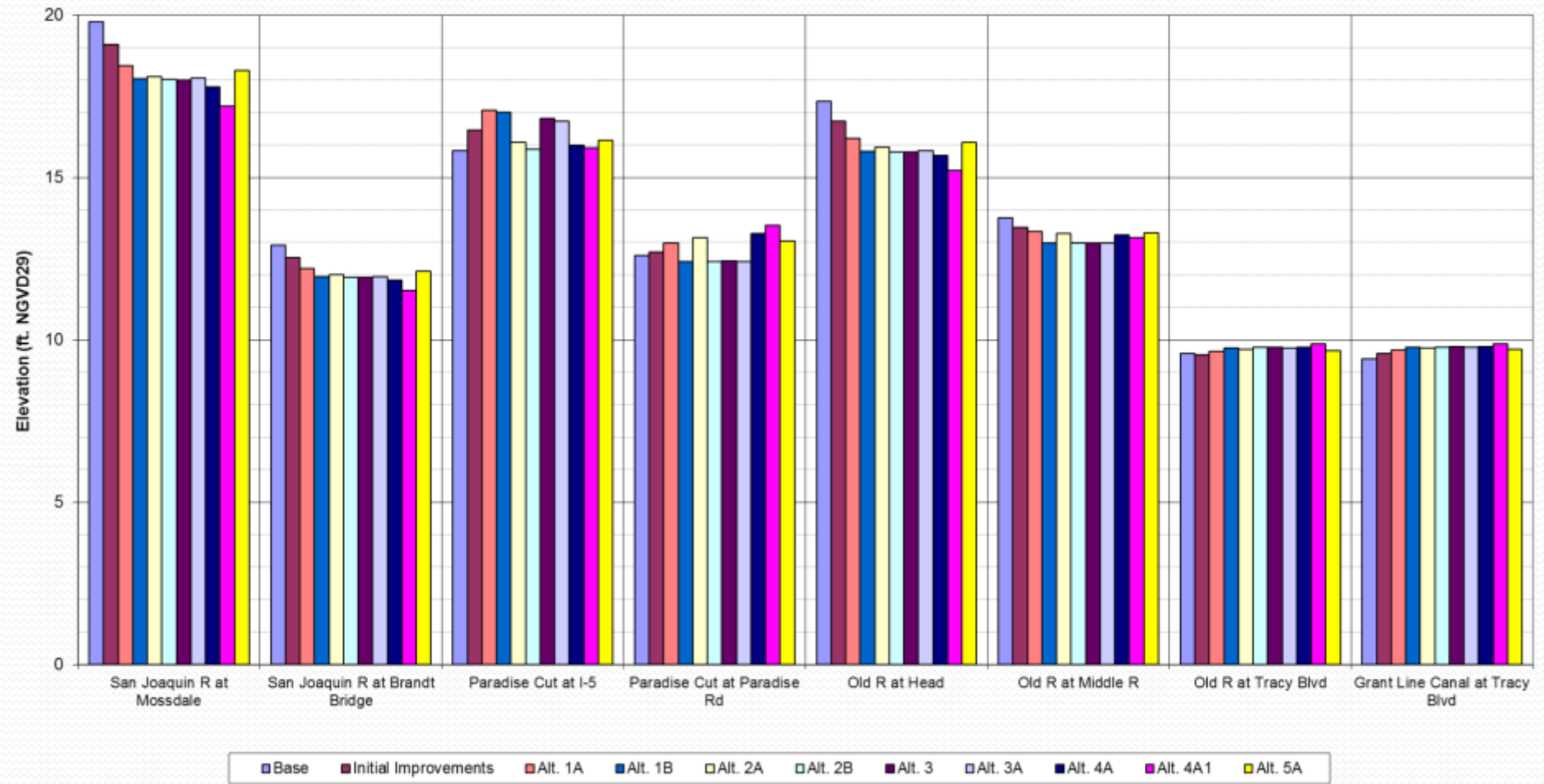
50-year Flood Event Simulation
Comprehensive Study Hydrology
(Peak flow at Vernalis = 47,700 cfs)



