# San Joaquin River Restoration Program

Water Education Foundation Tour
November 6 and 7, 2014

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## Friant Dam and Millerton Reservoir

- Completed in 1942
- Authorized for:
  - Water Supply
  - Flood Control
- 520,500 Acre-feet Storage Capacity
- 1.8 Million Acre-feet Average Inflow
- 1.4 Million Acre-feet Average Deliveries
- No Carryover Storage
- Controlled Releases:
  - San Joaquin River (8,000 cubic feet per second (cfs))
  - Friant-Kern Canal (5,000 cfs)
  - Madera Canal (1,250 cfs)

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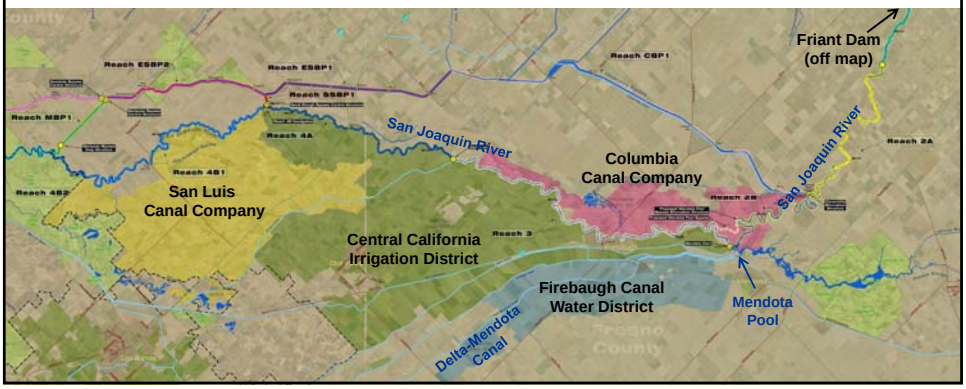
# Water Service and Holding Contracts

- Friant Division of the CVP
  - 29 long-term Friant Division water service contracts
  - Class 1 Water – 800,000 acre-feet
  - Class 2 Water – 1,400,000 acre-feet
- Holding Contracts
  - San Joaquin River downstream of Friant
  - 5 cfs required past diversions
  - Last diverter is at Gravelly Ford

# Exchange Contractors

- Agreed to not exercise senior water rights in exchange for “supplemental” supplies
- Receive Delta water via the Delta-Mendota Canal
- Four contractors serving more than 240,000 acres



# Settlement History

1942 - Friant Dam completed

1988 - Lawsuit filed challenging Reclamation's renewal of the long-term contracts with Friant Division contractors

2004 - Federal Judge rules Reclamation violated Section 5937 of the California Fish and Game Code

2005 - Settlement negotiations reinitiated

2006 - Settlement reached; implementation begins

2009 - Federal legislation enacted (Public Law 111-11); Interim Flow releases began October 1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# Settlement Goals

- Restoration Goal
  - To restore and maintain fish populations in "good condition" in the main stem of the San Joaquin River below Friant Dam to the confluence of the Merced River, including naturally reproducing and self-sustaining populations of salmon and other fish.
- Water Management Goal
  - To reduce or avoid adverse water supply impacts to all of the Friant Division long-term contractors that may result from the Interim Flows and Restoration Flows provided for in the Settlement.

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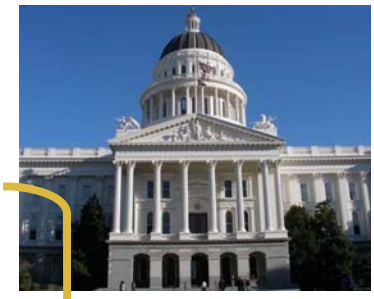
## Settling Parties & Implementing Agencies

**Settling Parties**

- NRDC Coalition
  - 14 organizations
- Friant Water Authority
  - 29 water agencies
- Federal Government
  - Department of the Interior
    - Bureau of Reclamation
    - Fish and Wildlife Service
  - Department of Commerce
    - National Marine Fisheries Service
- State of California
  - Department of Water Resources
  - Department of Fish and Wildlife
- Restoration Administrator



**Implementing Agencies**

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## Restoration Goal Activities

- Increase flows from Friant Dam
- Improve channel and structures to convey flows and improve fisheries habitat
- Reintroduce spring-run and fall-run Chinook salmon

