The Trinity River- A Triumph of Science Over Politics- For now

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Figure 4.4. Trinity River near Lewiston (RM 112.0) circa 1960, prior to the construction of TRD. Note alternate bar sequences and large floodplain.
Trinity River Basin
1952: Congressman Clair Engle promises local control, Trinity County Board of Supervisors endorse the Trinity River Division

Engle Says Dam Bill to Be Under Trinity County Thumb

Rep. Clair Engle Friday evening told an audience in Weaver-ville he would withdraw his proposed congressional bill to authorize construction of the Trinity River diversion project, at any stage of its enactment, if the people of Trinity county were not satisfied with its provisions.

(Emphasizing this statement, Engle on Saturday morning told The Trinity Journal he would withdraw the bill any time Trinity county did not approve of it — if provisions protecting Trinity county were deleted in its present form.)

Engle told a questioner that the county could not sell the power it would have reserved and take the proceeds. The Bureau of Reclamation would still sell the power, with proceeds to be applied to amortize the whole Central Valley project.

He told another questioner that the chances for his bill to get through Congress substan-
1953: Westlands Water District joins the fight in promoting legislation to dam the Trinity River

For more information on Westlands, see http://www.westlandswater.org

Congressman Clair Engle and the “California Committee for Trinity River Development” promise that the Trinity project “does not contemplate diversion of one bucketful of water which is necessary in this basin” and “the argument that it will ruin fishing is absolute nonsense.”
The 1955 House and Senate Committee Reports on the 1955 Act clearly stated that the destination of the Trinity’s water would be the San Luis Unit of the CVP.
The Trinity River Division Act of August 12, 1955: Broken Promises

“Provided further, That not less than 50,000 acre-feet shall be released annually from the Trinity Reservoir and made available to Humboldt County and downstream water users.”

“. . . the Secretary is authorized and directed to adopt appropriate measures to insure the preservation and propagation of fish and wildlife. . . . of the Trinity River. . .”
The Trinity River Division Act of 1955
PL 84-386

“For the principal purpose of increasing the supply of water available for irrigation and other beneficial uses in the Central Valley of California, the Secretary of the Interior . . . is authorized to construct, operate, and maintain, as an addition to and an integral part of the Central Valley Project, California, the Trinity River Division . . .”
1959: BOR applies to the State of California for water permits to store and divert the waters of the Trinity River.

Reclamation is issued 7 State Water Right Permits, protested by Humboldt County and CA Dept. of Fish and Game.

HumCo 50,000 AF put as term and condition of water permits and water contract signed between BOR and HumCo

Permit approval included the expansion of the CVP service area in the western San Joaquin Valley to some of the most toxic, seleniferous soils in the United States.

River flows at Lewiston 10% of historic amounts- 150-250 cfs (120,500 AF/year)
Drainage a Requirement of the SLU Act Before Water Can Be Delivered

1960: The San Luis Act is signed into law, authorizing Reclamation to sell water to Districts within the San Luis Unit of the CVP contingent upon the following:

The Secretary of the Interior “has received satisfactory assurance from the State of California that it will make provision for a master drainage outlet and disposal channel for the San Joaquin Valley . . . which will adequately serve . . . the drainage system for the San Luis Unit or has made provision for constructing the San Luis interceptor drain to the delta designed to meet the drainage requirements of the San Luis Unit. . .”

The San Luis Drain was never completed and was terminated at the Kesterson Wildlife Refuge.
Those Dammed Years:
1963-2005
Figure 2.2. Trinity River and Shasta Division of the Central Valley Project.
John F Kennedy, Whiskeytown Dam
Dedication September 28, 1963

“For too long this water ran unused to the sea.”

