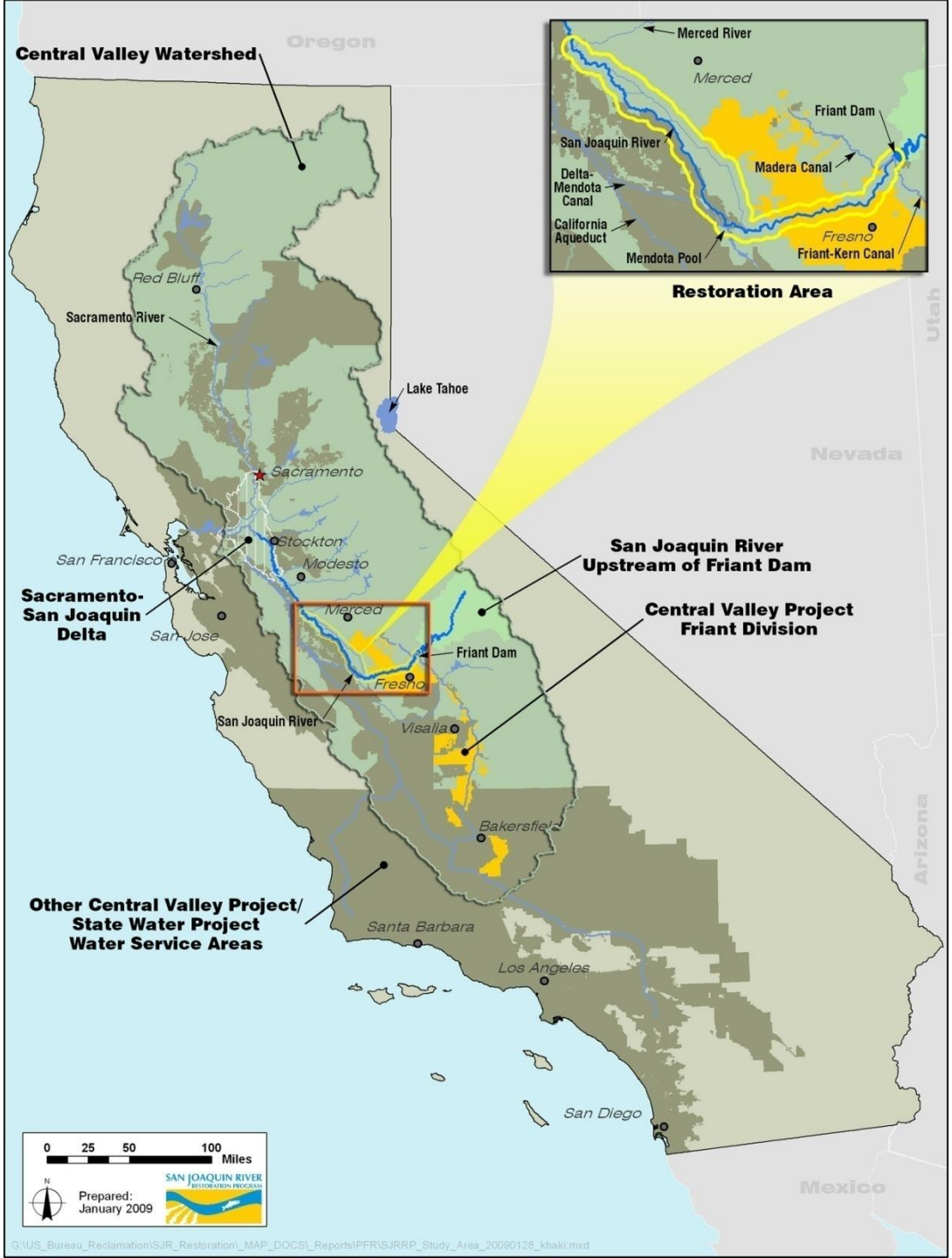
San Joaquin River Restoration Program

Water Education Foundation Tour

November 7 & 8, 2018

Overview of the Friant Division of the Central Valley Project and the San Joaquin River Restoration Settlement