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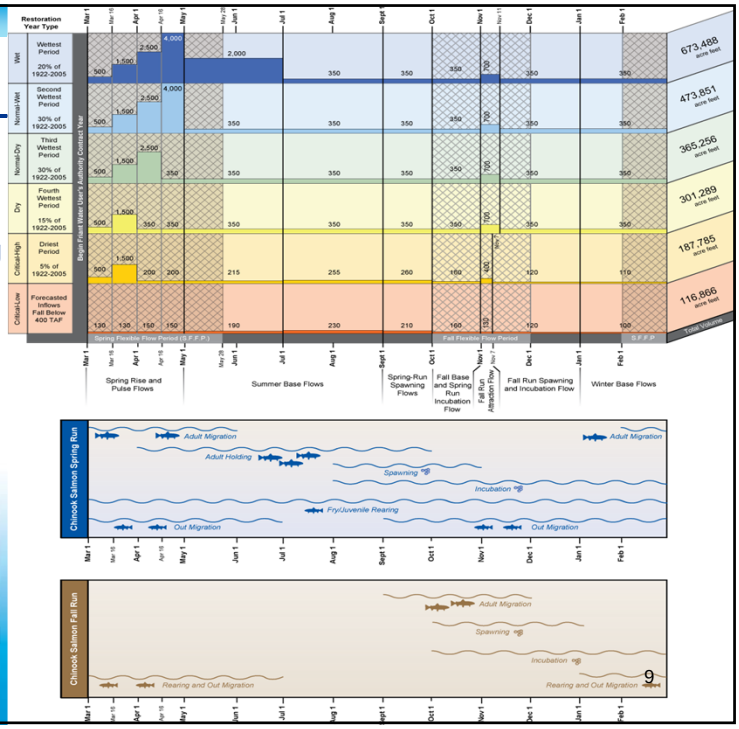
## Friant Release Schedule with Fisheries Migration Timing

- Interim Flows began in 2009 and continued through 2013
- Restoration Flows began in 2014
- All flows released up to "then current" channel capacities



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# Flow Releases

- Restoration Flow Guidelines identify how water is released
- In general:
  - Reclamation determines water year type and volume available to Program
  - Restoration Administrator makes recommendation on how to release that volume
  - Reclamation "***shall consider and implement***" the recommendation to the extent consistent with law, operational criteria, and the Settlement (Paragraph 18)
- Flow targets in each reach (Paragraph 13(a) and Exhibit B)
- If we can release water into the river, we shall consistent with the RA recommendation, law and the Settlement

# Flow Releases (cont)

- Flows not released into the river become "Unreleased Restoration Flows" and are (Paragraph 13(i)):
  1. Banked, stored, or exchanged with Friant for future use to supplement Restoration Flows
  2. Transferred or sold to Friant; proceeds deposited into SJRR Restoration Fund
  3. Same as above with third parties
  4. Released at other times of the year
- Unreleased Restoration Flows must be used to "best achieve the Restoration Goal"

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# Flow Challenges – Seepage

- Rewetting the San Joaquin River increases shallow groundwater elevations adjacent to the river
- Can affect crop productivity from increased salinity in the root zone, water logging of crops, and similar actions
- How we are addressing this:
  - Monitoring and setting thresholds
    - Monitoring shallow groundwater elevations (installed more than 180 shallow groundwater wells to date)
    - Set groundwater thresholds protective of adjacent lands
  - Short-term responses
    - Not increasing flows if groundwater elevations are projected to exceed thresholds
    - Reducing flows to avoid any material adverse seepage impacts
  - Long-term responses
    - Physical projects (interceptor lines, drainage ditches, slurry walls, and similar projects)
    - Realty actions (easements and fee-title purchases)

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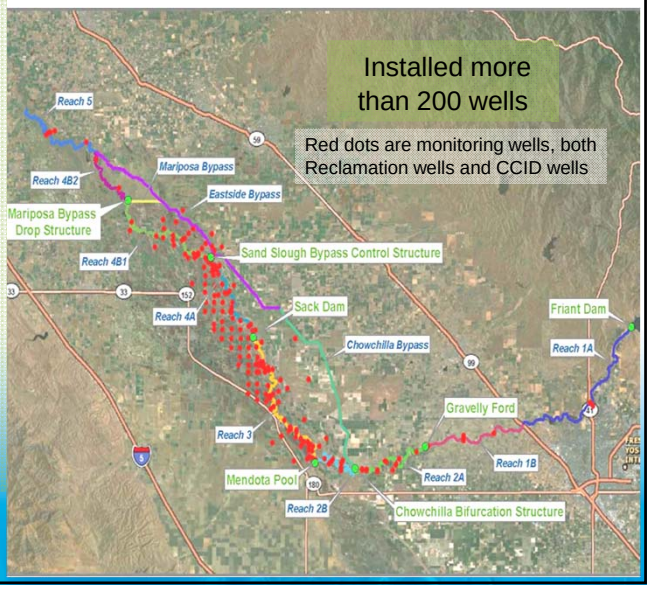
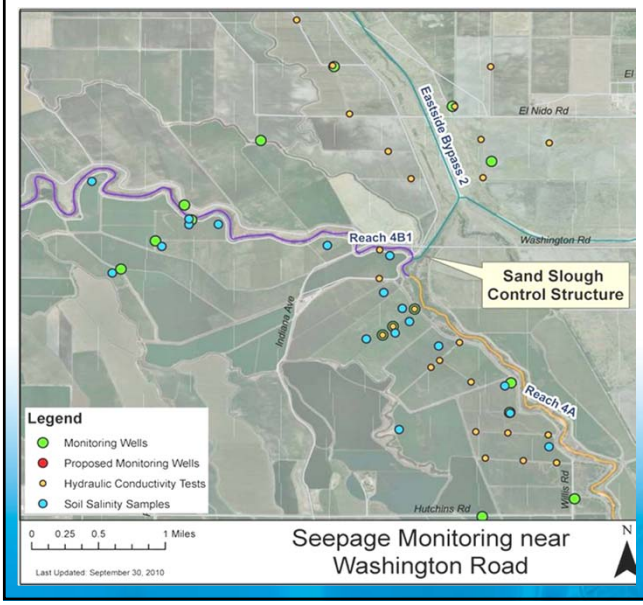
# SJRRP Monitoring Well Network

