

# Sacramento River General Reevaluation Report

*Stakeholder Coordination*

*Informational Briefing*

*January 2017*



US Army Corps of Engineers  
**BUILDING STRONG**



# Agenda

- Study Background
- Status Update
  - Plan Formulation Process
  - Locally Preferred Plan
- Next Steps
- Questions and Comments



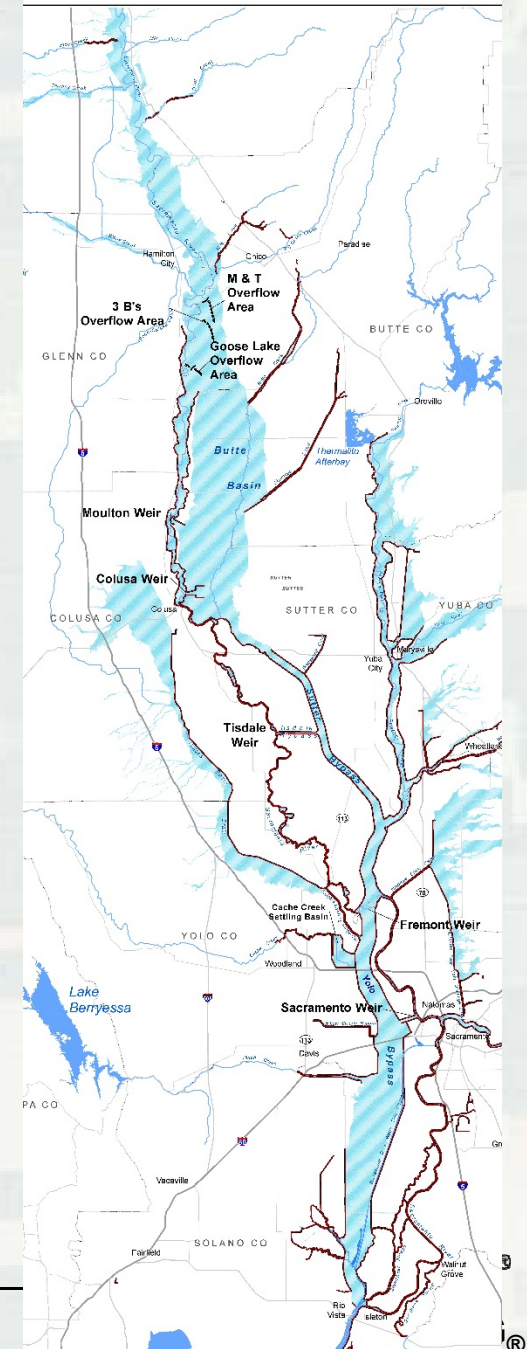
# Study Background



# Why are we conducting this Study?

## Conclusions from Central Valley Integrated Flood Management Watershed Study (CVIFMS)

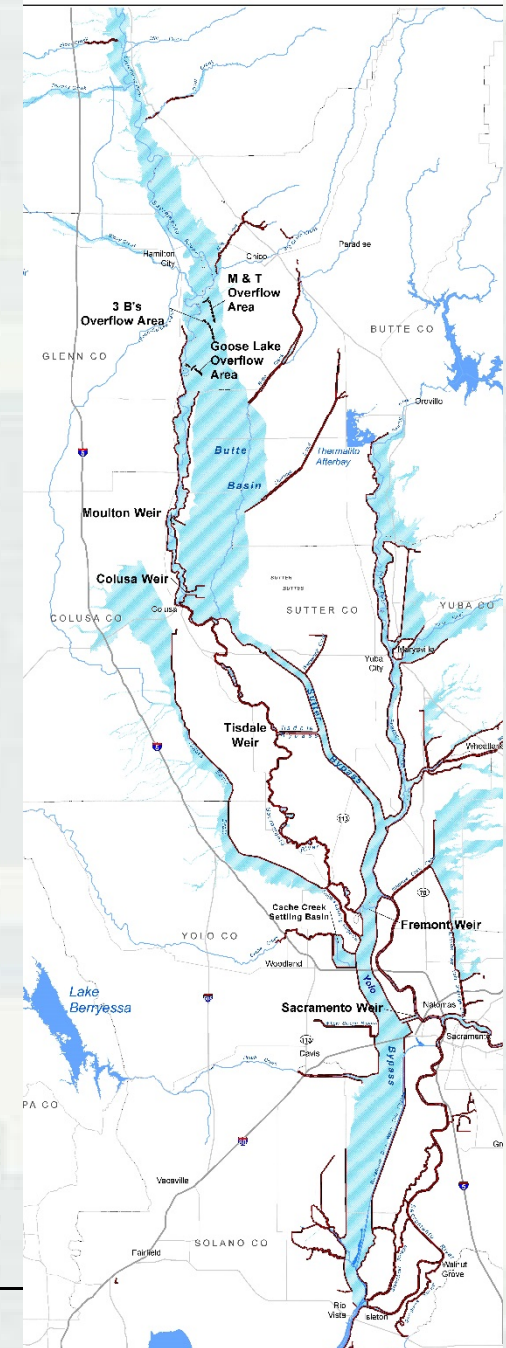
- Sac River GRR was early off-shoot recommendation
- Revision system for multiple purposes
- Modify flood management system to incorporate ecosystem restoration



# Sacramento River Flood Control Project

## Authorized by Flood Control Act 1917

- Reevaluating portion of system within our authority
- Look for ecosystem opportunities within system that was not envisioned with ER.
- Our process in recent years has led us to focus on urban areas with highest risk in form of consequences (damages and life loss).



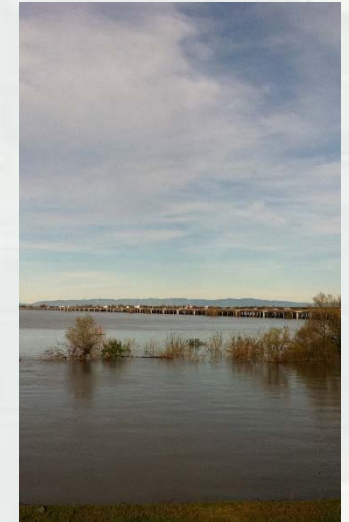
# Study Area

- Specifically focused on Flood Risk Management System from Knight's Landing to Collinsville
- USACE missions focused on Flood Risk Management and Ecosystem Restoration
- Improve Flood Risk Management System to achieve both purposes
- Covers 726 Square miles



# Objectives

- Reduce risk to life safety, property and critical infrastructure
- Restore riparian and aquatic ecosystems
- Increase sustainability and resiliency of the Flood Management System and its associated riverine and floodplain habitat
- Improve recreational access



# Constraints

- Do not increase bird strikes at airports (Federal Aviation Administration requirement)
- Creation of habitat for endangered species should not reduce the operational flexibility of water supply diversions