Images & Sound File Courtesy of Whiskeytown Division Website
That Same Year After JFK’s Dedication…

Reclamation signs a 40-year water contract with the Westlands Water District and other San Luis Unit Water Districts
SUMMARY OF VOLUME AND DIVERSION OF TRINITY RIVER WATER

Average Annual Volume of Trinity River at Lewiston:
(84 year period of record) (Source: TRFE):
1,249,000 acre-feet

1952 Bureau of Reclamation Ultimate Plan Report for Trinity River Division of CVP
Average Annual Diversion to Central Valley:
660,000 acre-feet
Percent Plan stated would be diverted: 52%

1955 House Report No. 602, 84th Cong., 1st Sess. 4
Average Annual Diversion to Central Valley:
704,000 acre-feet
Percent House understood would be diverted: 56%

1955 Senate Report No. 1154, 84th Cong. 1st Sess. 5
Average Annual Diversion to Central Valley:
704,000 acre-feet
Percent Senate understood would be diverted: 56%

1957 Bureau of Reclamation Report on the Plan of Development
Average Annual Diversion to the Central Valley:
704,000 acre-feet
Percent to be diverted as revised by Bureau: 69%

1961-1995 Actual Trinity River Diversions to the Central Valley
as a percentage of Trinity River volume (Source: TRFE):
72%
[The 28% released to Trinity River included dam safety releases neither related to nor scheduled for fishery needs.

TRFE Recommended average annual release to Trinity River
(based on weighted average of five water year types):
594,500 acre-feet
Percent to be released to Trinity River: 47%
Percent to be diverted to Central Valley: 53%
Since 1963...

- The TRD has supplied 25-30% of total CVP power.
- Up to 90% of Trinity River's water at Lewiston has been diverted for agricultural use south of the Delta.
- Annually, an average of nearly 1 million acre feet has been transferred out of the basin and into the Sacramento River since 1964.
- Habitat losses upstream of the dam amounted to 109 miles of steelhead habitat.
Environmental Consequences

- Perpetual drought conditions below the dam
- Loss of habitat related to the lack of flushing flows
- Poor water quality conditions due to sediment loading into the river. Trinity River listed as Sediment-Impaired Water Body under Section 303d of the federal Clean Water Act
- Temperatures reaching near lethal levels for salmonid species
- Trinity River coho salmon listed as threatened under both the federal and state Endangered Species Act
- Steelhead and natural Chinook populations have been severely depleted.
- Bay-Delta Ecosystem damaged by increased Delta exports from Trinity
Social and Economic Impacts

- Members of the Hoopa Valley and Yurok Tribes
- Del Norte, Humboldt and Trinity County residents
- Commercial Fishing
- Recreational Fishing - ocean and in-river
- Taxpayers (water and power subsidies to Westlands in 2002 alone were $56.7 million according to the Environmental Working Group (ewg.org))

Image Courtesy of the Glenlyon Gallery
1964: A major flood hits the Trinity River Basin. The dams kept the high waters from going down the Trinity River and sediment immediately began to accumulate. Damage to holding pools and spawning gravels was noticed immediately.
1970’s: Damage to Trinity River Fisheries is severe
Trinity River Task Force is formed

1975: Experiments with increased flows begin

1977: Driest year on record in California, Trinity Lake drained to approximately 10% of its capacity (224,000 af)- cold water pool nearly exhausted

1977: Trinity River Hatchery Fish Die because Reclamation refuses to bypass the Powerplant to provide cold water to the fish until September 9, 1977
County of Trinity vs. Interior Secretary Andrus

Trinity County files a lawsuit against the Interior Secretary for cessation of the high flow experiments

Hoopa Valley Tribe intervenes on the County’s behalf

Two major findings:

- NEPA is not required for ongoing CVP operations
- County of Origin Statutes could be used as a basis to keep water in the basin, but no proof provided of benefits
1980: Trinity River Stream Rectification Act (P.L. 86-335)

As a result of the Task Force’s work, federal legislation was passed in 1980 regarding the Trinity River, authorizing the following:

- Construction of the Buckhorn Mountain Debris Dam in Grass Valley Creek
- Construction and Maintenance of a sand dredging system at the mouth of Grass Valley Creek in cooperation with California Department of Water Resources
Grass Valley Creek, a Source of Fine Sediments in the River

Highly erodible granitic soils, typical of the GVC watershed.