## Data Reporting

- Real-time wells online
- Weekly measurements for key wells
- Monthly or quarterly for all other wells depending on site conditions
- Pressure transducers gathering hourly data
- Well Atlas provides well locations, groundwater elevations, topography and similar items and is updated about quarterly




# Monitoring Types and Reporting




## Examples of Data Collected:

- Soil salinity
- Hydraulic conductivity
- Geophysical
- Soil texture
- Groundwater level
- Surface water stage
- Temperature
- Electrical conductivity
- Water quality

## Flow Challenges – Levee Stability

- Flood control project designed and built assuming only flood releases from Friant Dam
- Considering four failure mechanisms: under-seepage, through-seepage, erosion, and landside slope stability
- How we are addressing this:
  - Flow management in the Restoration Area
    - Regularly estimate channel capacity using USACE criteria and other available information
    - Convene Channel Capacity Advisory Group
    - Maintain Interim and Restoration flows at or below estimated capacities
  - System monitoring
    - Levee system monitoring
    - Erosion monitoring

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## Major Channel and Structural Improvements

- Settlement requires 10 specific channel and structural improvement projects to address (Paragraph 11(a) or Phase 1 projects):
  - Channel capacity limitations
  - Fish habitat limitations
  - Fish passage and entrainment issues
- Settlement and Settlement Act do not identify priority of projects relative to each other
- Combined into 4 major projects
- 3 underway

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## Mendota Pool Bypass and Reach 2B Channel Improvements Project

- Project (Paragraph 11(a)(1) and (a)(2)):
  - Create bypass channel around the Mendota Pool (about ½ mile of new river channel)
  - Expand Reach 2B capacity to convey at least 4,500 cfs (11 miles of new levee and flood plain habitat)
  - Four alternatives currently under consideration
- Current Schedule:
  - Draft EIS/R – early 2015
  - Final EIS/R – early 2016
  - Construction start date – 2017 (funding dependent)

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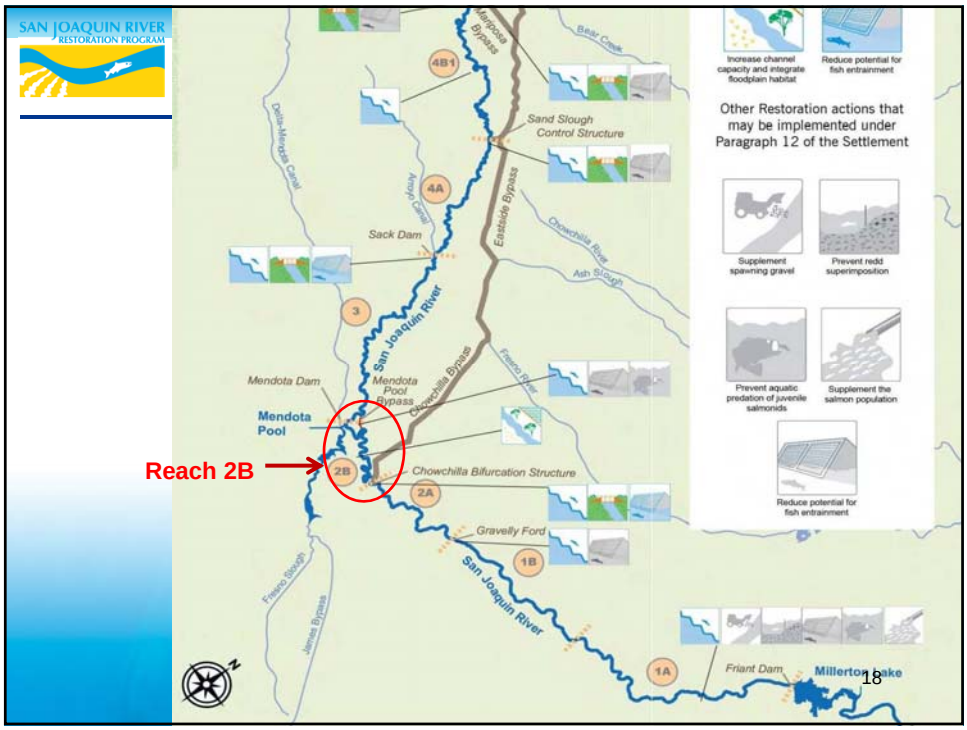


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Draft - Subject to Revision. For Discussion Purposes Only.