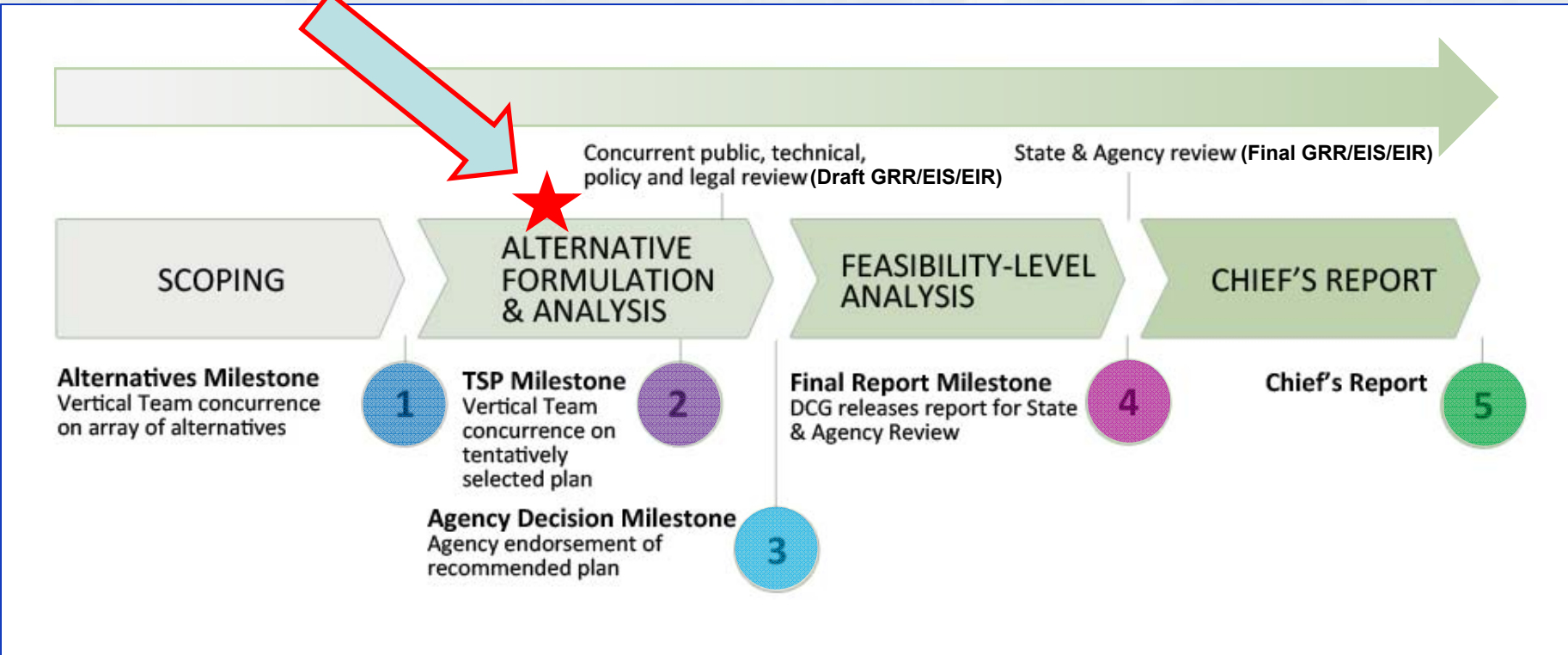


# Status Update





# Sacramento River GRR Process and Milestones



# Plan Formulation Process



# Comparison of plan formulation processes

## Flood Risk Management

- Benefit-Cost Analysis
- Based on Economic Damages
- Benefits of project must be greater than costs
- Prioritizes investments based on combination of probability and consequences
- Difficult to justify levee improvements for rural agricultural areas

## Ecosystem Restoration

- Cost Effective Analysis
- Based on Significance of Resource(s)
- Ecosystem Output (Acres/ HUs)
- Best Buy plans are those with lowest annual cost per acre
- Assumes land purchased in fee title and actively restored
- Note: restoration cannot be mitigation for another project



# Significant Fish and Wildlife Resources

- **Institutional Significance**
  - Within International Pacific Flyway
  - 50 federally and state listed species
- **Technical Significance**
  - ESA listings based on scientific and technical research
- **Public Significance**
  - Organizations formed to support resources
    - Yolo Basin Foundation
    - Sacramento Bypass Wildlife Area
    - Fremont Weir State Wildlife Area

Yellow  
billed  
Cuckoo

Valley Elderberry  
Longhorn Beetle

Delta Smelt

Green Sturgeon

Giant Garter Snake

Steelhead

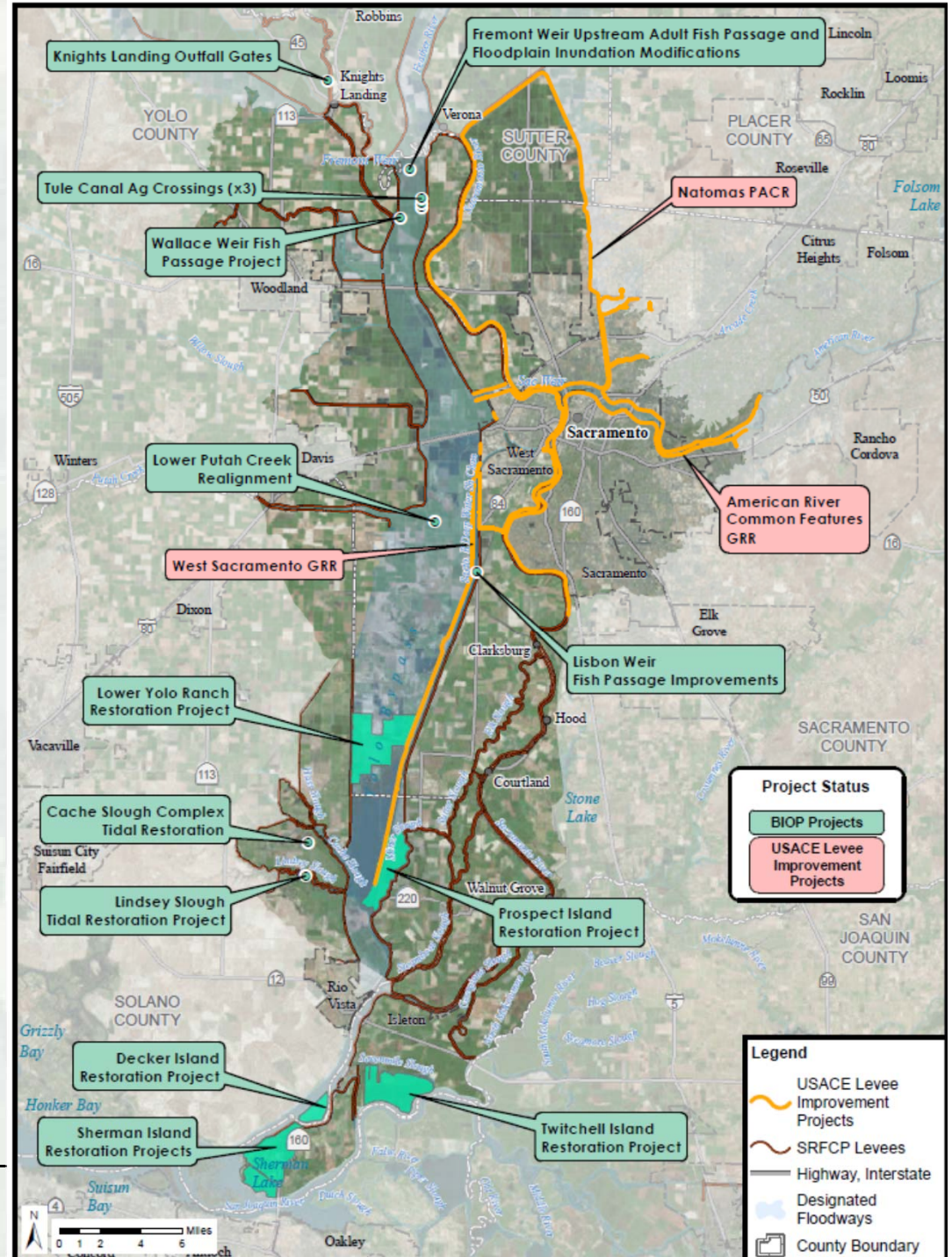
Chinook Salmon

Vernal Pools  
and Wetlands

# Future Without - Project Condition

Assumes the following actions would be in place:

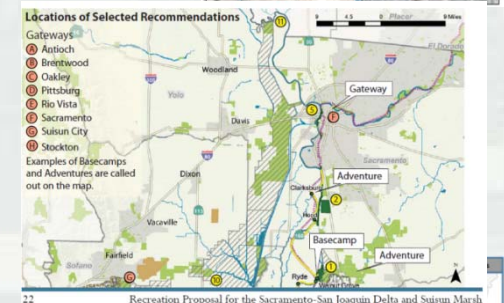
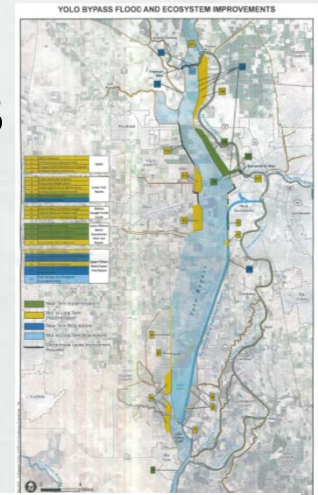
- American River Common Features
- West Sacramento
- Natomas Basin
- Sacramento River Bank Protection Project (additional 80,000 linear feet)
- Folsom Dam Joint Federal Project (JFP) + Dam Raise
- BiOp Actions
- Eco-Restore projects (not part of BiOp or RPA)



# Formulation Process

## Identify all possible measures – building blocks

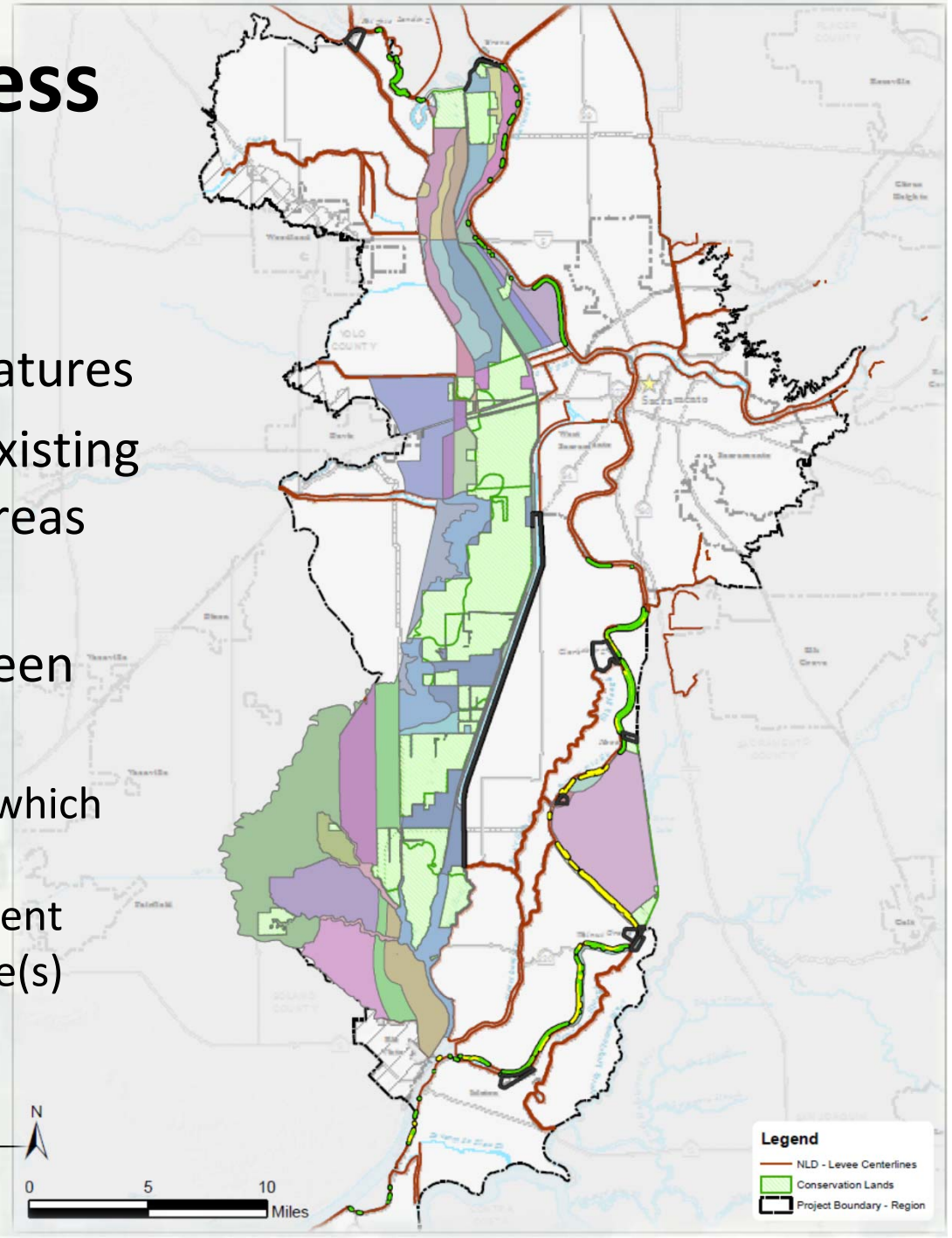
- Identify Ecosystem Restoration (ER) Measures
  - Locations with significant potential for ecosystem restoration
  - Gathered info from current projects/proposals/agency plans
- Identify Flood Risk Management (FRM) Measures
  - Areas with potential flood damages
  - Flood risk management system features (weirs, etc.)
  - Non-Structural elements



# Formulation Process

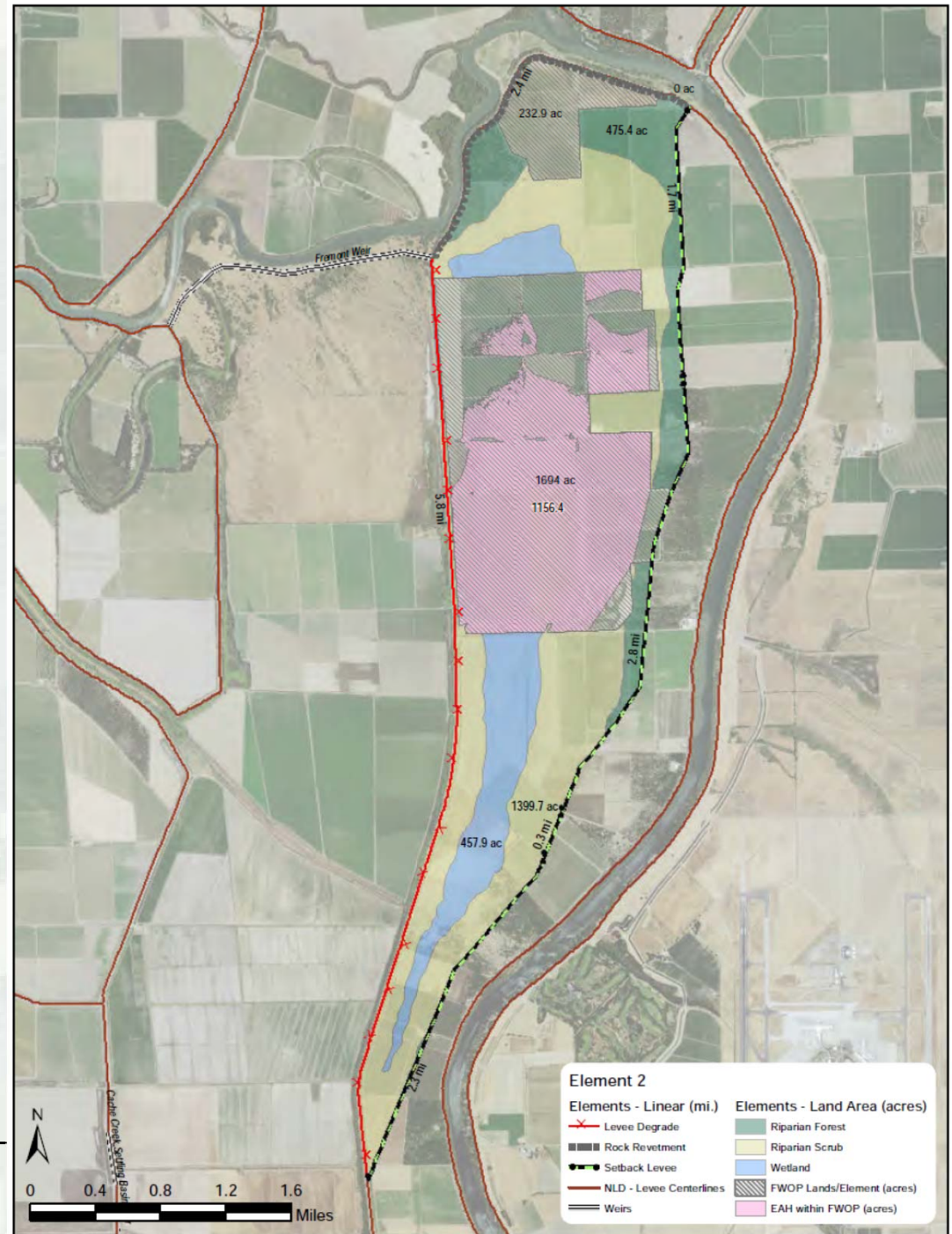
## Group measures into standalone “elements”