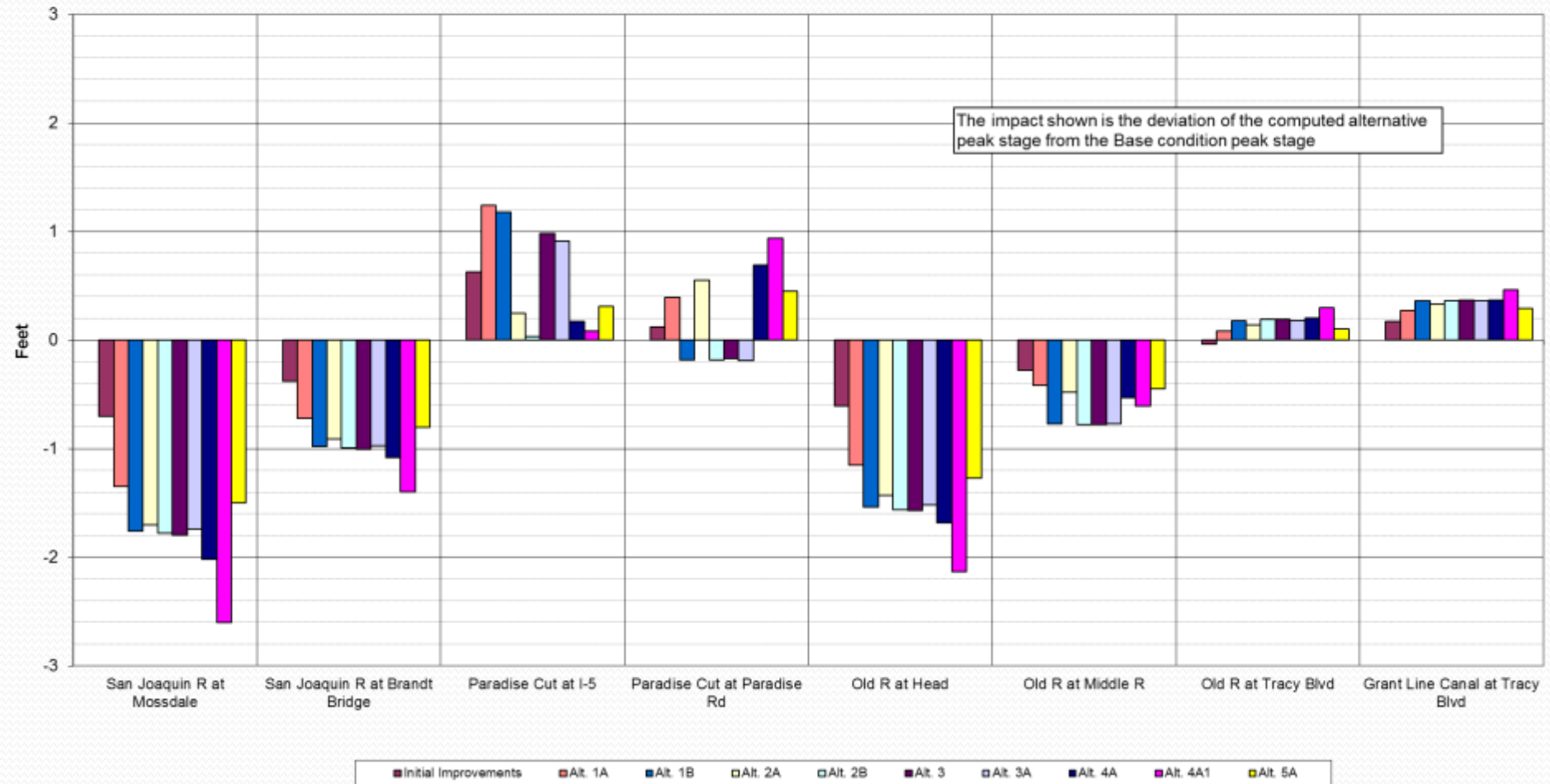
Data Presentation Locations

- Peak Stage
- ◆ Peak Flow