San Joaquin River Restoration Area in relation to the Central Valley



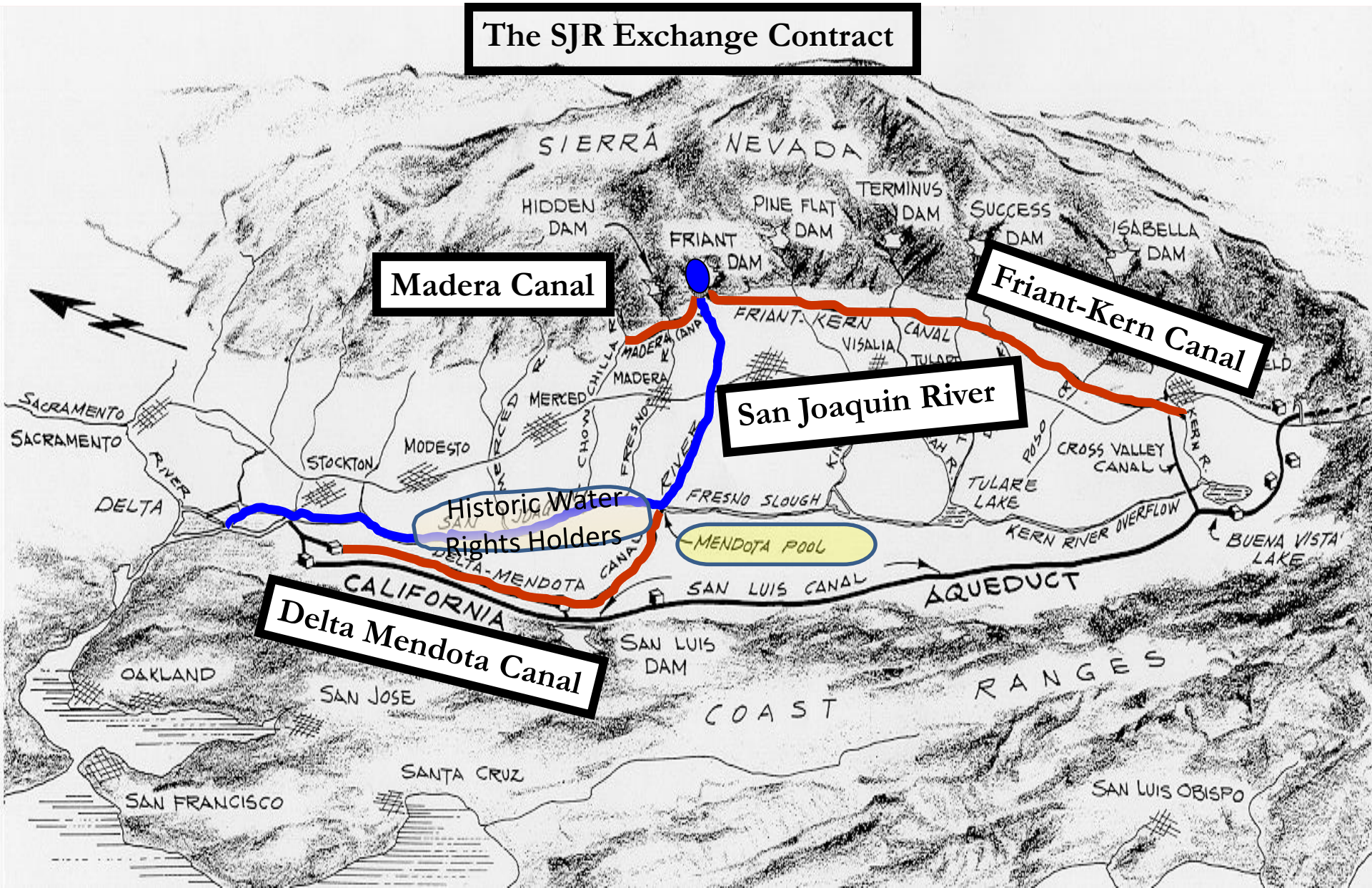
San Joaquin River History

- 1860-1880: Irrigation development; Miller & Lux water rights; first Mendota Dam and Sack Dam
- 1912-1914: Initial development of hydroelectric projects (Now: 8 dams; 611,000 AF Capacity)
- 1933: California Central Valley Project (including Friant Dam) approved by California voters
- 1937: CVP authorized by Congress to be a federal Reclamation project
- 1948: First deliveries to Friant Division

San Joaquin River History (continued)

- 1951-1959: Water rights litigation results in Rank v. Krug decision requiring 5 cfs at Gravelly Ford
- 1988: NRDC & others file lawsuit to challenge renewal of long term water supply contracts
- 1992: F&G Code §5937 violation added to complaint
- 1999-2003: Settlement negotiations with Pilot Projects and Joint Studies but are unsuccessful
- 2005-06: Settlement negotiations are successful
- 2009: Federal Authorizing Legislation; Interim Flows begin October 1
- 2014 and 2015: Severe drought; zero allocation to Friant contractors and the SJRRP

How The Friant Division Works



The Exchange Contract

- Allowed construction of the Friant Division and irrigation of about 1 million acres
- Allowed the diversion of almost the entire flow of the San Joaquin River
- Provided a firm substitute water supply to the Exchange Contractors (CCID, FCWD, CCC, and SLCC)
- But the diversion of flows resulted in extirpation of salmon runs on the upper SJR