# Reach 2B Background

- Bounded by Chowchilla Bypass and Mendota Pool
  - Not part of Flood Control Project
  - Chowchilla Structure is part of Flood Control Project
- Original design capacity was 2,500 cfs
- Current capacity is ~ 1,300 cfs
- Levees built by landowners of native soil on native soil

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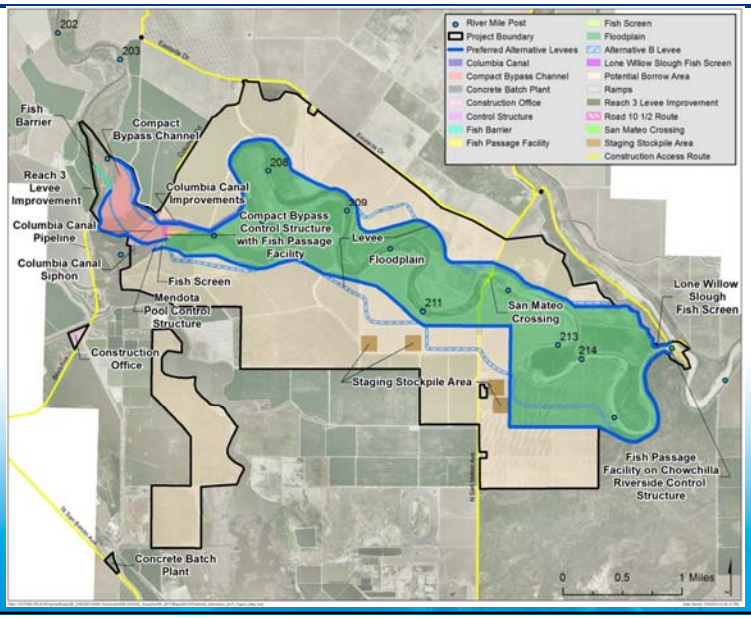
## Mendota Pool Bypass and Reach 2B Improvements Project - Preferred Alternative

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## Reach 4B, Eastside Bypass and Mariposa Bypass Channel and Structural Improvements Project

- Project (Paragraph 11(a)(3)-(5), (a)(8) and (a)(9) AND 11(b)(1) and 11(b)(4)):
  - Reach 4B
    - Modify to convey *at least* 475 cfs, possibly up to 4,500 cfs
    - Modify Sand Slough and Reach 4B headgates for flows and fish passage
  - Eastside and Mariposa Bypass
    - Modify structures for fish passage
    - Establish low-flow channel
  - Three "fundamental" alternatives currently under consideration
  - Variety of levee alignments and infrastructure in each
  - Project will have to account for subsidence
- Current Schedule:
  - Draft EIS/R – mid 2017
  - Final EIS/R – mid 2018
  - Construction start date – to be determined
- Report to Congress required in Section 10009(f)(2)

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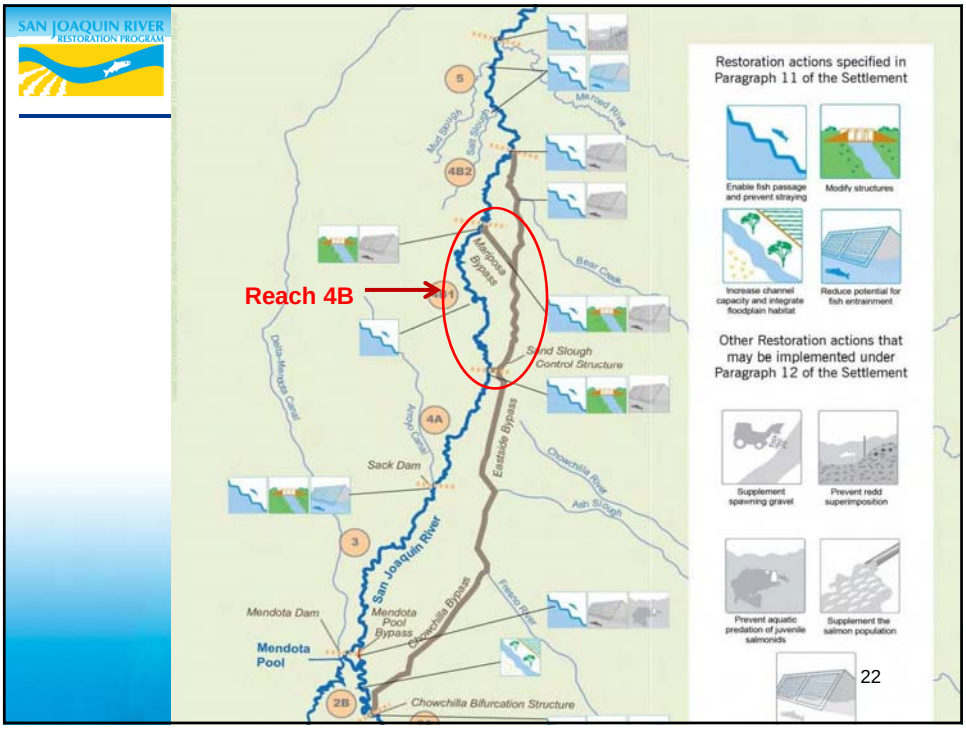