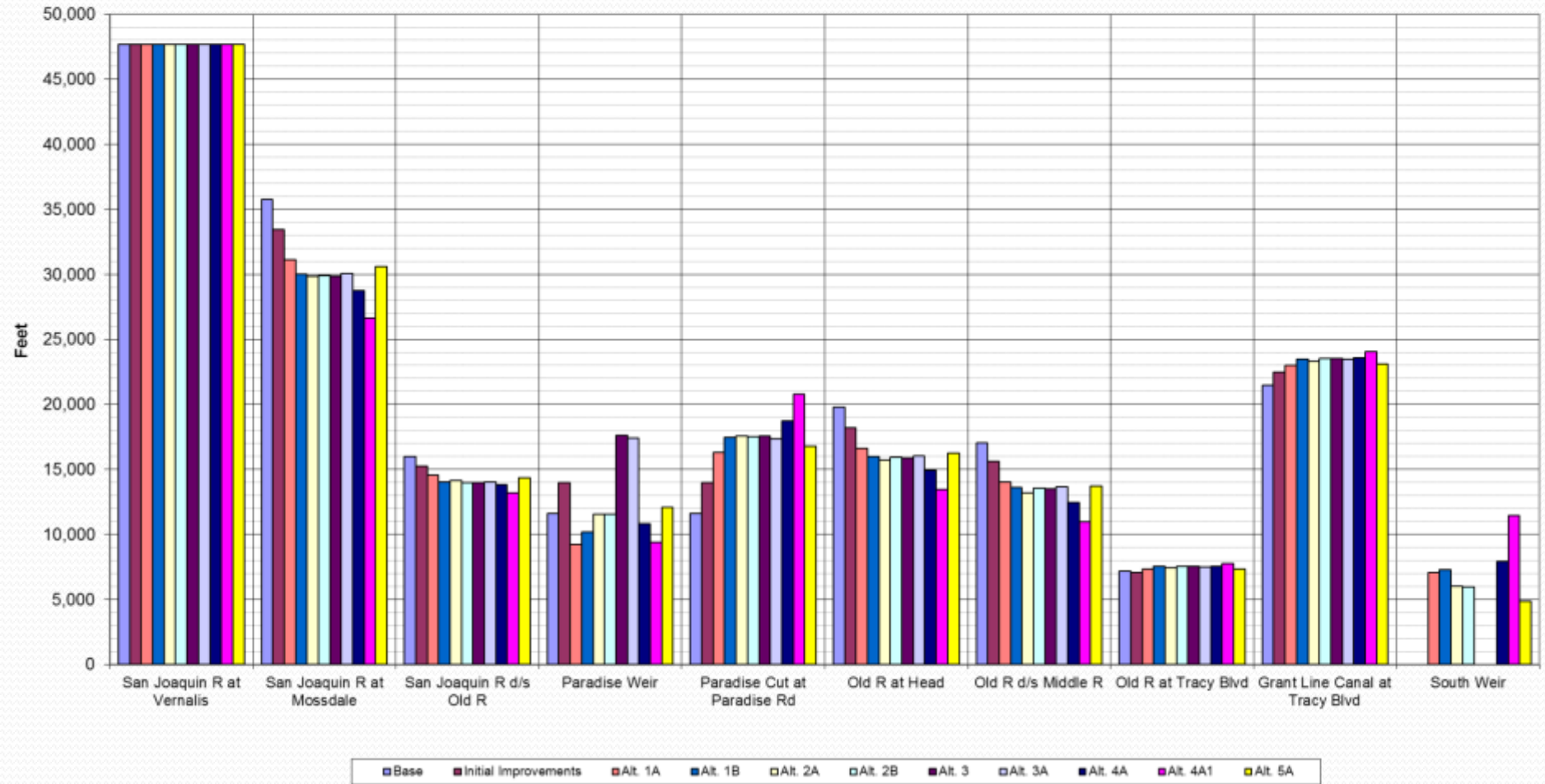
Lower San Joaquin River Bypass Alternatives Analysis Peak Stages 50-year Flood Event