- More than 60 potential features
- Elements do not include existing and future conservation areas (shown as green areas)
- Some dependencies between elements identified
  - Restoration within bypass, which would reduce conveyance efficiency would be dependent upon adjacent setback levee(s)



# Example: Setback Levee Elements

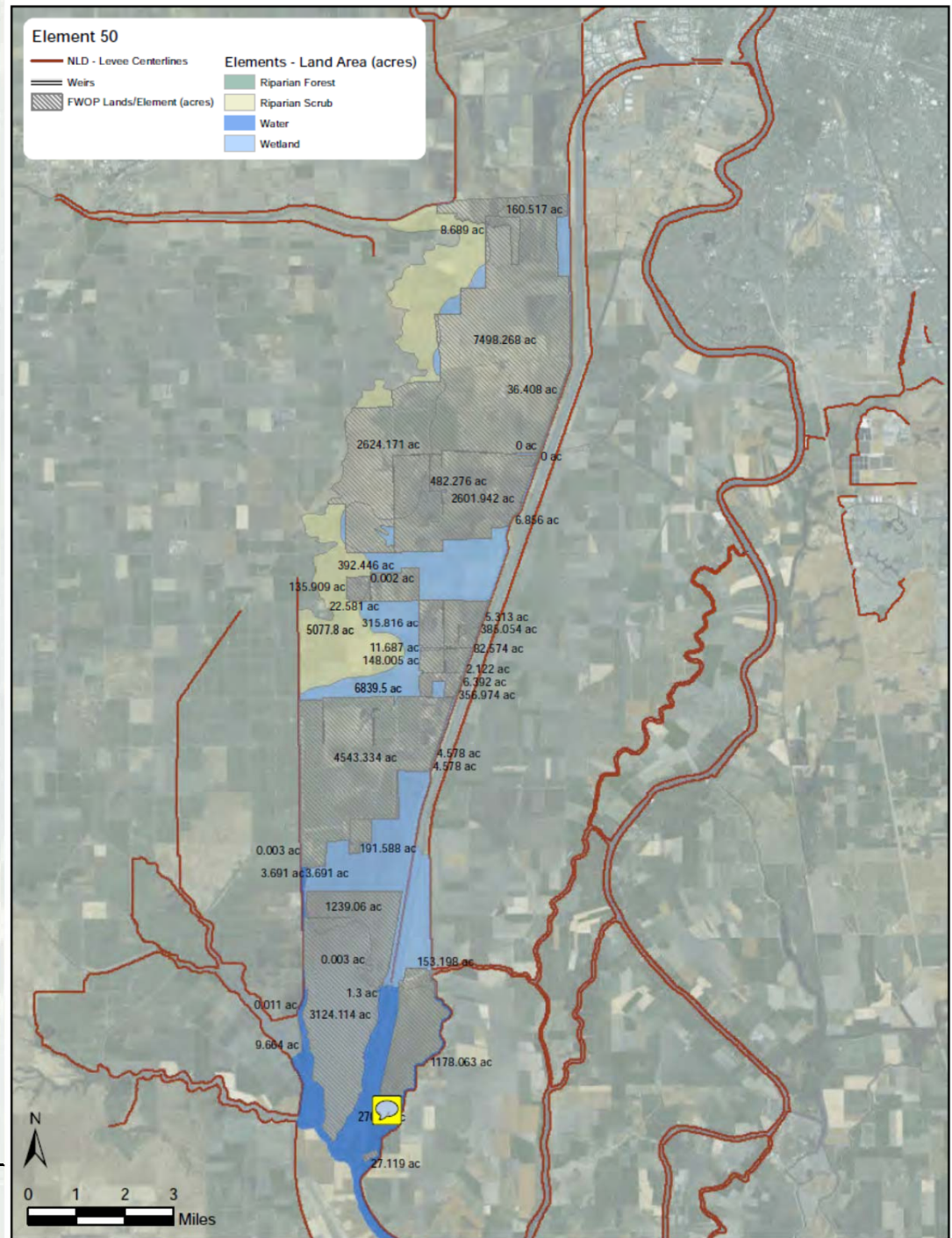
- Remove existing levee
- Construction of new setback levee
- Restoration of lands within floodway
- Account for lands already restored (hatched area)





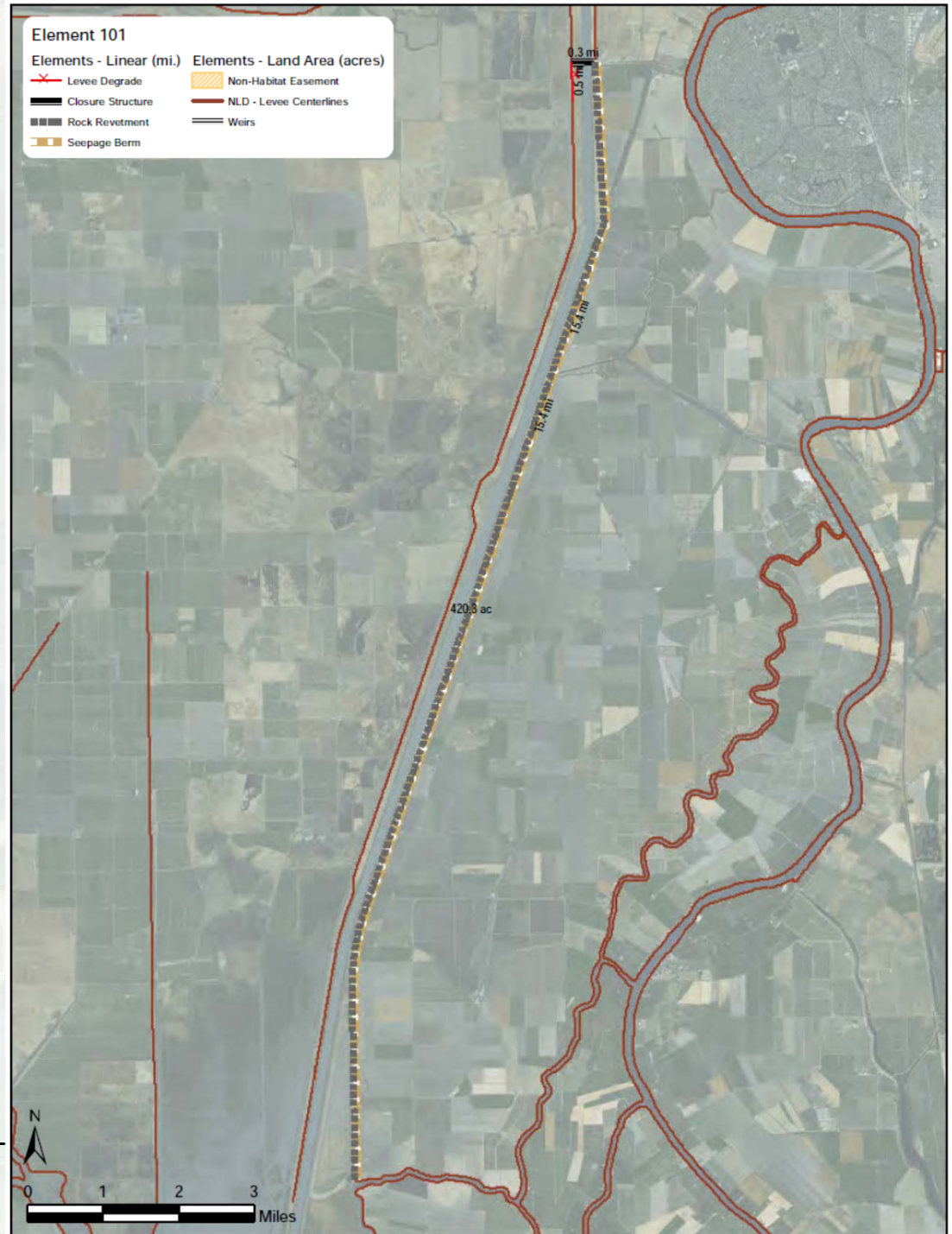
# Example: Restoration of habitat within the Yolo Bypass

