March 25, 2010

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N. E.
Washington, D. C 20426

Re: Turlock and Modesto Irrigation Districts -
Project No. 2299 -- Article 58 Annual Report for 2009

Dear Secretary Bose:

Enclosed pursuant to Article 58 of the license for Project No. 2299 and Section 15 of the 1995 Don Pedro Project Settlement Agreement is the 2009 Lower Tuolumne River annual report. If you have any questions, please contact Tim Ford at 209-883-8275.

Respectfully submitted,

MODESTO IRRIGATION DISTRICT

Allen Short
General Manager

TURLOCK IRRIGATION DISTRICT

Larry Weis
General Manager

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UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Turlock Irrigation District	)	
	)	
and	)	Project No. 2299
	)	
Modesto Irrigation District	)	

2009 LOWER TUOLUMNE RIVER ANNUAL REPORT

2009 Annual Summary Report

Exhibits: Spawning runs, harvest data, rearing/outmigration data, Delta salvage and exports

Attachment A: Water Conditions, Flows, Temperature, and Flow Schedule Correspondence

Attachment B: 2009 Tuolumne River Technical Advisory Committee Materials

Report 2009-1: 2008 Spawning Survey Report

Report 2009-2: Spawning Survey Summary Update

Report 2009-3: 2009 Seine Report and Summary Update

Report 2009-4: 2009 Rotary Screw Trap Report

Report 2009-5: 2009 Snorkel Report and Summary Update

Report 2009-6: Review of 2009 Summer Flow Operation

Report 2009-7: Aquatic Invertebrate Monitoring and Summary Update

Report 2009-8: 2009 Counting Weir Report

- FERC PROJECT NO. 2299 –

2009 ANNUAL SUMMARY REPORT

Turlock and Modesto Irrigation Districts

By
Tim Ford
Aquatic Biologist

Exhibits:

1. Spawning run estimates
2. Ocean catch and harvest rate data
3. January-June 2009 Basin salmon rearing/outmigration data
4. January-June 2009 delta salmon salvage data, water exports, and basin flows

Attachment A: Water, Flows, Temperature, and Flow Schedule Correspondence

Attachment B: 2009 Technical Advisory Committee Materials

Introduction

This is the Districts' 14th annual report to the Federal Energy Regulatory Commission (FERC) in a series begun pursuant to Article 58 of the July 31,1996 Order on FERC Project License 2299 (1996 Order) and the 1995 Don Pedro Project FERC Settlement Agreement (FSA). This is also the second annual report pursuant to the "Order on Ten-Year Summary Report Under Article 58" issued on April 3, 2008 (2008 Order).

This report covers the 2009 calendar year and contains:

(1) Fishery monitoring
(2) Other monitoring
(3) Downstream issues
(4) Hydrology, flow schedules, and river operations
(5) Status of habitat restoration
(6) Coordination and regulatory information
(7) Technical reports on fishery/habitat monitoring and flow operations

An eight volume report pursuant to Article 39 of the License was filed in 1992 (20-Year Report) and included 28 technical reports. The 1996 Annual Report was filed in 1997 pursuant to the 1996 Order and consisted of seven volumes that included information for 1992-96 as well as other material not contained in the 20-Year Report. The Article 58 annual reports filed since have been of 1-3 volumes.

A Ten-Year Summary Report was filed in March 2005 as required by the 1996 Order and the Districts continued to file annual reports in 2005-2009. A listing of the Article 39 and Article 58 technical reports filed from 1992 to present is at the end of this annual report. The 2008 Order required (1) continued annual reporting by April 1 of San Joaquin River tributary salmon escapement numbers, (2) implementation of certain *Oncorhynchus mykiss* monitoring elements, and (3) an *O. mykiss* monitoring report which was filed on January 15, 2010.

1 - Fishery Monitoring

1.1. Fall-run Salmon Counts and Estimates

The ban on commercial and sport ocean harvest continued for a second year in 2009, yet the Central Valley fall Chinook runs may have been the lowest on record. Exhibits 1 and 2 contain graphs of run estimates/counts.

1.1.1. San Joaquin Tributary Chinook Salmon Run Estimates

The San Joaquin River tributaries presently have primarily fall run Chinook salmon, with incidental numbers of Chinook salmon observed with other run timing outside of the September to mid-January period. The FERC Order of April 3, 2008 specified that the annual Article 58

report include a comparison the Stanislaus, Tuolumne, and Merced River Chinook salmon escapement (run) numbers. CDFG conducts their fall-run surveys on the tributaries each year and the Districts depend on them to provide such information in a timely manner. To date, CDFG has not provided us directly with their run estimates for those rivers, so the CDFG estimates contained here were obtained indirectly through an online CDFG "GrandTab" compilation that was updated on March 9, 2010.

A counting weir operation was started in September 2009 in both the Tuolumne and Stanislaus rivers. The Tuolumne weir operation was supported by the Districts and CCSF and implemented by FISHBIO consultants, whom also operated the Stanislaus counting weir. The respective 2009 fall run counts for the Tuolumne and Stanislaus weirs (through January 15, 2010) were 280 and 1,250 salmon. The Tuolumne River also had some salmon spawn downstream of the weir and an initial estimate of 20 salmon there results in our provisional total estimate of 300 for the 2009 fall run. Both weir operations have continued into March 2010 with a few additional salmon being counted, but those may not be part of the fall run and are not included in these totals.

In contrast to those actual weir counts, the CDFG float surveys, using their customary carcass survey method by boat, resulted in preliminary 2009 fall-run Chinook population estimates (from GrandTab) of just 124 salmon for the Tuolumne River and 595 for the Stanislaus River. It is not clear at this time if those estimates are inclusive of all river reaches or why those estimates are so much lower than the weir counts. The 2009 GrandTab numbers for the Merced River run are 358 (river) and 246 (hatchery) for a total of 604. These tributary counts/estimates of 300, 1,250, and 604 total 2,154 salmon for the basin and are graphed in Exhibit 1.

A draft CDFG Tuolumne fall spawning survey report for 2008 in included here as Report 2009-1 but a CDFG report for the 2009 run has not been provided. Consequently, Report 2009-2 only contains an abbreviated update, but does include tributary estimates for prior years. Report 2009-8 has a detailed review of the Tuolumne weir operation.

1.1.2. Sacramento and Central Valley Fall-run Chinook Salmon Estimates

Overall numbers of fall-run salmon for the entire Central Valley (including hatcheries) were much lower in 2009 with a preliminary Grandtab estimate of just 53,624 (including 22,682 in hatcheries), less than the 71,899 total in 2008. The estimate of adult fall-run in the Sacramento basin was 39,530 (PFMC 2010a), down from the prior low of 64,456 in 2008 and much less than the PFMC lower management target of 122,000 for the Sacramento River system. It was also much less than the PFMC preseason forecast of 122,196. There was a 2nd year of ocean commercial and sport salmon fishery closure for California in 2009.

The estimated 2-year olds were 9,216 in the Sacramento basin, an indication that the cohort of 3-year olds (year class from 2007 runs) in 2010 runs may be higher (PFMC 2009b). The PFMC uses those estimates in their Sacramento Index (SI) as a predictor of population abundance for fishery management purposes. The SI forecast for the 2010 Sacramento basin is 245,483 adults (95% CI = 0-532,657), so some limited ocean harvest is being considered for 2010. Exhibits 1 and 2 contain graphs of harvest and abundance data.

1.2. Seine Sampling

Report 2009-3 reviews the routine seine monitoring conducted in eleven surveys during January-June at eight Tuolumne River sites from RM 50.5-3.4 and two San Joaquin River locations. A total of 779 juvenile Chinook salmon were caught in the Tuolumne River, much more than the 198 caught in 2007. Salmon were captured from RM 50.5-24.9 (La Grange to Charles Road).

Density of fry (≤ 50 mm) peaked on February 9 and density of juveniles (>50 mm) peaked late on June 2, mainly due a large catch at RM 48. Fork length (FL) ranged from 33-97 mm, fry were caught throughout the sampling season, and maximum FL exceeded 70 mm starting in late March. A comparative review with other years is in Report 2009-3. The seine report classifies "juvenile" salmon as >50 mm, whereas the screw trap report distinguishes parr (50-69 mm) and smolt (≥ 70 mm) size ranges.

Seven *O. mykiss* (26-70 mm FL) were caught in the Tuolumne River from March 10-May 5. A total of 15 fish species were recorded in the Tuolumne River and 9 species in the SJR during the season.

1.3. Screw Trapping

Report 2009-4 reviews the screw trap monitoring conducted near Waterford (RM 29.8) from January 7-June 9 and near Grayson (RM 5.2) from January 8-June 4 and includes a comparison with other years. Total salmon catches were 3,725 at Waterford and 155 at Grayson.

Fry (< 50 mm) capture at the Waterford screw trap occurred from January 19 through mid-May with an estimated passage of 13,399 for that life stage (15,259 in 2008); estimated peak passage was in early March associated with storm events and elevated turbidity. Grayson had an estimated passage of 145 fry (917 in 2008).

Waterford had a passage estimate of 4,562 parr (50-69 mm) and 19,213 smolts (≥ 70 mm), more than the 2008 estimates of 1,102 parr and 8,534 smolts in 2008. The Grayson passage estimates were also higher with 200 parr and 4,332 smolts, as compared to 14 parr and 2,532 smolts in 2008. The peak smolt passage was associated with an early May storm event and spring pulse flows. Comparing the estimated total passage at both sites resulted in a survival index between sites of 11.9% over the 24.6 miles (13.2% estimated in 2008). These estimates do not account for any salmon produced from spawning below the Waterford trap site.

One *O. mykiss* of 120 mm was caught at Waterford on February 17 and none were caught at Grayson. There were 26 other fish species captured in the screw traps in 2009.

1.4. June Reference Count Snorkeling

Report 2009-5 reviews the "early summer" snorkel survey that was conducted on June 16-18 within the RM 31.5-50.7 (Waterford to La Grange) reach of the Tuolumne River during a flow range of 92-96 cfs. Water temperature ranged from 11.2 C (52.2 F) to 25.5 C (77.9 F) and a total of 1,902 juvenile Chinook salmon and 142 rainbow trout (*O. mykiss*) were recorded. Those

salmon totals are much higher than the 43 juvenile Chinook salmon recorded in June 2008 and the highest comparable counts to date, while the rainbow trout number was less than the 232 observed in June 2008.

Chinook salmon were observed downstream to Riffle 41A (RM 35.3) and rainbow trout downstream to Riffle 23C (RM 42.3). Other native fish species observed were Sacramento sucker, Sacramento pikeminnow, hardhead, and riffle sculpin. The non-native species recorded were largemouth bass, smallmouth bass, redear sunfish, bluegill and white catfish. Report 2009-5 contains a comparison with other years, including previous late summer snorkel surveys.

1.5. *O. mykiss* Population Estimate Surveys

This snorkeling study pursuant to the 2008 FERC Order was first done in July 2008. There were surveys conducted in March and July of 2009 and the 2009 report was submitted to FERC on January 15, 2010. A separate required *O. mykiss* monitoring report was also submitted on that date which summarized, among other monitoring results, the outcome of those population estimate surveys.

Habitat mapping of RM 29-39.5 was done in March 2009 (the reach upstream reach to RM 52 was mapped in 2008). *O. mykiss* population estimates from habitat-specific counts (in parentheses) for YOY/juvenile (< 150 mm FL) and adult (> 150 mm FL) were:

- July 2008: 2,472 (128) YOY/juvenile and 643 (41) adult *O. mykiss*
- March 2009: 63 (5) YOY/juvenile and 170 (7) adult *O. mykiss*
- July 2009: 3,475 (641) YOY/juvenile and 963 (105) adult *O. mykiss*

The March 2009 survey extended down to RM 29.5, but *O. mykiss* were observed only down to RM 43; the July surveys were upstream of RM 41. Both 2009 surveys found most juveniles and adults within pool or riffle habitats. While the estimates for both size groups were higher in July 2009 than in July 2008, they were not were significantly different. However the March estimates were significantly lower than the July 2009 estimates, but the reason for such low March numbers are not evident at this time.

Comparable estimates for Chinook salmon (*O. tshawytscha*) in these surveys were:

- July 2008: 2,636 (96) YOY/juvenile
- March 2009: 39,563 (4,281) YOY/juvenile
- July 2009: 29,389 (4,696) YOY/juvenile

Most of the salmon in the July surveys were in the 50-99 mm range. A notable result of the July 2009 survey was the very large number of juvenile salmon present, consistent with the June snorkel survey finding. There were also six adult Chinook salmon incidentally observed from RM 50.6-51.6 in July 2009.

2 - Other Monitoring

2.1. Aquatic Invertebrates

Aquatic invertebrate sampling was done in the summer of 2009 due to suitable (non-flood) flow conditions. Results of analysis of samples from 2009 and a comparative long-term trend assessment are in Report 2009-7.

2.2. Temperature

Daily average thermograph data and daily max-min air temperatures are graphed in Part 2 of Attachment A with a more detailed review of the summer period contained in Report 2009-6. Complete thermograph data for the Tuolumne and San Joaquin Rivers are posted at http://tuolumnerivertac.com/data.htm.

2.3. Sedimentation

Most of the 2009 turbidity data is from the screw trap monitoring reviewed in Report 2009-4. Episodic inputs of extreme amounts of fine sediment again entered the river near RM 45 from the Peaslee Creek watershed associated with rain runoff events. The identified primary source has been a large area of new orchard land to the south of Lake Road. Ongoing enforcement action by state agencies resulted in an Administrative Civil Liability Complaint issued by the Regional Water Quality Control Board in November 2009 to the landowner. More information is at:
http://www.waterboards.ca.gov/centralvalley/board_decisions/tentative_orders/almondranch_aclc/r5-2009-0563_cov.pdf

3 – Downstream Issues

Important factors influencing salmonid populations occur downstream of the Tuolumne River from the San Joaquin River to the Pacific Ocean where they spend most of their life. Some of these are reviewed in this section. Exhibits 3 and 4 have information on the size and numbers of salmon captured in sampling efforts from lower tributary stations, the SJR, and the South Delta. Those include screw trap, trawl, and export salvage sampling programs within the Jan-Jun season that spans the juvenile salmon (fry to smolt) rearing and migration period. Fry density was low in 2009 for both the Mossdale trawl catch and in the export salvage.

3.1. Ocean Conditions

Central Valley Chinook salmon spend the majority of their lives in the eastern Pacific Ocean and the influence of ocean conditions on their growth and survival is widely recognized (Williams, 2006). Temperature, upwelling, and general productivity of the Northern California Current varies considerably from year to year and the understanding of that environment has increased in recent years. The Northwest Fisheries Science Center (NWFSC) reported that many of the positive conditions of 2008 for ocean ecosystem indicators declined to neutral status in 2009

(http://www.nwfsc.noaa.gov/research/divisions/fed/oeip/g-forecast.cfm). The effects of ocean conditions may not be evident for years until salmon cohorts (year classes) return to spawn. In addition, conditions for southern salmon populations (i.e. Central Valley salmon) may differ from those reported by the NWFSC, particularly as related to the continuing decline of Sacramento River and other Central Valley fall-run salmon populations. NMFS issued an extensive analysis of the Sacramento fall run salmon stock collapse in a report to the PFMC issued in March 2009 http://swfsc.noaa.gov/news.aspx?id=14474 . The NMFS news release stated "The panel found that poor conditions in the coastal ocean in 2005 and 2006 resulted in unusually poor survival of fall-run Chinook salmon returning to the river in 2007 and 2008." There were also other contributing factors identified that were associated with the salmon decline, notably hatchery and habitat concerns.

3.2. Delta Issues

3.2.1. Salmon salvage and losses at Delta water export facilities

Exhibit 4 contains 2009 State (SWP) and Federal (CVP) delta water export facility salmon salvage and loss information. Additional review will be available in SJRGA 2010. Natural/unmarked salmon salvage and losses for January-June at the facilities were lower in 2009 with combined facility estimates for Jan-Jun of 7,115 salmon salvaged and about 14,295 in losses (vs. 10,615 and 22,693 respectively in 2008). The reported numbers do not include associated indirect losses within the Delta, plus the salvage loss estimates for fry (mostly in Jan-Mar) may be inherently low due to reduced screening efficiency. It is not known how many of these salmon were from the San Joaquin basin, but salmon within the same size range and timing are recorded in catches from tributary and mainstem (Mossdale) sampling programs (Exhibit 3).

Few salmon fry (<50mm) were reported at the facilities from January-March, but there was a dominant salvage of larger juveniles/smolts (75-110 mm) from late March through late May. Weekly density (combined salvage and loss/1000 AF of export) was highest from mid-April to mid-May at both facilities.

3.2.2. Spring smolt conditions and evaluation

The San Joaquin River Agreement (SJRA) and the Vernalis Adaptive Management Plan (VAMP) are elements for meeting the objectives of the 1995 State Water Resources Control Board (SWRCB) Bay-Delta Water Quality Control Plan over a 12 year period beginning in 2000, pursuant to SWRCB Decision 1641. The program includes a 31-day period, from about mid-Apr to mid-May, with an experimental combination of salmon protective measures: specified San Joaquin River flows at Vernalis, Head of Old River Barrier (HORB), and reduced State and Federal delta exports. The Tuolumne River outmigration pulse volume has been scheduled to partly coincide with the VAMP period, accounting for a 2-day lead time for flows from La Grange to arrive at Vernalis, and to provide transition days to and from base flows. An additional Tuolumne River spring pulse flow volume of up to 22,000 acre-feet (AF) from TID/MID, supplemental to FERC pulse allocations, can be required under the SJRA to help meet target flows at Vernalis.

The dry 2009 conditions resulted in an "offramp" year such that there were no specific flow and export conditions under the SJRA and no supplemental VAMP flows were required. As will be reported in SJRGA 2010, the 2009 spring implementation for the first time had a behavioral barrier (light, sound, bubbles) operated at the head of Old River. However, the behavioral barrier was operated in the "on" mode only half of the time for evaluation purposes. Consequently, much less deterrence for salmon entering Old River (directly towards the export facilities) occurred in 2009 than when a physical barrier was present in prior years. In addition, exports were greater than 1,500 cfs, approximating the average SJR flow at Vernalis (about 2100 cfs) during the designated period of about April 19 to May 19, and resulted in a lower than usual flow/export ratio during VAMP.

The combined presence of low flows, higher exports, lower flow/export ratio, and only partial barrier operation resulted in conditions that were likely less favorable overall for salmon survival in 2009, perhaps more so for those factors than in any year since VAMP began. Those conditions, in combination with the low salmon numbers to begin with, are factors related to the salmon cohort produced by the 2008 runs which will begin returning as 2-year olds in 2010.

The smolt evaluation design used a total of 933 hatchery smolts with implanted acoustic transmitters. There were 7 releases made of about 135 smolts each from April 22 to May 13 at Durham Ferry on the San Joaquin River. Those salmon were tracked with the use of several stationary receivers downstream into the central delta near Turner Cut, including evaluation arrays near the behavioral barrier and the export facilities, and a mobile receiver. The study results are preliminary at this time, but indicate that overall survival was extremely low and predation losses were extensive.

3.2.3. Other Delta issues

There are several other recognized issues of concern for salmon and steelhead in the Delta region. Water quality issues, from toxicants in general to low dissolved oxygen in the Stockton Deep Water Ship Channel, are being addressed by various agencies. In addition, the recent years of low SJR salmon smolt survival in VAMP studies also correspond to a general decline reported in several other delta fish species, referred to as the Pelagic Organism Decline (POD), which continues to be extensively investigated by CALFED agencies and other researchers (Baxter et al. 2008); more information is available at http://science.calwater.ca.gov/pod/pod_index.html. There were also reductions during 2009 in delta exports resulting from court orders or Biological Opinions to reduce "take" of ESA-listed species, including delta smelt and steelhead.

4 – Hydrology, Flow Schedules, and River Operations

The 2009 calendar year included part of the 2009 and 2010 "water years (WY)" which run from October-September. The WY2009 Tuolumne River preliminary computed natural runoff was 88% of the long-term average. The 2009 San Joaquin Basin 60-20-20 Water Supply Index was 2,733,195 – a "Median Below Normal" Fish Flow Year (FFY) in the Article 37 classification, which run from 15Apr-14Apr. The daily average computed natural flow, actual La Grange flow,

and fish flow schedules of WYs 2009 & 2010 are graphed in Part 1 of Attachment A; actual flows at other SJR basin locations, Delta exports, Don Pedro Reservoir storage, and snow and precipitation data are also included. There were no flood management releases pursuant to ACOE criteria required in 2009 as the Don Pedro Reservoir storage was not close to encroaching the designated flood control space as shown in the graph in Part 1 of Attachment A.

Calendar year 2009 included Article 37 minimum flow and pulse flow requirements spanning the 2008 and 2009 FFYs. Part 3 of Attachment A contains the primary flow schedule correspondence. The initial volume used in the April 2009 scheduling process was 151,222 AF. Similar to 2003, wetter spring conditions caused a substantial increase in the Article 37 volume which in August resulted in a final 2009 FFY requirement of 175,791 AF. That was up from the 121,838 AF final requirement of the previous FFY, but still less than the maximum requirement of 300,923 AF due to below average runoff conditions.

The spring (outmigration) pulse flow volume of 36,317 AF during April 16-May 31 was combined with another 3,570 AF from April 19-May 6 (total of 39,887 AF) as shown in the May 5, 2009 letter. Those volumes were scheduled with the base flow of 180 cfs to provide a pulse flow peak of 640 cfs in April and a pulse flow peak of 930 cfs in May. Another 2,569 AF was scheduled from Jun 1-15, in addition to the base flow of 75 cfs, as transition flow declining from the spring pulse.

Report 2009-6 reviews operations of the June 16-August 31 period in which 75 cfs was the minimum requirement. As in 2008, the base flow requirement was augmented in 2009 by the water managers to provide summer in-river conditions similar to the dry years of 2007 and 2008. A variable flow operation was utilized with higher flows released on days when high daily maximum air temperatures (> 99 F) were forecasted for Modesto. The resulting flows averaged 106 cfs for the 77-day period and ranged from 95-131 cfs (daily averages). The September flow schedule was set at 95 cfs during the initial April scheduling process.

With the increased FFY volume identified, most fall/winter base flows and the fall pulse were increased although the October 1-11 flow requirement was left unchanged for the year type at 200 cfs. A fall pulse volume of 9,352 AF (increased from 1,736 AF) occurred during October 12-23 and was scheduled to provide a peak of 700 cfs. The base flow of 175 cfs was increased to 225 cfs for October 24-December 31, followed by 200 cfs starting on January 1, 2010.

5 – TRTAC Habitat Restoration Activities

TID had acted as the Project Manager on behalf of the TRTAC for the identified ten TRTAC priority projects ("Non-flow Measures"). Four of the ten identified TRTAC projects were completed (SRP 9, 7-11 Mining Reach Segment #1, River Mile 43 at Bobcat Flat, and Gasburg Creek) prior to 2008. There are no longer any active projects as noted below.

Following a rigorous and competitive review/selection process, substantial CALFED grant funding was approved for three other projects (Ruddy Mining Reach Segment #2 and Warner-

Deardorff Mining Reach Segment #3 - $10,839,000 and the Spawning Gravel Transfusion Project near La Grange - $3,898,989). As reviewed in previous annual reports, these projects were later not supported by CDFG and the monies were withheld. As a result, these three major habitat improvement projects that were cooperatively selected and advanced by the TRTAC, and specifically intended to benefit salmon and steelhead, were never implemented. That was despite the fact that considerable FSA and the federal AFRP funds were expended for extensive related pre-project efforts, including proposal development and refinement, completion of the Habitat Restoration Plan, the Floodway Restoration Design Manual, and the Coarse Sediment Management Plan. The other three non-active TRTAC projects were: SRP 10 (design work was completed), gravel cleaning, and the Reed Gravel Mining Reach Segment #4.

Also, another TRTAC-developed proposal to provide funding for three years of restoration project monitoring/river-wide monitoring was submitted to CALFED and that proposal was successfully approved for funding in 2005. However, CDFG, as CALFED Grant Administrator, never approved a Scope of Work nor provided any of the $1,263,900 for monitoring. The Districts and CCSF continued to conduct and fund several monitoring activities that were part of the TRTAC grant proposal on their own initiative and at their own expense.

6 – Tuolumne River Technical Advisory Committee (TRTAC)

Four quarterly TRTAC meetings were held in 2009: March, June, September, and December; the fishery agencies attended none of the meetings in 2009. Attachment B contains the 2009 TRTAC meeting agendas, summaries, handouts, and other materials. The website (http://tuolumnerivertac.com/) was used for posting various TRTAC-related items (documents, reports, correspondence, meeting materials, etc.) and other fishery/habitat information.