Friant Dam

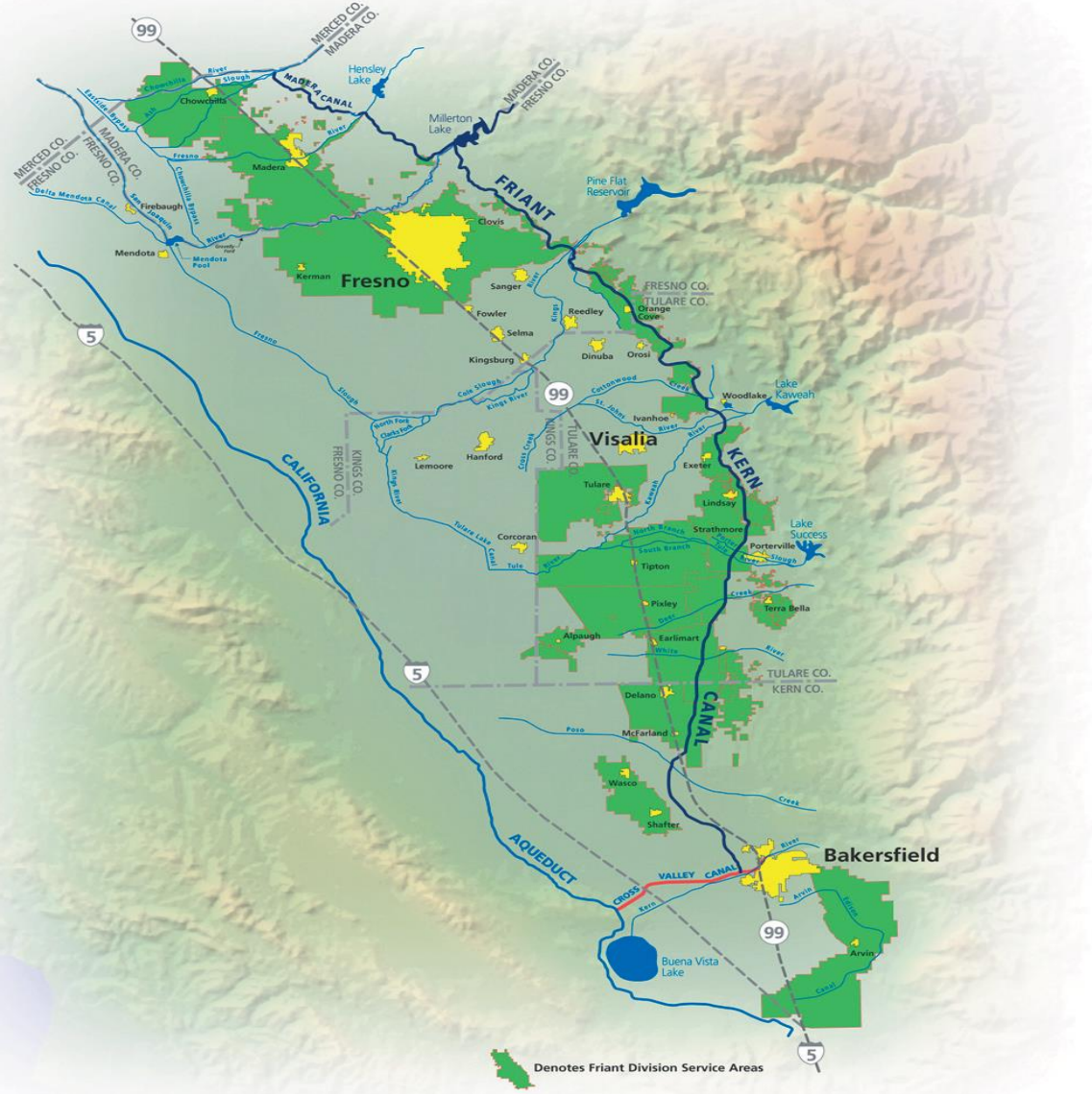
Inflow
1,750 TAF/yr

Millerton Lake
520 TAF capacity

Average annual flood releases (prior to Settlement): 450 TAF/YR

Flood Releases To SJR reduced by Settlement. Flood releases exceed 100 TAF in 25% of years and 500 TAF in 10% of years

Friant Division Service Area



Friant Division Facts

- The SJR is highly variable (runoff ranges from 327 TAF to 4.6 MAF) with an average annual supply of approx. 1.3 MAF available for delivery (pre-Settlement)
- There are 32 contractors (districts and cities)
- Provides water for 15,000 family farms and several cities
- Two class system:
  - Class 1 water: is the first 800 KAF developed that is available for delivery (usually for M&I use and for districts w/o access to g/w supplies)
  - Class 2 water: is the next 1.4 MAF developed (much of which is used for g/w recharge)
  - Some districts have only Class 1 supplies, some have only Class 2 supplies, and some have both Class 1 and Class 2 supplies

Friant Division Facts - continued

- Conjunctive Use Project – no significant surface storage available to carry water over to next year
- Groundwater acts as a form of carryover to be used in dry years, but not available for all districts
- Before Settlement:
  - A live stream had been required for about 40 miles below Friant Dam to satisfy riparian demands
  - Beyond that point, dry river bed except when flood releases were made