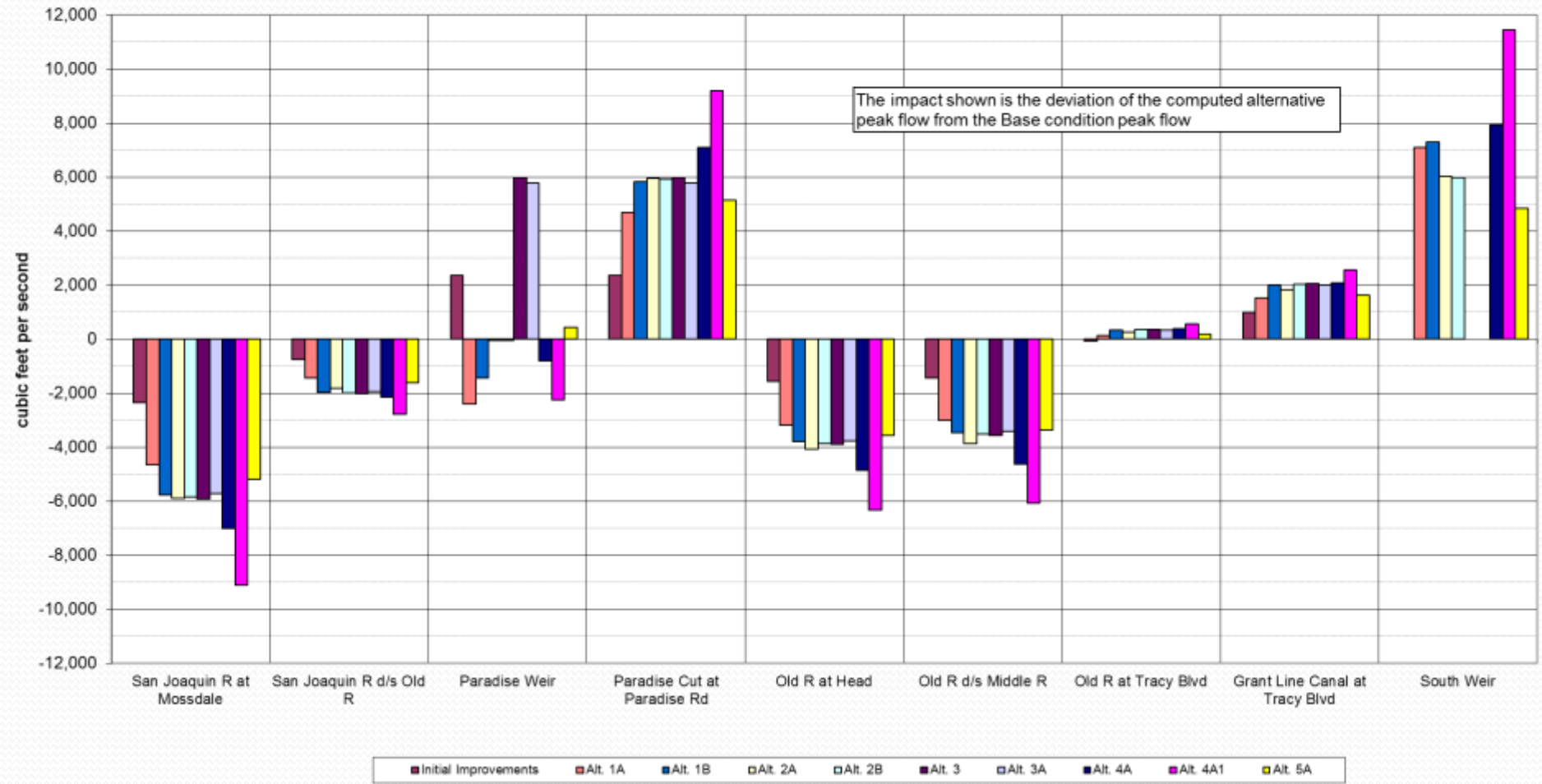
Lower San Joaquin River Bypass Alternatives Analysis Peak Stage Impacts 50-year Flood Event