7 - References

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Pacific Fishery Management Council 2010a. Review of 2009 Ocean Salmon Fisheries. Portland, OR Available at: http://www.pcouncil.org/wp-content/uploads/Salmon_Review_2009_Final.pdf

Pacific Fishery Management Council 2010b. Preseason Report 1: stock abundance analysis for 2010 ocean salmon fisheries. Portland, OR Available at: http://www.pcouncil.org/wp-content/uploads/Salmon_Preseason_Rpt_I_FEBRUARY_2010.pdf

San Joaquin River Group Authority (SJRGA). 2010. (In Progress) 2009 Annual Technical Report: On implementation and monitoring of the San Joaquin River Agreement and the Vernalis Adaptive Management Plan. Prepared for California State Water Resources Control Board in Compliance with D-1641. Available when completed at http://www.sjrg.org/

Williams, John G. 2006. Central Valley Salmon: A Perspective on Chinook and Steelhead in the Central Valley of California. San Francisco Estuary and Watershed Science. Vol. 4, Issue 3 (December 2006), Article 2. http://repositories.cdlib.org/jmie/sfews/vol4/iss3/art2

8 - General List of Acronyms and Abbreviations

ACOE	Army Corps of Engineers
AF	acre-feet, a measure of water volume
AFRP	Anadromous Fish Restoration Program (part of USFWS)
AMF	Adaptive Management Forum
AT	air temperature
BAWSCA	Bay Area Water Supply and Conservation Agency
C	degrees Celsius
CALFED	now known as California Bay-Delta Authority
CBDA	California Bay-Delta Authority
CCSF	City and County of San Francisco
CDEC	California Data Exchange Center
CDFG or DFG	California Department of Fish and Game
CDRR	combined differential recovery rate
cfs	cubic feet per second, a measure of flow rate
CRRF	California Rivers Restoration Fund
CSPA	California Sportfishing Protection Alliance
CWT	coded wire tag
CVP	Central Valley Project
CY	cubic yard
DPS	distinct population segment
DWR	Department of Water Resources
ESA	Endangered Species Act
ESU	evolutionarily significant unit
F	degrees Fahrenheit
FERC	Federal Energy Regulatory Commission
FL	fork length
FOT	Friends of the Tuolumne
FSA	Don Pedro Project 1995 FERC Settlement Agreement
FWS	see USFWS
HORB	Head of Old River Barrier
HRI	harvest rate index
IEP	Interagency Ecological Program
IFIM	Instream flow incremental methodology
mm	millimeter
MID	Modesto Irrigation District

NHI	Natural Heritage Institute
NMFS	National Marine Fisheries Service
NOAA Fisheries	also National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
NWS	National Weather Service
ORNL	Oak Ridge National Laboratory
PFMC	Pacific Fishery Management Council
R(letter and/or #)	specific riffle (location identifier, e.g. RA7 is Riffle A7)
RM	river mile
RST	rotary screw trap
SJR	San Joaquin River
SJRA	San Joaquin River Agreement
SJRGA	San Joaquin River Group Authority
SRP	Special Run/Pool (mined area of river, usually with #, e.g. SRP 9)
SWP	State Water Project
TID	Turlock Irrigation District
TRE	Tuolumne River Expeditions
TRT	Tuolumne River Trust
TRTAC	Tuolumne River Technical Advisory Committee
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VAMP	Vernalis Adaptive Management Plan
WT	water temperature
WY	Water Year
YOY	Young of Year

8 - List of 1992-2009 Technical Reports by Topic

Salmon Population Models

1992 Appdx. 1: Population Model Documentation
1992 Appdx. 26: Export Mortality Fraction Submodel
1992 Appdx. 2: Stock Recruitment Analysis of the Population Dynamics of San Joaquin River System Chinook salmon
Report 1996-5: Stock-Recruitment Analysis Report

Salmon Spawning Surveys

1992 Appdx. 3: Tuolumne River Salmon Spawning Surveys 1971-88
Report 1996-1: Spawning Survey Summary Report

- 96-1.1 1986 Spawning Survey Report
- 96-1.2 1987 Spawning Survey Report
- 96-1.3 1988 Spawning Survey Report
- 96-1.4 1989 Spawning Survey Report
- 96-1.5 1990 Spawning Survey Report
- 96-1.6 1991 Spawning Survey Report
- 96-1.7 1992 Spawning Survey Report
- 96-1.8 1993 Spawning Survey Report
- 96-1.9 1994 Spawning Survey Report
- 96-1.10 1995 Spawning Survey Report
- 96-1.11 1996 Spawning Survey Report
- 96-1.12 Population Estimation Methods

1997-1: 1997 Spawning Survey Report and Summary Update
1998-1: Spawning Survey Summary Update
1999-1: 1998 Spawning Survey Report
2000-1: 1999 and 2000 Spawning Survey Reports
2000-2: Spawning Survey Summary Update
2001-1: 2001 Spawning Survey Report
2001-2: Spawning Survey Summary Update
2002-1: 2002 Spawning Survey Report
2002-2: Spawning Survey Summary Update
2003-1: Spawning Survey Summary Update
2004-1: 2003 and 2004 Spawning Survey Reports
2004-2: Spawning Survey Summary Update
2006-1: 2005 and 2006 Spawning Survey Reports
2006-2: Spawning Survey Summary Update
2007-1: 2007 Spawning Survey Report
2007-2: Spawning Survey Summary Update
2008-2: Spawning Survey Summary Update
2009-1: 2008 and 2009 Spawning Survey Reports
2009-2: Spawning Survey Summary Update
2009-8: 2009 Counting Weir Report

Seine, Snorkel, Fyke Reports and Various Juvenile Salmon Studies

1992 Appdx. 10: 1987 Juvenile Chinook salmon Mark-Recapture Study
1992 Appdx. 12: Data Reports: Seining of Juvenile Chinook salmon in the Tuolumne, San Joaquin, and Stanislaus Rivers, 1986-89
1992 Appdx. 13: Report on Sampling of Chinook Salmon Fry and Smolts by Fyke Net and Seine in the Lower Tuolumne River, 1973-86
1992 Appdx. 20: Juvenile Salmon Pilot Temperature Observation Experiments
Report 1996-2: Juvenile Salmon Summary Report
- 96-2.1 1986 Snorkel Survey Report
- 96-2.2 1988-89 Pulse Flow Reports
- 96-2.3 1990 Juvenile Salmon Report
- 96-2.4 1991 Juvenile Salmon Report
- 96-2.5 1992 Juvenile Salmon Report
- 96-2.6 1993 Juvenile Salmon Report
- 96-2.7 1994 Juvenile Salmon Report
- 96-2.8 1995 Juvenile Salmon Report
- 96-2.9 1996 Juvenile Salmon Report

1997-2: 1997 Juvenile Salmon Report and Summary Update
1998-2: 1998 Juvenile Salmon Report and Summary Update
1999-4: 1999 Juvenile Salmon Report and Summary Update
2000-3: 2000 Seine/Snorkel Report and Summary Update
2001-3: 2001 Seine/Snorkel Report and Summary Update
2002-3: 2002 Seine/Snorkel Report and Summary Update
2003-2: 2003 Seine/Snorkel Report and Summary Update
2004-3: 2004 Seine/Snorkel Report and Summary Update
2005-3: 2005 Seine/Snorkel Report and Summary Update
2006-3: 2006 Seine/Snorkel Report and Summary Update
2007-3: 2007 Seine/Snorkel Report and Summary Update
2008-3: 2008 Seine Report and Summary Update
2008-5: 2008 Snorkel Report and Summary Update
2009-3: 2009 Seine Report and Summary Update
2009-5: 2009 Snorkel Report and Summary Update

Screw Trap Monitoring

1996-12: Screw Trap Monitoring Report: 1995-96
1997-3: 1997 Screw Trap and Smolt Monitoring Report
1998-3: 1998 Tuolumne River Outmigrant Trapping Report
1999-5: 1999 Tuolumne River Upper Rotary Screw Trap Report
2000-4: 2000 Tuolumne River Smolt Survival and Upper Screw Traps Report
2000-5: 1999-2000 Grayson Screw Trap Report
2001-4: 2001 Grayson Screw Trap Report
2004-4: 1998, 2002, and 2003 Grayson Screw Trap Reports
2004-5: 2004 Grayson Screw Trap Report
2005-4: 2005 Grayson Screw Trap Report
2005-5: Rotary Screw Trap Summary Update

2006-4: 2006 Rotary Screw Trap Report
2006-5: Rotary Screw Trap Summary Update
2007-4: 2007 Rotary Screw Trap Report
2008-4: 2008 Rotary Screw Trap Report
2009-4: 2009 Rotary Screw Trap Report

Fluctuation Assessments

1992 Appdx. 14: Fluctuation Flow Study Report
1992 Appdx. 15: Fluctuation Flow Study Plan: Draft
Report 2000-6: Tuolumne River Chinook Salmon Fry and Juvenile Stranding Report
2005 Ten-Year Summary Report Appdx. E: Stranding Survey Data (1996-2002)

Predation Evaluations

1992 Appdx. 22: Lower Tuolumne River Predation Study Report
1992 Appdx. 23: Effects of Turbidity on Bass Predation Efficiency
2006-9: Lower Tuolumne River Predation Assessment Final Report

Smolt Monitoring and Survival Evaluations

1992 Appdx. 21: Possible Effects of High Water Temperature on Migrating Salmon Smolts in the San Joaquin River
1996-13: Coded-wire Tag Summary Report
1998-4: 1998 Smolt Survival Peer Review Report
1998-5: CWT Summary Update
1999-7: Coded-wire Tag Summary Update
2000-4: 2000 Tuolumne River Smolt Survival and Upper Screw Traps Report
2000-8: Coded-wire Tag Summary Update
2001-5: Large CWT Smolt Survival Analysis
2001-6: Coded-wire Tag Summary Update
2002-4: Large CWT Smolt Survival Analysis
2002-5: Coded-wire Tag Summary Update
2003-3: Coded-wire Tag Summary Update
2004-7: Large CWT Smolt Survival Analysis Update
2004-8: Coded-wire Tag Summary Update
2005-6: Coded-wire Tag Summary Update
2006-6: Coded-wire Tag Summary Update
2007-5: Coded-wire Tag Summary Update

Fish Community Assessments

1992 Appdx. 24: Effects of Introduced Species of Fish in the San Joaquin River System
1992 Appdx. 27: Summer Flow Study Report 1988-90
Report 1996-3: Summer Flow Fish Study Annual Reports: 1991-94
- 96-3.1 1991 Report
- 96-3.2 1992 Report
- 96-3.3 1993 Report
- 96-3.4 1994 Report

2001-8: Distribution and Abundance of Fishes Publication

2002-9: Publication on the Effects of Flow on Fish Communities
2007-7: 2007 Rainbow Trout Data Summary Report
2008-6: 2008 July *Oncorhynchus mykiss* Population Estimate Report
March and July 2009 Population Estimates of *Oncorhynchus mykiss* Report (submitted Jan 15, 2010)
Tuolumne River *Oncorhynchus mykiss* Monitoring Report (submitted Jan 15, 2010)

Invertebrate Reports
1992 Appdx. 16: Aquatic Invertebrate Studies Report
1992 Appdx. 28: Summer Flow Invertebrate Study
Report 1996-4: Summer Flow Aquatic Invertebrate Annual Reports: 1989-93
- 96-4.1 1989 Report
- 96-4.2 1990 Report
- 96-4.3 1991 Report
- 96-4.4 1992 Report
- 96-4.5 1993 Report

1996-9: Aquatic Invertebrate Report
2002-8: Aquatic Invertebrate Report
2004-9: Aquatic Invertebrate Monitoring Report (2003-2004)
2008-7: Aquatic Invertebrate Monitoring (2005, 2007, 2008) and Summary Update
2009-7: 2009 Aquatic Invertebrate Monitoring and Summary Update

Delta Salmon Salvage
1999-6: 1993-99 Delta Salmon Salvage Report

Gravel, Incubation, and Redd Distribution Studies
1992 Appdx. 6: Spawning Gravel Availability and Superimposition Report (incl. map)
1992 Appdx. 7: Salmon Redd Excavation Report
1992 Appdx. 8: Spawning Gravel Studies Report
1992 Appdx. 9: Spawning Gravel Cleaning Methodologies
1992 Appdx. 11: An Evaluation of the Effect of Gravel Ripping on Redd Distribution
1996-6: Redd Superimposition Report
1996-7: Redd Excavation Report
1996-8: Gravel Studies Report: 1987-89
1996-10: Gravel Cleaning Report: 1991-93
2000-7: Tuolumne River Substrate Permeability Assessment and Monitoring Program Report
2006-7: Survival to Emergence Study Report
2008-9: Monitoring of Winter 2008 Runoff Impacts from Peaslee Creek

Water Temperature and Water Quality
1992 Appdx. 17: Preliminary Tuolumne River Water Temperature Report
1992 Appdx. 18: Instream Temperature Model Documentation: Description and Calibration
1992 Appdx. 19: Modeled Effects of La Grange Releases on Instream Temperatures in the Lower Tuolumne River
1996-11: Intragravel Temperature Report: 1991
1997-5: 1987-97 Water Temperature Monitoring Data Report
2002-7: 1998-2002 Temperature and Conductivity Data Report

2004-10: 2004 Water Quality Report
2007-6: Flow, Delta Export, Weather, and Water Quality Data Report: 2003-2007

IFIM Assessment

1992 Appdx. 4: Instream Flow Data Processing, Tuolumne River
1992 Appdx. 5: Analysis of 1981 Lower Tuolumne River IFIM Data
1995 USFWS Report on the Relationship between Instream Flow and Physical Habitat Availability (submitted by Districts to FERC in May 2004)

Flow and Delta Exports

1997-4: Streamflow and Delta Water Export Data Report
2002-6: 1998-2002 Streamflow and Delta Water Export Data Report
2003-4: Review of 2003 Summer Flow Operation
2007-6: Flow, Delta Export, Weather, and Water Quality Data Report: 2003-2007
2008-8: Review of 2008 Summer Flow Operation
2009-6: Review of 2009 Summer Flow Operation

Restoration, Project Monitoring, and Mapping

1996-14: Tuolumne River GIS Database Report and Map
1999-8: A Summary of the Habitat Restoration Plan for the Lower Tuolumne River Corridor
1999-9: Habitat Restoration Plan for the Lower Tuolumne River Corridor
1999-10: 1998 Restoration Project Monitoring Report
1999-11: 1999 Restoration Project Monitoring Report
2001-7: Adaptive Management Forum Report
2004-12: Coarse Sediment Management Plan
2004-13: Tuolumne River Floodway Restoration (Design Manual)
2005 Ten-Year Summary Report Appdx. D: Salmonid Habitat Maps
2005 Ten-Year Summary Report Appdx. F: GIS Mapping Products
2005-7: Bobcat Flat/River Mile 43: Phase 1 Project Completion Report
2006-8: Special Run Pool 9 and 7/11 Reach: Post-Project Monitoring Synthesis Report
2006-10: Tuolumne River La Grange Gravel Addition, Phase II Annual Report
2006-11: Tuolumne River La Grange Gravel Addition, Phase II Geomorphic Monitoring Report

General Monitoring Information

1992 Fisheries Studies Report
2002-10: 2001-2002 Annual CDFG Sportfish Restoration Report
2005 Ten-Year Summary Report

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Exhibits

1. Spawning run estimates
   1.1. San Joaquin River tributary estimates
   1.2. Other Central Valley Fall-run estimates
2. Salmon harvest and Sacramento abundance data
   2.1. California Chinook ocean harvest
   2.2. Sacramento River Fall-run Estimates
   2.3. Abundance Index and Harvest Rates
3. January-June 2009 Basin salmon rearing/outmigration data
   3.1. Tributary screw trap catches and San Joaquin River (Mossdale) trawl catch
   3.2. Average size in catch and delta salvage
   3.3. Mossdale catch individual size and mark
4. January-June 2009 delta salmon salvage data, water exports, and basin flows
   4.1. Table of weekly salvage and flow/export data
   4.2. Graphs of estimated salvage/loss numbers and density (relative abundance)
   4.3. Weekly average flow and exports
   4.4. Size and hatchery origin of delta salvage
   4.5. Daily San Joaquin Basin flows and rainfall

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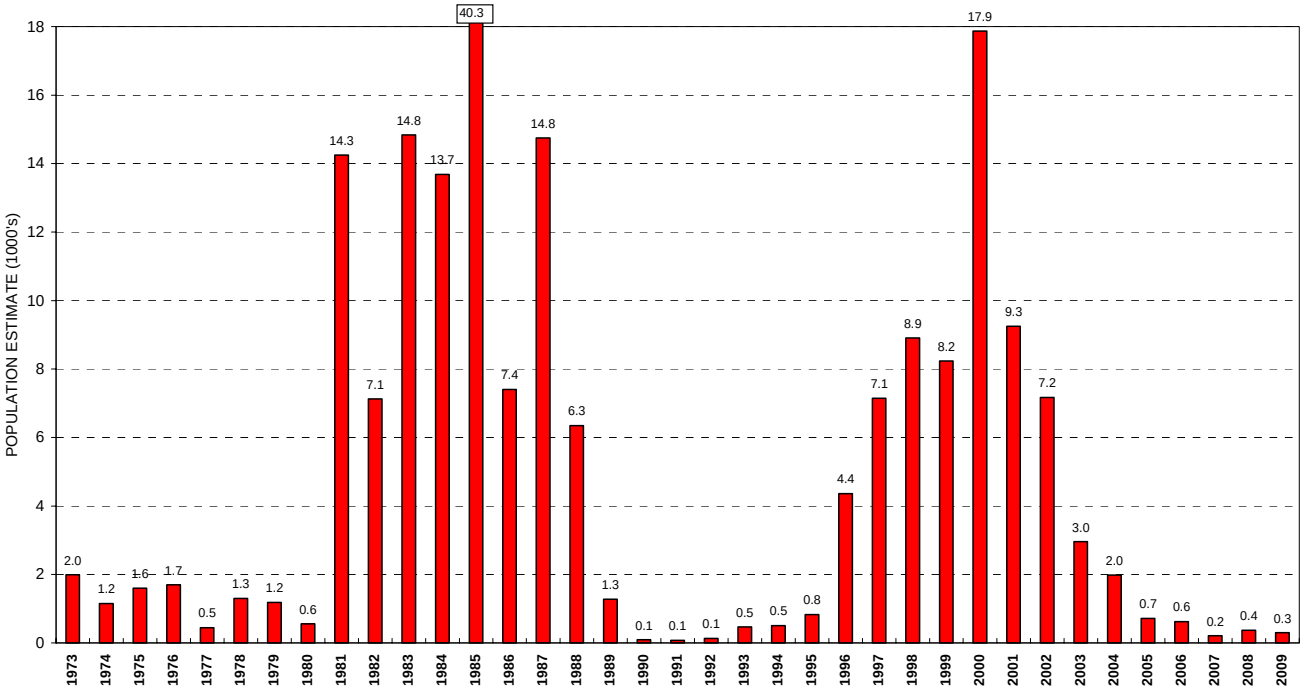
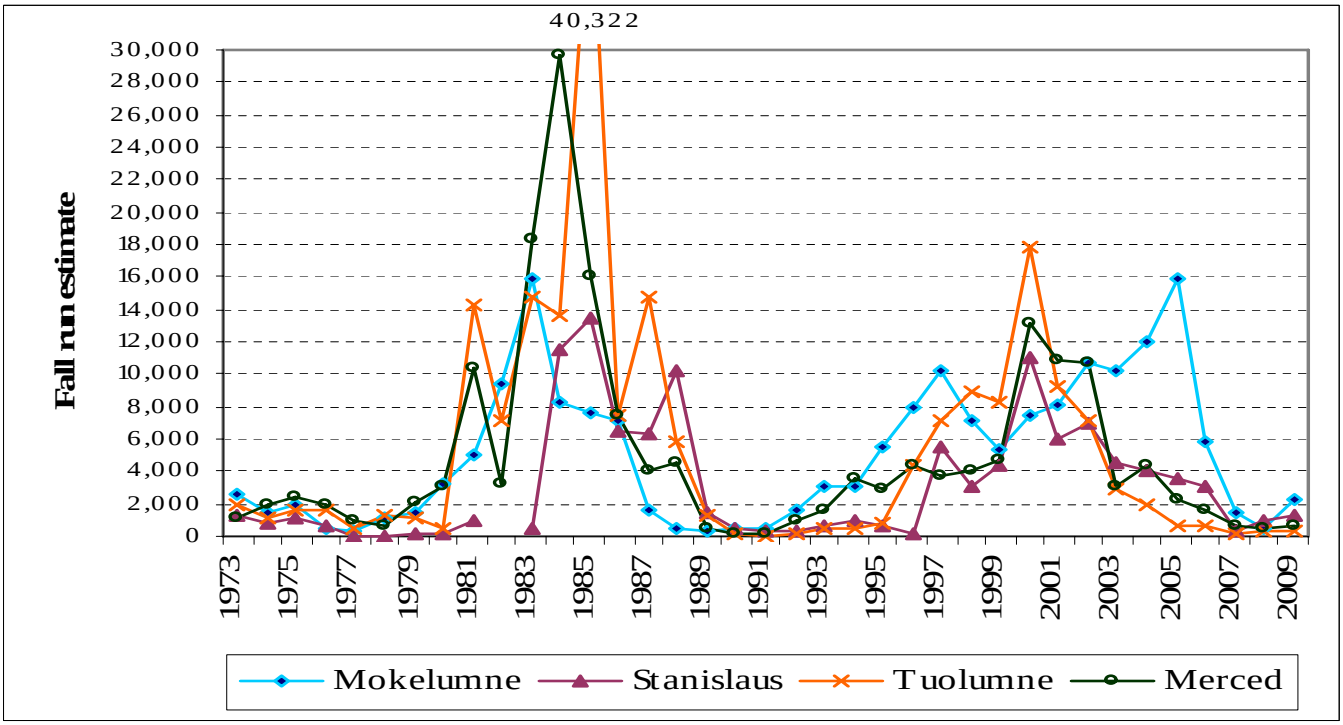
Exhibit 1 – Spawning run estimates

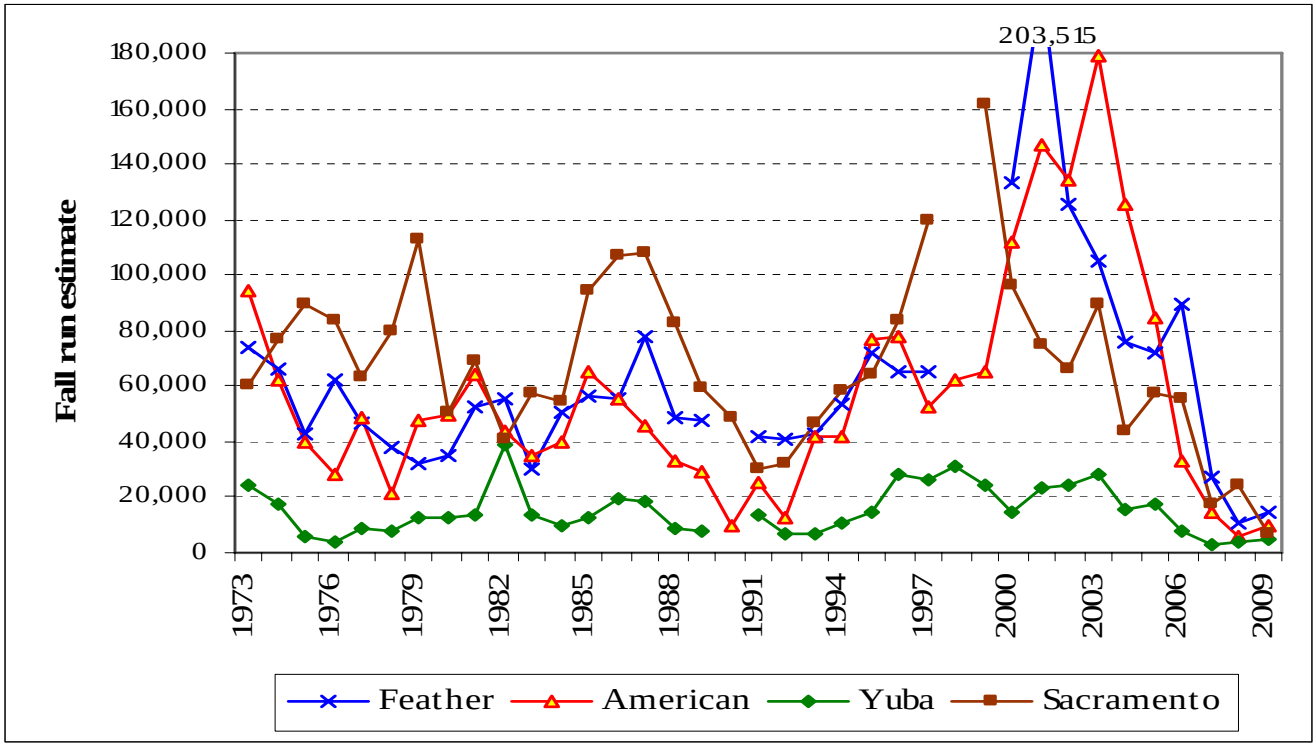
Tuolumne River Salmon Run Estimates/Count



San Joaquin River Tributaries Fall-run Salmon Estimates – Hatcheries are on Merced and Mokelumne (Mokelumne is an Eastside Delta tributary)



Some Fall-run Salmon Rivers in Sacramento Basin
(Yuba River does not have a hatchery)