Benefits of Settlement to the Non-Federal Parties

Benefits of Settlement to Friant Contractors

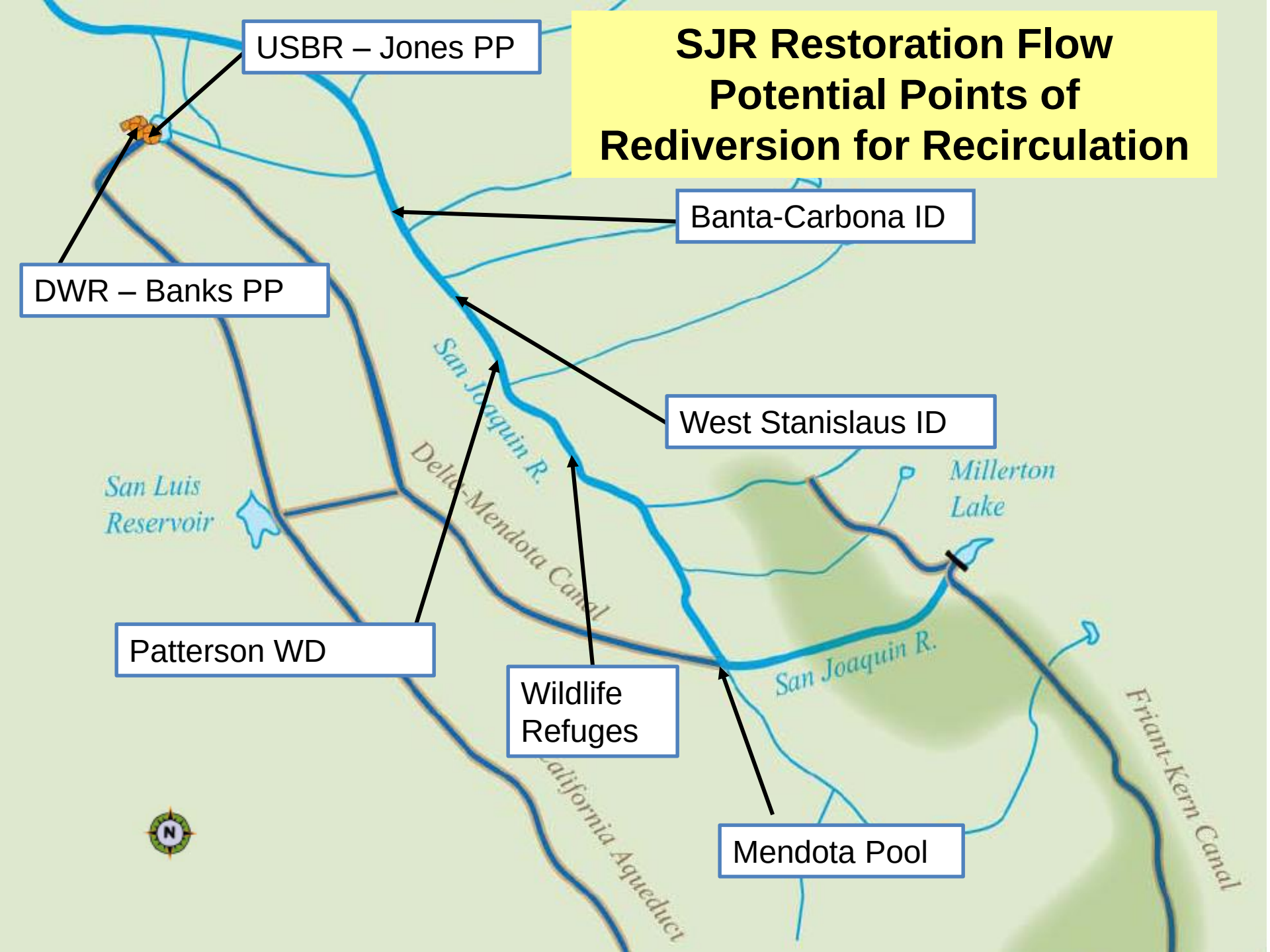
- Water Supply Certainty – River releases are prescribed and a set amount of water is designated for fish;
- Financial Certainty – Friant financial commitments limited to payments already being made;
- Water Recovery Opportunity – Equal goal to recover water released for fishery purposes;
- Water Management – Greater ability to transfer water by relief from certain provisions of CVPIA;

Benefits of Settlement to Friant Contractors

- Reliable Water Contracts with Reclamation;
- Ensures that the federal and state governments are partners and committed to the restoration and water management goals and funding; and
- End of Litigation – Settlement ended all aspects of the *NRDC v. Rodgers* litigation including ESA and Reclamation Law issues and claims, and protects Friant Contracts from being invalidated by the federal Court.