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# Reach 4B Background

- Bounded by Sand Slough Control Structure and Mariposa Bypass
- Part of Flood Control Project
- Original design capacity was 1,500 cfs
- Current capacity is ~ 0 cfs
- No flows in Reach 4B for many decades
  - All flows routed down the Eastside Bypass

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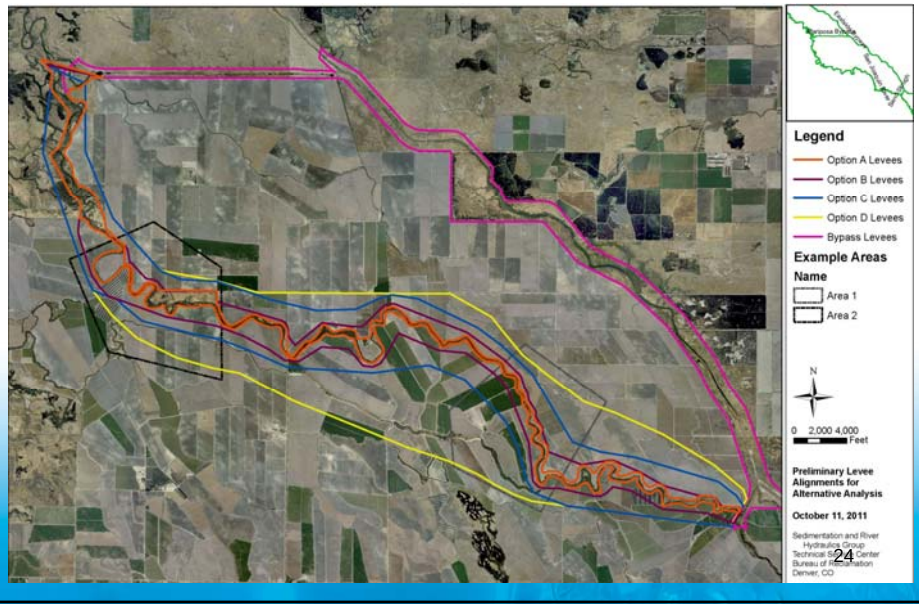
## Reach 4B, Eastside Bypass and Mariposa Bypass Channel and Structural Improvements Project

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## Reach 4B, Eastside Bypass and Mariposa Bypass Channel and Structural Improvements Project

| | **Alternative 1** Main Channel Restoration | | | **Alternative 2** Bypass Restoration | **Alternative 3** Bypass Pulse Flows | **Alternative 4** Split Pulse Flows, Restore Both | | |
|---|---|---|---|---|---|---|---|---|
| | **Levee Alignments** | | | **Levee Alignments** | **Levee Alignments** | **Levee Alignments** | | |
| | **B** | **C** | **D** | **A** | **A** | **A** | **B** | **C** |
| Total Floodplain Created | 2,985 | 6,195 | 10,150 | 1,265 | 1,265 | 1,265 | 2,985 | 6,195 |
| Total Acreage of Farmland Removed from Production | 1,876 | 4,788 | 5,757 | 242 | 242 | 242 | 1,876 | 4,788 |
| All values in acres. | | | | | | | | |

Preliminary information; subject to change.

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## Arroyo Canal Fish Screen and Sack Dam Fish Passage Project

Sack Dam – Modify for fish passage

NEPA and CEQA completed

Construction – on hold pending path forward with subsidence issue

Arroyo Canal – Screen to prevent fish entrainment

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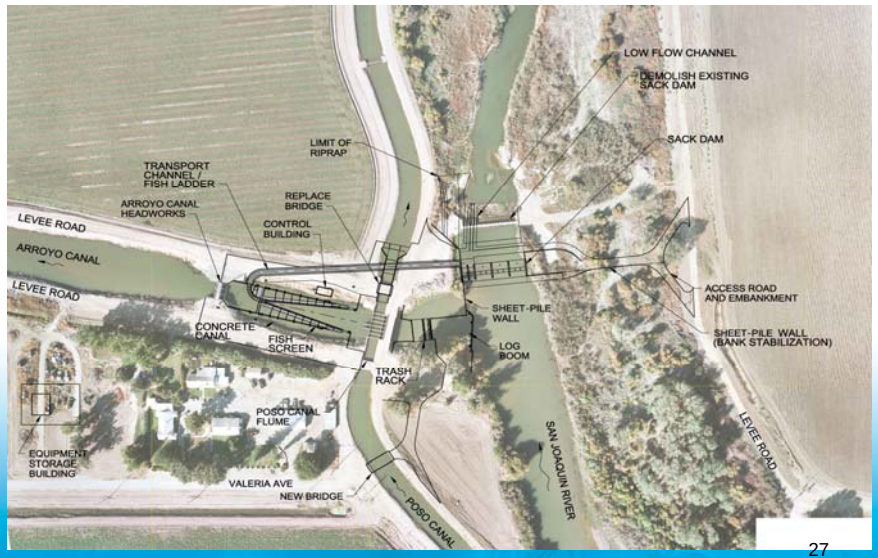
## Arroyo Canal Fish Screen and Sack Dam Fish Passage Project