Combined Natural Spawning and Hatchery Fall- run Total Since 1973

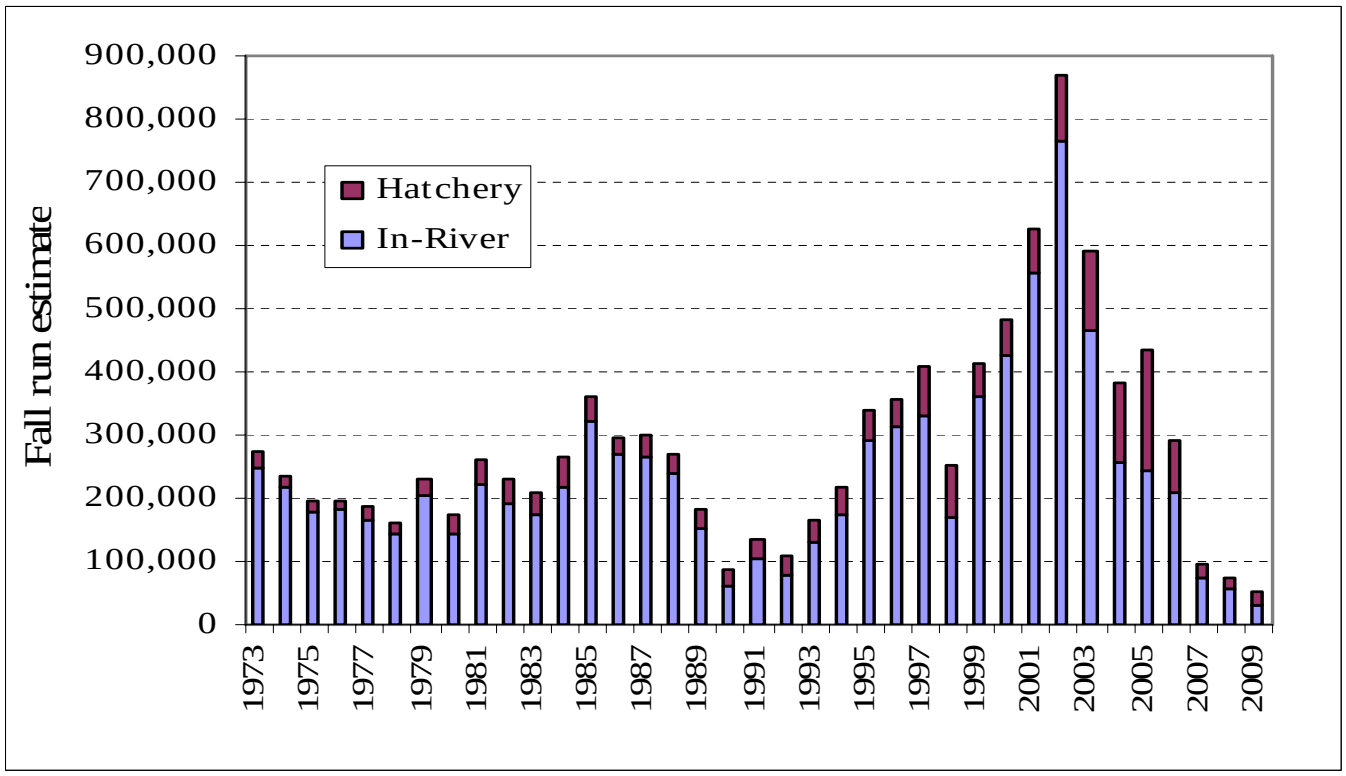
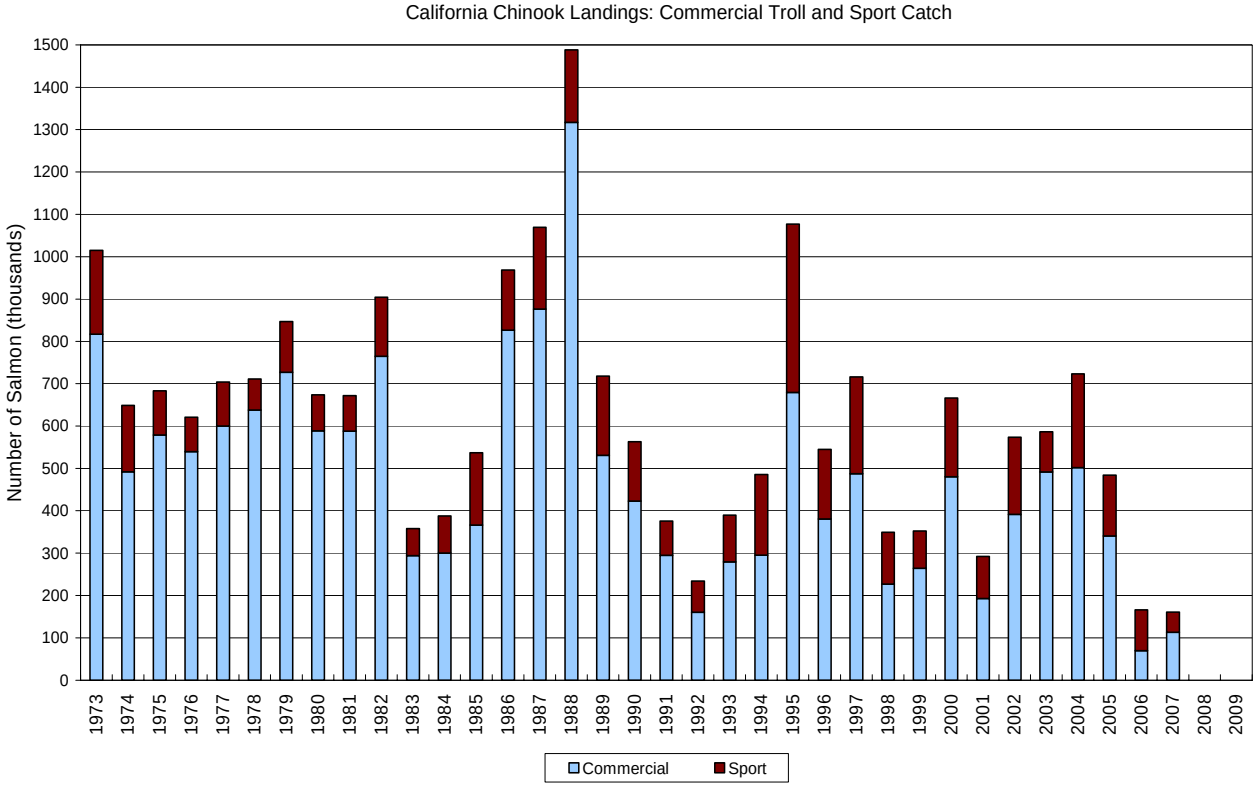
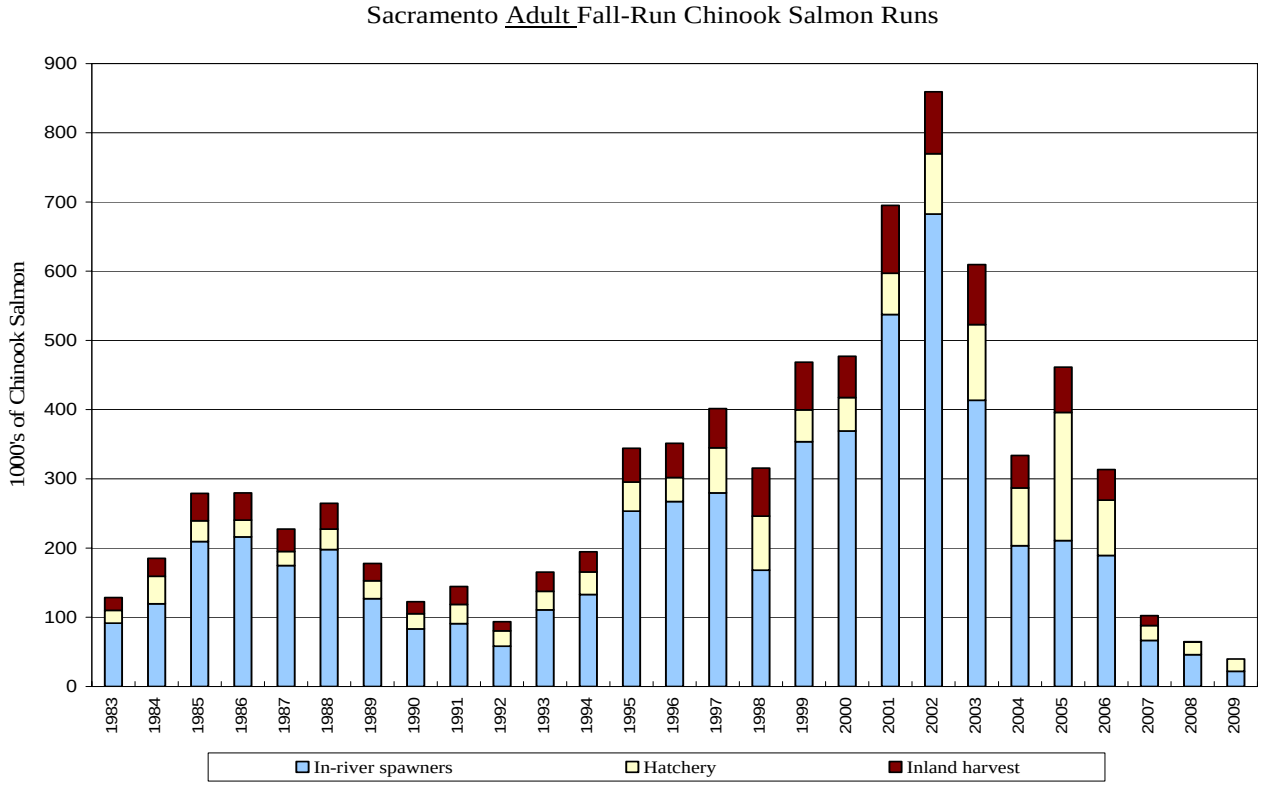
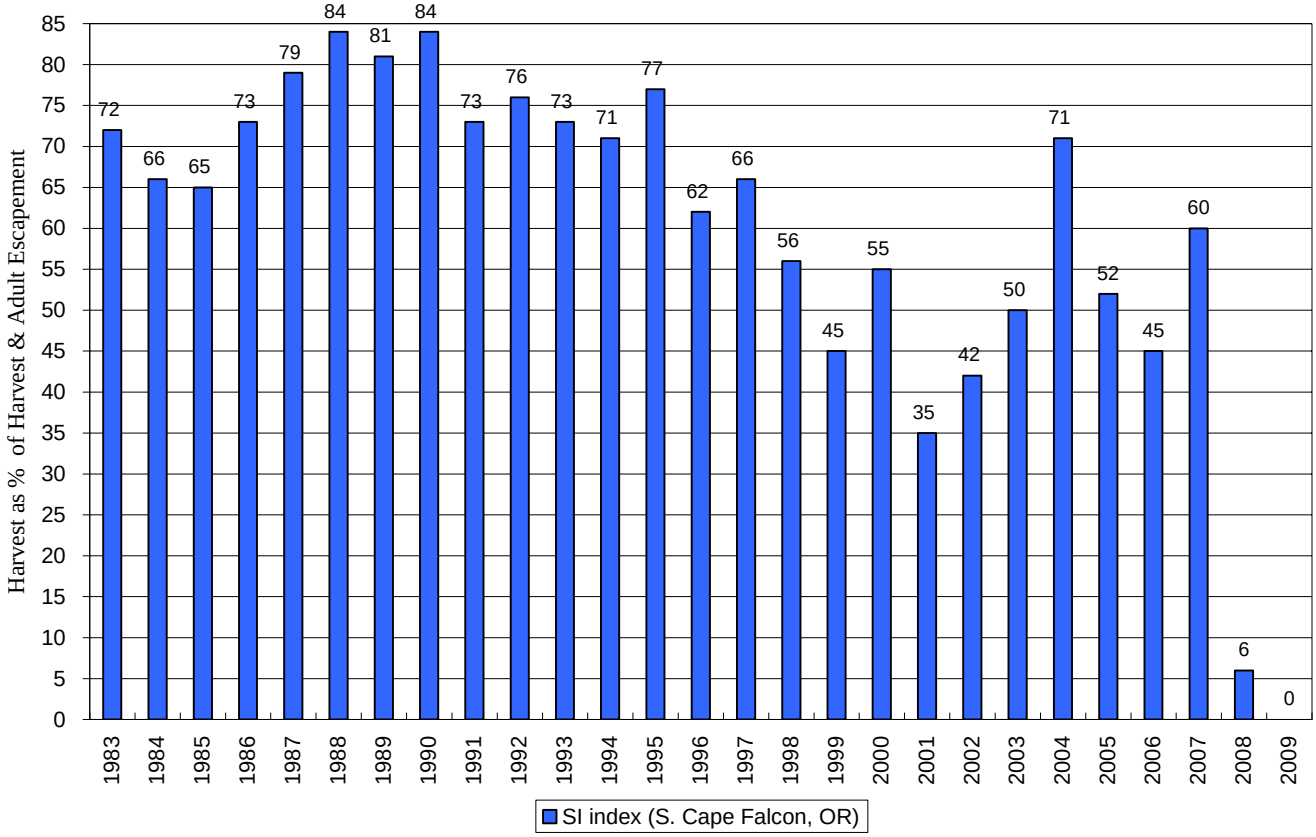


Exhibit 2 – Salmon harvest and Sacramento abundance data





Sacramento Index (south of Cape Falcon, OR)



Sacramento River Chinook Abundance Index: River and Ocean Totals

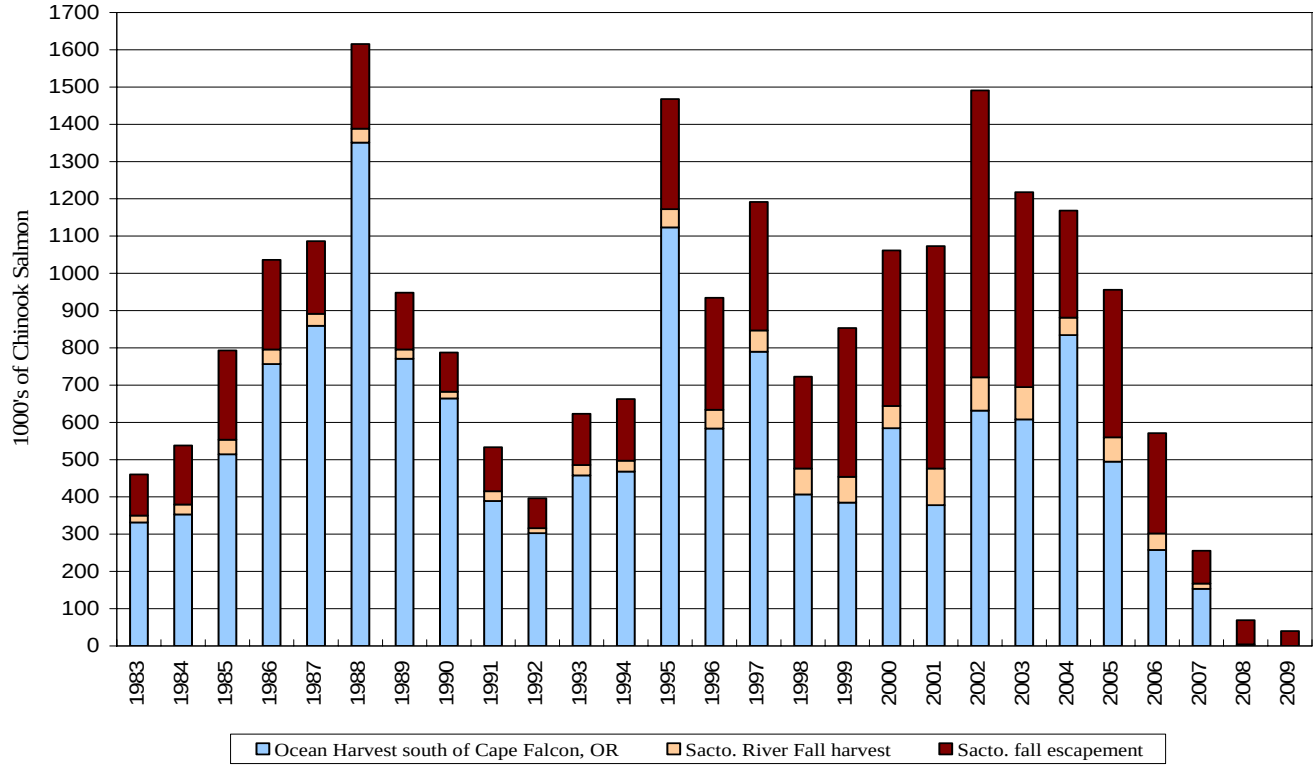
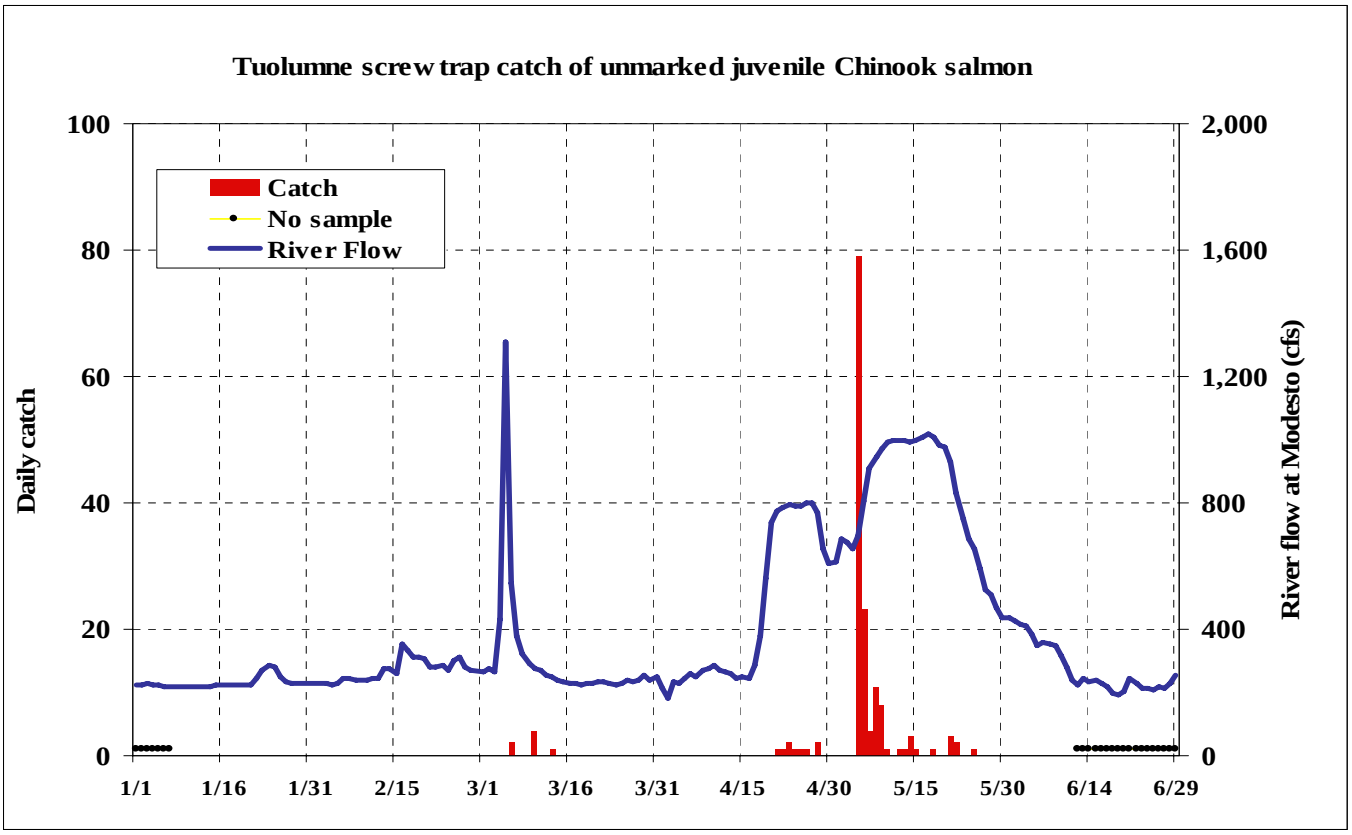
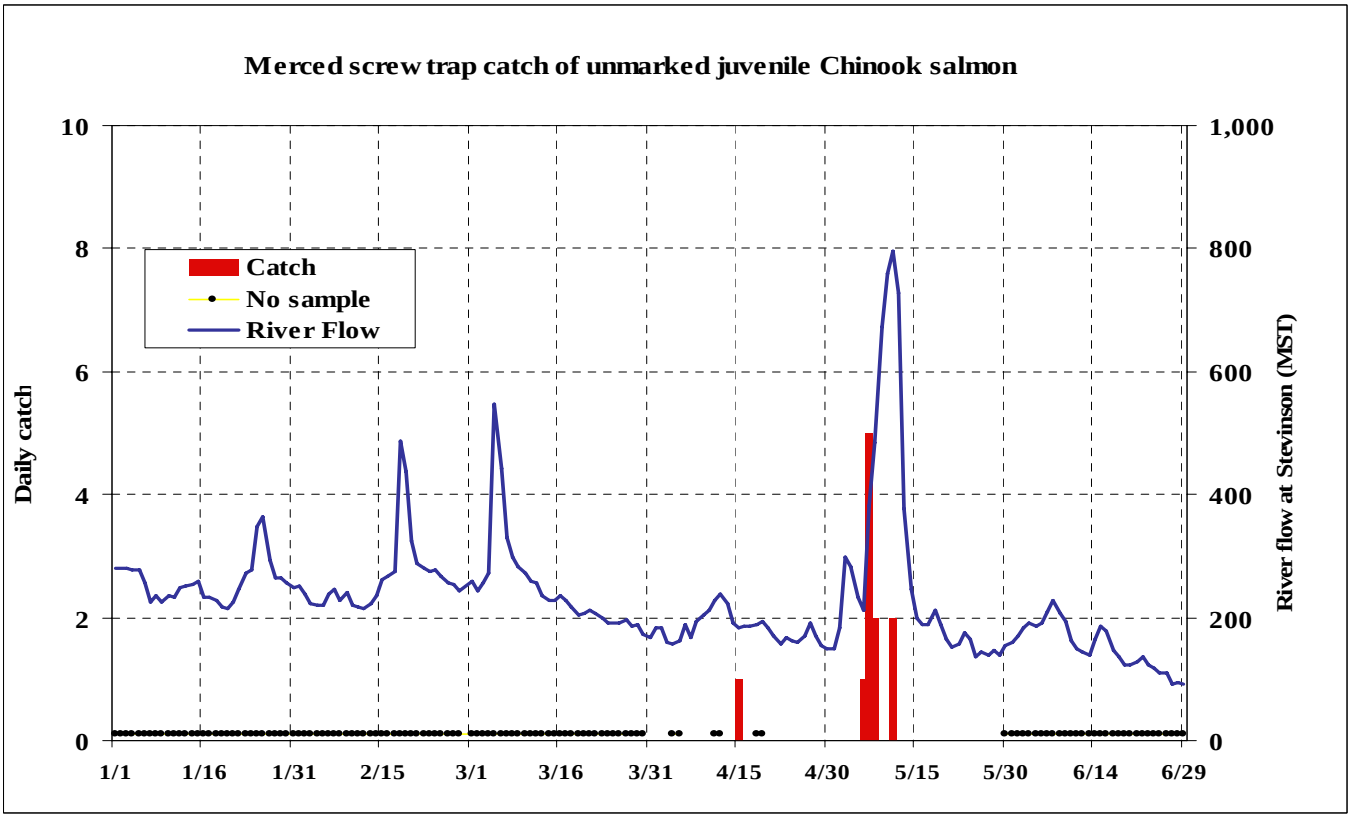
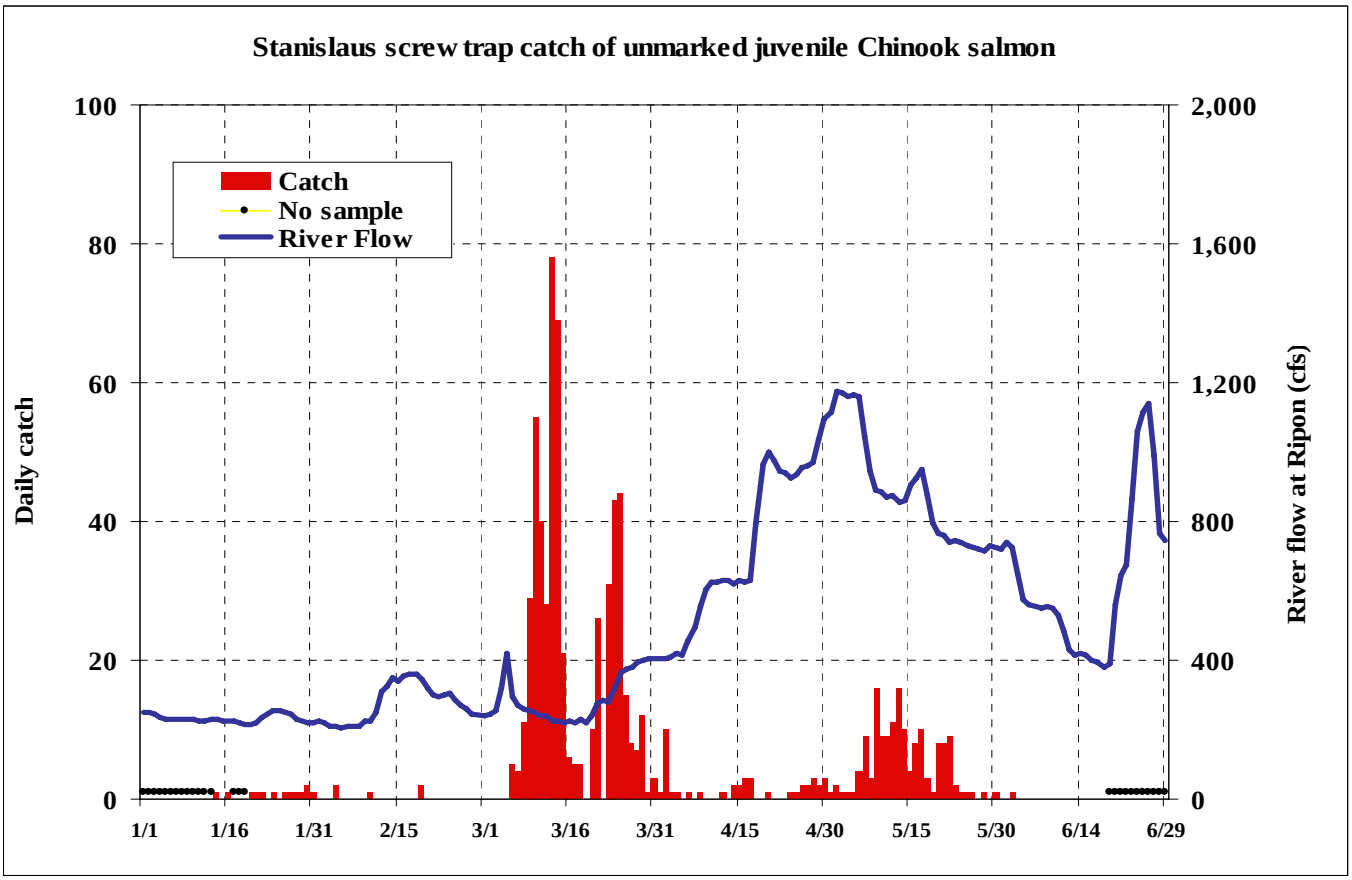
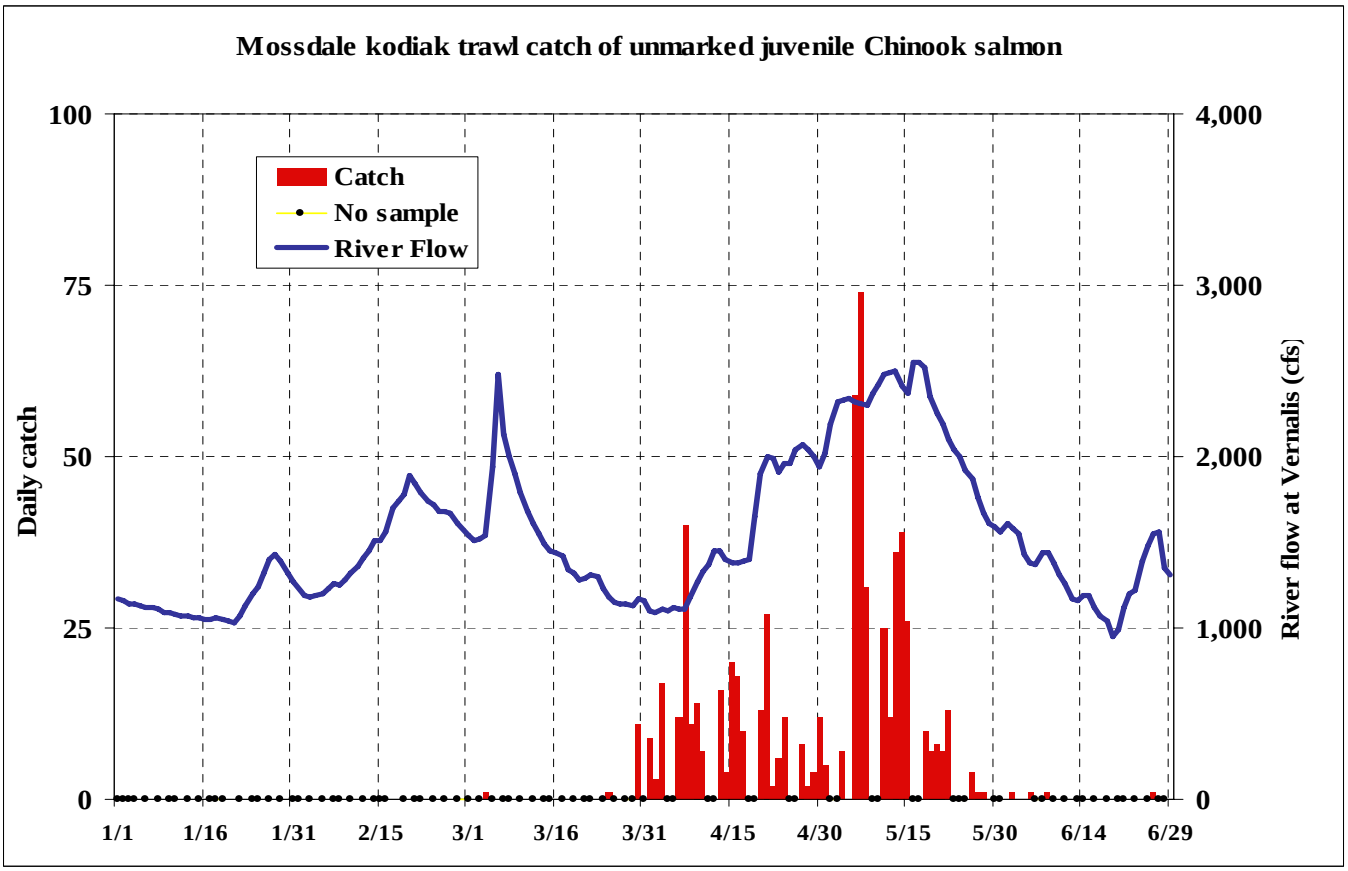


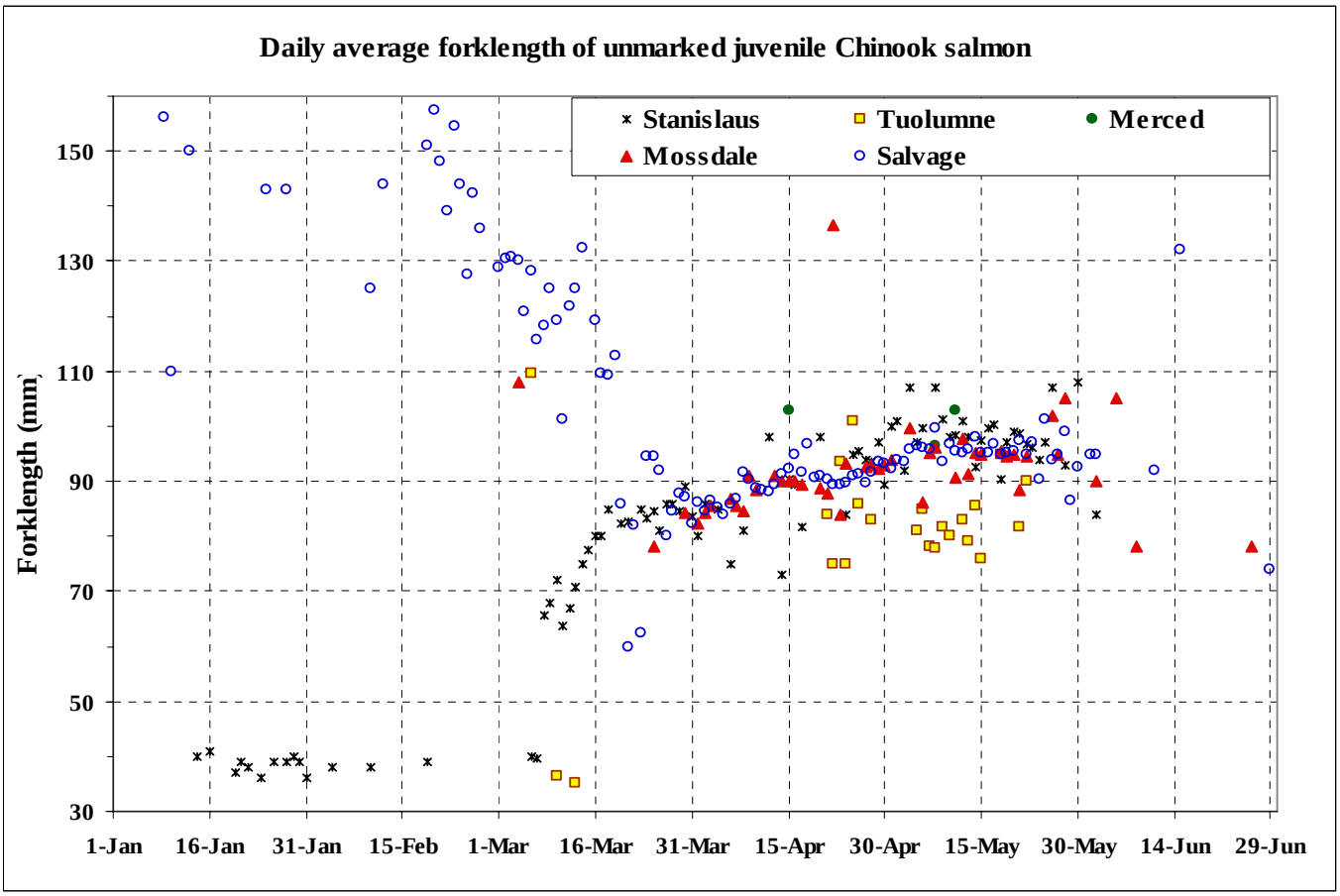
Exhibit 3 – January-June 2009 Basin salmon rearing/outmigration data