Water Management Goal

- Equal Goal of the Settlement
- The Secretary of the Interior is required to
  - Develop and implement a plan for recirculation, recapture, reuse, exchange or transfer of water to mitigate impacts
  - Implement a Recovered Water Account program to reduce impacts
  - Make water available in wet years at reduced prices
  - Provide funding assistance for local groundwater recharge and banking projects


SJR Restoration Flow
Potential Points of
Rediversion for Recirculation
USBR – Jones PP
DWR – Banks PP
Banta-Carbona ID
West Stanislaus ID
Patterson WD
Wildlife
Refuges
Mendota Pool
San Luis
Reservoir
San Joaquin R.
Delta-Mendota Canal
Millerton
Lake
San Joaquin R.
Friant-Kern Canal
N

Role of RA and TAC in Settlement Implementation

Implementation of the Settlement

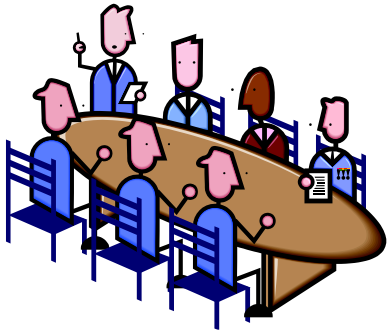
To assist in implementation, the Settlement provides for:

- A Restoration Administrator

  Appointed by Friant and NRDC

- A Technical Advisory Committee

  Appointed by Friant and NRDC



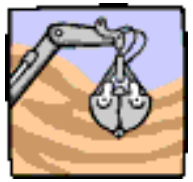
Role of the Restoration Administrator

- Recommendations for submittal to the Secretary on:
  - additional measures not provided for by the Settlement to enhance the success of achieving the Restoration Goal
  - the need to provide for Buffer Flows during a particular Restoration Year
  - acquisition of additional water from willing sellers over and above Settlement water year allocations

Role of the RA - continued

- Recommendations for submittal to the Secretary on:
  - measures for reintroducing of spring run and fall run Chinook salmon
  - the program of Interim Flows designed to collect relevant information concerning flow temperatures, fish needs, seepage losses, recirculation, re-capture and re-use of water (Interim Flows ended in 2013)
  - the manner in which Restoration Flow hydrographs shall be implemented and when Buffer Flows shall be needed

The Secretary of the Interior is to consult with the RA on:



Completion of river improvements specified in Settlement Paragraph 11

Reintroduction of Chinook salmon at the earliest possible date after commencement of sufficient flows and issuance of necessary permits

Determination of existing channel capacity and impact of flows on channel construction

Technical Advisory Committee

- A Technical Advisory Committee (TAC) was established to assist and advise the RA on implementation of the Settlement

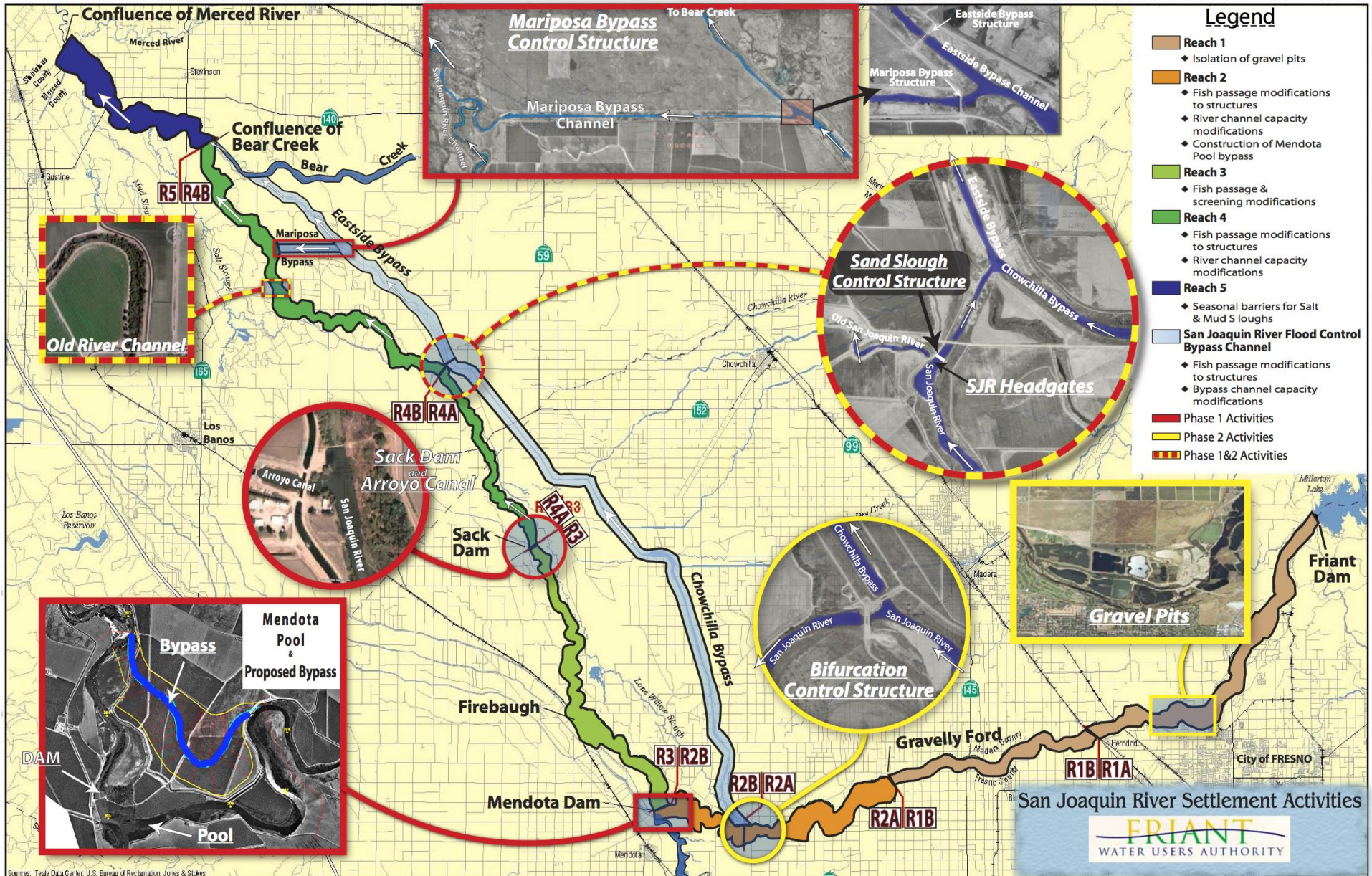
- Made up of 6 members (two named by Friant, two named by NRDC, and two selected jointly by Friant and NRDC) along with two non-voting, *ex-officio* members (representing and appointed by DWR and DFW)