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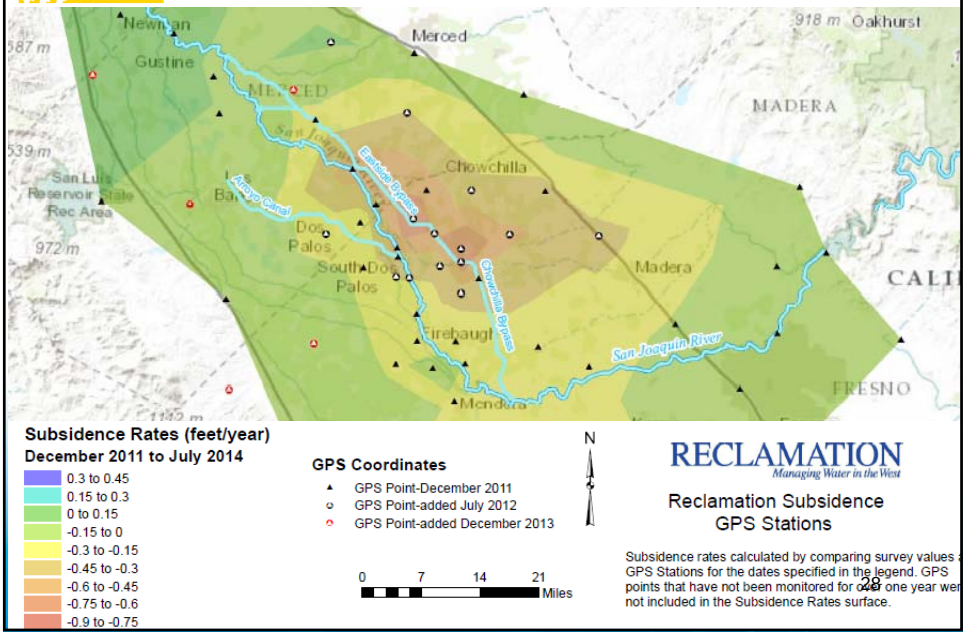
## Subsidence, Control Point Survey Results

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## Reintroduction of Salmon

- Settlement requires reintroduction of spring-run and fall-run Chinook salmon (Paragraph 14)
- Settlement Act requires ESA rules to release spring-run; no other requirements or conditions precedent (Section 10011)
- Paragraph 14(a) – "Secretary, through the FWS . . . ***shall ensure*** spring and fall run are reintroduced at earliest practical date after commencement of sufficient flows and the issuance of all necessary permits"
- NMFS report to Congress on progress no later than December 2024 (Section 10011(d))

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## Reintroduction of Salmon

- Spring-run broodstock efforts began in 2012
- Permitting and approvals received Dec 2013 for direct release of spring-run to river
- First direct release of juvenile spring-run into the river April 2014

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## Water Management Goal

- Paragraph 16 of the Settlement
  - Restoration Flow Guidelines
  - Recovered Water Account
  - Recapture and Recirculation Plan
- Part III of the Settlement Act
  - Friant-Kern Canal and Madera Canal Capacity Restoration projects
  - Friant-Kern Canal Reverse Flow Project
  - Financial assistance for groundwater banks

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## Recapture, Recirculation and Recovered Water Account

- Recovered Water Account
  - Available only in wet hydrologic conditions
  - Total cost of $10/acre-foot
  - 680,440 acre-feet allocated to date
  - 356,200 acre-feet delivered to date
- Recapture and Recirculation
  - Draft Plan released February 2011; Revised Plan scheduled to be completed in 2015
  - Recaptured and recirculated (rounded):
    - Contract Year 2010 = 52,000 acre-feet
    - Contract Year 2011 = 36,000 acre-feet
    - Contract Year 2012 = 108,000 acre-feet
    - Contract Year 2013 = 90,000 acre-feet
    - Recapture amounts vary each year based on flows release and recapture locations
      - Recaptured roughly 50-60% of the flows released to date
      - Will be less in the future as flows go past the Merced River confluence and are recaptured at the Delta facilities