Buckhorn Dam, on Grass Valley Creek was constructed to trap sand.

Watershed stabilization in GVC.

Dredging of Hamilton Ponds, where GVC sediments are captured before entering the river.
More History

- **1980**: BIA and USFWS complete an EIS on the Increased River Flows, resulting in:

- **1981**: Secretary Andrus temporarily increases Trinity River flows from 120,500 af to a range of 140,000 to 340,000 af and orders a 12-year flow study to determine the needs of the fishery.

- **1981-82**: James Watt, under President Reagan, unsuccessfully tries to stop the Flow Study.

- **1983**: EIS on Restoration Program is completed, recommending an 11 point action plan.

- **1984**: The Flow Study begins!
1984: Trinity River Basin Fish and Wildlife Management Act P.L. 98-541

- Findings of damage to the fishery from loss of flows and habitat from TRD, inadequate erosion control and overfishing;
- Findings of losses of wildlife habitat from inundation of the 2 reservoirs;
- Direction from the 1955 Act to “preserve and propagate” fish and wildlife was clarified to require restoration to pre-dam levels;
- Restoration will be measured by the ability of dependent tribal, commercial, and sport fisheries to participate fully in the benefits of restoration (1996 amendment);
- Role of Hatchery is to mitigate for lost habitat upstream of Lewiston Dam, but not to interfere with natural production below the dam (1996 amendment).
- Formed Trinity River Task Force (now extinct)
- Authorized $60 million with reimbursement from Humboldt/Trinity counties, state, and federal taxpayers, and water and power users (more money since then)
- 1993 – Authorized purchase and restoration of 17,000 acres in Grass Valley Creek (1993 Amendments) and an additional $15 million
1986: Klamath Act Passed, forming the Klamath Fisheries Management Council and the Klamath River Task Force

1986: Trinity River Field Office is opened in Trinity County by the USFWS and Reclamation

1990: Water Right Order 90-05, the SWRCB directed Reclamation not to divert water to the Sacramento River from the Trinity River Division for temperature control in a manner which would harm Trinity River Fish as measured by 56 degrees at Douglas City and North Fork confluence
Dry Year Cutbacks Impair Flow Study

- **1987**: Drought begins

- **1988**: Hoopa Valley Tribe Appeals Dry Year Cutbacks in flows

- **1991**: Lujan Decision increases flows to 340,000 af, eliminates dry year cutbacks per Andrus Decision

- **1992**: Lujan Decision and State temperature objectives make for whitewater boating bonanza
1991-1992: Trinity Temperature Objectives approved by NCRWQB, SWRCB and USEPA as Clean Water Act Standards

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<th>Daily Average Not to Exceed</th>
<th>Period</th>
<th>River Reach</th>
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<tr>
<td>60 F</td>
<td>July 1-Sept.14th</td>
<td>Lewiston Dam to Douglas City Bridge</td>
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<td>56 F</td>
<td>Sept. 15 – Oct. 1</td>
<td>Lewiston Dam to Douglas City Bridge</td>
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<td>56 F</td>
<td>Oct. 1 – Dec. 31</td>
<td>Lewiston Dam to confluence of North Fork Trinity River</td>
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The Central Valley Project Improvement Act, 1992

- “In order to meet Federal trust responsibilities to protect the fishery resources of the Hoopa Valley Tribe, and to meet the fishery restoration goals of the Act of October 24, 1984, Pub. L. 98-541, provide through the Trinity River Division, for water years 1992 through 1996, an instream release of water to the Trinity River of not less than 340,000 acre-feet per year for the purposes of fishery restoration, propagation, and maintenance.”