The San Joaquin River

LEGEND

- Upper River
- Middle River – Restoration Reach
- Lower River

Overview of SJR Reaches

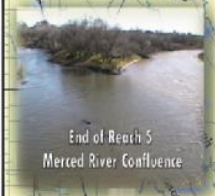


SAN JOAQUIN RIVER STUDY AREA
FRIANT DAM TO MERCED RIVER

Merced River

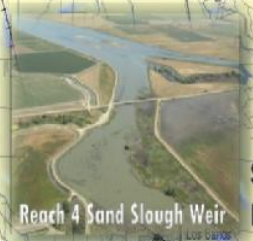
Bear Creek

R5 | R4B



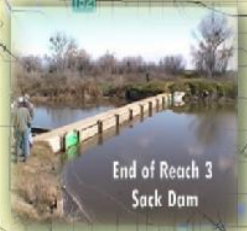
Mariposa Bypass

East Side Bypass



Sand Slough Diversion Structure

R4B | R4A

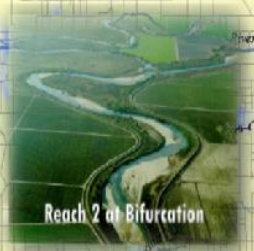


R4A | R3

Sack Dam

Friant Dam

DF & G Fish Hatchery



Chowchilla Bypass

Milburn Unit

Bifurcation Control Structure

R3 | R2B

R2B | R2A

R2A | R1B

R1B | R1A

Mendota Pool and Dam

Gravelly Ford

Legend

- Reach Division
- Reach 1
- Reach 2
- Reach 3
- Reach 4
- Reach 5
- Hydrologic Features (polygon)
- Hydrologic Features (linear)
- County Boundary
- Major Highway
- Highway
- Roads
- Railroads
- Cities
- River Mile

Miles

Sources: Teale Data Center, U.S. Bureau of Reclamation, Jones & Stokes

Reach 1: Friant Dam to Gravelly Ford (General Overview)

- Approximately 38 Miles
- Average channel width is 3,300 ft..
- Average channel slope is 0.00056
- Design capacity = 8,000 cfs
- Water flowing all year
- Extensive riparian vegetation
- Gravel mining & pits
- Potential spawning habitat
- Current location of fish hatchery
- San Joaquin River Parkway and Conservancy general plan (Land Use)

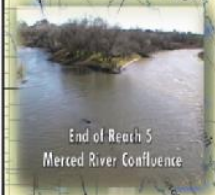
Source: Friant/NRDC SJR Draft Restoration Strategies for San Joaquin River Report

SAN JOAQUIN RIVER STUDY AREA
FRIANT DAM TO MERCED RIVER

Merced River

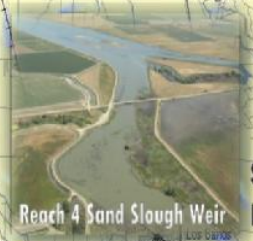
Bear Creek

R5 | R4B



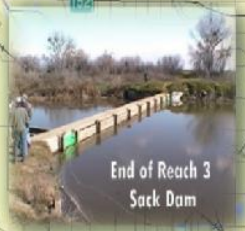
Mariposa Bypass

East Side Bypass



Sand Slough Diversion Structure

R4B | R4A

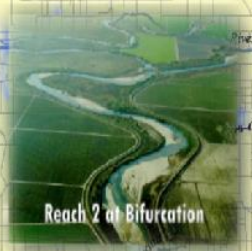


R4A | R3

Sack Dam

Friant Dam

DF & G Fish Hatchery



Chowchilla Bypass

Milburn Unit

Bifurcation Control Structure

R3 | R2B

R2B | R2A

R2A | R1B

R1B | R1A

Mendota Pool and Dam

Gravelly Ford

Legend

- Reach Division
- Reach 1
- Reach 2
- Reach 3
- Reach 4
- Reach 5
- Hydrologic Features (polygon)
- Hydrologic Features (linear)
- County Boundary
- Major Highway
- Highway
- Roads
- Railroads
- Cities
- River Mile