- Identification of lands already in conservation ownership
- Restoration of wetland or riparian habitat based on elevation



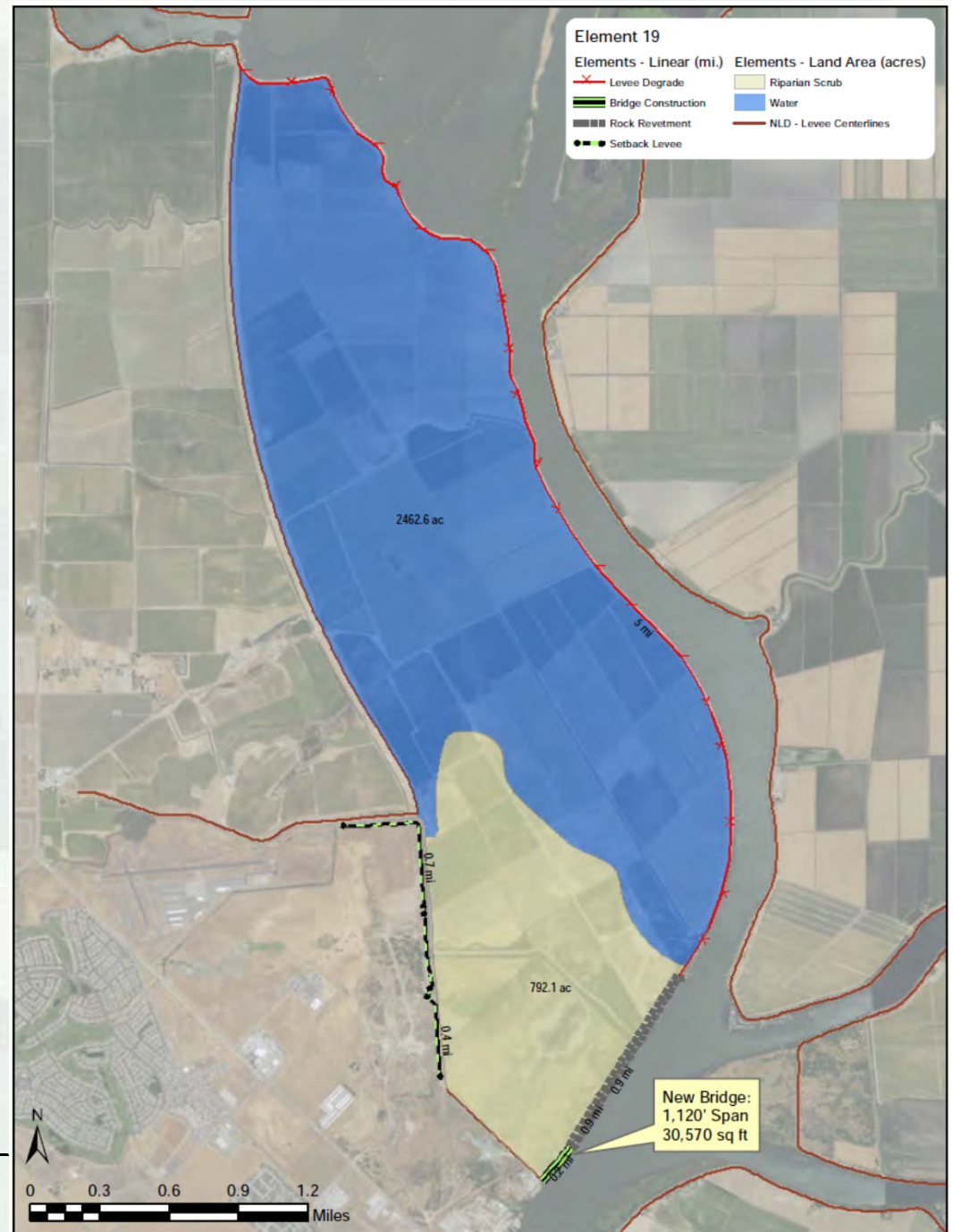
# Example: Deep Water Ship Channel

- Use of DWSC to convey flood flows
- Construction of notch and closure structure
- Improvement of east levee