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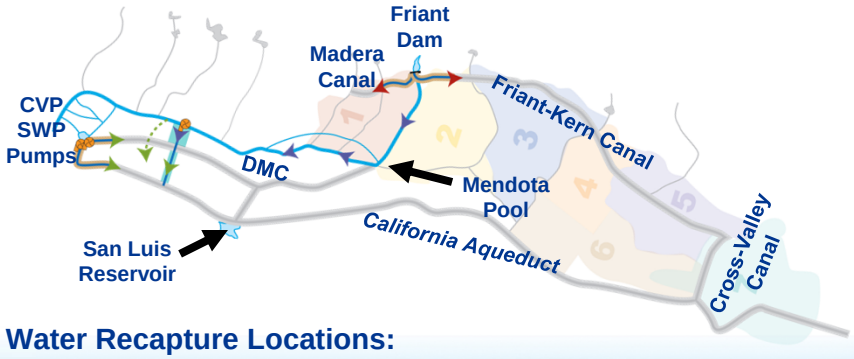
# Recapture and Recirculation




**Water Recapture Locations:**
- Mendota Pool (temp)
- In Delta
- Along San Joaquin River at existing pumping plants
- New pumping plant along the river (considered in PEIS/R)

**Recirculation Options:**
- Exchanges
- Direct Deliveries (AEWSD/SWID)
- Sales

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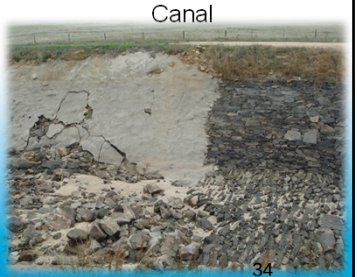
# Settlement Act Projects

- FKC Capacity Restoration Project (Section 10201(a)(1) and 10203(b))
  - Feasibility Report released for public review in June 2011
  - Construction to start in 2015
- Madera Canal Capacity Restoration Project (same sections)
  - Demonstration Projects
  - Feasibility Report scheduled for public review in 2016
- $35M total, not indexed

Friant-Kern Canal
Canal



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Madera Canal

## Settlement Act Projects (cont)

- Friant-Kern Canal Pump-back Project (Section 10201(a)(2) and 10203(b))
  - $17M, not indexed
  - Requires determination that funding will not conflict with or delay implementing Part I of the Act (generally, the Settlement)
  - Notice of determination to be published with Reach 4B Report to Congress
  - On-hold
- Part III - Local Groundwater Banking Projects (Section 10202 and 10203(c))
  - $50M, indexed at Oct 2008 levels
  - At least 50% cost share
  - Final Guidelines released August 2012
  - Awarded over $14M in Financial Assistance in FY2013

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## Settlement Funding Sources

| Source | Amount |
|---|---|
| Friant Surcharge (average collected) | $5.6 million/year |
| Recovered Water Account Receipts (average collected) | $0.8 million/year |
| Unreleased Restoration Flows sales | unknown |
| Sales of Other Water and Property | unknown |
| Friant Capital Repayment (est. collected) | $225 million |
| Non-Federal Contributions | unknown |
| CVPIA Restoration Fund (maximum) | $2 million/year |
| New Federal Appropriations (maximum) | $300 million |
| State Funding (stated commitment) | $200 million |

Deposited into the San Joaquin River Restoration Fund

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# Revised Implementation Framework

- Some actions required by the Settlement are unavoidably behind schedule
- Implementing Agencies, Settling Parties, and Third Parties are working to develop a revised schedule that will:
  - Address the requirements of the Settlement for expeditious action
  - Meet the requirements of the legislation to minimize impacts on third-party interests
- Revised schedule and budget will be realistic and achievable
- Will provide common vision / path forward for implementing the Program
- Will identify Implementing Agencies roles and responsibilities and have more accountability by all agencies
- Target completion is spring 2015

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# Key Accomplishments to Date – Settlement

| Paragraph | Project | Accomplishment |
|---|---|---|
| 11(a) projects | Phase 1 projects | • Began all except Mud and Salt Slough Project<br>• Completed NEPA and 60% design on Arroyo Canal Fish Screen and Sack Dam Fish Passage Project |
| 11(b) projects | Phase 2 projects | • Began Reach 4B-related projects |
| 13(g) | Measure and monitor flows | • Additional gages installed and on-going monitoring since October 2009<br>• Process established in Restoration Flows Guidelines (RFGs) |
| 13(h) | Retain, acquire and perfect all rights to manage and control all flows | • State Water Resources Control Board (SWRCB) orders protecting Interim Flows.<br>• SWRCB order modifying water rights at Friant Dam to implement Interim Flows and Restoration Flows on a long-term basis. |
| 13(i) | Commence Restoration Flows no later than January 1, 2014 | • Release of Restoration Flows on January 1, 2014.<br>• Technical Memorandum on the Management of Unreleased Restoration Flows |
| 13(j) | Restoration Flow Guidelines | • Completed December 30, 2014. |