- “Not later than December 31, 1996, the Secretary shall forward the recommendations of the Trinity River Flow Evaluation Study. . . If the Secretary and the Hoopa Valley Tribe concur in these recommendations, any increase to the minimum Trinity River instream fishery releases . . . shall be implemented accordingly.”
1999: Trinity River Flow Evaluation Final Report completed

2000: Trinity River EIS/EIR completed

2000: ROD for the Trinity River signed by Interior Secretary Bruce Babbitt
Requirements:

- Increased Flow Regime
- Spawning Gravel Introduction
- Bank Feather and Channel Rehabilitation
- Watershed Component
- Trinity River Bridges and Flood Zone Inundation (see http://www.trinitycounty.org/departments/planning/naturalresources.htm>
- Adaptive Management

12/19/2000 Secretary of the Interior Bruce Babbitt at Hoopa for Signing of the ROD.
Flow Regime Based on Historic Flows

- Winter floods
- Instantaneous peak discharge = 32,500 cfs
- Snowmelt peak
- Snowmelt recession
- Post-TRD Lewiston Dam releases
- Summer baseflows
- Daily Average Discharge (cfs)
- Day of Water Year
Flows are Scheduled for Salmonid Life Cycles

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<th>Adult Migration and Holding</th>
<th>Chinook</th>
<th>Coho</th>
<th>Steelhead</th>
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<td>Steelhead age 0, age 1, age 2</td>
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*A small percentage of chinook in the Trinity River overwinter and outmigrate at age 1, similar to coho age 1 life history.*
Trinity River ROD Flows from Lewiston by Water Year

<table>
<thead>
<tr>
<th>Water-year Class</th>
<th>Volume (Acre-feet)</th>
<th>Peak Flow (cfs)</th>
<th>Peak Flow Duration (days)</th>
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<tr>
<td>Critically dry</td>
<td>369,000</td>
<td>1,500</td>
<td>36</td>
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<td>Dry</td>
<td>453,000</td>
<td>4,500</td>
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<tr>
<td>Normal</td>
<td>647,000</td>
<td>6,000</td>
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<tr>
<td>Wet</td>
<td>701,000</td>
<td>8,500</td>
<td>5</td>
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<tr>
<td>Extremely wet</td>
<td>815,000</td>
<td>11,000</td>
<td>5</td>
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Coarse Sediment Introduction

Since the dams were built, the Trinity River no longer receives new gravel from the upper parts of the river basin.

Good spawning gravel has been washed downriver, and there are fewer places for salmon to spawn.

Gravel placement below Lewiston Dam provides spawning habitat for spring and fall chinook salmon to supplement upstream habitat for those that spawn at the impoundment and are not taken in by the hatchery.

<table>
<thead>
<tr>
<th>Water Year</th>
<th>Coarse Sediment Introduction (yd³/year)</th>
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</thead>
<tbody>
<tr>
<td>Extremely Wet</td>
<td>31,000-67,000</td>
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<tr>
<td>Wet</td>
<td>10,000-18,000</td>
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<tr>
<td>Normal</td>
<td>1,800-2,200</td>
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<tr>
<td>Dry</td>
<td>150-250</td>
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<tr>
<td>Critically Dry</td>
<td>0</td>
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Channel Rehabilitation

- Prior to the Dam, the river was highly alluvial in nature with a wide flood plain.

- After the Dam, the river became channelized and impounded due to low flows and riparian vegetation encroachment.
A Loss of Biodiversity

- Low Flows Have Channelized the River
- Floodplain Loss
- Habitat Loss
- Increase in Riparian Plant Encroachment
- Fry are Stranded at Lower Flows

- Original V-Shape Channel
- Wide Floodplain
- Habitat Increased
- Decrease in Riparian Plant Encroachment
- Fry are not Stranded at Lower Flows
These willows have sprouted up since 1964 as a result of diminished flows in the Trinity River. The river is to the right. The willows have cut off the river from its historical flood plain.

The same site after willows were removed. The graded bank on the left is a feather edge, created to provide slow water habitat for chinook salmon fry.
Four Bridges were identified for replacement to implement 11,000 cfs flows:

- Biggers
- Bucktail
- Salt Flat
- Poker Bar

Many of the original bridges were structurally insufficient to allow flows higher than 7,000-10,000 cfs.

The pics above are of the Salt Flat Bridge before replacement. You'll notice that basically they are rail cars tied together.
Bridge Replacement, cont.