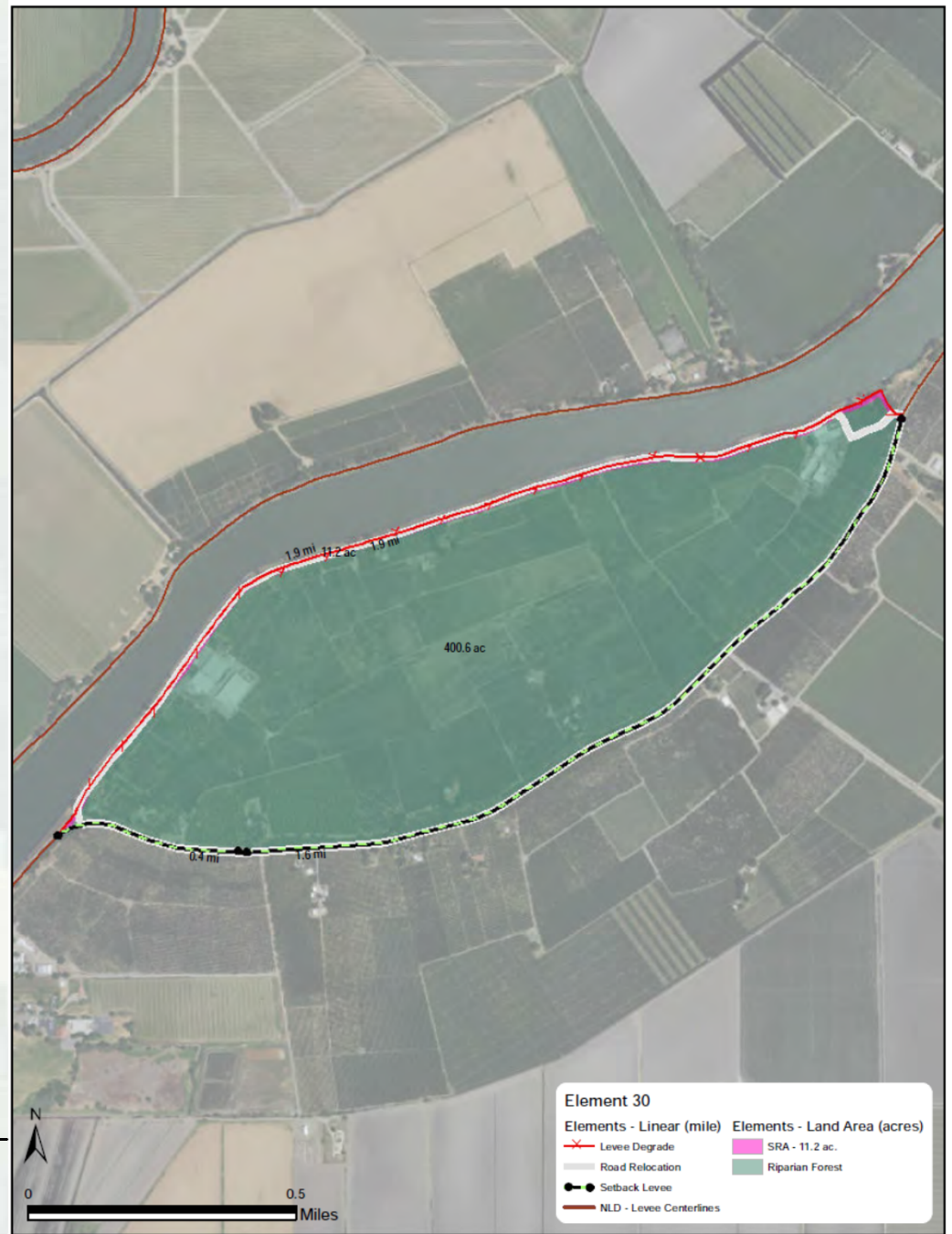
# Example: Levee Removal

- Remove existing levees
- Construct setback levee where required and improve other infrastructure, if needed
- Restore habitat within new floodway



# Example: Setback levee along the Sacramento River Mainstem

- Degrade existing levee
- Construct new setback levee
- Restore habitat within widened river corridor



# Formulation Process

## Develop rough order annual Costs and Benefits for Elements

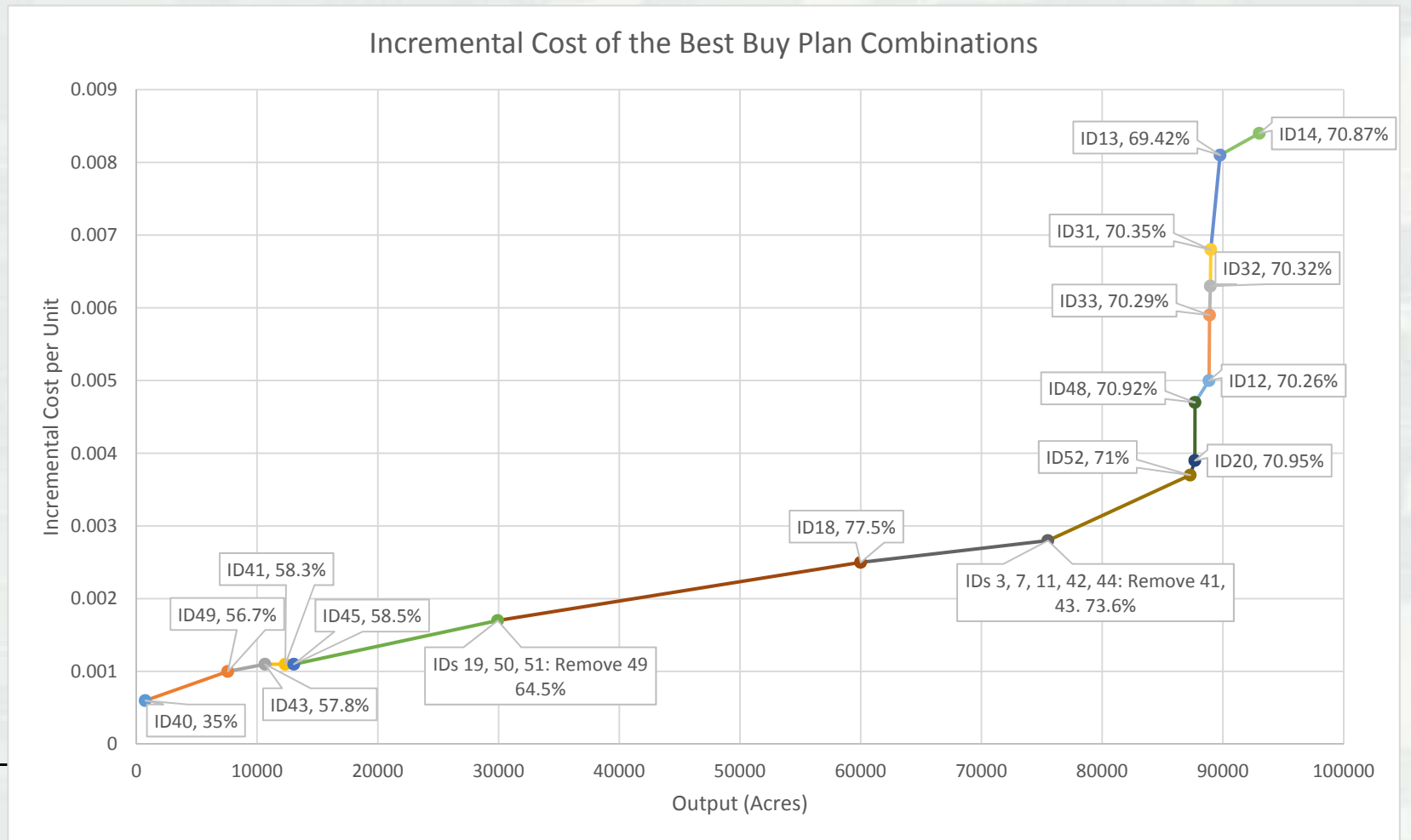
- Annual costs based on unit prices, levee construction cost per mile
- Outputs (Benefits) for ER based on acreages
- FRM benefits - preliminary analysis based on stage reduction



# Formulation Process

## Identify Annual Cost per Output

- Conduct a Cost Effective/Incremental Cost Analysis (CE/ICA)
- Identifies plans that provide greatest output for a given cost