Stanislaus screw trap catch of unmarked juvenile Chinook salmon
Catch
No sample
River Flow
Daily catch
River flow at Ripon (cfs)
100
80
60
40
20
0
2,000
1,600
1,200
800
400
0
1/1
1/16
1/31
2/15
3/1
3/16
3/31
4/15
4/30
5/15
5/30
6/14
6/29


Mossdale kodiak trawl catch of unmarked juvenile Chinook salmon
Catch
No sample
River Flow
Daily catch
River flow at Vernalis (cfs)
100
75
50
25
0
4,000
3,000
2,000
1,000
0
1/1
1/16
1/31
2/15
3/1
3/16
3/31
4/15
4/30
5/15
5/30
6/14
6/29


Daily average forklength of unmarked juvenile Chinook salmon
Stanislaus
Tuolumne
Merced
Mossdale
Salvage
Forklength (mm)
150
130
110
90
70
50
30
1-Jan
16-Jan
31-Jan
15-Feb
1-Mar
16-Mar
31-Mar
15-Apr
30-Apr
15-May
30-May
14-Jun
29-Jun

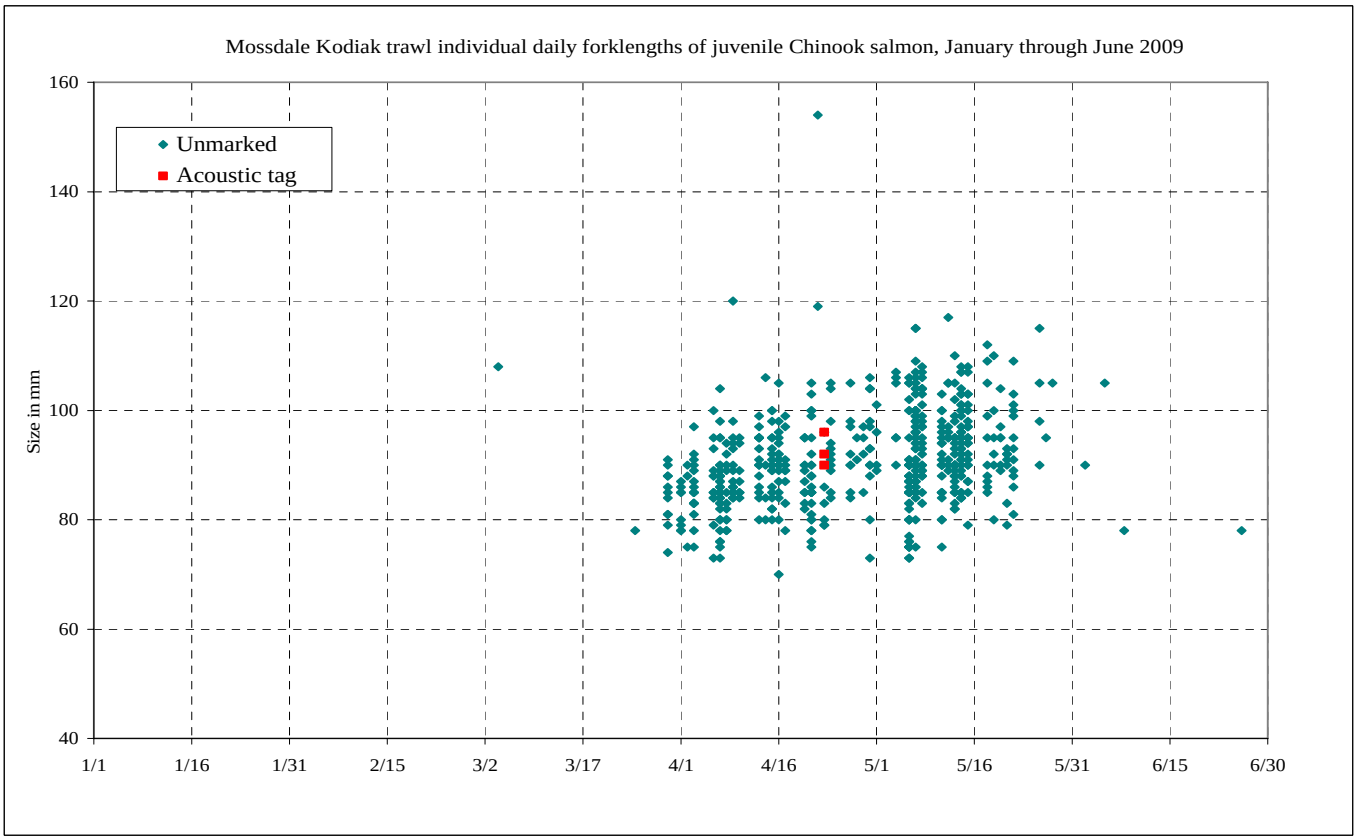
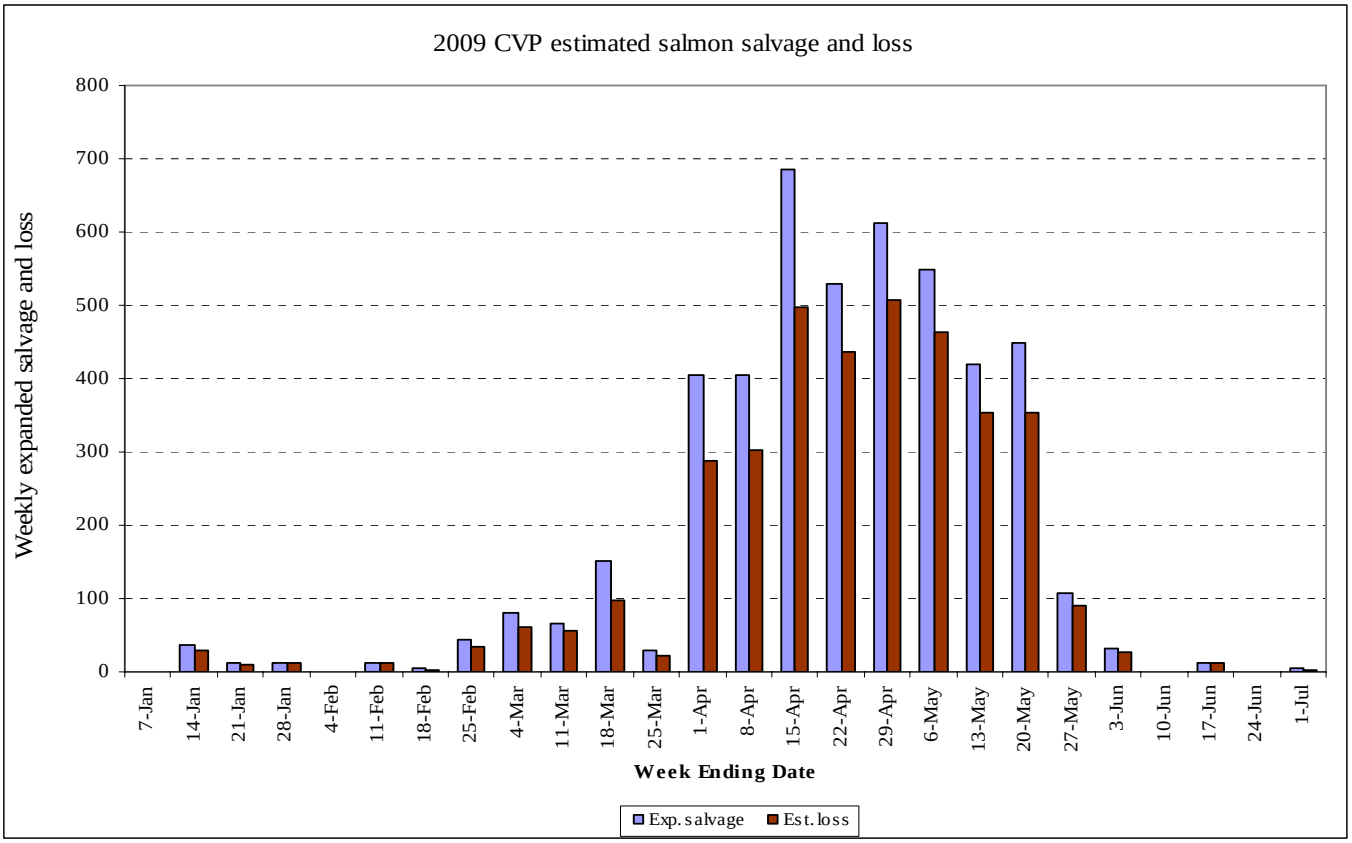
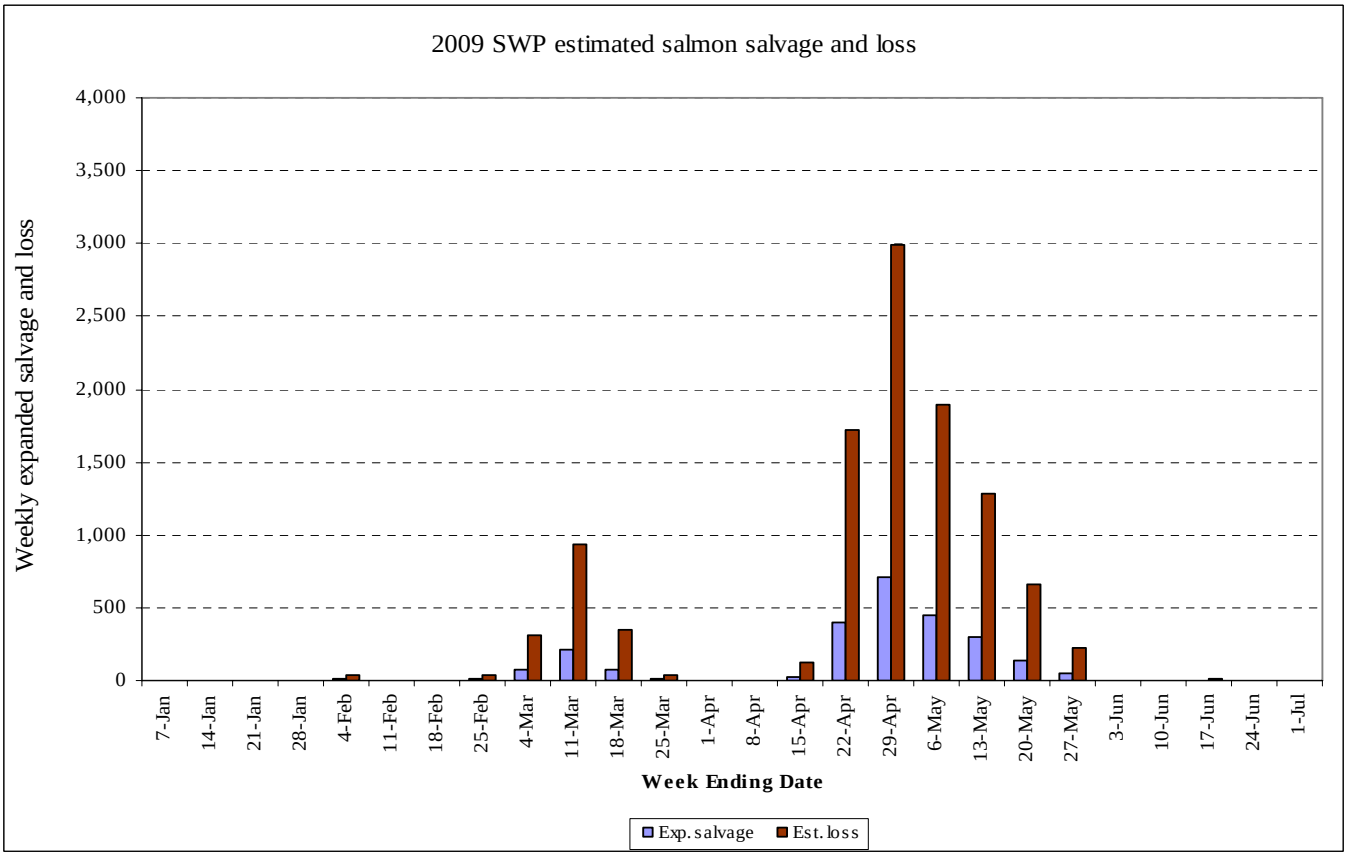

Mossdale Kodiak trawl individual daily forklengths of juvenile Chinook salmon, January through June 2009
Unmarked
Acoustic tag
Size in mm
160
140
120
100
80
60
40
1/1
1/16
1/31
2/15
3/2
3/17
4/1
4/16
5/1
5/16
5/31
6/15
6/30

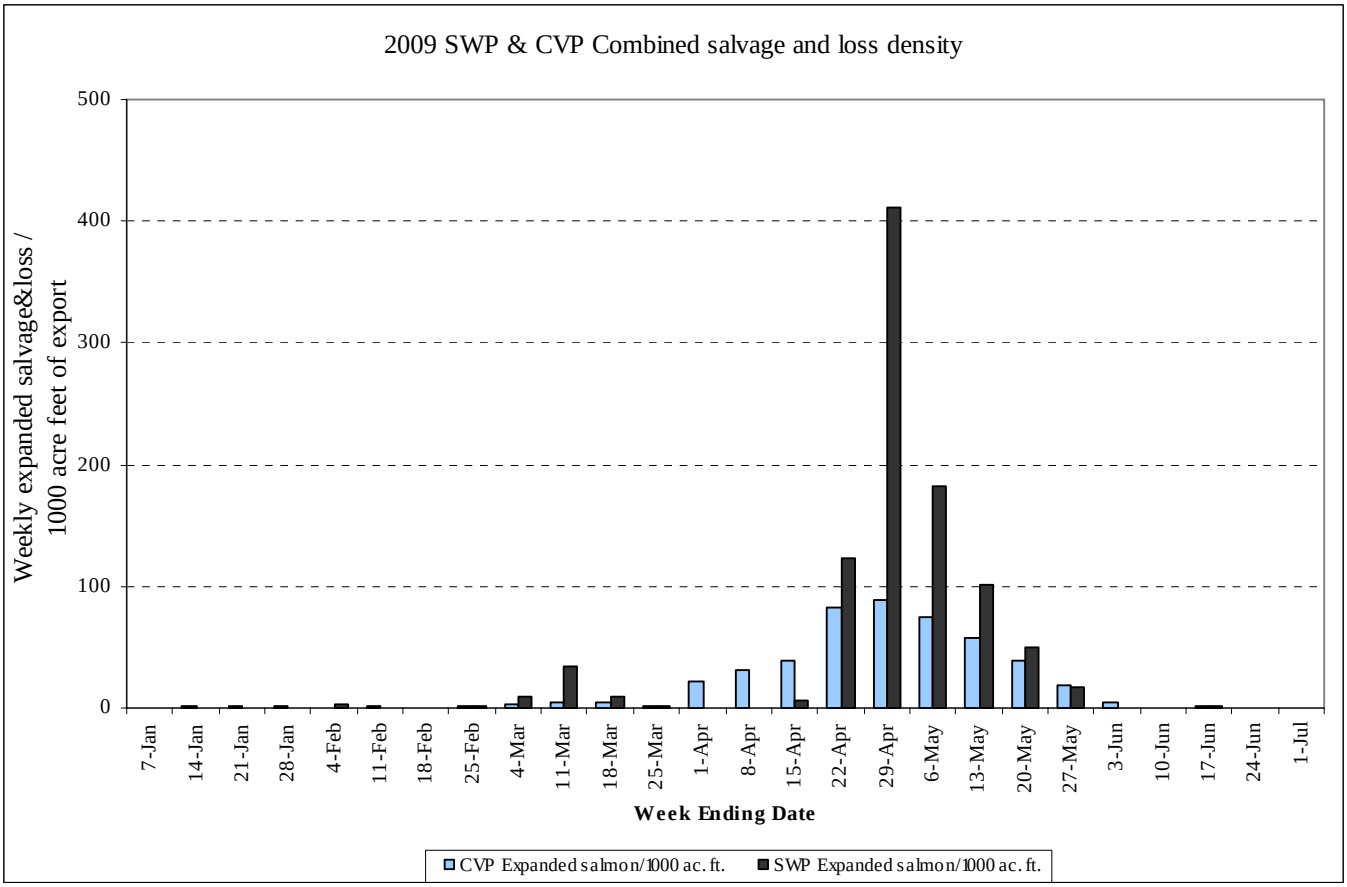
Exhibit 4 – January-June 2009 delta salmon salvage data, water exports, and basin flows

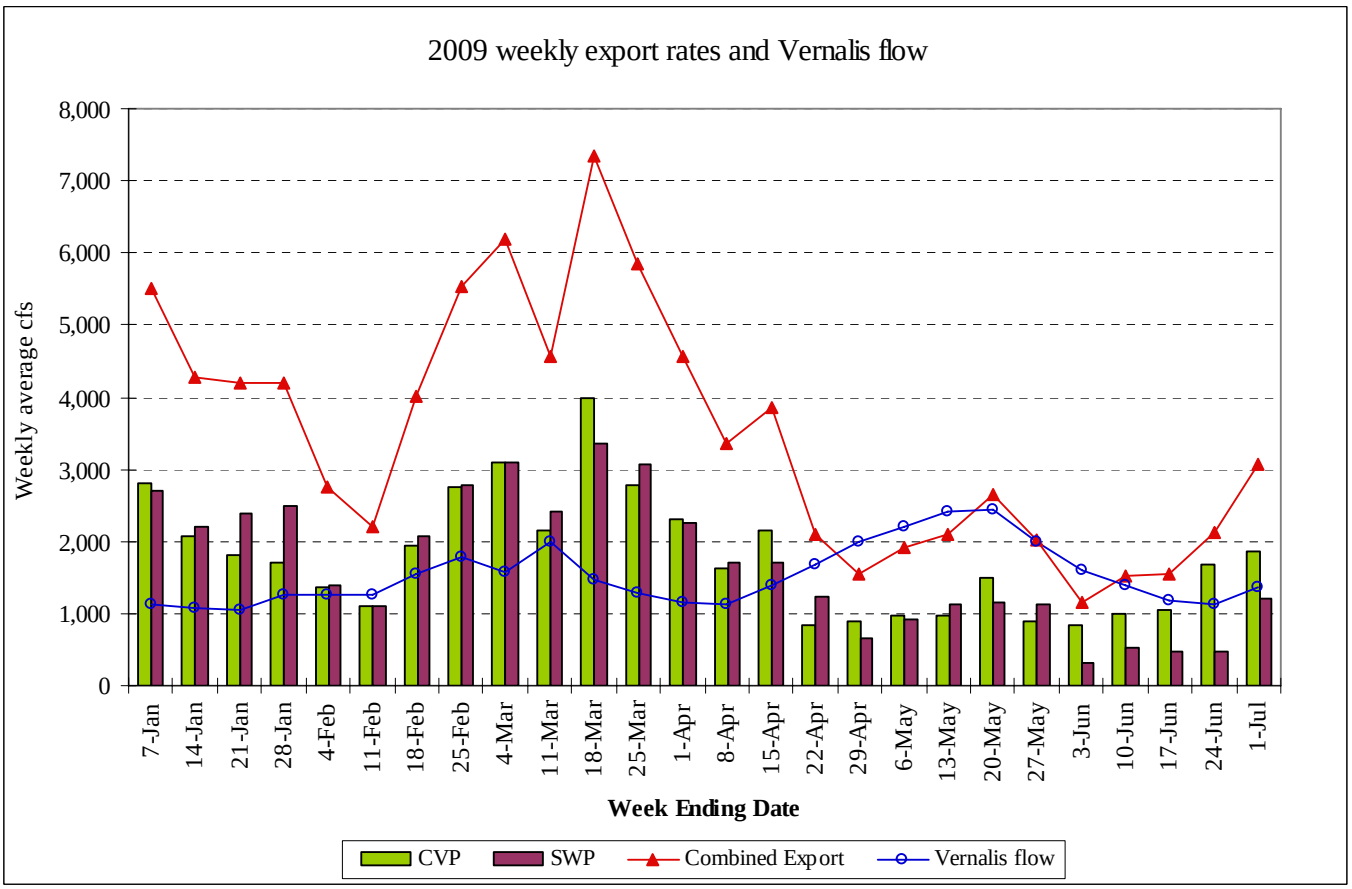
STATE WATER PROJECT							SWP	SWP	CVP&SWP
week ending							Expanded	Combined	average
date	Total chinook salvage			Combined	Ave. cfs	Acre ft.	salvage /	salvage & loss	export rate
	Observed	Exp.Salvage	Est. Loss	salvage & loss	Export	Export	1000 ac.ft.	per 1000 ac.ft.	(cfs)
7-Jan				0	2702	37,506	0.0	0.0	5,517
14-Jan				0	2203	30,580	0.0	0.0	4,275
21-Jan				0	2398	33,293	0.0	0.0	4,201
28-Jan				0	2497	34,661	0.0	0.0	4,191
4-Feb	2	9	41	49.8	1383	19,193	0.5	2.6	2,746
11-Feb				0	1106	15,348	0.0	0.0	2,210
18-Feb				0	2068	28,704	0.0	0.0	4,014
25-Feb	4	10	44	54	2785	38,653	0.3	1.4	5,545
4-Mar	21	70	309	379	3087	42,855	1.6	8.9	6,182
11-Mar	53	206	930	1,136	2403	33,356	6.2	34.1	4,556
18-Mar	23	78	351	429	3359	46,630	1.7	9.2	7,356
25-Mar	2	8	34	42	3079	42,742	0.2	1.0	5,852
1-Apr				0	2251	31,240	0.0	0.0	4,556
8-Apr				0	1715	23,812	0.0	0.0	3,345
15-Apr	7	28	121	149	1695	23,522	1.2	6.3	3,845
22-Apr	110	403	1714	2,117	1239	17,205	23.4	123.1	2,091
29-Apr	190	709	2992	3,701	648	8,991	78.9	411.6	1,551
6-May	116	446	1900	2,346	930	12,911	34.5	181.7	1,911
13-May	99	301	1289	1,590	1126	15,636	19.3	101.7	2,087
20-May	46	139	661	800	1157	16,066	8.7	49.8	2,640
27-May	16	48	225	273	1121	15,565	3.1	17.6	2,020
3-Jun				0	307	4,258	0.0	0.0	1,142
10-Jun				0	522	7,248	0.0	0.0	1,530
17-Jun	1	2	9.58	12	481	6,675	0.3	1.7	1,541
24-Jun				0	460	6,391	0.0	0.0	2,133
1-Jul				0	1206	16,742	0.0	0.0	3,067
Tot&avg	**690**	**2,457**	**10,620**	**13,077**	**1,690**	**609,782**	**6.9**	**36.6**	3,466
VAMP	451	1,595	6,841	8,436	965	53,604	35	186	2,047

CENTRAL VALLEY PROJECT							CVP	CVP	
							Expanded	Combined	Vernalis
week ending	Total chinook salvage			Combined	Ave. cfs	Acre ft.	salvage/	salvage & loss	flow
date	Observed	Expanded	Est. Loss	salvage & loss	Export	Export	1000 ac.ft.	per 1000 ac.ft.	(cfs)
7-Jan				0	2815	39,071	0.0	0.0	1140
14-Jan	3	36	30	65.68	2072	28,757	1.3	2.3	1080
21-Jan	1	12	11	22.56	1803	25,021	0.5	0.9	1051
28-Jan	2	13	12	25.22	1694	23,514	0.6	1.1	1256
4-Feb				0	1363	18,922	0.0	0.0	1255
11-Feb	3	12	12	23.63	1105	15,333	0.8	1.5	1272
18-Feb	1	4	4	7.52	1946	27,014	0.1	0.3	1556
25-Feb	11	44	35	79	2760	38,318	1.1	2.1	1779
4-Mar	20	80	61	141	3095	42,960	1.9	3.3	1583
11-Mar	17	67	57	124	2153	29,882	2.2	4.1	1990
18-Mar	38	151	97	248	3997	55,480	2.7	4.5	1473
25-Mar	10	30.3	21	51	2773	38,492	0.8	1.3	1273
1-Apr	102	405	289	694	2306	32,004	12.7	21.7	1142
8-Apr	103	405	302	707	1630	22,622	17.9	31.3	1118
15-Apr	173	685	499	1,184	2150	29,844	23.0	39.7	1378
22-Apr	133	530	438	968	852	11,827	44.8	81.8	1673
29-Apr	159	611.2	507	1,118	903	12,537	48.8	89.2	1997
6-May	138	548	464	1,012	981	13,621	40.2	74.3	2210
13-May	105	420	352	772	960	13,330	31.5	58.0	2411
20-May	115	449	354	803	1482	20,578	21.8	39.0	2429
27-May	27	107	91	198	899	10,693	10.0	18.5	1984
3-Jun	8	32	26	58	835	11,593	2.8	5.0	1596
10-Jun				0	1008	13,994	0.0	0.0	1395
17-Jun	3	12	11	23	1060	14,720	0.8	1.6	1168
24-Jun				0	1673	23,223	0.0	0.0	1129
1-Jul	1	4	3.01	7	1861	25,831	0.2	0.3	1371
Tot&avg	**1,173**	**4,658**	**3,675**	**8,332**	**1,776**	**639,179**	**10.2**	**18.5**	**1,527**
VAMP	517	2,028	1,677	3,705	1,082	60,065	36	65	2,262


2009 CVP estimated salmon salvage and loss
Weekly expanded salvage and loss
800
700
600
500
400
300
200
100
0
7-Jan
14-Jan
21-Jan
28-Jan
4-Feb
11-Feb
18-Feb
25-Feb
4-Mar
11-Mar
18-Mar
25-Mar
1-Apr
8-Apr
15-Apr
22-Apr
29-Apr
6-May
13-May
20-May
27-May
3-Jun
10-Jun
17-Jun
24-Jun
1-Jul
Week Ending Date
Exp. salvage
Est. loss