Salt Flat During Construction Phase
The Finished Product: The New Salt Flat Bridge
2001-2004

- ROD was under litigation- 2001-2004, SEIS/EIR was required; Draft SEIS/EIR issued May 2004
- 2001-2004 Flows increased somewhat, but not to ROD levels
- 50,000 af in 2003 to prevent fish kill on Lower Klamath- MWD gets involved
- Long-Term OCAP BA/BO
- Napa Proposition- Send 1 million AF more south of Delta
Litigation

- The ROD wasn’t lawful
- Improperly narrow purpose and need
- Inadequate range of alternatives
- Lead agencies should have looked at an alternative that minimized the amount of water in river by using other tools through an Integrated Management Alternative
- USFWS Biological Opinion (BO) resulted in major modifications to CVP w/o a jeopardy opinion and the effects of implementing the BO were not properly disclosed
Litigation, cont.

- Reasonable and Prudent Measures (RPM’s) in the NMFS BO was not adequately defined for analysis such that it improperly made implementation of the ROD a condition of compliance - circular in nature. NMFS doesn’t have that authority to direct BOR to do what it has the authority to do.
- There was an inadequate analysis of the power implications
Litigation, cont.

- Must complete the SEIS by 7/9/2004
- Limited flows to dry or critically dry year flows (369,000 af or 452,000 af)
- 50,000 af provided to avert another fish kill in 2003
9th Circuit to the Rescue

- ROD can proceed
- Normal Year flows in 2004
- SEIS not required
- Trinity River has been studied extensively
- USFWS and NMFS BO’s upheld, except for illegal Reasonable and Prudent Measures
- Westlands and NCPA decline to go to Supremes!!!
Long-Term OCAP BA/BO

- See http://www.usbr.gov/mp.cvo/ocap.html
- Necessary to renew long-term CVP water contracts
- Babbitt ROD for Trinity included in baseline
- One ESA Biological Opinion (from NMFS and USFWS) for entire OCAP
- Napa Proposition complicated OCAP completion
Napa Proposition

- Use of CVP Storage for SWP Deliveries
- Use of SWP pumps to move CVP water
- Freeport Diversion - EBMUD
- South Delta Improvement Project/Increased Delta exports
- Delta-Mendota Intertie
- Is intended to be included in Long-term OCAP
- Controversial - NEPA/CEQA for COA?
- Implements CALFED plans to deliver more water
Colorado River/Metropolitan Water District

- Colorado River 4.4 Plan - loss of 900,000 AF to S. Cal urban areas
- Imperial Irrigation District
- Purchase of rice water in Sac Valley
- 50,000 af of rice water for Trinity 50kaf flows in 2003
- Portion carried over in Shasta for 2004
Amazing Trinity Facts

- Lujan Decision increased Trinity flows nearly 3X in the 4th year of drought with no litigation while farmers cut back on water for first time.
- 1996 Amendments to PL 98-541 passed unanimously through House and Senate during Newt Gingrich’s reign.
- Trinity River restoration transcends political parties, political boundaries, personalities and test of time.
Besides meddling in Trinity County’s affairs & litigating against us the last 50 years…

Much of their land and groundwater has high selenium levels

They have no drainage as per the requirements of the 1960 San Luis Act

Their contract is 1.15M AF of CVP/TRD water a year…the dam’s capacity is 2.48M af

100,000 ac of land has been retired…Westlands has identified another 100,000 ac…BOR has identified an additional 100k ac…so 300,000 ac can be retired

Yet…Westlands will still receive the water for those lands, roughly 2 af per ac or 600k+ af total, at a rough cost of $40 af…which they could sell on the market for $100-200/AF or more…you do the math!