2 0 2 4 6
Miles

Sources: Teale Data Center, U.S. Bureau of Reclamation, Jones & Stokes

Reach 2A: Gravelly Ford to Bifurcation (General Overview)

- Approximately 12 Miles
- Average Channel width is 3,300 ft.
- Design capacity = 8,000 cfs
- Anabranched, meandering channel
- State flood flow protection
  - Levees
  - Bifurcation
  - East Side Bypass
- Little or no water
- Little or no riparian vegetation
- Location of 1999, 2000 & 2001 Experimental Pilot Projects


Chowchilla Bypass Structure
EAST-SIDE BYPASS
SAN JOAQUIN RIVER
BIFURCATION STRUCTURE
SAN JOAQUIN RIVER
SAN JOAQUIN RIVER
San Joaquin River Structure
ENLARGED VIEW

Reach 2B: Bifurcation to Mendota Dam (General Overview)

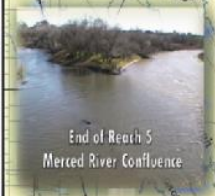
- Approximately 12 Miles
- Average Channel width is 3,300 ft.
- Design capacity = 2,500 cfs (actual capacity ~1,200 cfs)
- Local levee system
- Little or no water
- Little or no riparian vegetation
- Backwater effect from Mendota Dam

SAN JOAQUIN RIVER STUDY AREA
FRIANT DAM TO MERCED RIVER

Merced River

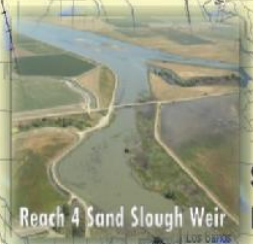
Bear Creek

R5 | R4B



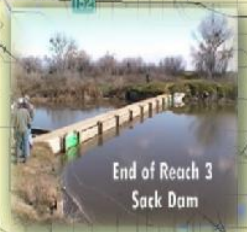
Mariposa Bypass

East Side Bypass



Sand Slough Diversion Structure

R4B | R4A

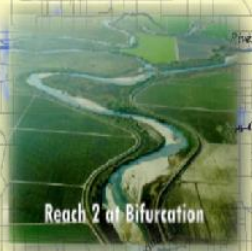


R4A | R3

Sack Dam

Friant Dam

DF & G Fish Hatchery



Chowchilla Bypass

Milburn Unit

Bifurcation Control Structure

R3 | R2B

R2B | R2A

R2A | R1B

R1B | R1A

Mendota Pool and Dam

Gravelly Ford

Legend

- Reach Division
- Reach 1
- Reach 2
- Reach 3
- Reach 4
- Reach 5
- Hydrologic Features (polygon)
- Hydrologic Features (linear)
- County Boundary
- Major Highway
- Highway
- Roads
- Railroads
- Cities
- River Mile

Miles

Sources: Teale Data Center, U.S. Bureau of Reclamation, Jones & Stokes

Reach 3: Mendota Dam to Sack Dam (General Overview)

- Approximately 23 Miles
- Average Channel width is 3,000 ft.
- Design capacity = 4,500 cfs
- Single threaded channel
- Water flowing all year (conveyance to Arroyo Canal)
- Water is imported from the Delta
- Extensive riparian vegetation

- **Sack Dam – Built during the Mid-1800's for Miller & Lux**
- **Located Approx. 86 River-miles Downstream of Friant Dam**

SAN JOAQUIN RIVER STUDY AREA FRIANT DAM TO MERCED RIVER

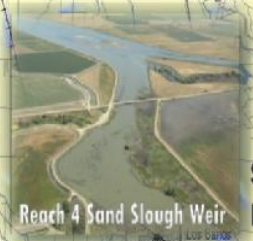
Merced River

Bear Creek

R5 | R4B

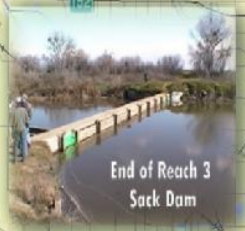
Mariposa Bypass

East Side Bypass



Sand Slough Diversion Structure

R4B | R4A

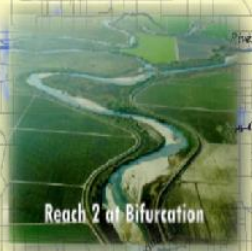


R4A | R3

Sack Dam

Friant Dam

DF & G Fish Hatchery



Chowchilla Bypass

Milburn Unit

Bifurcation Control Structure

R3 | R2B

Mendota Pool and Dam

R2B | R2A

R2A | R1B

Gravelly Ford

R1B | R1A

Legend

- Reach Division
- Reach 1
- Reach 2
- Reach 3
- Reach 4
- Reach 5
- Hydrologic Features (polygon)
- Hydrologic Features (linear)
- County Boundary
- Major Highway
- Highway
- Roads
- Railroads
- Cities
- River Mile