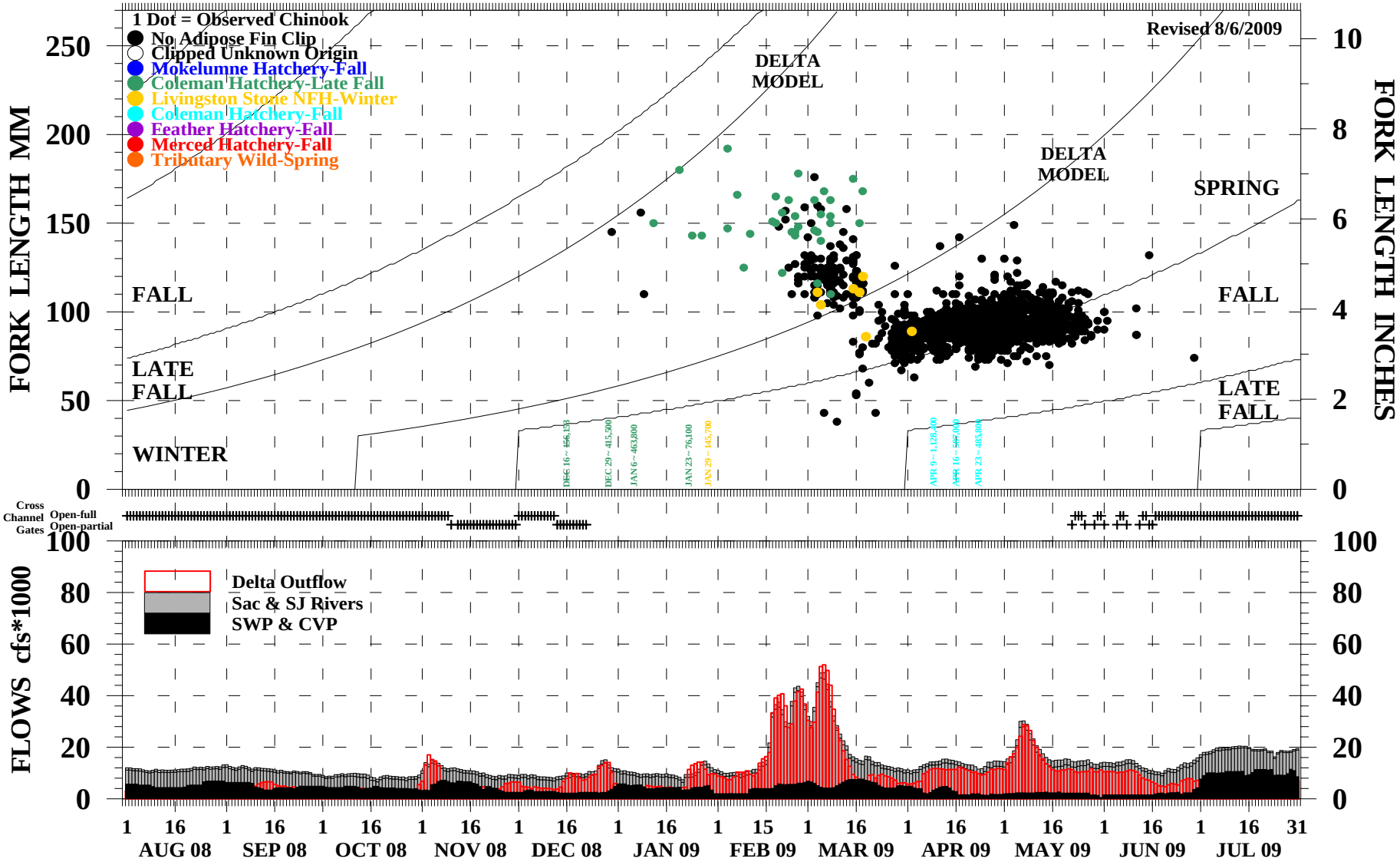

2009 SWP estimated salmon salvage and loss
Weekly expanded salvage and loss
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
7-Jan
14-Jan
21-Jan
28-Jan
4-Feb
11-Feb
18-Feb
25-Feb
4-Mar
11-Mar
18-Mar
25-Mar
1-Apr
8-Apr
15-Apr
22-Apr
29-Apr
6-May
13-May
20-May
27-May
3-Jun
10-Jun
17-Jun
24-Jun
1-Jul
Week Ending Date
Exp. salvage
Est. loss

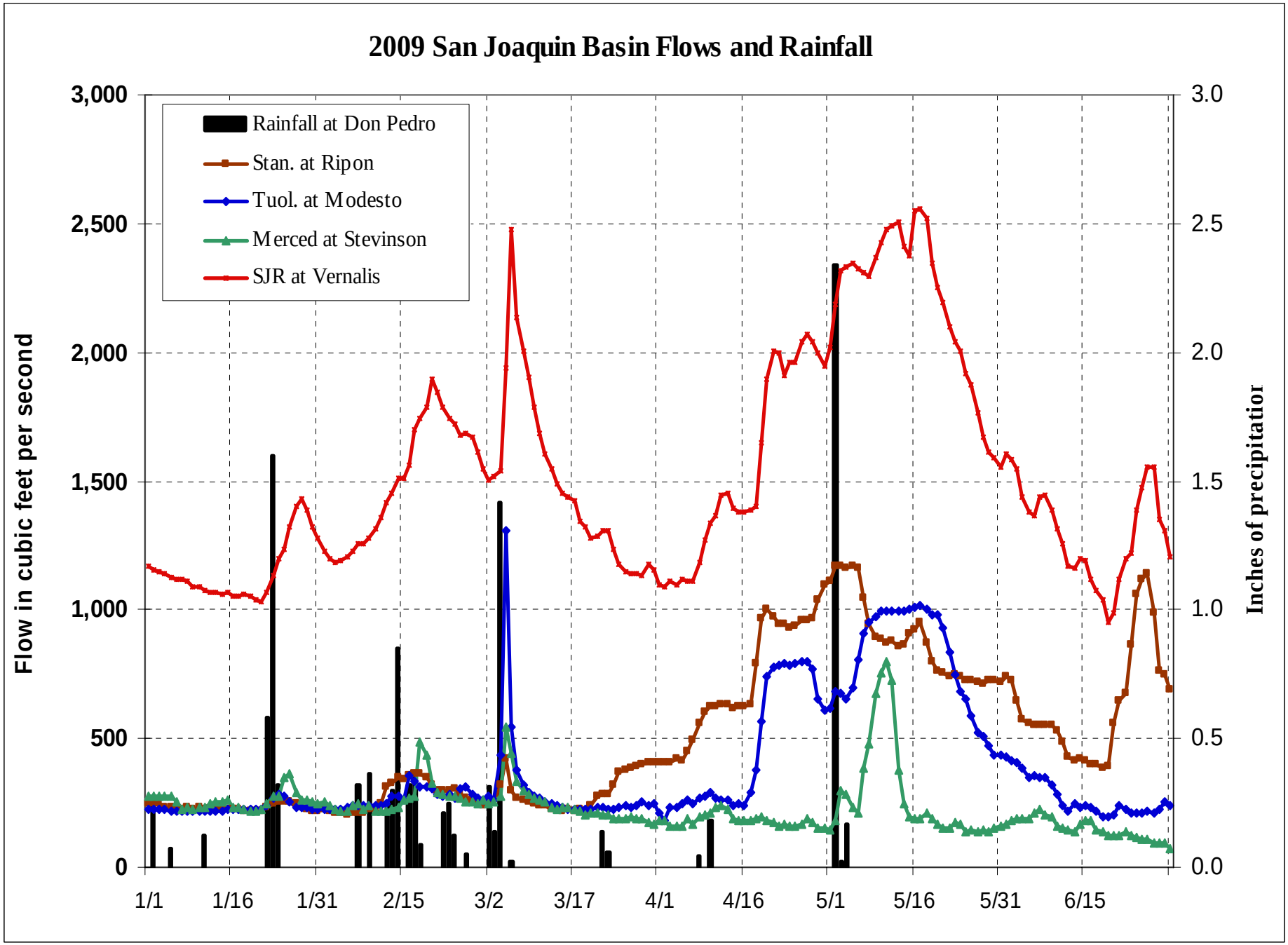

2009 SWP & CVP Combined salvage and loss density
Weekly expanded salvage&loss / 1000 acre feet of export
500
400
300
200
100
0
7-Jan
14-Jan
21-Jan
28-Jan
4-Feb
11-Feb
18-Feb
25-Feb
4-Mar
11-Mar
18-Mar
25-Mar
1-Apr
8-Apr
15-Apr
22-Apr
29-Apr
6-May
13-May
20-May
27-May
3-Jun
10-Jun
17-Jun
24-Jun
1-Jul
Week Ending Date
CVP Expanded salmon/1000 ac. ft.
SWP Expanded salmon/1000 ac. ft.


2009 weekly export rates and Vernalis flow
Weekly average cfs
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
7-Jan
14-Jan
21-Jan
28-Jan
4-Feb
11-Feb
18-Feb
25-Feb
4-Mar
11-Mar
18-Mar
25-Mar
1-Apr
8-Apr
15-Apr
22-Apr
29-Apr
6-May
13-May
20-May
27-May
3-Jun
10-Jun
17-Jun
24-Jun
1-Jul
Week Ending Date
CVP
SWP
Combined Export
Vernalis flow

Note: “Delta Model” size/date categories by run designation are approximate

OBSERVED CHINOOK SALVAGE AT THE SWP & CVP DELTA FISH FACILITIES 8/1/2008 THROUGH 7/31/2009




2009 San Joaquin Basin Flows and Rainfall
Rainfall at Don Pedro
Stan. at Ripon
Tuol. at Modesto
Merced at Stevinson
SJR at Vernalis
Flow in cubic feet per second
Inches of precipitation
3,000
2,500
2,000
1,500
1,000
500
0
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/1
1/16
1/31
2/15
3/2
3/17
4/1
4/16
5/1
5/16
5/31
6/15

Attachment -A-

Water, Flows, Temperature, and Flow Schedule Correspondence

1. Graphs of flows, FERC flow schedule, reservoir status, and precipitation data
   1.1. 2009/2010 Water Years (Oct-Sep) daily average computed natural flow, actual flow, and FERC flow schedule at La Grange
   1.2. 2009/2010 Water Years actual flow: Tuolumne at Modesto, Stanislaus at Ripon, Merced at Cressey, San Joaquin at Stevinson and at Vernalis, Vernalis and combined exports, Vernalis flow minus combined exports
   1.3. Required flow volume forecasts and final amount
   1.4. 2009/2010 Water Years Don Pedro Reservoir storage
   1.5. 2009/2010 Precipitation Years (Sep-Aug) watershed precipitation index and snow sensor water content index as percent of average
2. Graphs of water temperature and air temperature
   2.1. Water Years 2009/2010 daily average water temperature for Tuolumne and San Joaquin Rivers
   2.2. Modesto air temperature for Water Years 2009/2010
3. Flow schedule correspondence for 2009
   3.1. Mar 25 – Minimum flow coordination process and draft flow schedules
   3.2. May 5 – Initial flow schedule, including spring pulse flow
   3.3. Oct 19 – Final annual flow volume and revised flow schedule

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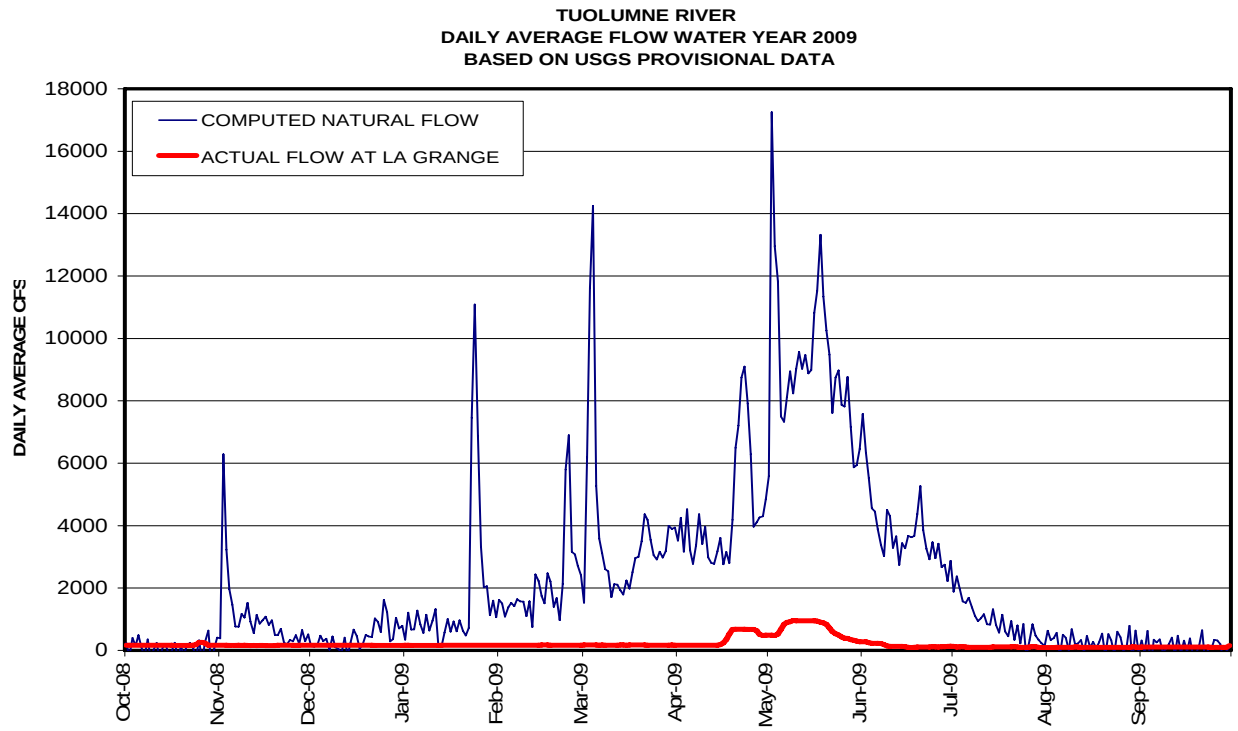
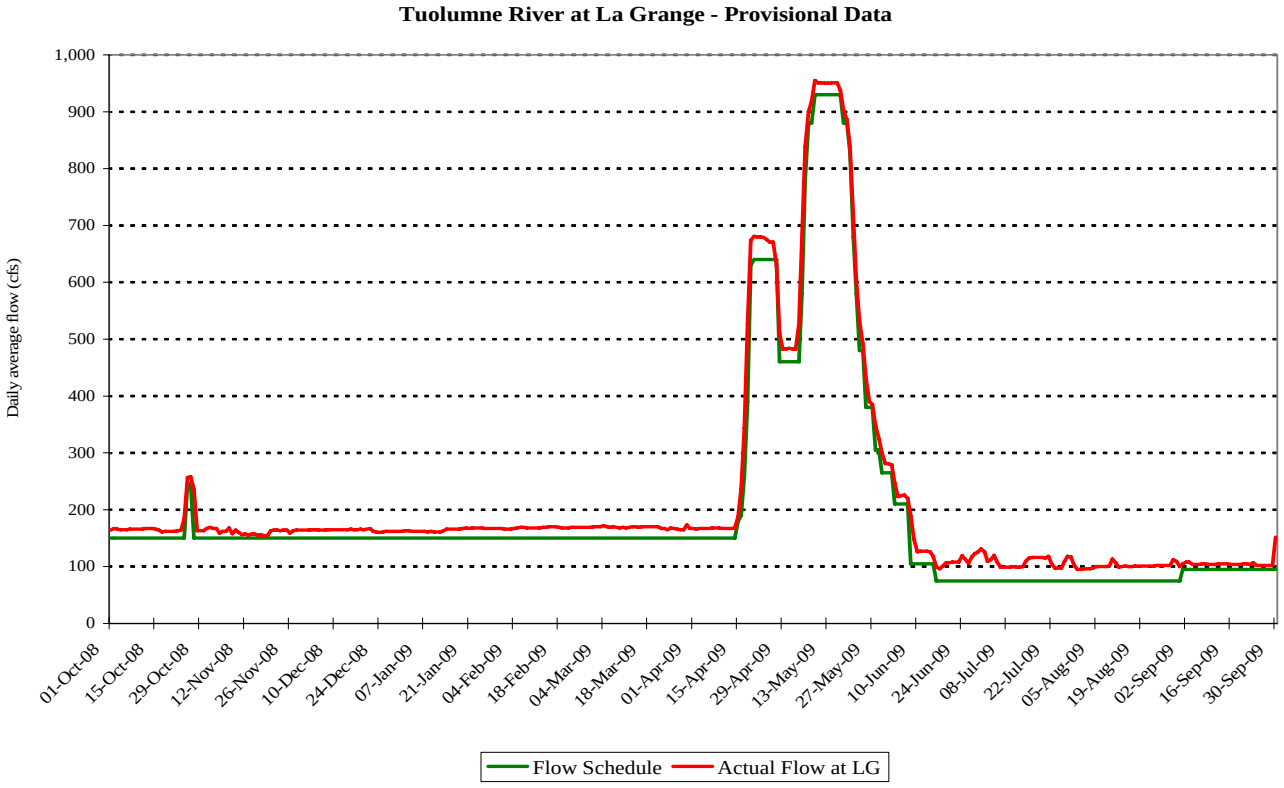
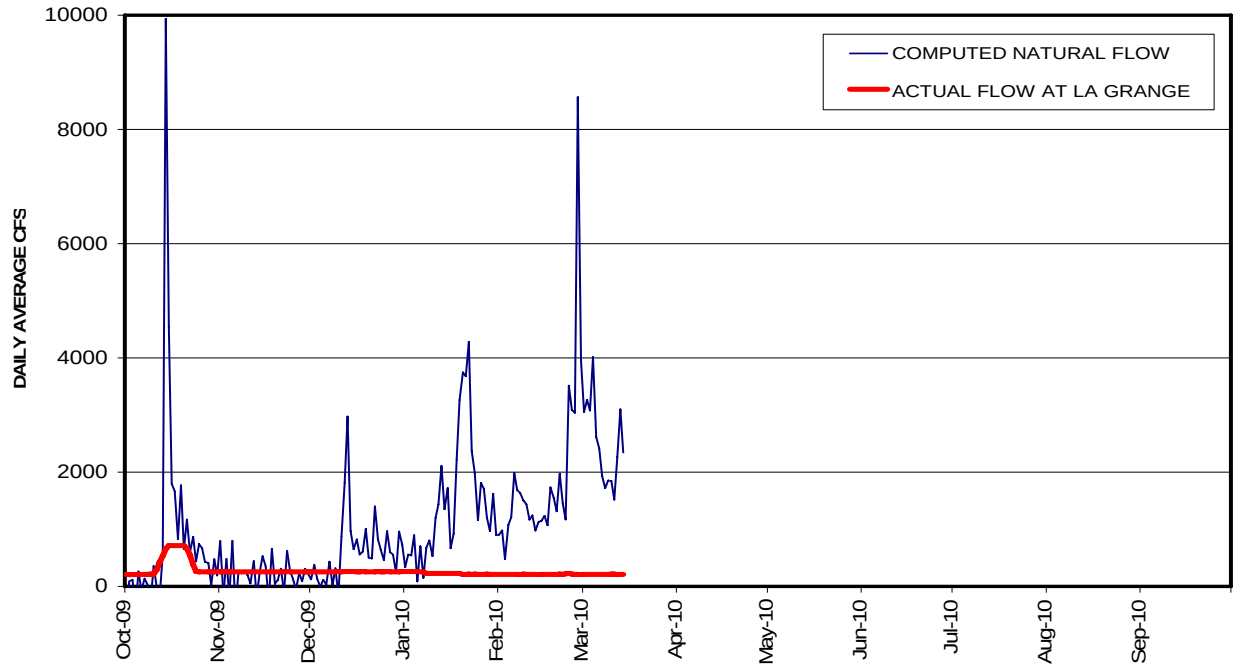
1. Graphs of flows, flow schedule, reservoir status, and precipitation data

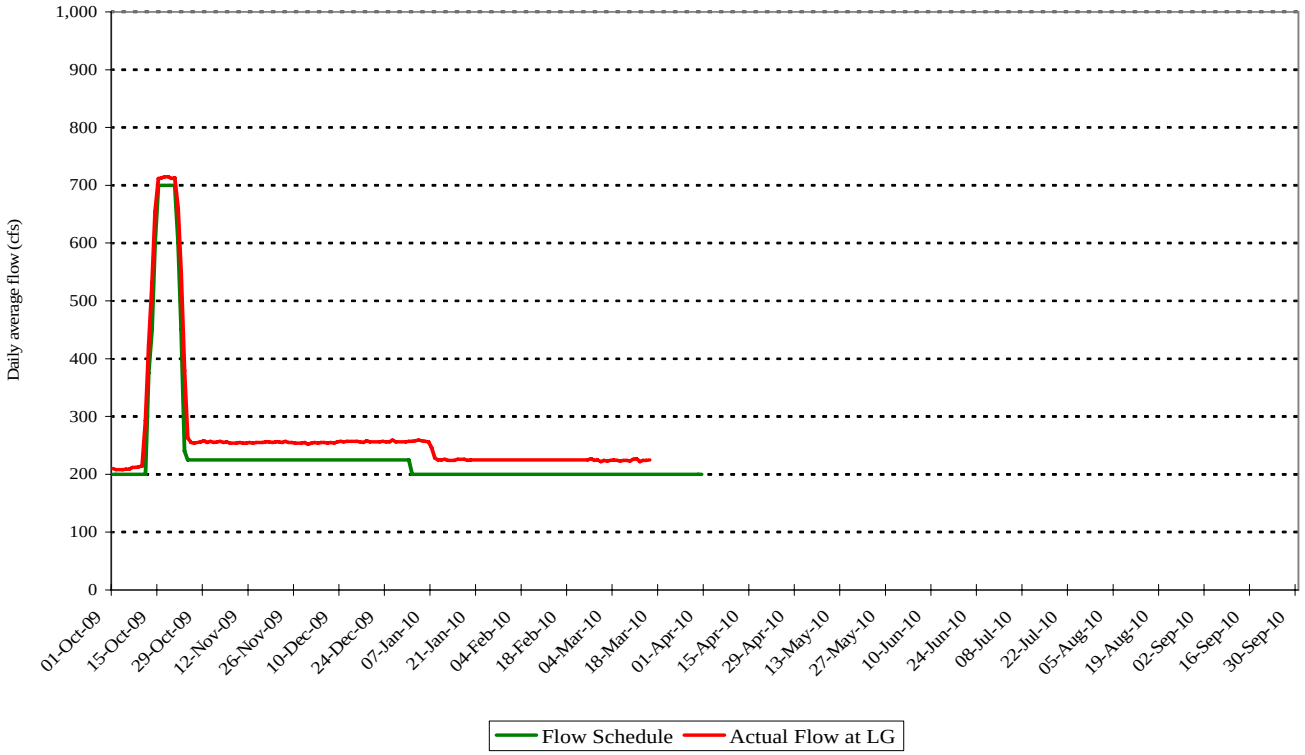


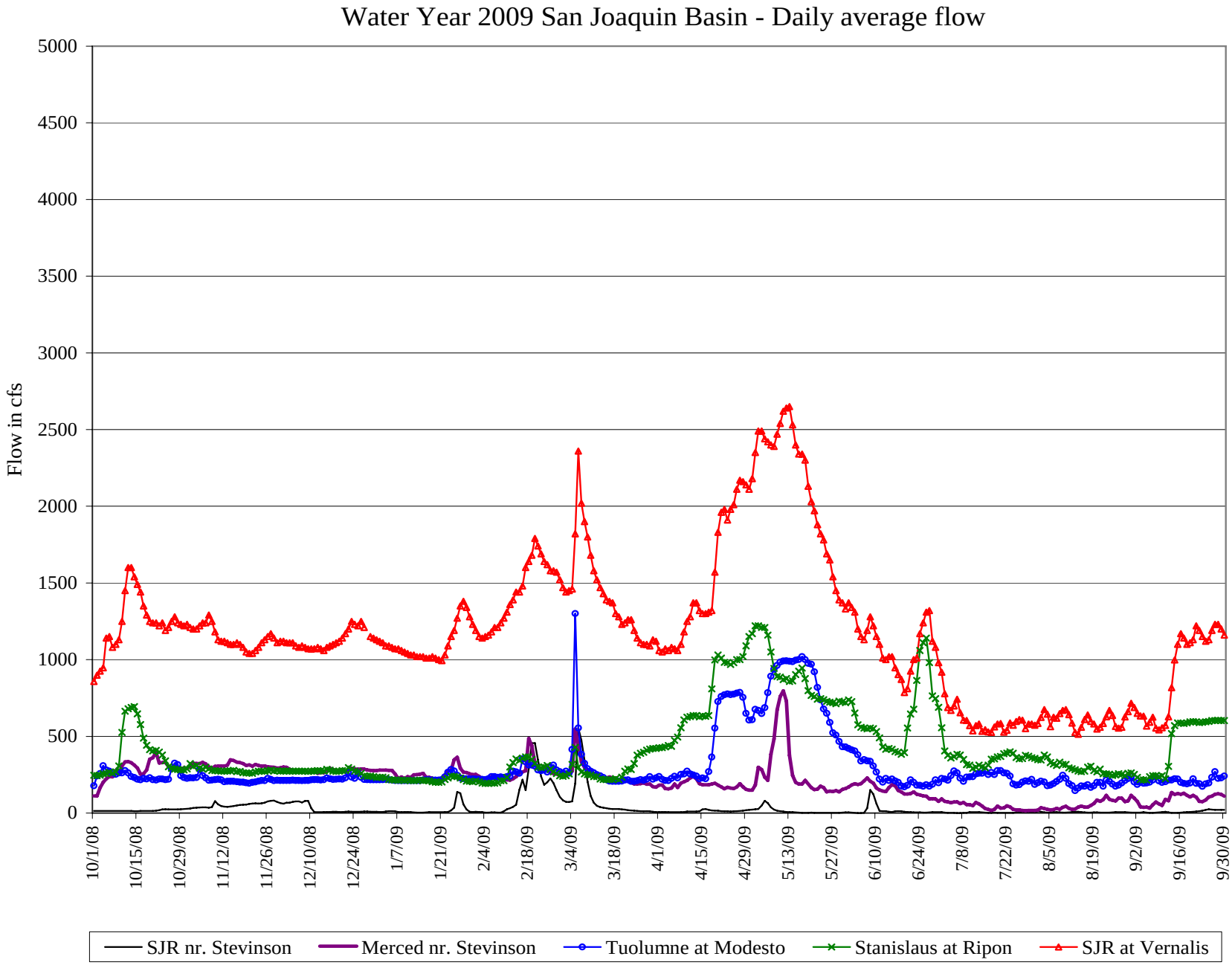


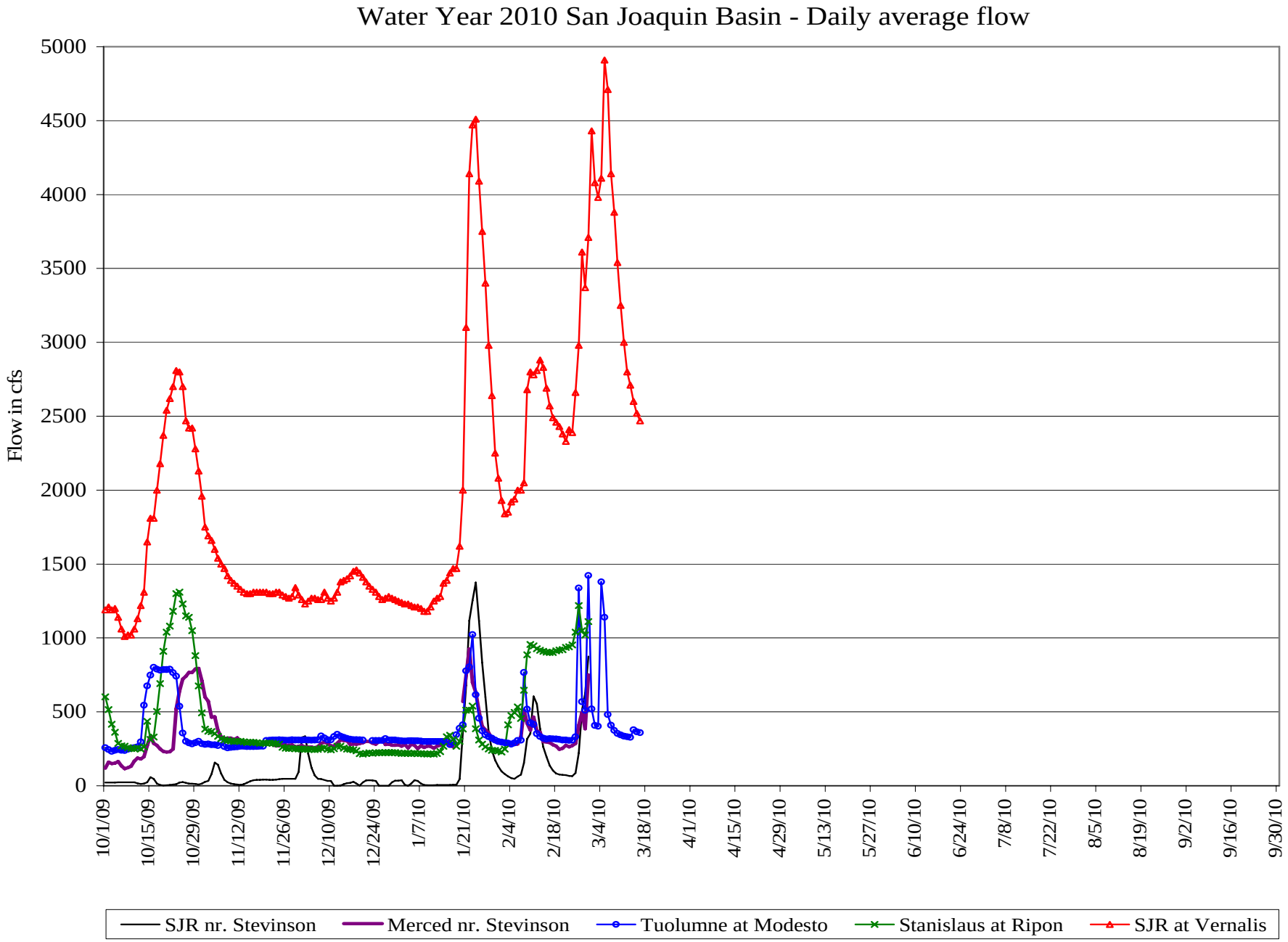
TUOLUMNE RIVER
DAILY AVERAGE FLOW WATER YEAR 2010
BASED ON USGS PROVISIONAL DATA