Can you figure out who is getting rich at the expense of the environment & taxpayers?
“We went ahead with the Westlands project before we solved the drainage problem. We thought we knew how to solve the drainage problem. We thought the Kesterson Reservoir could be flushed on out into the Delta. We didn’t have it solidified. So I made a terrible mistake by going ahead with Westlands at the time we did”

Floyd Dominy- Commissioner of Reclamation, 1959-69 (on delivering water to Westlands where drainage and selenium contamination problems persist today)
Drainage is needed due to the impervious Corcoran Clay Barrier which separates the confined and unconfined aquifers and ponds tailwater within the unconfined portion.
Creation of Drainage Water

An illustration of how water that drains from irrigated fields is collected and removed to maintain long-term, sustainable salt and water balance in the root zone of irrigated lands.

The San Luis Drain at Kesterson
Figure 101. Although the quality of the water in the Central Valley aquifer system is generally suitable for agricultural, industrial, and public-supply uses, some areas have potential or actual problems. Boron levels that are damaging to some crops are in ground water in the Sacramento and the San Joaquin Valleys; nitrate levels that might be damaging to crops or that exceed drinking-water standards are in the Sacramento Valley; selenium levels that exceed drinking-water standards are in three wells in the Sacramento Valley; potentially toxic levels of heavy metals are in the western part of the San Joaquin Valley; and the pesticide dibromochloropropane has been detected throughout the San Joaquin Valley.

EXPLANATION

Area affected by excessive concentrations of:

- **Boron**
- **Nitrate**
- **Selenium**
- **Selenium, mercury, chromium, and boron**
- **Dibromochloropropane (DBCP)**

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Table 1 from the Draft Trinity River Fishery Restoration Supplemental Environmental Impact Report (Trinity County 2004, as amended 1/24/05 and 2/16/05)

<table>
<thead>
<tr>
<th>District</th>
<th>Acres</th>
<th>Acres Requiring Drainage Service</th>
<th>% of District Requiring Drainage Service</th>
<th>Max CVP Contract Amount (AF)</th>
<th>Max CVP Contract Water Savings (AF)</th>
<th>2002 CVP Contract Deliveries (AF)</th>
<th>2002 CVP Water Savings (AF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadview Water District</td>
<td>9,515</td>
<td>9,515</td>
<td>100.00%</td>
<td>27,000</td>
<td>27,000</td>
<td>18,588</td>
<td>18,588</td>
</tr>
<tr>
<td>Panoche Water District</td>
<td>39,292</td>
<td>27,000</td>
<td>68.72%</td>
<td>94,000</td>
<td>64,593</td>
<td>66,743</td>
<td>45,863</td>
</tr>
<tr>
<td>Westlands Water District</td>
<td>604,000</td>
<td>298,000</td>
<td>49.34%</td>
<td>1,154,198</td>
<td>569,455</td>
<td>776,631</td>
<td>383,172</td>
</tr>
<tr>
<td>Eagle Field</td>
<td>1,438</td>
<td>1,435</td>
<td>99.82%</td>
<td>4,550</td>
<td>4,542</td>
<td>2,869</td>
<td>2,864</td>
</tr>
<tr>
<td>Mercy Springs</td>
<td>3,589</td>
<td>2,417</td>
<td>67.35%</td>
<td>2,842</td>
<td>1,914</td>
<td>4,679</td>
<td>3,151</td>
</tr>
<tr>
<td>Oro Loma</td>
<td>1,095</td>
<td>1,095</td>
<td>100%</td>
<td>4,600</td>
<td>4,600</td>
<td>3,173</td>
<td>3,173</td>
</tr>
<tr>
<td>Widren</td>
<td>881</td>
<td>881</td>
<td>100%</td>
<td>2,990</td>
<td>2,990</td>
<td>2,094</td>
<td>2,094</td>
</tr>
<tr>
<td>Firebaugh</td>
<td>23,457</td>
<td>23,457</td>
<td>100%</td>
<td>85,000</td>
<td>85,000</td>
<td>85,000</td>
<td>85,000</td>
</tr>
<tr>
<td>Cent. Cal ID</td>
<td>149,825</td>
<td>4,951</td>
<td>3.30%</td>
<td>532,400</td>
<td>17,569</td>
<td>532,400</td>
<td>17,569</td>
</tr>
<tr>
<td>Charleston Drainage District</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(portion of San Luis WD with drainage problems)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4,314</td>
<td>3,000</td>
<td>69.54%</td>
<td>8,130</td>
<td>5,654</td>
<td>Not avail</td>
<td>Not avail</td>
</tr>
<tr>
<td>Pacheco Water District</td>
<td>5,175</td>
<td>5,000</td>
<td>96.62%</td>
<td>10,080</td>
<td>9,739</td>
<td>7,137</td>
<td>6,896</td>
</tr>
<tr>
<td>Total</td>
<td>842,581</td>
<td>376,751</td>
<td>NA</td>
<td>1,925,790</td>
<td>793,056</td>
<td>1,499,314</td>
<td>568,370</td>
</tr>
</tbody>
</table>
Trinity River Water via San Luis Unit to the San Joaquin River & Bay-Delta