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## Key Accomplishments to Date – Settlement (cont)

| Paragraph | Project | Accomplishment |
|---|---|---|
| 14 | Reintroduce spring and fall run Chinook salmon | • Fisheries Management Plan, Hatchery and Genetics Management Plan, Strategy for Spring-run Chinook Salmon Reintroduction, and permit applications.<br>• Trapped and transported fall-run salmon starting in 2012.<br>• Natural spawning of fall-run in fall 2012 and naturally produced fall-run in spring 2013.<br>• Initiated spring-run broodstock efforts in 2013<br>• Completed special rules to allow release of spring-run, consistent with applicable law<br>• Constructed and began operations of the Interim Salmon Conservation and Research Facility (Conservation Facility).<br>• Commenced direct releases of spring-run into the San Joaquin River in 2014. |
| 14(a) | Spring-run Chinook salmon permitting | • Service submitted two permit applications, one for broodstock and one for direct release of spring-run. Both applications requested 5 years terms.<br>• NMFS issued Section 10(a)(1)(A) Permit 14868 on October 11, 2012.<br>• NMFS issued Section 10(a)(1)(A) Permit 17781, in March 2014, for direct release of spring-run into the San Joaquin River.<br>• 50,000 spring-run juveniles released in 2014 |

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## Key Accomplishments to Date – Settlement (cont)

| Paragraph | Project | Accomplishment |
|---|---|---|
| 15 | Interim Flows and associated monitoring program | • Commencement of Interim Flows on October 1, 2009.<br>• Establishment of monitoring network.<br>• Commencement of Restoration Flows |
| 16(a) | Plan for recirculation, recapture, reuse, exchange or transfer of Interim Flows and Restoration Flows | • 2010, 2011, 2012, 2013, and 2014 program of recirculation, recapture, reuse, exchange or transfer of Interim Flows and Restoration Flows.<br>• 2010, 2011, 2012, and 2013-2017 Environmental Assessment and Finding of No Significant Impact.<br>• Draft Recapture and Recirculation Plan, dated February 2011 |
| 16(b) | Recovered Water Account | • Methodology to determine water supply impacts in the Restoration Flow Guidelines.<br>• Allocated 680,440 acre-feet of Recovered Water Account credits.<br>• Delivered 365,200 acre-feet of Recovered Water Account water to date. |

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## Key Accomplishments to Date – Settlement Act

| Section | Project | Accomplishment |
|---|---|---|
| 10004(h)(1) | Prior to releasing Interim Flows, complete an analysis in compliance with NEPA | • Completed several Environmental Assessments and Supplemental Environmental Assessments for Interim Flows. |
| 10004(h)(3) | Reduce Interim Flows to the extent necessary to address any material adverse impact to Third Parties from groundwater seepage | • Interim Flows were managed and reduced to the extent necessary to address any material adverse seepage impacts.<br>• Financially compensated landowner that experienced material adverse seepage impacts from Interim Flows. |
| 10004(h)(4) | Evaluate the effectiveness of the Hills Ferry Barrier in preventing the unintended upstream migration of anadromous fish | • Evaluations were completed in 2010 and 2011 and reports were prepared as part of the SJRRP's Annual Technical Report process. |
| 10009(f)(1) | Study that specifies the cost of undertaking work in Reach 4B, impacts associated with reintroduction of flows, and measure that shall be implemented to mitigate impacts. | • Study completed in December 2013. |

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## Key Accomplishments to Date – Settlement Act

| Section | Project | Accomplishment |
|---|---|---|
| 10010 | Convert the Friant Division, Hidden Unit, and Buchanan Unit contractors from water service contracts to repayment contracts under section 9(d) of the Act of August 4, 1939. | • Completed. |
| 10011(c)(2) | Rule pursuant to section 4(d) of the Endangered Species Act governing the incidental take of reintroduced spring-run salmon | • Rule issued on December 31, 2013. |
| 10201(a)(1) | Friant-Kern Canal Capacity Restoration Project | • Draft feasibility study and Environmental Assessment for the Friant-Kern Canal Capacity Restoration Project completed in 2011.<br>• 60-percent design. |
| 10202 | Financial assistance to local agencies for the planning, design, environmental compliance, and construction of local facilities to groundwater banking facilities | • Part III Guidelines<br>• FY 2013, Reclamation awarded $14.29 million to four projects and provided $10 million in funding. With local cost-share contributions, more than $39.6 million in groundwater improvements will be implemented with a projected yield over 760,000 acre-feet during the projects' 30-year life cycle, approximately 25,000 acre-feet/year. |

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Interim Flows in Reach 2A

- The Settlement is a substantial change in the last 60 years of operations of the San Joaquin River and CVP Friant Division.
- We are working to implement the Settlement in an open, transparent, and collaborative process.

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Alicia Forsythe

SJRRP Program Manager

916-978-5464

aforsythe@usbr.gov


www.restoresjr.net