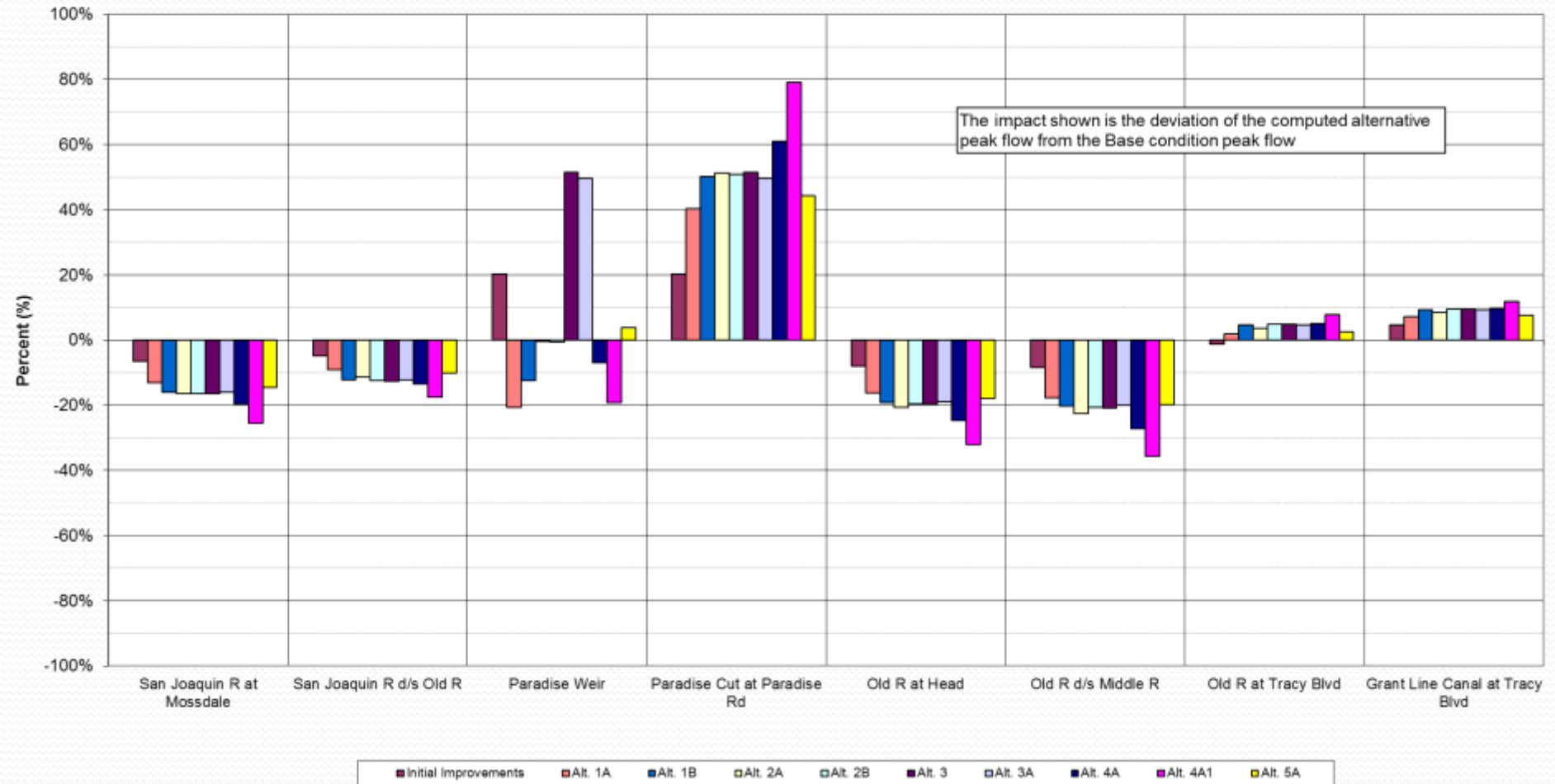
Lower San Joaquin River Bypass Alternatives Analysis Peak Flows 50-year Flood Event



Lower San Joaquin River Bypass Alternatives Analysis Peak Flow Impacts 50-year Flood Event



Lower San Joaquin River Bypass Alternatives Analysis Peak Flow Impacts (%) 50-year Flood Event



Questions?