- Water travels down the Sacramento River, through the Bay-Delta, and down the Delta-Mendota & San Luis Canal to San Luis Unit
- Area drainage water flows into the San Joaquin via the San Luis Drain, groundwater accretions & sloughs
- The San Joaquin empties into the Bay-Delta carrying agricultural wastes such as pesticides, herbicides, salts, and substances of particular concern such as selenium
"The subsurface drainage problem is region-wide. The total acreage of lands impacted by rising water tables and increasing salinity is approximately 1 million acres. (SWRCB 147, p.21.) The drainage problem may not be caused entirely by the farmer from whose lands the drainage water is discharges. In the western San Joaquin Valley, the salts originate from the application of irrigation water and from soil minerals, which dissolve as water flows through the soil. The salts are stored in groundwater. As more water is applied, hydraulic pressures increase, water moves downgradient, and salt-laden waters are discharged through existing drainage systems and directly to the river as groundwater accretion (SJREC 5a). Drainage found in a farmer’s field may originate upslope and may not have risen into the tile drains on the downslope farmer’s land, but for the pressures caused by upslope irrigation. (SJREC 5a, pp.27-29.)” Page 82

“The SWRCB finds that the actions of the CVP are the principal cause of the salinity concentrations exceeding the objectives at Vernalis. The salinity problem at Vernalis is the result of saline discharges to the river, principally from irrigated agriculture, combined with low flows in the river from upstream water development. ” Page 83
“The source of much of the saline discharge to the San Joaquin River is from lands on the west side of the San Joaquin Valley which are irrigated with water provided from the Delta by the CVP, primarily through the Delta-Mendota Canal and the San Luis Unit.”

“The USBR, through its activities associated with the in the San Joaquin River Basin, is responsible for significant deterioration of water quality in the Southern Delta.”
Environmental Consequences of San Luis Unit Irrigation

- Bay-Delta Ecosystem damaged by increased Delta exports from Trinity
- Drainage Problem area in 1990 was 450,000 acres. If no resolution, problem area will be 950,000 acres in 2040 (Rainbow Report)
- If no more irrigation of the western San Joaquin Valley were to occur and the San Luis Drain were completed, it would still take 63-300 years to drain the accumulated Se from the aquifer at a rate of 43,500 lbs./year. (USGS Open File Report 00-416)
- Completion of the San Luis Drain will severely contaminate the Bay-Delta with Se, which bioaccumulates (USGS Open File Report 00-416)
Selenium Contamination

Remember Kesterson?

Avian Chicks Sampled from Kesterson
Courtesy of the USGS
Selenium Poisoning in Splittail in Bay-Delta due to Westside Agricultural Runoff

Food Web Pathway Determines How Selenium Affects Aquatic Ecosystems: A San Francisco Bay Case Study by Stewart et al

- Within Suisun Bay Se suspended particle concentrations are the highest between 0.5 - 1.5 μg g⁻¹
- Toxicity ranged from low to potentially toxic in both invertebrates and fish
- Deformities occur within embryos when Se replaces S in sulfur-rich hard tissues
- Concentrations of Se greater than 3 μg g⁻¹ in the diet of fish result in deposition of elevated Se concentrations in developing eggs, particularly the yolk
- Se bioaccumulates, so upper trophic level species such as Salmon & Sturgeon, will have potentially higher levels of this toxin