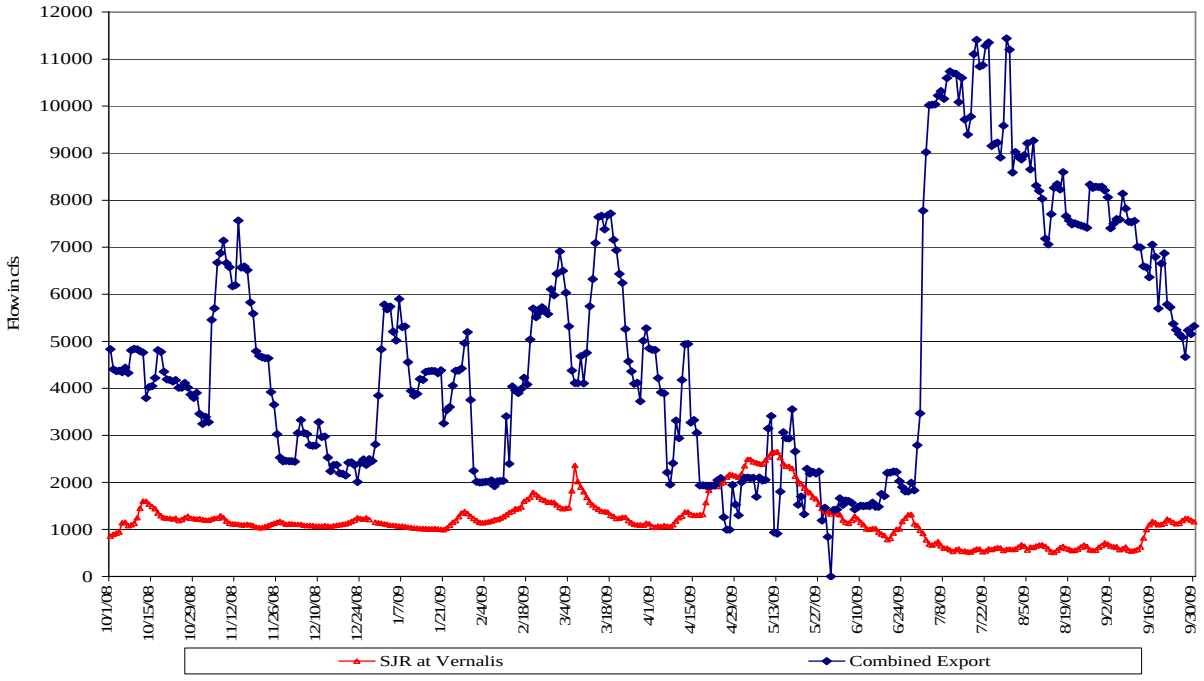
Tuolumne River at La Grange - Provisional Data



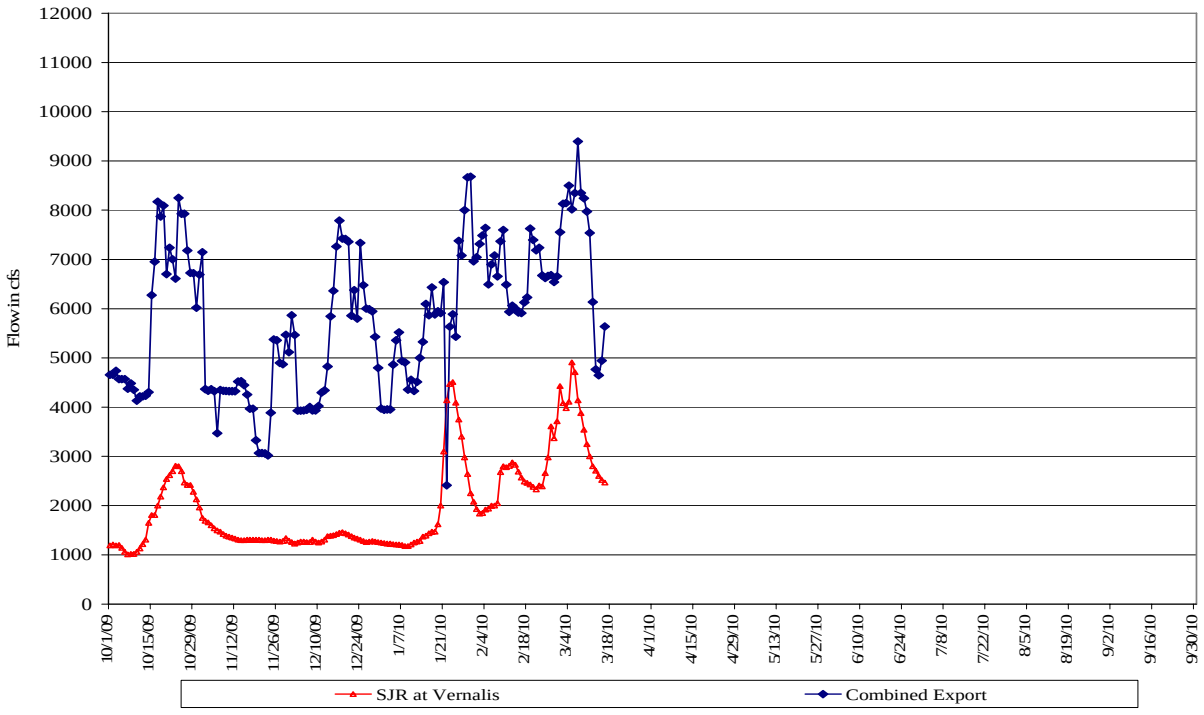

Water Year 2009 San Joaquin Basin - Daily average flow
Flow in cfs
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
10/1/08
10/15/08
10/29/08
11/12/08
11/26/08
12/10/08
12/24/08
1/7/09
1/21/09
2/4/09
2/18/09
3/4/09
3/18/09
4/1/09
4/15/09
4/29/09
5/13/09
5/27/09
6/10/09
6/24/09
7/8/09
7/22/09
8/5/09
8/19/09
9/2/09
9/16/09
9/30/09
SJR nr. Stevinson
Merced nr. Stevinson
Tuolumne at Modesto
Stanislaus at Ripon
SJR at Vernalis


Water Year 2010 San Joaquin Basin - Daily average flow
Flow in cfs
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
10/1/09
10/15/09
10/29/09
11/12/09
11/26/09
12/10/09
12/24/09
1/7/10
1/21/10
2/4/10
2/18/10
3/4/10
3/18/10
4/1/10
4/15/10
4/29/10
5/13/10
5/27/10
6/10/10
6/24/10
7/8/10
7/22/10
8/5/10
8/19/10
9/2/10
9/16/10
9/30/10
SJR nr. Stevinson
Merced nr. Stevinson
Tuolumne at Modesto
Stanislaus at Ripon
SJR at Vernalis

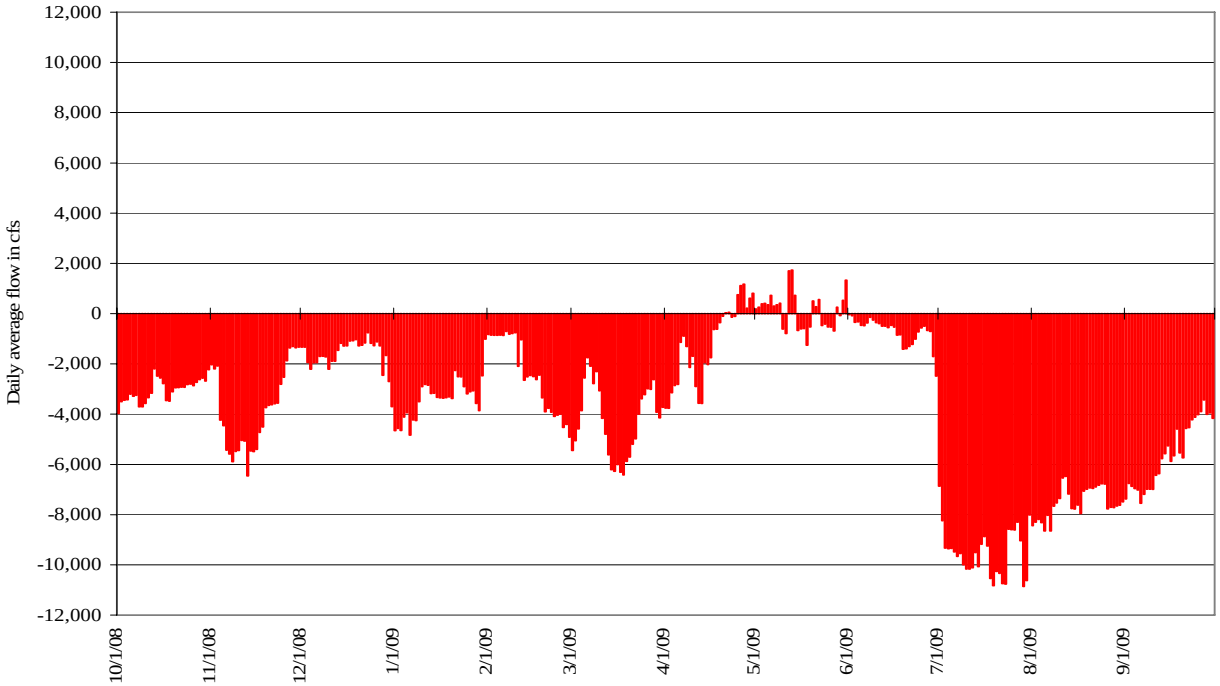
Daily average flow at Vernalis (SJR) and combined CVP/SWP delta export - Water Year 2009



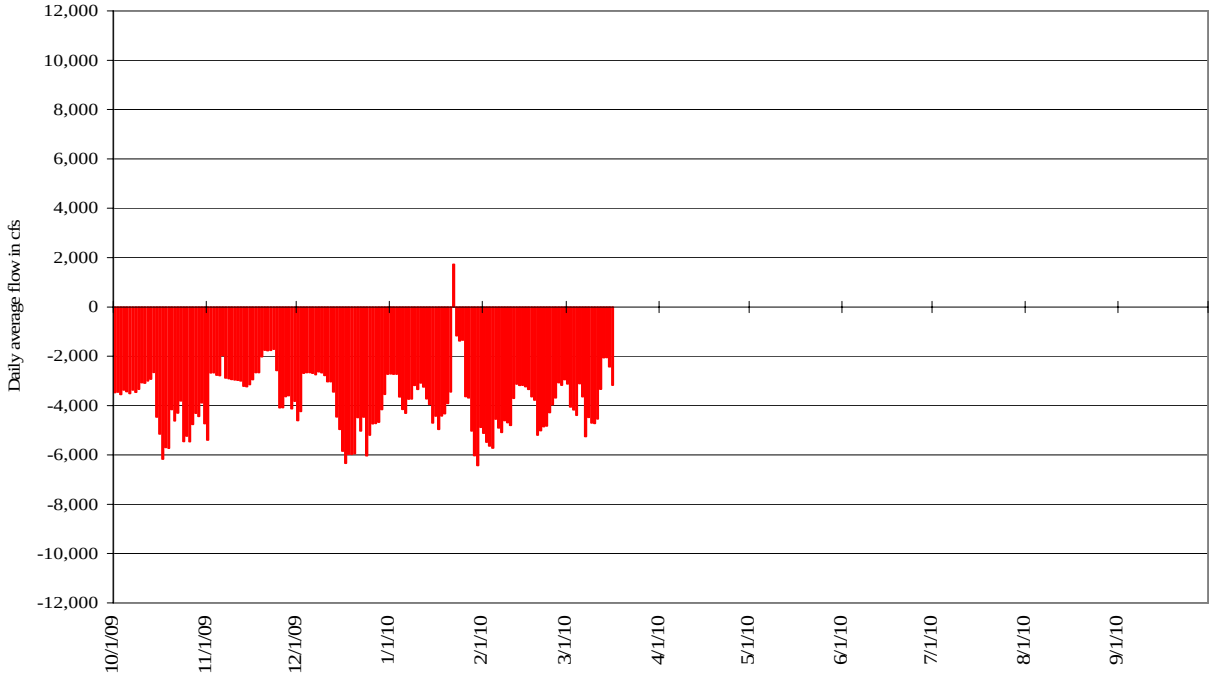
Daily average flow at Vernalis (SJR) and combined CVP/SWP delta export - Water Year 2010

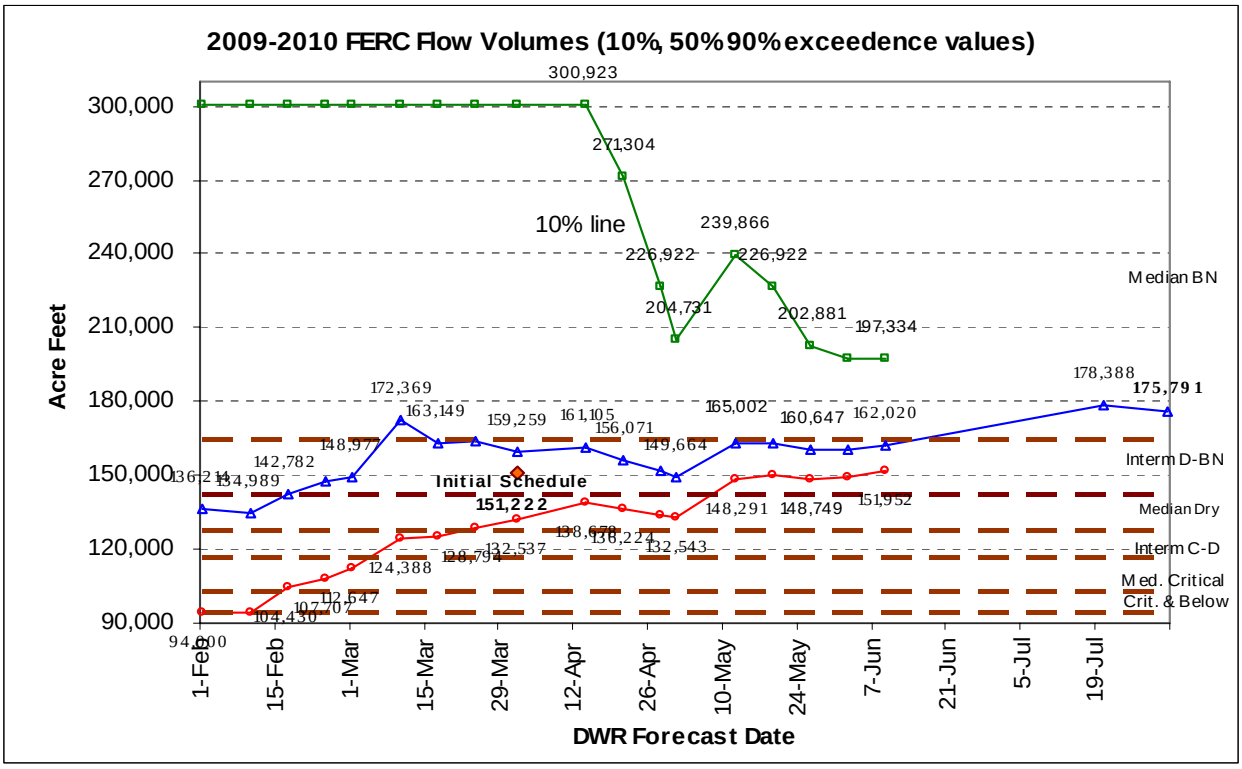


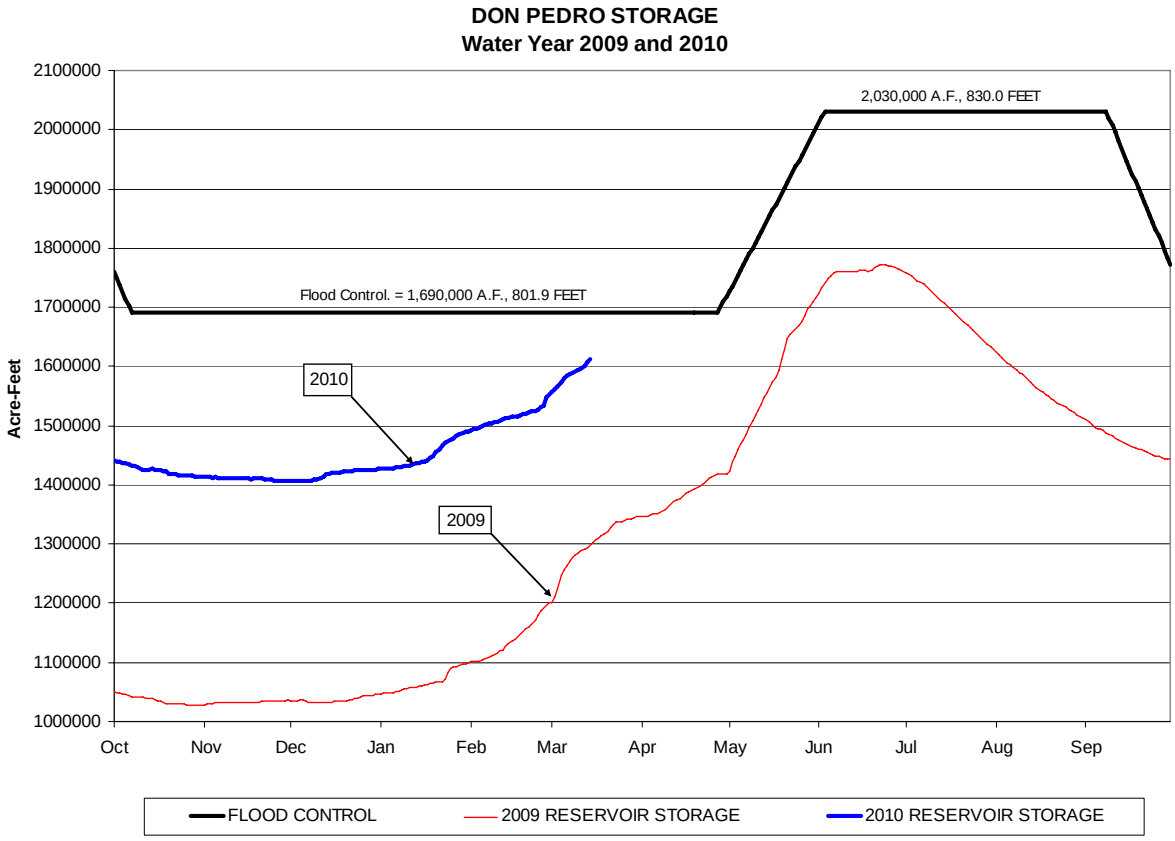
Daily average flow at Vernalis (SJR) minus combined CVP/SWP delta export - Water Year 2009

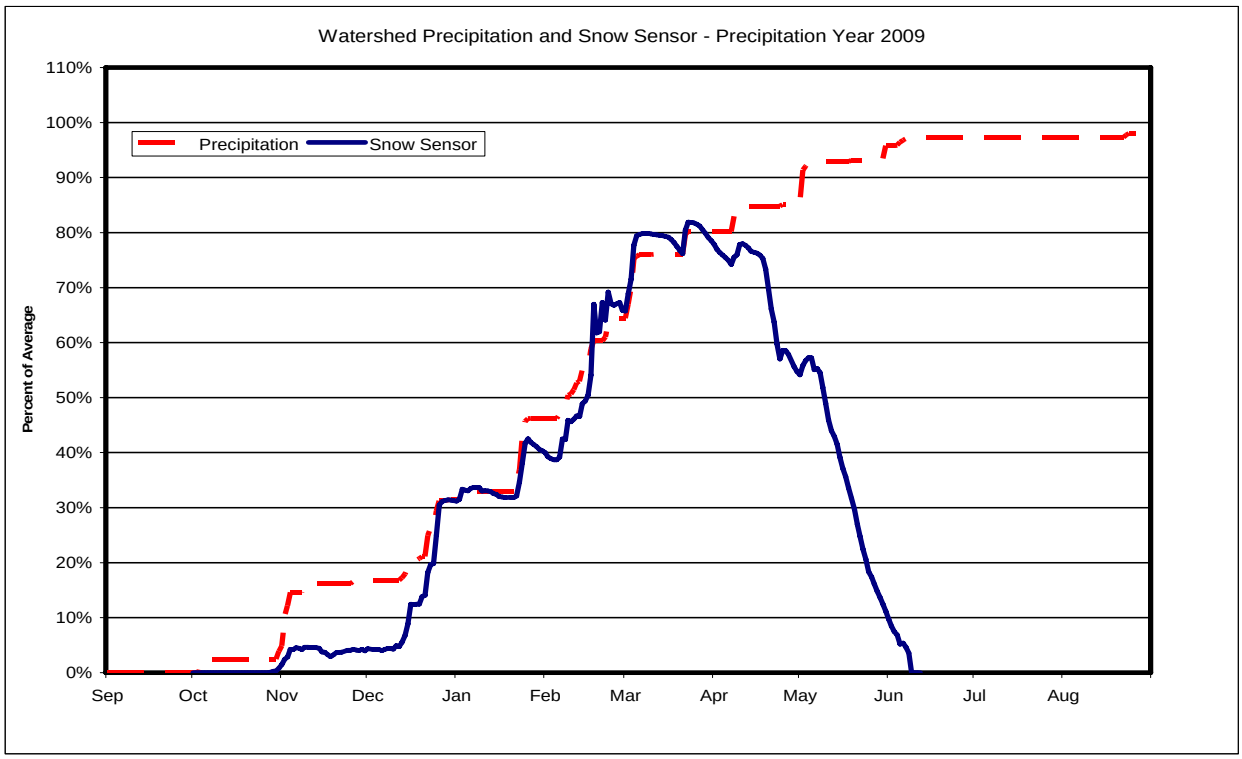


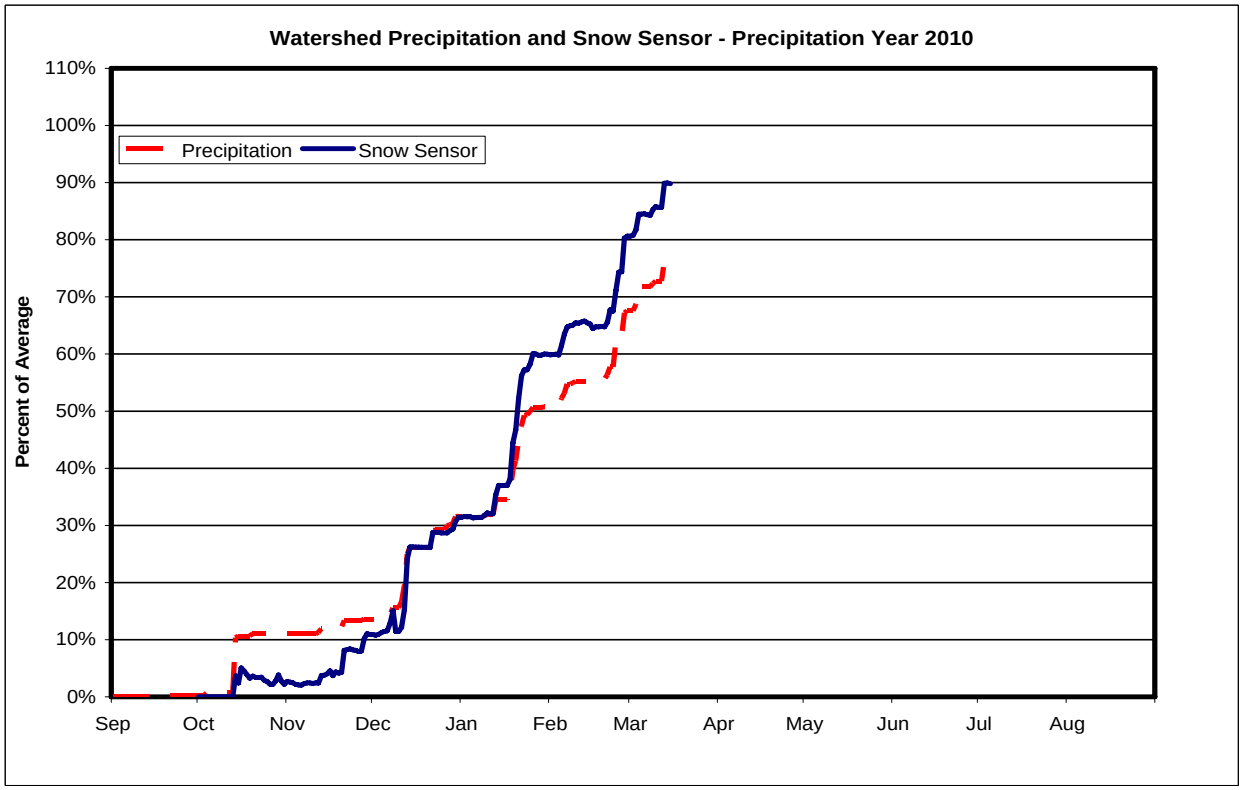
Daily average flow at Vernalis (SJR) minus combined CVP/SWP delta export - Water Year 2010