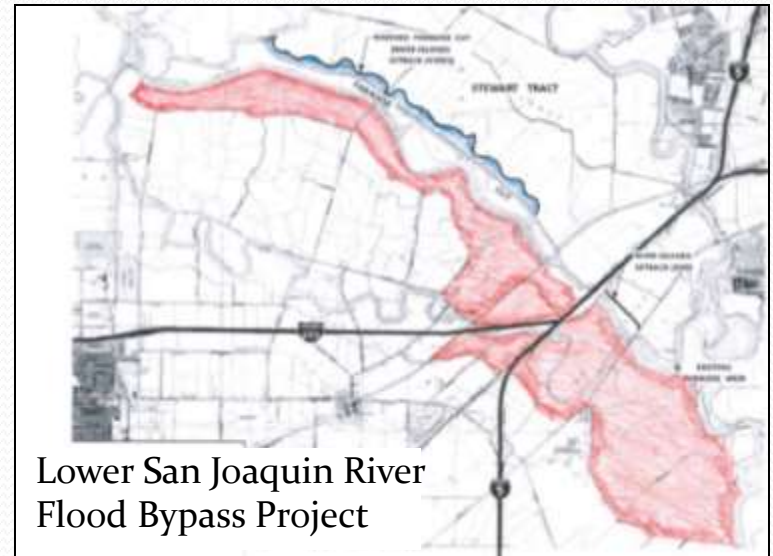
Potential Bypass Configuration and Footprint

- Planning Studies have not yet determined the optimum footprint or configuration necessary to reduce flood risk and enhance habitat.
- Future planning efforts will need to engage affected landowners.
- High probability that farming can continue in expanded bypass.
- Large number of landowners north of highway 5 and a much smaller number of landowners south of highway 5.