FIGURE 5. Sacramento splittail collected from North San Francisco Bay, CA, in 1999 displaying lordosis, a selenium-induced teratogenic deformity. Photo taken by Fred Feyrer, California Department of Water Resources.
Proposed Drainage Options for SLDPFRE

- Complete San Luis Drain to the Bay-Delta
- Pipeline to Monterey Bay, a National Marine Sanctuary
- Pipeline to Morro Bay, where a protected and ecologically important State Park is located
- Deep Well Injection, into the confined aquifer most of the people in the Central Valley rely upon for freshwater
- In Valley Disposal
Both Westlands and Trinity County agree that land retirement is a viable option to solve drainage problems. Key issue is disposition of the water savings.
2002 Klamath Fish Kill

- ~68k Salmon died in the lower Klamath without spawning.
- Caused by low flows & crowding, leading to disease outbreaks; 22 Degrees C is migration barrier.
The Effects of the 2002 Klamath Fish Kill

- Rep. Mike Thompson (CA District 1) delivered 500 lbs of dead salmon onto the doorstep of the DOI Office in DC.

- The affects of the fish kill have been felt by a decrease in 2004 – 2006 harvestable fish for tribes, commercial fisherman, and recreational anglers.

Image Courtesy of Rep. Mike Thompson’s Office
This Year’s Water Forecast for the Trinity

### Mid-Pacific Region
Initial Water Allocation for Water Year 2005
March 15, 2005

<table>
<thead>
<tr>
<th>Probability of Exceedence Forecasts</th>
<th>Percent of Historical Average Sacramento Valley Index &amp; Year Type</th>
<th>North of Delta Allocation</th>
<th>South of Delta Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>50%</td>
<td>81% Below Normal</td>
<td>100 100 100 100</td>
<td>65 90 100 100</td>
</tr>
<tr>
<td>90%</td>
<td>69% Dry</td>
<td>65 90 100 100</td>
<td>65 90 100 100</td>
</tr>
<tr>
<td>Recent Historic Average</td>
<td>(5-Year Average Allocation)</td>
<td>92 97 100 100</td>
<td>66 91 100 100</td>
</tr>
</tbody>
</table>

| M&I supply is based on historical deliveries |

<table>
<thead>
<tr>
<th>Trinity River - Record of Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forecast Exceedence/Year Type</td>
</tr>
<tr>
<td>90% Dry</td>
</tr>
<tr>
<td>50% Normal</td>
</tr>
</tbody>
</table>

As of March 18th:
- Middle of the range for a “Normal Water Year” based on 50% Exceedence
- Official forecast to be based off of April 1st outlook
- 6,000 cfs flow is likely to occur
- The TMC will make it’s official recommendation April 13 &/or 14th
- Flows will be ramped up to ~2,000 cfs on April 28th
And the Forecast on the Klamath is…

- As of March 21st it’s Not Good
- Forecasted as a “Dry Year”
- Snow Pack is 29% of Average
- Stream Flow Forecast is 185k af
- On March 22nd, the Humboldt BOS requested from BOR their 50,000 AF contract of TRD water as per the stipulations of the 1955 Trinity River Act to supplement Fall flows within the Lower Klamath.

This request has yet to be satisfied, we may be looking at another Fish-Kill this year…awaiting development.
What’s Next

- Implement ROD
- Amend BOR’s Trinity River Water Permits to require temperature compliance, minimum pool at Trinity Lake, HumCo’s 50,000 AF and to amend minimum instream flow from 120,500 AF to ROD flows (avg. 594,500 AF)
- Stop Long-Term Water Contract Renewals
- Halt Irrigation of Drainage-Problem lands in Western San Joaquin Valley
Diversity is the Key to Stability
What Can You Do?

- Subscribe to env-trinity list server
- Volunteer to review CVP Water Contract Renewal Documents
- Stay informed
- Take care of yourself
Keep Up the Good Fight for the Trinity River