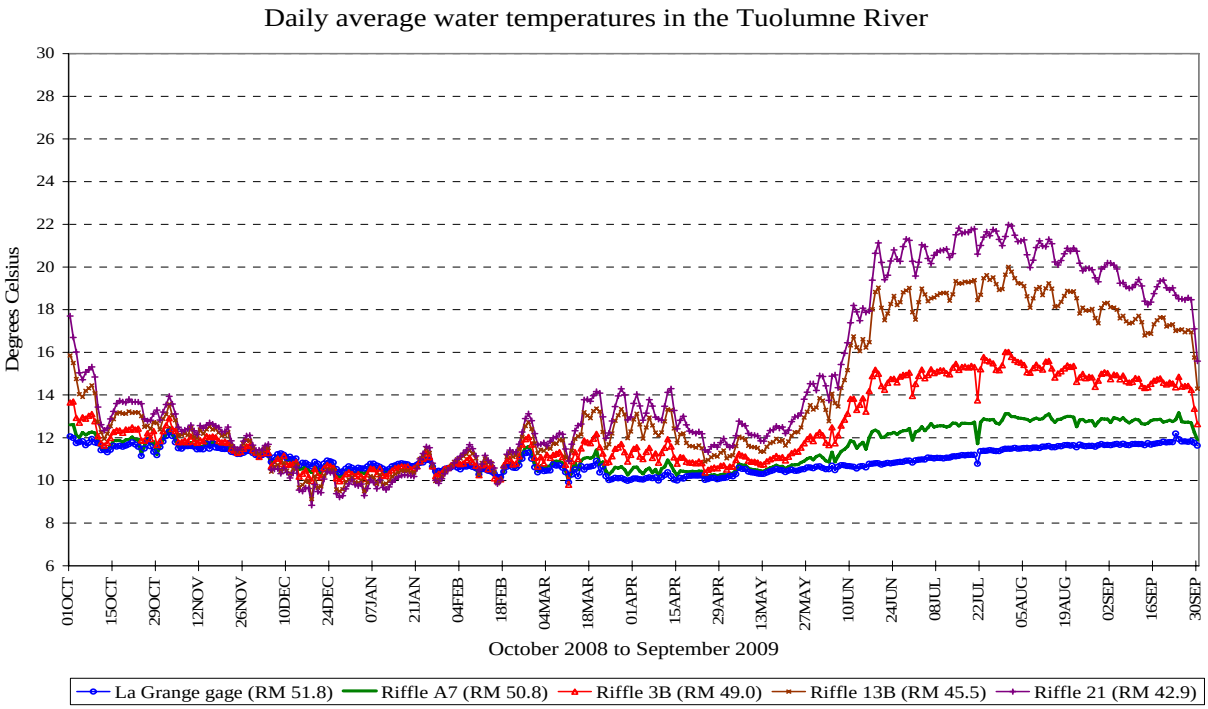

2009-2010 FERC Flow Volumes (10%, 50% 90% exceedence values)
Acre Feet
DWR Forecast Date
10% line
Median BN
Interm D-BN
Median Dry
Interm C-D
Med. Critical
Crit. & Below
Initial Schedule
151,222
300,923
271,304
239,866
226,922
226,922
204,731
202,881
197,334
178,388
175,791
172,369
163,149
159,259
161,105
156,071
165,002
160,647
162,020
149,664
148,977
142,782
136,214
134,989
148,291
148,749
151,952
138,678
138,224
132,543
132,537
126,794
124,388
107,707
102,547
104,430
94,200
300,000
270,000
240,000
210,000
180,000
150,000
120,000
90,000
1-Feb
15-Feb
1-Mar
15-Mar
29-Mar
12-Apr
26-Apr
10-May
24-May
7-Jun
21-Jun
5-Jul
19-Jul

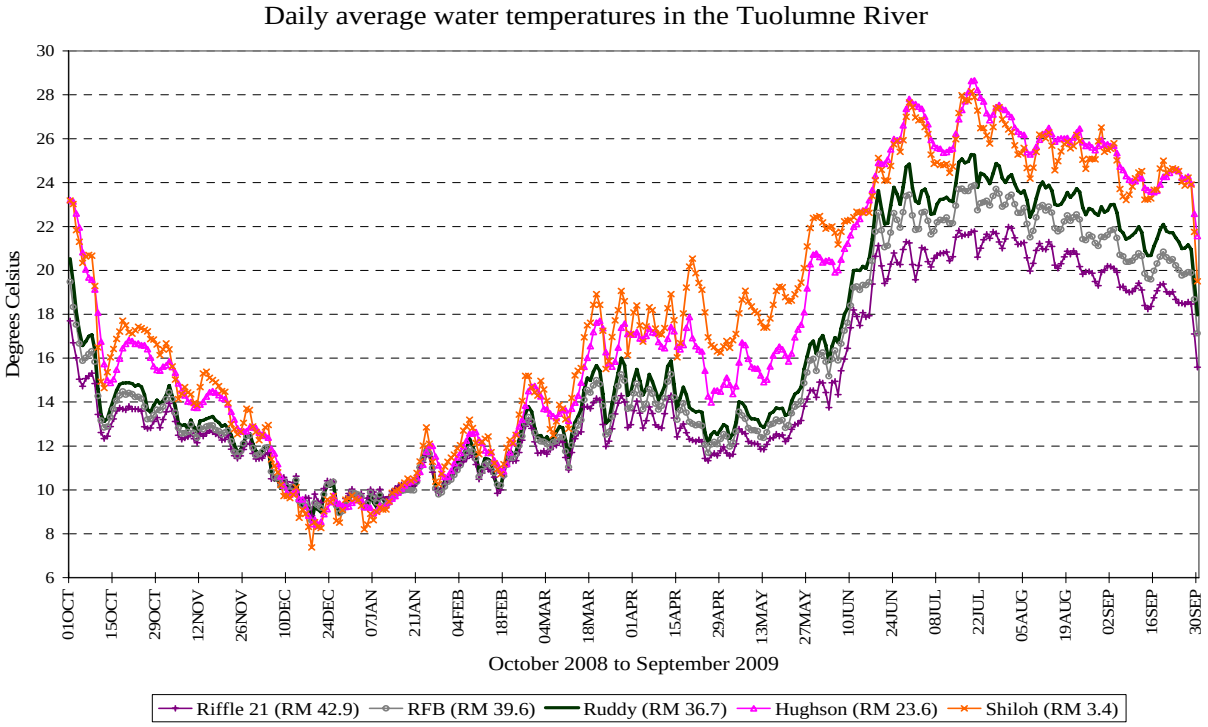

DON PEDRO STORAGE
Water Year 2009 and 2010
Acre-Feet
2,030,000 A.F., 830.0 FEET
Flood Control. = 1,690,000 A.F., 801.9 FEET
2010
2009
2100000
2000000
1900000
1800000
1700000
1600000
1500000
1400000
1300000
1200000
1100000
1000000
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
FLOOD CONTROL
2009 RESERVOIR STORAGE
2010 RESERVOIR STORAGE


Watershed Precipitation and Snow Sensor - Precipitation Year 2009
Precipitation
Snow Sensor
Percent of Average
110%
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug

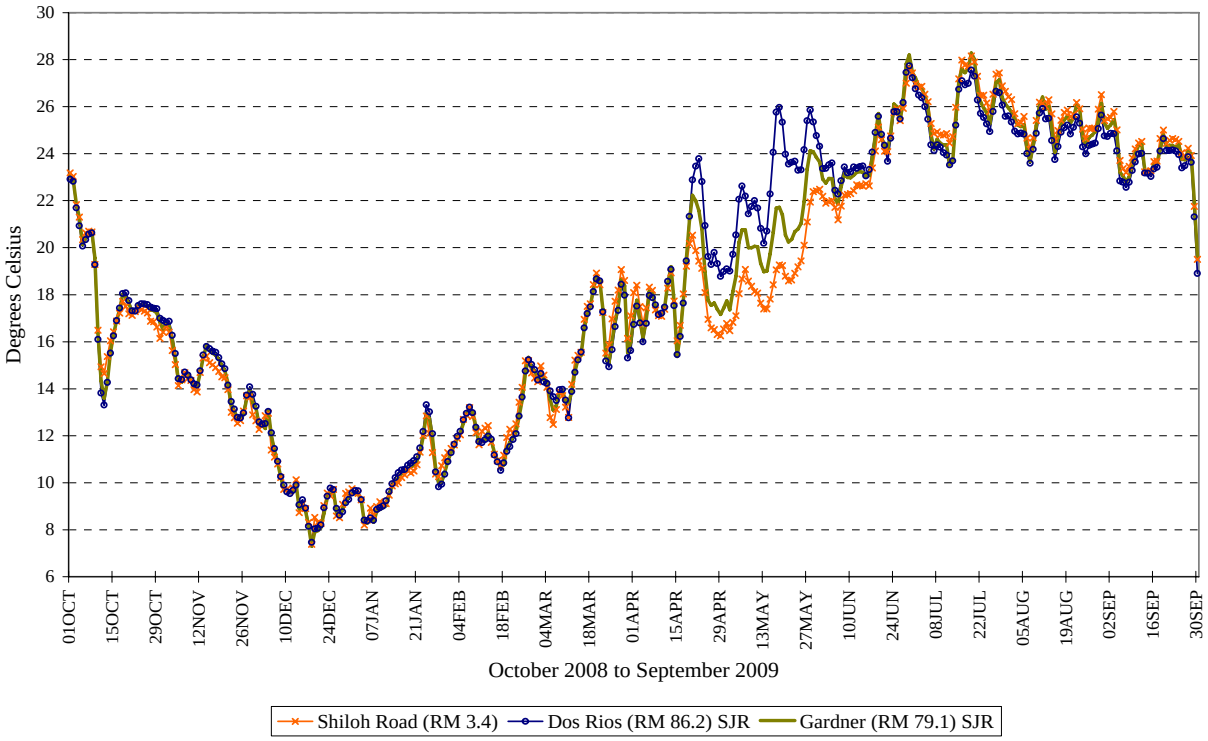

Watershed Precipitation and Snow Sensor - Precipitation Year 2010
Precipitation
Snow Sensor
Percent of Average
110%
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug

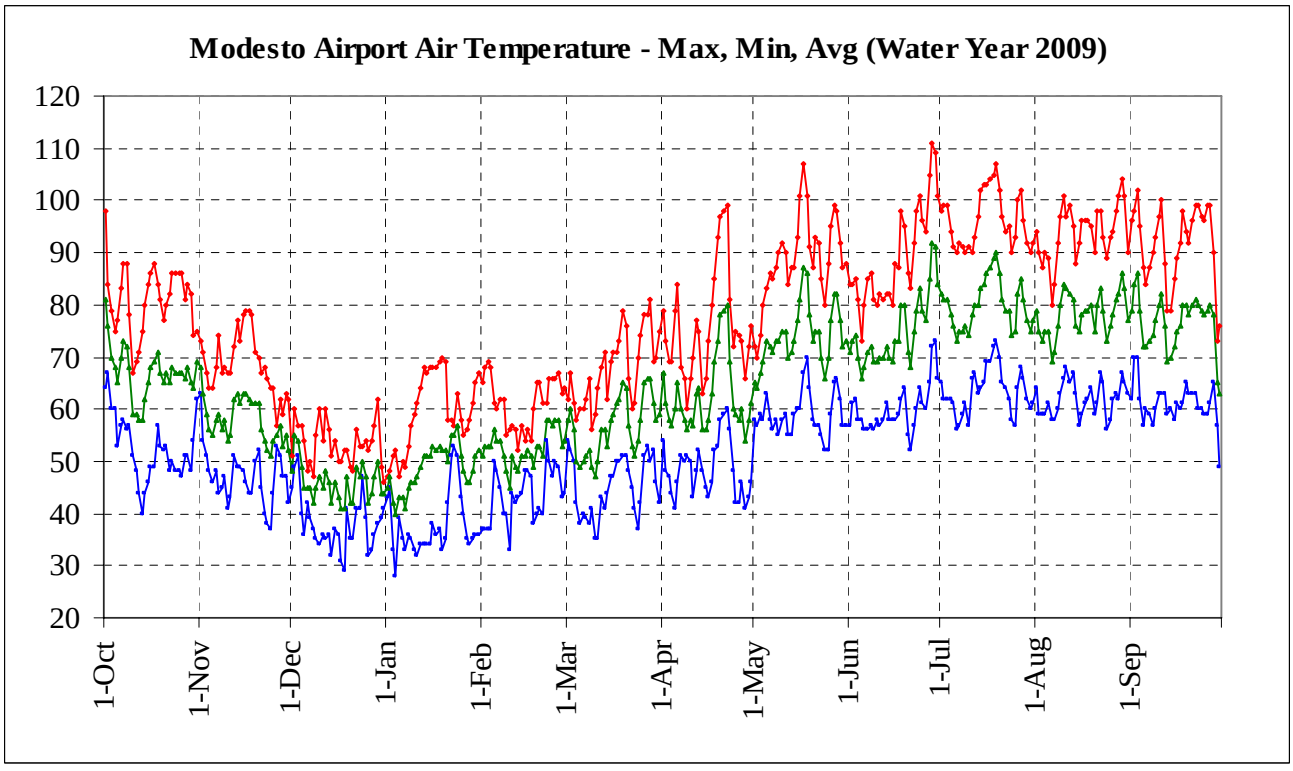
2. Graphs of water temperature and air temperature



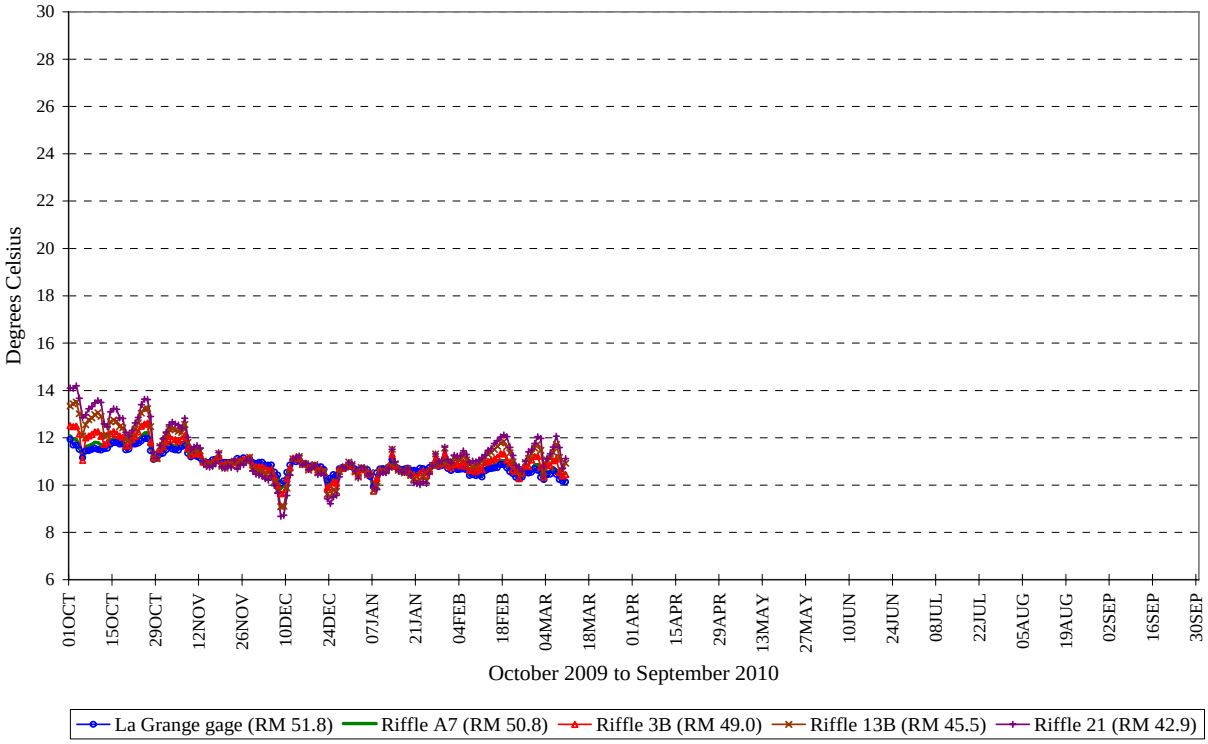


Daily average water temperatures in San Joaquin R. & Tuolumne R. at Shiloh Road

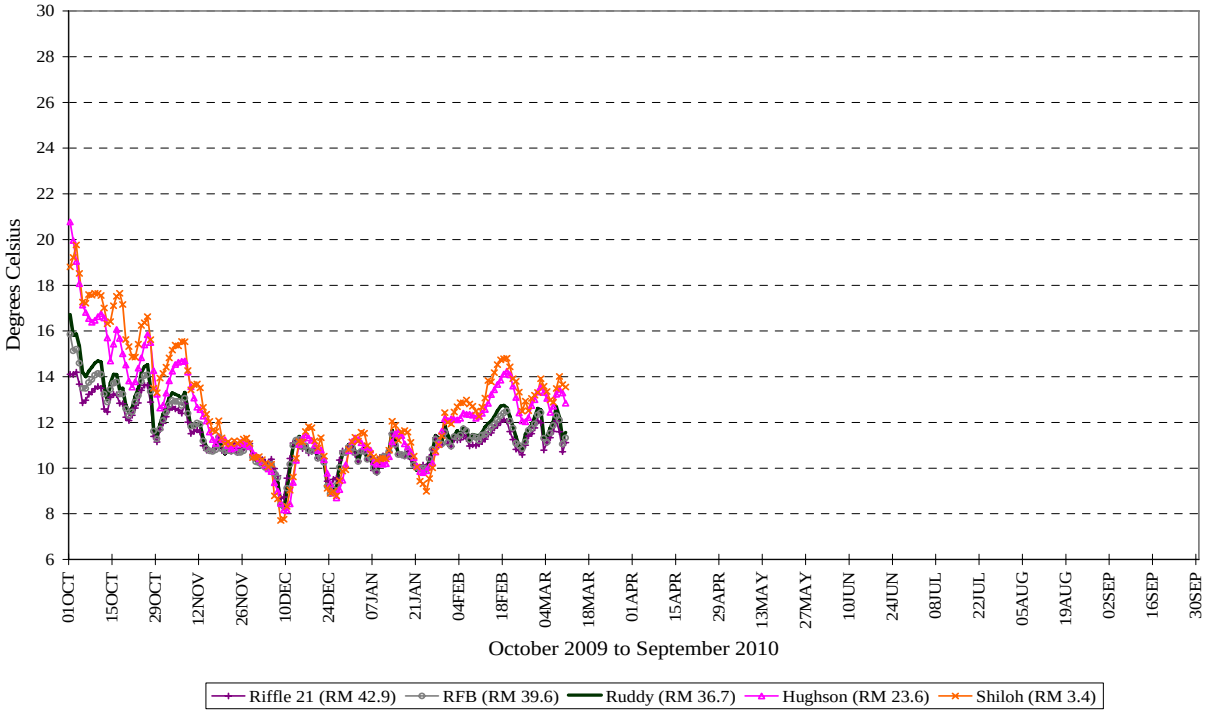




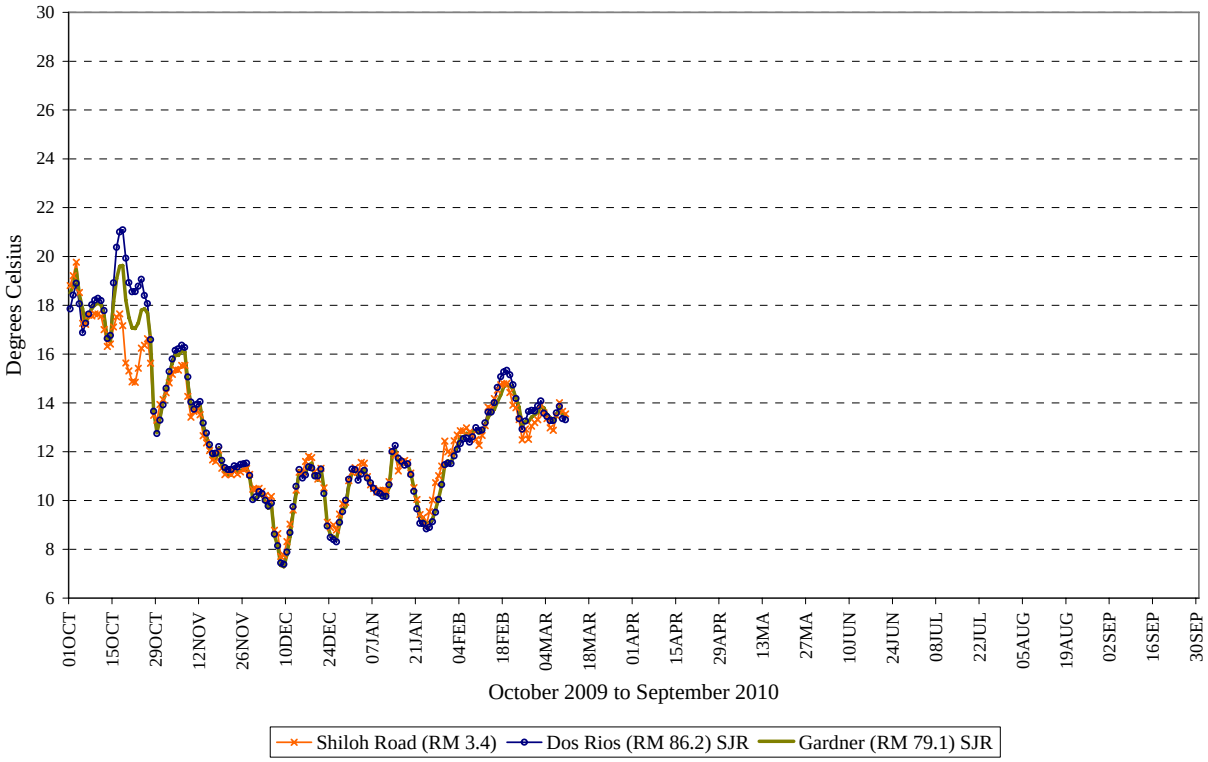
Daily average water temperatures in the Tuolumne River

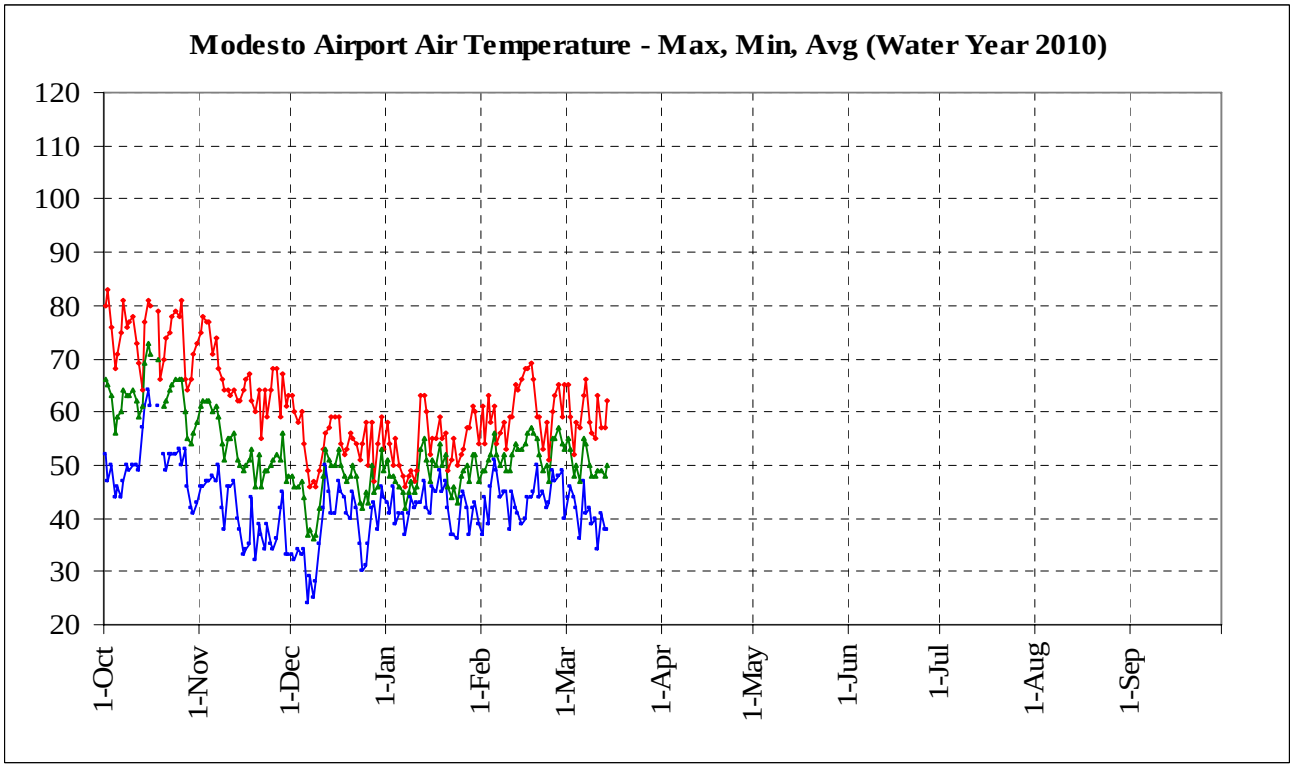


Daily average water temperatures in the Tuolumne River



Daily average water temperatures in San Joaquin R. and Tuolumne R. at Shiloh Road





TURLOCK IRRIGATION DISTRICT
333 EAST CANAL DRIVE
POST OFFICE BOX 949
TURLOCK, CALIFORNIA 95381
(209) 883-8300

Don Pedro Dam and Powerhouse

March 25, 2009

VIA E-MAIL

Tim Heyne
California Dept. of Fish and Game
P.O. Box 10
La Grange, CA 95329

Deborah Giglio
U.S. Fish and Wildlife Service
2800 Cottage Way, W-2605
Sacramento, CA 95825

RE: Project 2299 – Minimum Flow Coordination Process for 2009-2010 Fish Flow Year

Dear Fishery Agency representatives:

The 1996 FERC Order, Amended Article 37, contained a Water Year Classification Index for determining the volume of scheduled stream flows for each fish flow year. The classifications are based on the San Joaquin Basin 60-20-20 Indices for water years. The index has been updated in a continuous fashion based on the Department of Water Resources (DWR) monthly forecasts and updates of those forecasts are provided in Table 1. We are in another below average year so far and as such each update changes the fish flow volume at the 50% and 90% exceedence levels.

TID has again been tracking the forecasts and providing your agencies with corresponding flow volume information in e-mails sent on Feb 23, Feb 27, Mar 18, and Mar 19. The volumes resulting from the Mar 1 forecast were reviewed at the Mar 12 TRTAC meeting. TID also supplied preliminary dry and average scenario daily schedules for initial Vernalis Adaptive Management Program (VAMP) pulse flow schedules that were provided to your agencies in a Mar 19 e-mail from the VAMP Hydrology Coordinator and at the Mar 19 VAMP technical meeting. At that meeting, the selection for the VAMP period timing was initially determined to be from April 22 through May 22, the same as last year. The corresponding start of that period at La Grange would be April 20, 2008 using the customary 2-day lead time for flow to arrive at Vernalis on the San Joaquin River. Consideration could be made to adding to the base flow during the April 15-19 period.

Based on applying the current DWR April-July runoff forecast update of March 17 to the DWR March 1 60-20-20 basin index, the annual minimum Article 37 flow requirements are 125,253 AF (Intermediate Critical–Dry) in the 90% Exceedence case and 163,149 AF (Intermediate Dry-Below Normal) in the 50% Exceedence case. These values are also shown on Table 1 with the respective 60-20-20 index. Those present forecast values for the 50% (average) and 90% (dry) cases for the 2009-2010 Fish Year are shown in Figures 2 through 4 along with the different flow components within each classification. Due to the present dry year, the 50% and 90% levels are considered at present.

Based on the above, two daily schedules are presented as examples (Tables 2 & 3). The schedules have the following features:

1) The base flow and pulse flow amounts are based on those specified for the year types in Article 37.
2) The timing of the spring pulse flow is consistent with the proposed VAMP period.
3) The spring pulse flows are shown here as steady with a rampdown. However a varied pattern with about two peaks as has been used in past years is recommended as coordinated schedules are refined over the next few weeks.
4) Rampdown (transition) flows after VAMP and leading into the June flow are shown.
5) The "interpolation water" volume for these two cases is shown at the bottom of the schedule. Allocating this variable category could be considered in subsequent schedules when there is more information
6) The initial timing of a fall pulse flow is shown as based on a default schedule of October 6 thorough 10 that was established in 1996. The actual timing and pattern could be determined after July if applicable when the final 2008-2009 fish flow year volume is known.

We will need rapid consensus and approval as in 2008 to (1) implement a FERC flow schedule starting April 15 and for the VAMP scheduling process, and (2) for all subsequent schedule adjustments so that any flow modifications can be conducted in a timely manner, including adequate advance notice for the Districts to implement such operations.

If you have any questions, please contact Wes Monier at 209-883-8321.