Delta Plan Guidance

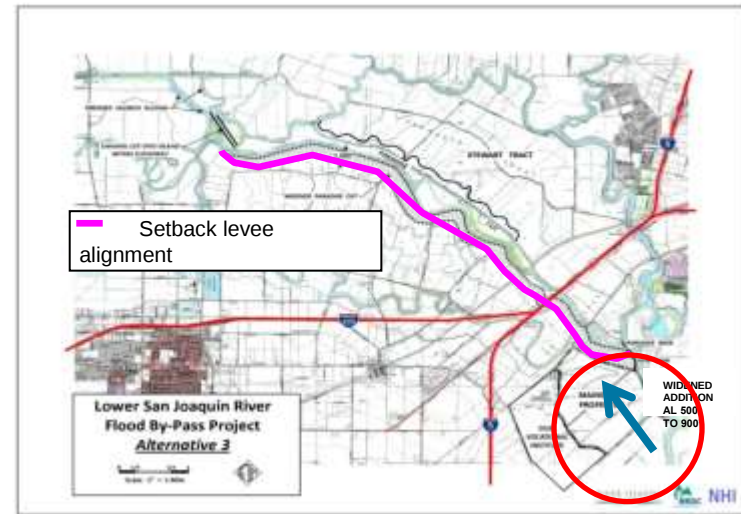
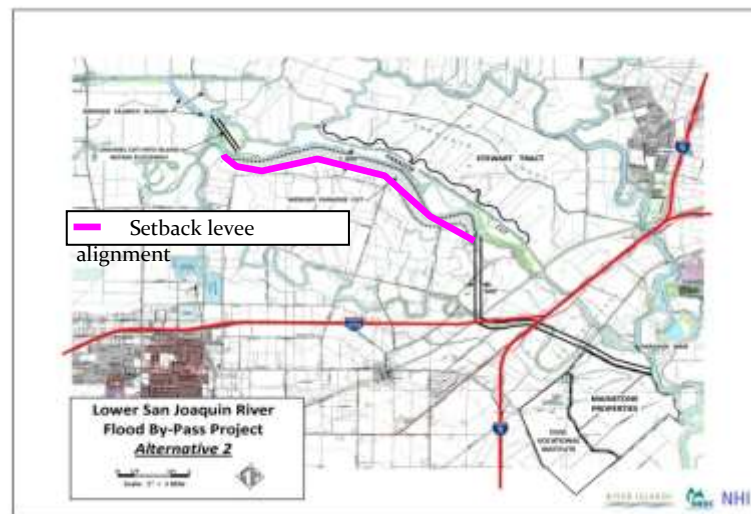
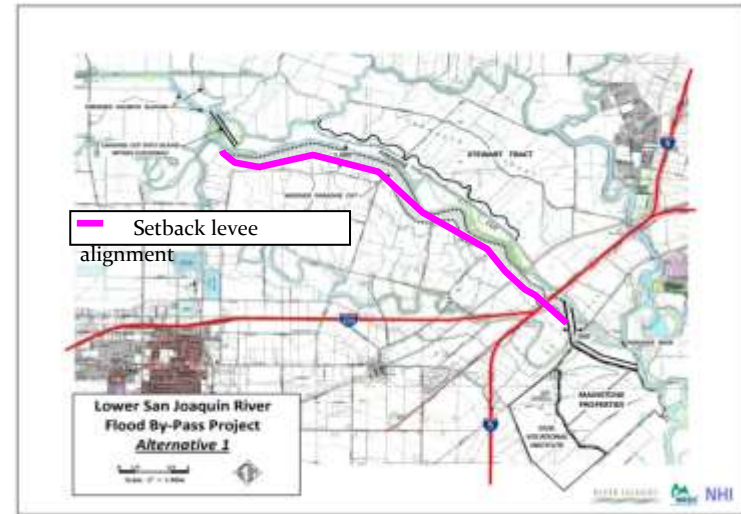
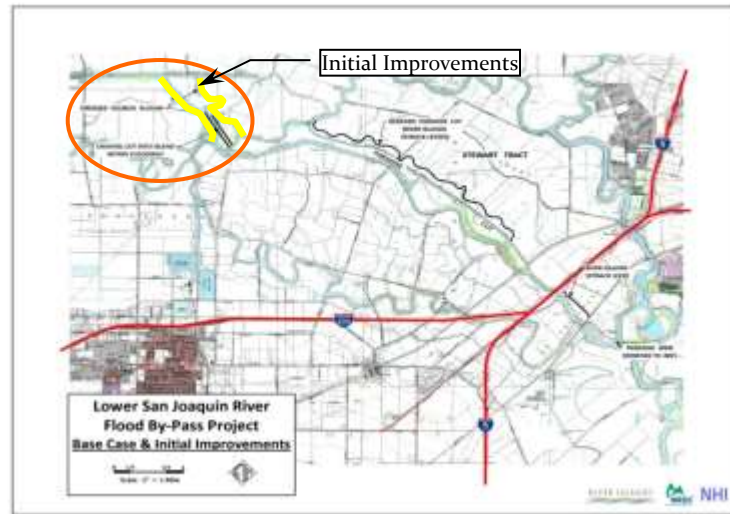
Policy RP4: Floodplain Protection prohibits encroachments in the Lower San Joaquin River Floodplain Bypass Area

(3) The Lower San Joaquin River Floodplain Bypass area, located on the Lower San Joaquin River upstream of Stockton immediately southwest of Paradise Cut on lands both upstream and downstream of the Interstate 5 crossing. This area is described in the Lower San Joaquin River Floodplain Bypass Proposal, submitted to the California Department of Water Resources by the partnership of the South Delta Water Agency, the River Islands Development Company, Reclamation District 2062, San Joaquin Resource Conservation District, American Rivers, the American Lands Conservancy, and the Natural Resources Defense Council, March 2011. This area may be modified in the future through the completion of this project.