# Formulation Process

## Identify ER + FRM Alts based on CE/ICA

- Alternative 1
- Alternative 2
- Alternative 3

## Identify FRM + ER Alts starting with FRM focused features

- Alternative 4
- Alternative 5

## Identify less land intensive alternatives

- Alternative 6
- Alternative 7

## Locally Preferred Plan

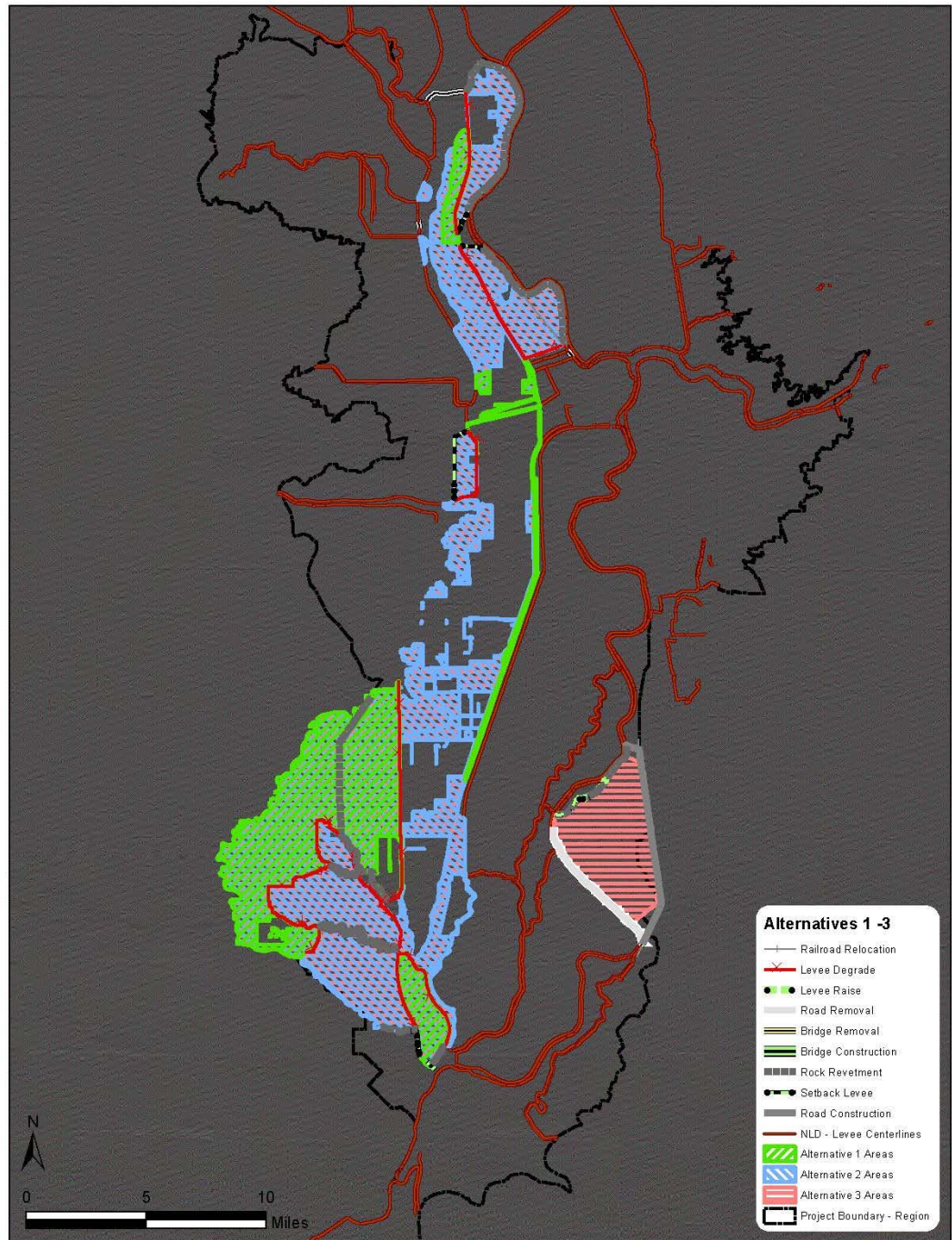


# Formulation Process

## Identify ER + FRM

## Alts based on CE/ICA

- Alternative 1
- Alternative 2
- Alternative 3

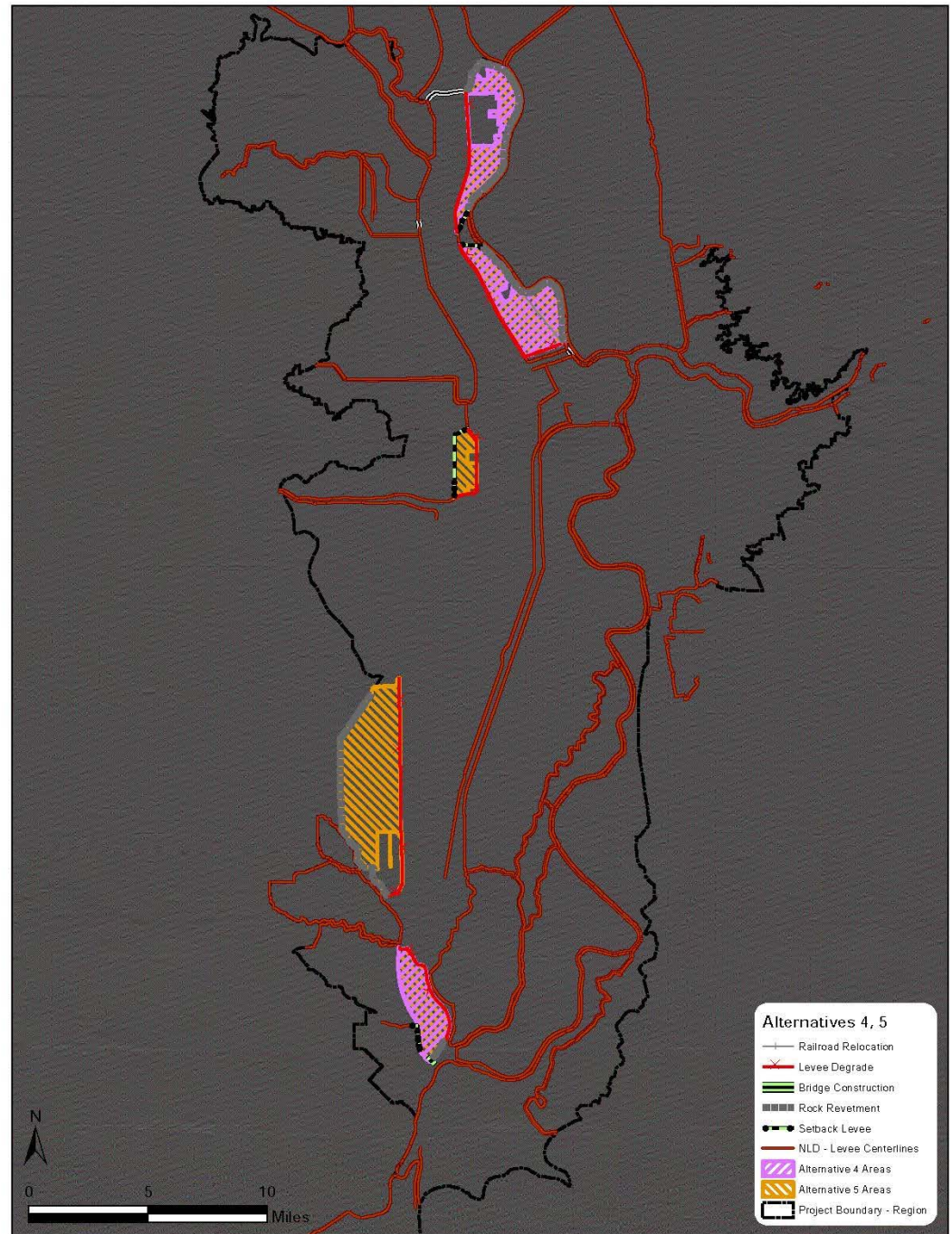




# Formulation Process

Identify FRM +  
ER Alts starting  
with FRM focused features

- Alternative 4
- Alternative 5

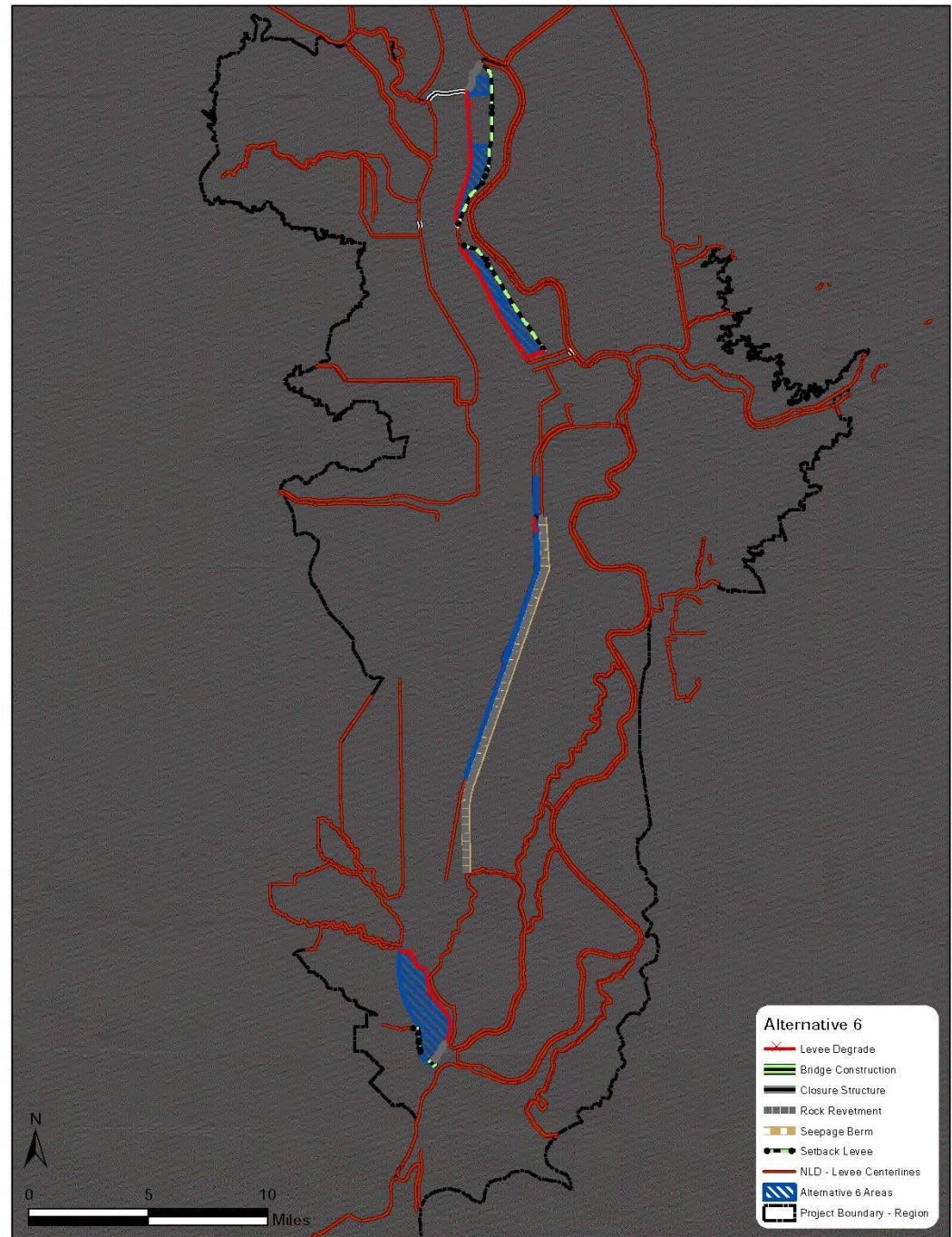


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# Formulation Process

Identify less land intensive alternatives

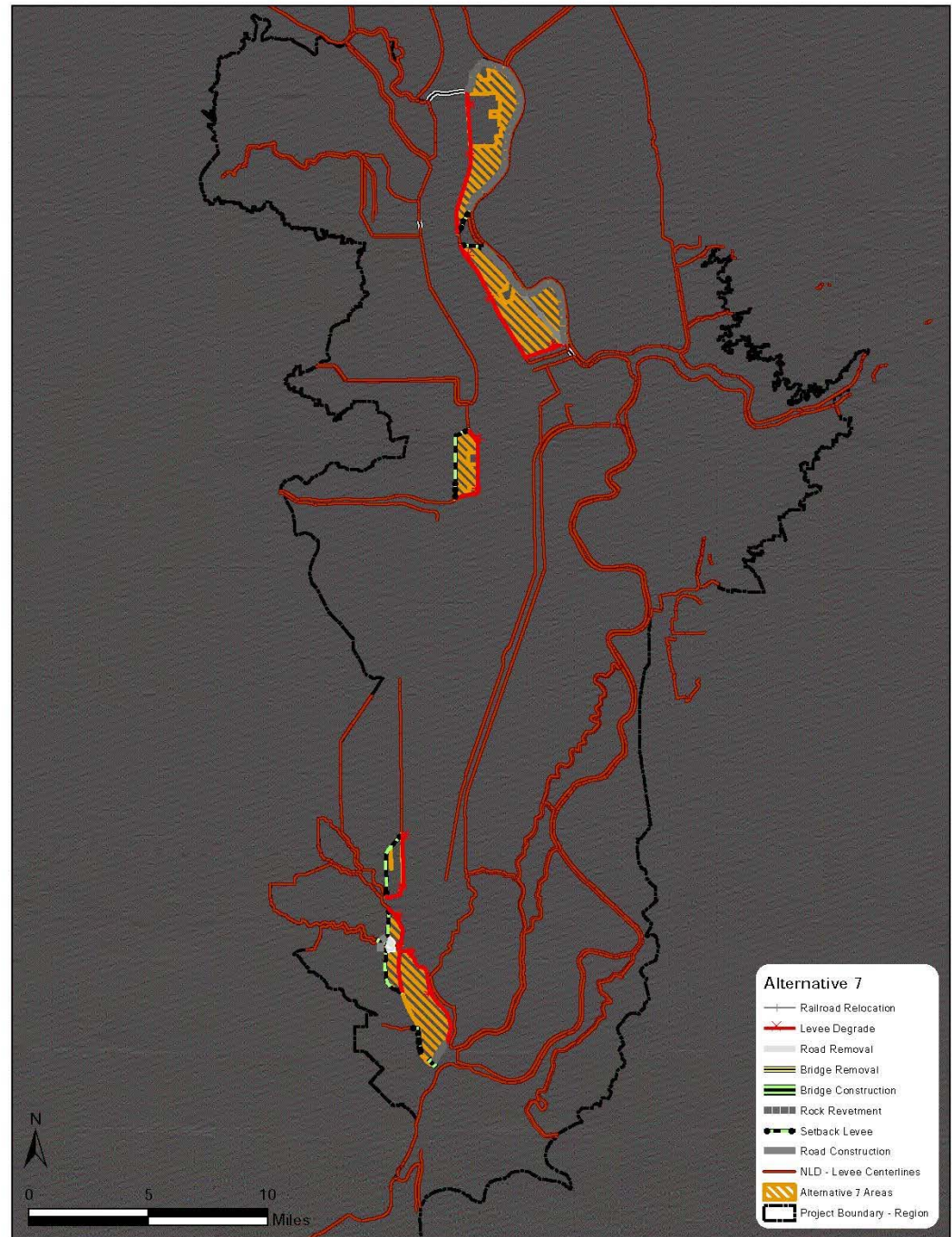
- Alternative 6



# Formulation Process

Identify less land intensive alternatives

- Alternative 7



# Locally Preferred Plan



# Locally Preferred Plan (LPP)

- Once Federal interest is identified from array of alternatives, the sponsor may submit a LPP
- Federal interest plan (NER/NED) becomes basis for cost share
- LPP is compared to Federal interest plan to determine cost share balance
- If federally supportable, LPP would be plan ultimately recommended



# Next Steps



# Next Steps

- **Selection of final array of alternatives**
  - Quantify flood risk management benefits
  - Tradeoff Analysis between project purposes
  - Identification of NER/NED Plan
  - Development of a Locally Preferred Plan
- **Additional Stakeholder meetings**
  - Present final alternatives
  - Summer 2017
- **Development of Draft Report**



# Questions and Comments



*Fremont Weir - 1963*





# Contact Information

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