Miles

Sources: Teale Data Center, U.S. Bureau of Reclamation, Jones & Stokes

Reach 4A: Sack Dam to Sand Slough Control Structure (General Overview)

- Approximately 16 Miles
- Average Channel width is 2,300 ft.
- Design capacity = 4,500 cfs
- Bounded by Poso and Riverside Canals and local dikes
- Operationally dry (minus operational spills below Sack Dam)
- Relatively shallow groundwater feeding riparian vegetation
- Terminates into East Side Bypass

Reach 4B: Sand Slough Control Structure to Bear Creek (General Overview)

- Approximately 30 Miles
- Average Channel width is 2,300 ft.
- Design capacity = 1,500 cfs (actual capacity ~300 cfs)
- Operationally dry
- Relatively shallow groundwater and drainage tailwater feeding riparian vegetation
- Connectivity to East Side Bypass
  - Sand Slough
  - Mariposa Bypass
  - Bear Creek

SAN JOAQUIN RIVER STUDY AREA
FRIANT DAM TO MERCED RIVER

Merced River

Bear Creek

R5 | R4B

End of Reach 5
Merced River Confluence

Mariposa Bypass

East Side Bypass

Reach 4 Sand Slough Weir

Sand Slough Diversion Structure

R4B | R4A

End of Reach 3
Sack Dam

R4A | R3

Sack Dam

Reach 5

Chowchilla Bypass

Reach 2 at Bifurcation

Bifurcation Control Structure

R3 | R2B

R2B | R2A

R2A | R1B

Mendota Pool and Dam

Gravelly Ford

R1B | R1A

Reach 1 Gravel Pits

Milburn Unit

Friant Dam

DF & G Fish Hatchery

Legend

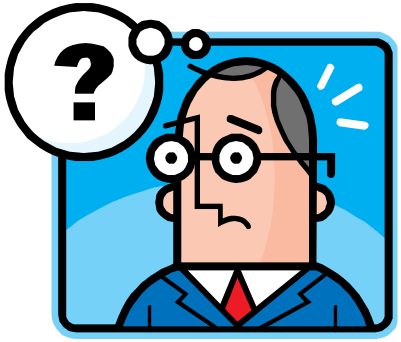
- Reach Division
- Reach 1
- Reach 2
- Reach 3
- Reach 4
- Reach 5
- Hydrologic Features (polygon)
- Hydrologic Features (linear)
- County Boundary
- Major Highway
- Highway
- Roads
- Railroads
- Cities
- River Mile

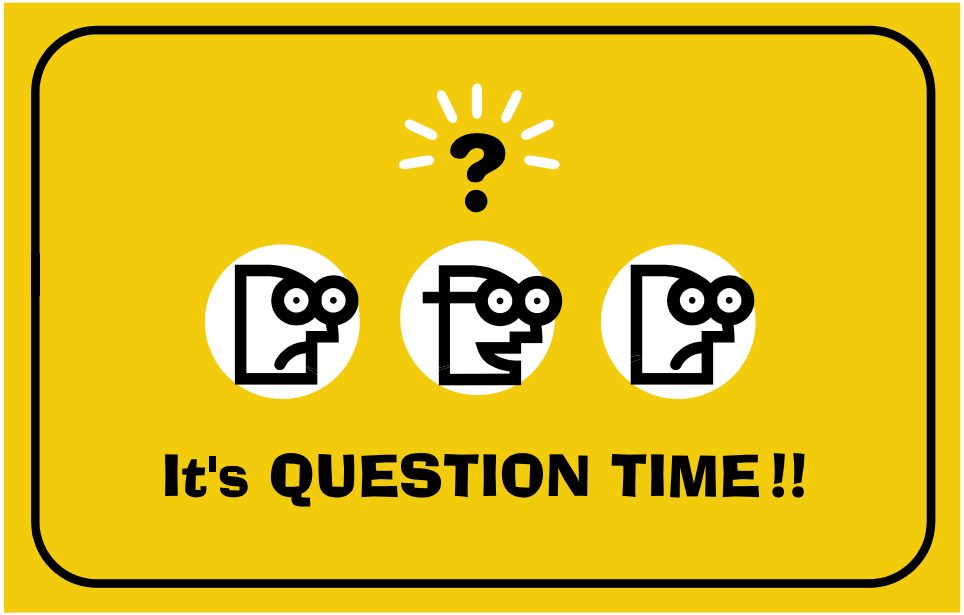
Miles

Sources: Teale Data Center, U.S. Bureau of Reclamation, Jones & Stokes

Reach 5: Bear Creek to Merced River (General Overview)

- Approximately 18 Miles
- Average Channel width is 3,500 ft.
- Design capacity = 26,000 cfs
- Flow all year
  - Bear Creek
  - Salt Slough
  - Ag drainage
- Relatively shallow groundwater feeding riparian vegetation
- Backwater effect from Merced River
- Floodplain habitat opportunities
- Location of DF&G Hills Ferry fish barrier




It's QUESTION TIME!!