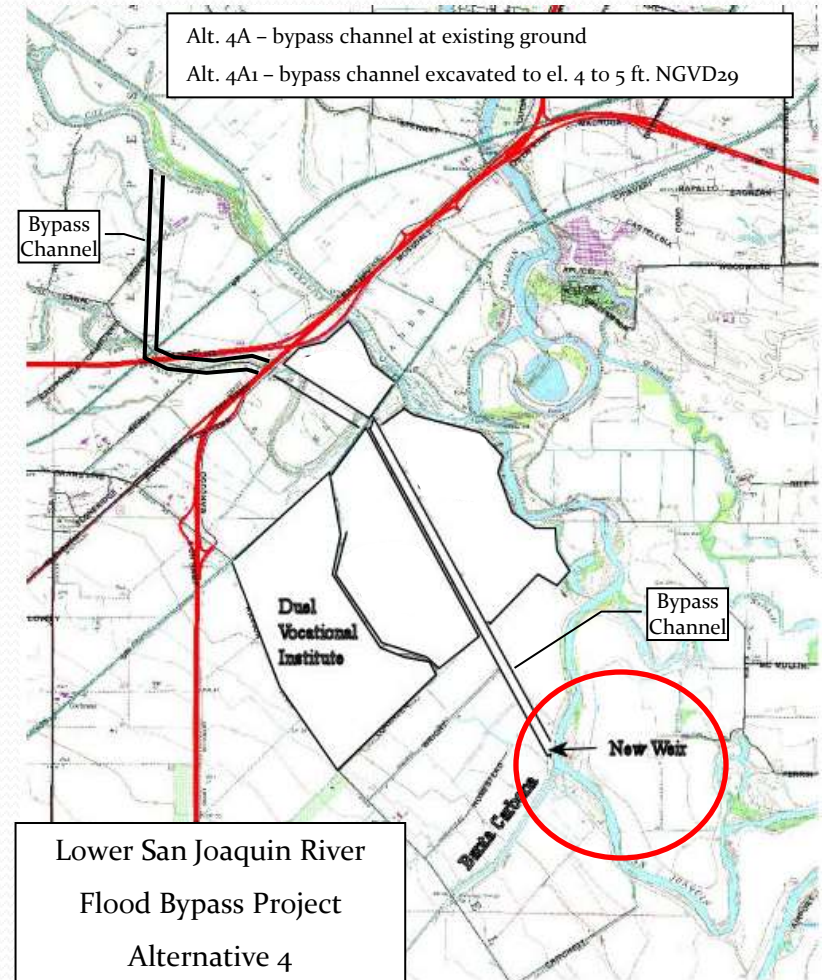
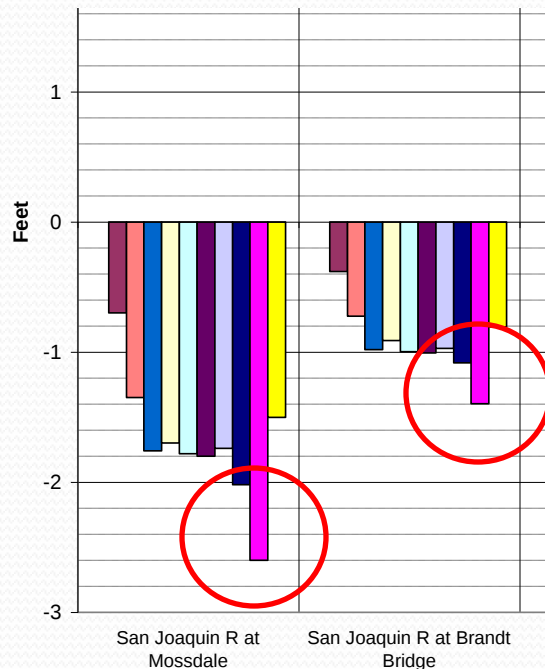
Two maps from March 2011 Proposal

Scenarios Evaluated by MBK Broadly Representative of Potential Footprint



Benefits of New South Weir

New weir south of existing weir could have significant stage reduction benefits.



Potential footprint size still very broad



Small



Medium with South Weir



Medium



Large

Questions?

Unresolved Issue Discussion

- PC footprint
- Weir configuration
- Bridges (debris or?)
- Hydraulic impacts
 - Water stage
 - Erosion
 - Levee geometry
 - Seepage
 - Sedimentation
 - Water diversion infra.
 - Maintenance costs
 - Water quality
- More stakeholders (export facilities +)
- Ecosystem objectives
- Ecosystem impacts
- Change in flow splits
- Compensation for landowner losses
- Permitting (408 +)
- How to stay informed
- \$\$\$ Expensive (cost-share)
- Others from participants

Next Steps

- Prepare & post notes on SJAFCAs web page
 - Summarize discussions
 - To do list?
- Modify Draft RFMP as needed
- Stay involved in continuing studies [BWFS for example]
 - Periodic meetings
 - Review/comment on interim products
 - Another symposium at key milestone?
- Reconsider with new climate change hydrology