Sincerely,

Robert M. Nees
Directory of Water Resources and Regulatory Affairs

C: Larry Weis - TID
Allen Short – MID
Michael Carlin - CCSF
Maria Rea - NMFS
FERC Secretary

Table 1

SAN JOAQUIN VALLEY WATER YEAR HYDROLOGIC CLASSIFICATION

602020 INDEX

YEAR	APRIL-JULY RUNOFF (AF) STANISLAUS	TUOLUMNE	MERCED	FRIANT	TOTAL	OCTOBER-MARCH RUNOFF (AF) STANISLAUS	TUOLUMNE	MERCED	FRIANT	TOTAL	602020 INDEX	TUOLUMNE RIVER MINIMUM FLOW REQUIREMENT	San Joaquin Index (not the FERC Index)
Feb 1 Forecast													
Dry	200,000	400,000	180,000	400,000	1,180,000	150,000	305,000	130,000	210,000	795,000	1,279,899	94,000	Critical
Average	500,000	890,000	430,000	910,000	2,730,000	270,000	470,000	220,000	340,000	1,300,000	2,310,899	136,214	Dry
Wet	960,000	1,680,000	900,000	1,730,000	5,270,000	450,000	735,000	380,000	550,000	2,115,000	3,997,899	300,923	Wet
Feb 10 Update													
Dry	210,000	420,000	190,000	430,000	1,250,000	150,000	305,000	130,000	210,000	795,000	1,321,899	94,000	Critical
Average	490,000	870,000	430,000	910,000	2,700,000	270,000	470,000	220,000	340,000	1,300,000	2,292,899	134,989	Dry
Wet	930,000	1,610,000	850,000	1,660,000	5,050,000	450,000	735,000	380,000	550,000	2,115,000	3,865,899	300,923	Wet
Feb 17 Update													
Dry	260,000	540,000	260,000	530,000	1,590,000	150,000	305,000	130,000	210,000	795,000	1,525,899	104,430	Critical
Average	520,000	940,000	470,000	960,000	2,890,000	270,000	470,000	220,000	340,000	1,300,000	2,406,899	142,782	Dry
Wet	940,000	1,630,000	850,000	1,650,000	5,070,000	450,000	735,000	380,000	550,000	2,115,000	3,877,899	300,923	Wet
Feb 24 Update													
Dry	300,000	600,000	300,000	580,000	1,780,000	150,000	305,000	130,000	210,000	795,000	1,639,899	107,707	Critical
Average	540,000	960,000	500,000	990,000	2,990,000	270,000	470,000	220,000	340,000	1,300,000	2,466,899	147,359	Dry
Wet	940,000	1,610,000	840,000	1,620,000	5,010,000	450,000	735,000	380,000	550,000	2,115,000	3,841,899	300,923	Wet
Mar 1 Forecast													
Dry	350,000	670,000	320,000	620,000	1,960,000	230,000	410,000	190,000	285,000	1,115,000	1,811,899	112,652	Critical
Average	560,000	980,000	500,000	980,000	3,020,000	270,000	465,000	225,000	355,000	1,315,000	2,487,899	148,961	Dry
Wet	950,000	1,600,000	850,000	1,570,000	4,970,000	261,304	443,544	218,333	360,063	1,283,245	3,651,548	300,923	Above Normal
Mar 10 Forecast													
Dry	460,000	870,000	390,000	750,000	2,470,000	230,000	410,000	190,000	285,000	1,115,000	2,117,899	124,392	Dry
Average	650,000	1,150,000	550,000	1,060,000	3,410,000	270,000	465,000	225,000	355,000	1,315,000	2,721,899	172,308	Below Normal
Wet	1,000,000	1,700,000	870,000	1,570,000	5,140,000	261,304	443,544	218,333	360,063	1,283,245	3,753,548	300,923	Above Normal
Mar 17 Forecast													
Dry	480,000	880,000	390,000	750,000	2,500,000	230,000	410,000	190,000	285,000	1,115,000	2,135,899	125,253	Dry
Average	640,000	1,130,000	530,000	1,030,000	3,330,000	270,000	465,000	225,000	355,000	1,315,000	2,673,899	163,149	Below Normal
Wet	960,000	1,630,000	820,000	1,490,000	4,900,000	261,304	443,544	218,333	360,063	1,283,245	3,609,548	300,923	Above Normal

TABLE 2

Tuolumne River Flow Schedule

SCHEDULE FOR 2009 - 20010 Fish Flow Year

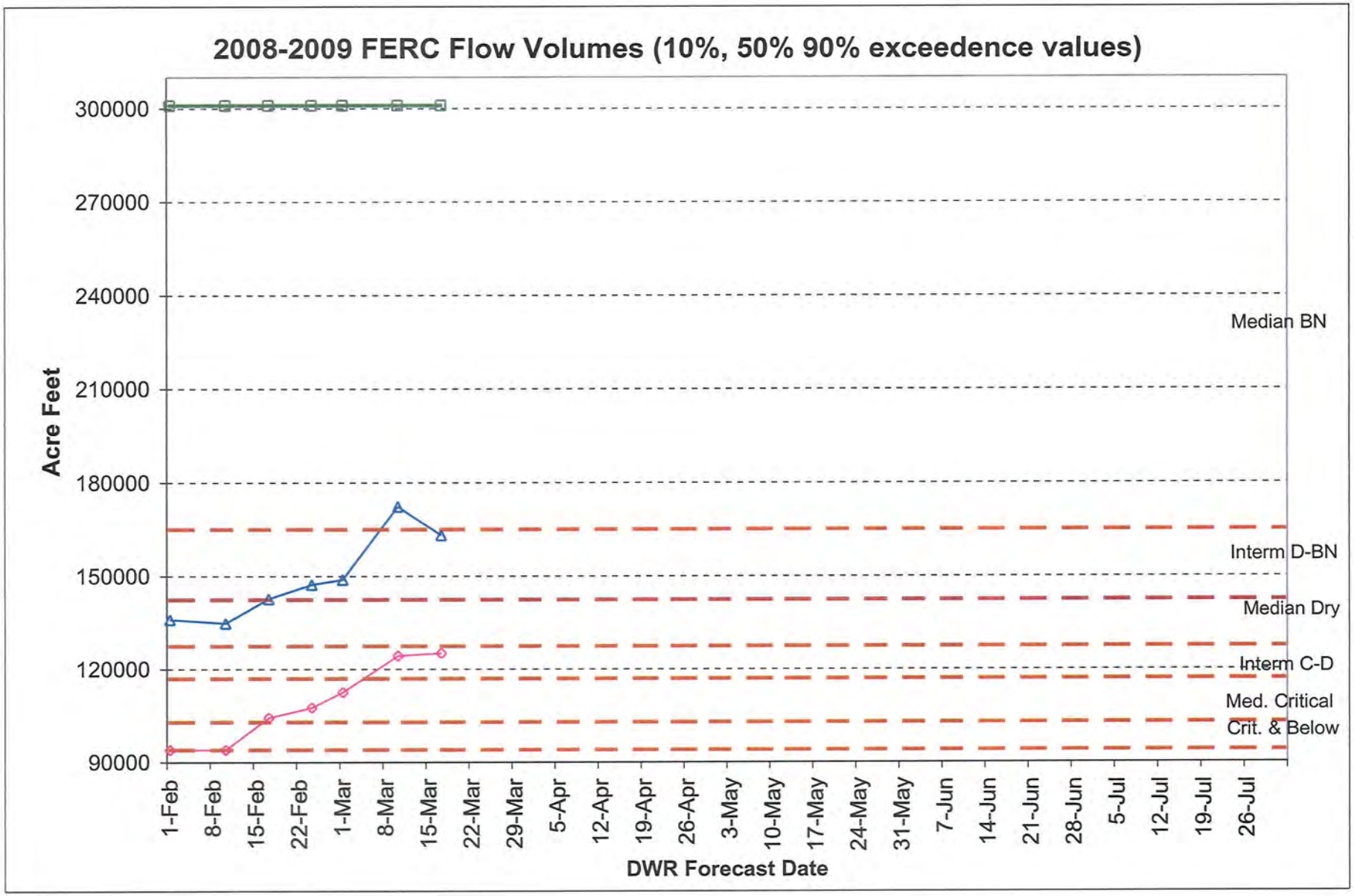
DATE		Number of	Flow for Dry														
			Flow			Pulse Flows			Interpolation Flow			Other Adjusted Flow			Total FERC Flow	
From:	To:	DAYS	CFS	AF	ACCUM. A.F.	CFS	AF	ACCUM. A.F.	CFS	AF	ACCUM. A.F.	CFS	AF	ACCUM. A.F.	CFS	ACCUM. A.F.
15-Apr-2008	15-Apr-2008	1	150	298	298	0	0	0	0	0	0	0	0	0	150	298
16-Apr-2008	16-Apr-2008	1	150	298	595	0	0	0	0	0	0	0	0	0	150	595
17-Apr-2008	17-Apr-2008	1	150	298	893	0	0	0	0	0	0	0	0	0	150	893
18-Apr-2008	18-Apr-2008	1	150	298	1,190	0	0	0	0	0	0	0	0	0	150	1,190
19-Apr-2008	19-Apr-2008	1	150	298	1,488	498	988	988	0	0	0	0	0	0	648	2,476
20-Apr-2008	20-Apr-2008	1	150	298	1,785	498	988	1,976	0	0	0	0	0	0	648	3,762
21-Apr-2008	21-Apr-2008	1	150	298	2,083	498	988	2,965	0	0	0	0	0	0	648	5,047
22-Apr-2008	22-Apr-2008	1	150	298	2,380	498	988	3,953	0	0	0	0	0	0	648	6,333
23-Apr-2008	23-Apr-2008	1	150	298	2,678	498	988	4,941	0	0	0	0	0	0	648	7,619
24-Apr-2008	24-Apr-2008	1	150	298	2,975	498	988	5,929	0	0	0	0	0	0	648	8,905
25-Apr-2008	25-Apr-2008	1	150	298	3,273	498	988	6,918	0	0	0	0	0	0	648	10,190
26-Apr-2008	26-Apr-2008	1	150	298	3,570	498	988	7,906	0	0	0	0	0	0	648	11,476
27-Apr-2008	27-Apr-2008	1	150	298	3,868	498	988	8,894	0	0	0	0	0	0	648	12,762
28-Apr-2008	28-Apr-2008	1	150	298	4,165	498	988	9,882	0	0	0	0	0	0	648	14,048
29-Apr-2008	29-Apr-2008	1	150	298	4,463	498	988	10,871	0	0	0	0	0	0	648	15,333
30-Apr-2008	30-Apr-2008	1	150	298	4,760	498	988	11,859	0	0	0	0	0	0	648	16,619
01-May-2008	01-May-2008	1	150	298	5,058	498	988	12,847	0	0	0	0	0	0	648	17,905
02-May-2008	02-May-2008	1	150	298	5,355	498	988	13,835	0	0	0	0	0	0	648	19,191
03-May-2008	03-May-2008	1	150	298	5,653	498	988	14,824	0	0	0	0	0	0	648	20,477
04-May-2008	04-May-2008	1	150	298	5,950	498	988	15,812	0	0	0	0	0	0	648	21,762
05-May-2008	05-May-2008	1	150	298	6,248	498	988	16,800	0	0	0	0	0	0	648	23,048
06-May-2008	06-May-2008	1	150	298	6,545	498	988	17,788	0	0	0	0	0	0	648	24,334
07-May-2008	07-May-2008	1	150	298	6,843	498	988	18,777	0	0	0	0	0	0	648	25,620
08-May-2008	08-May-2008	1	150	298	7,140	498	988	19,765	0	0	0	0	0	0	648	26,905
09-May-2008	09-May-2008	1	150	298	7,438	498	988	20,753	0	0	0	0	0	0	648	28,191
10-May-2008	10-May-2008	1	150	298	7,736	498	988	21,741	0	0	0	0	0	0	648	29,477
11-May-2008	11-May-2008	1	150	298	8,033	498	988	22,730	0	0	0	0	0	0	648	30,763
12-May-2008	12-May-2008	1	150	298	8,331	498	988	23,718	0	0	0	0	0	0	648	32,048
13-May-2008	13-May-2008	1	150	298	8,628	498	988	24,706	0	0	0	0	0	0	648	33,334
14-May-2008	14-May-2008	1	150	298	8,926	498	988	25,694	0	0	0	0	0	0	648	34,620
15-May-2008	15-May-2008	1	150	298	9,223	498	988	26,683	0	0	0	0	0	0	648	35,906
16-May-2008	16-May-2008	1	150	298	9,521	498	988	27,671	0	0	0	0	0	0	648	37,191
17-May-2008	17-May-2008	1	150	298	9,818	498	988	28,659	0	0	0	0	0	0	648	38,477
18-May-2008	18-May-2008	1	150	298	10,116	498	988	29,647	0	0	0	0	0	0	648	39,763
19-May-2008	19-May-2008	1	150	298	10,413	498	988	30,636	0	0	0	0	0	0	648	41,049
20-May-2008	20-May-2008	1	150	298	10,711	400	793	31,429	0	0	0	0	0	0	550	42,140
21-May-2008	21-May-2008	1	150	298	11,008	300	595	32,024	0	0	0	0	0	0	450	43,032
22-May-2008	22-May-2008	1	150	298	11,306	200	397	32,421	0	0	0	0	0	0	350	43,726
23-May-2008	23-May-2008	1	150	298	11,603	100	198	32,619	0	0	0	0	0	0	250	44,222
24-May-2008	24-May-2008	1	150	298	11,901	0	0	32,619	0	0	0	0	0	0	150	44,520
25-May-2008	25-May-2008	1	150	298	12,198	0	0	32,619	0	0	0	0	0	0	150	44,817
26-May-2008	26-May-2008	1	150	298	12,496	0	0	32,619	0	0	0	0	0	0	150	45,115
27-May-2008	27-May-2008	1	150	298	12,793	0	0	32,619	0	0	0	0	0	0	150	45,412
28-May-2008	28-May-2008	1	150	298	13,091	0	0	32,619	0	0	0	0	0	0	150	45,710
29-May-2008	29-May-2008	1	150	298	13,388	0	0	32,619	0	0	0	0	0	0	150	46,007
30-May-2008	30-May-2008	1	150	298	13,686	0	0	32,619	0	0	0	0	0	0	150	46,305
31-May-2008	31-May-2008	1	150	298	13,983	0	0	32,619	0	0	0	-35	(69)	(69)	115	46,533
01-Jun-2008	01-Jun-2008	1	50	99	14,083	0	0	32,619	0	0	0	35	69	0	85	46,702
02-Jun-2008	02-Jun-2008	1	50	99	14,182	0	0	32,619	0	0	0	0	0	0	50	46,801
03-Jun-2008	03-Jun-2008	1	50	99	14,281	0	0	32,619	0	0	0	0	0	0	50	46,900
04-Jun-2008	04-Jun-2008	1	50	99	14,380	0	0	32,619	0	0	0	0	0	0	50	46,999
05-Jun-2008	30-Jun-2008	26	50	2,579	16,959	0	0	32,619	0	0	0	0	0	0	50	49,578
01-Jul-2008	31-Jul-2008	31	50	3,074	20,033	0	0	32,619	0	0	0	0	0	0	50	52,652
01-Aug-2008	31-Aug-2008	31	50	3,074	23,107	0	0	32,619	0	0	0	0	0	0	50	55,726
01-Sep-2008	10-Sep-2008	10	50	992	24,099	0	0	32,619	0	0	0	0	0	0	50	56,718
11-Sep-2008	13-Sep-2008	3	50	298	24,397	0	0	32,619	0	0	0	0	0	0	50	57,016
14-Sep-2008	30-Sep-2008	17	50	1,686	26,083	0	0	32,619	0	0	0	0	0	0	50	58,702
01-Oct-2008	05-Oct-2008	5	150	1,488	27,570	0	0	32,619	0	0	0	0	0	0	150	60,189
06-Oct-2008	10-Oct-2008	5	150	1,488	29,058	0	0	32,619	0	0	0	0	0	0	150	61,677
11-Oct-2008	24-Oct-2008	14	150	4,165	33,223	0	0	32,619	0	0	0	0	0	0	150	65,842
25-Oct-2008	26-Oct-2008	2	150	595	33,818	0	0	32,619		0	0	0	0	0	150	66,437
27-Oct-2008	27-Oct-2008	1	150	298	34,116	0	0	32,619	0	0	0	0	0	0	150	66,735
28-Oct-2008	28-Oct-2008	1	150	298	34,413	0	0	32,619	0	0	0	0	0	0	150	67,032
29-Oct-2008	31-Oct-2008	3	150	893	35,306	0	0	32,619	0	0	0	0	0	0	150	67,925
01-Nov-2008	16-Nov-2008	16	150	4,760	40,066	0	0	32,619	0	0	0	0	0	0	150	72,685
17-Nov-2008	30-Nov-2008	14	150	4,165	44,231	0	0	32,619	0	0	0	0	0	0	150	76,850
01-Dec-2008	31-Dec-2008	31	150	9,223	53,455	0	0	32,619	0	0	0	0	0	0	150	86,074
01-Jan-2009	31-Jan-2009	31	150	9,223	62,678	0	0	32,619	0	0	0	0	0	0	150	95,297
01-Feb-2009	28-Feb-2009	28	150	8,331	71,008	0	0	32,619	0	0	0	0	0	0	150	103,627
01-Mar-2009	31-Mar-2009	31	150	9,223	80,231	0	0	32,619	0	0	0	0	0	0	150	112,850
01-Apr-2009	14-Apr-2009	14	150	4,165	84,397	0	0	32,619	0	0	0	0	0	0	150	117,016
No. of days		365	(April 15 through April 14)								8,237				Total =	125,253

TABLE 3

Tuolumne River Flow Schedule

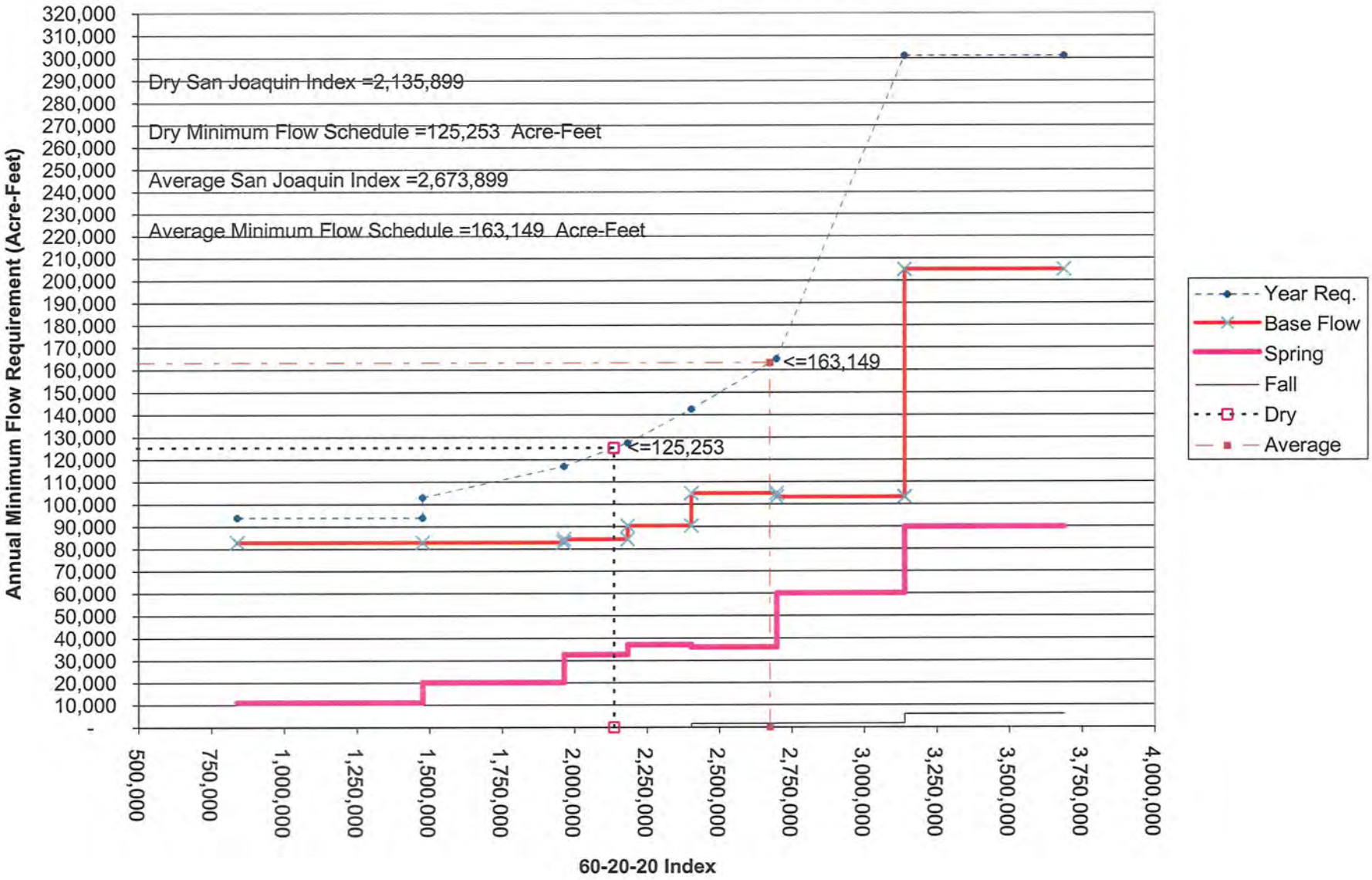
SCHEDULE FOR 2009 - 20010 Fish Flow Year

DATE		Number of	Flow for Average														
			Flow			Pulse Flows			Interpolation Flow			Other Adjusted Flow			Total FERC Flow	
From:	To:	DAYS	CFS	AF	ACCUM. A.F.	CFS	AF	ACCUM. A.F.	CFS	AF	ACCUM. A.F.	CFS	AF	ACCUM. A.F.	CFS	ACCUM. A.F.
15-Apr-2008	15-Apr-2008	1	180	357	357	0	0	0	0	0	0	0	0	0	180	357
16-Apr-2008	16-Apr-2008	1	180	357	714	0	0	0	0	0	0	0	0	0	180	714
17-Apr-2008	17-Apr-2008	1	180	357	1,071	0	0	0	0	0	0	0	0	0	180	1,071
18-Apr-2008	18-Apr-2008	1	180	357	1,428	0	0	0	0	0	0	0	0	0	180	1,428
19-Apr-2008	19-Apr-2009	1	180	357	1,785	513	1,018	1,018	0	0	0	0	0	0	693	2,803
20-Apr-2008	20-Apr-2008	1	180	357	2,142	513	1,018	2,036	0	0	0	0	0	0	693	4,178
21-Apr-2008	21-Apr-2008	1	180	357	2,499	513	1,018	3,054	0	0	0	0	0	0	693	5,553
22-Apr-2008	22-Apr-2008	1	180	357	2,856	513	1,018	4,072	0	0	0	0	0	0	693	6,928
23-Apr-2008	23-Apr-2008	1	180	357	3,213	513	1,018	5,090	0	0	0	0	0	0	693	8,303
24-Apr-2008	24-Apr-2008	1	180	357	3,570	513	1,018	6,108	0	0	0	0	0	0	693	9,678
25-Apr-2008	25-Apr-2008	1	180	357	3,927	513	1,018	7,126	0	0	0	0	0	0	693	11,053
26-Apr-2008	26-Apr-2008	1	180	357	4,284	513	1,018	8,144	0	0	0	0	0	0	693	12,428
27-Apr-2008	27-Apr-2008	1	180	357	4,641	513	1,018	9,162	0	0	0	0	0	0	693	13,803
28-Apr-2008	28-Apr-2008	1	180	357	4,998	513	1,018	10,179	0	0	0	0	0	0	693	15,178
29-Apr-2008	29-Apr-2008	1	180	357	5,355	513	1,018	11,197	0	0	0	0	0	0	693	16,553
30-Apr-2008	30-Apr-2008	1	180	357	5,712	513	1,018	12,215	0	0	0	0	0	0	693	17,928
01-May-2008	01-May-2008	1	180	357	6,069	513	1,018	13,233	0	0	0	0	0	0	693	19,303
02-May-2008	02-May-2008	1	180	357	6,426	513	1,018	14,251	0	0	0	0	0	0	693	20,678
03-May-2008	03-May-2008	1	180	357	6,783	513	1,018	15,269	0	0	0	0	0	0	693	22,053
04-May-2008	04-May-2008	1	180	357	7,140	513	1,018	16,287	0	0	0	0	0	0	693	23,428
05-May-2008	05-May-2008	1	180	357	7,498	513	1,018	17,305	0	0	0	0	0	0	693	24,803
06-May-2008	06-May-2008	1	180	357	7,855	513	1,018	18,323	0	0	0	0	0	0	693	26,178
07-May-2008	07-May-2008	1	180	357	8,212	513	1,018	19,341	0	0	0	0	0	0	693	27,553
08-May-2008	08-May-2008	1	180	357	8,569	513	1,018	20,359	0	0	0	0	0	0	693	28,928
09-May-2008	09-May-2008	1	180	357	8,926	513	1,018	21,377	0	0	0	0	0	0	693	30,303
10-May-2008	10-May-2008	1	180	357	9,283	513	1,018	22,395	0	0	0	0	0	0	693	31,677
11-May-2008	11-May-2008	1	180	357	9,640	513	1,018	23,413	0	0	0	0	0	0	693	33,052
12-May-2008	12-May-2008	1	180	357	9,997	513	1,018	24,431	0	0	0	0	0	0	693	34,427
13-May-2008	13-May-2008	1	180	357	10,354	513	1,018	25,449	0	0	0	0	0	0	693	35,802
14-May-2008	14-May-2008	1	180	357	10,711	513	1,018	26,467	0	0	0	0	0	0	693	37,177
15-May-2008	15-May-2008	1	180	357	11,068	513	1,018	27,485	0	0	0	0	0	0	693	38,552
16-May-2008	16-May-2008	1	180	357	11,425	513	1,018	28,503	0	0	0	0	0	0	693	39,927
17-May-2008	17-May-2008	1	180	357	11,782	513	1,018	29,520	0	0	0	0	0	0	693	41,302
18-May-2008	18-May-2008	1	180	357	12,139	513	1,018	30,538	0	0	0	0	0	0	693	42,677
19-May-2008	19-May-2008	1	180	357	12,496	513	1,018	31,556	0	0	0	0	0	0	693	44,052
20-May-2008	20-May-2008	1	180	357	12,853	650	1,289	32,846	0	0	0	0	0	0	830	45,699
21-May-2008	21-May-2008	1	180	357	13,210	500	992	33,837	0	0	0	0	0	0	680	47,047
22-May-2008	22-May-2008	1	180	357	13,567	400	793	34,631	0	0	0	0	0	0	580	48,198
23-May-2008	23-May-2008	1	180	357	13,924	300	595	35,226	0	0	0	0	0	0	480	49,150
24-May-2008	24-May-2008	1	180	357	14,281	200	397	35,622	0	0	0	0	0	0	380	49,903
25-May-2008	25-May-2008	1	180	357	14,638	100	198	35,821	0	0	0	0	0	0	280	50,459
26-May-2008	26-May-2008	1	180	357	14,995	50	99	35,920	0	0	0	0	0	0	230	50,915
27-May-2008	27-May-2008	1	180	357	15,352	0	0	35,920	0	0	0	0	0	0	180	51,272
28-May-2008	28-May-2008	1	180	357	15,709	0	0	35,920	0	0	0	0	0	0	180	51,629
29-May-2008	29-May-2008	1	180	357	16,066	0	0	35,920	0	0	0	0	0	0	180	51,986
30-May-2008	30-May-2008	1	180	357	16,423	0	0	35,920	0	0	0	0	0	0	180	52,343
31-May-2008	31-May-2008	1	180	357	16,780	0	0	35,920	0	0	0	-35	(69)	(69)	145	52,631
01-Jun-2008	01-Jun-2008	1	75	149	16,929	0	0	35,920	0	0	0	35	69	0	110	52,849
02-Jun-2008	02-Jun-2008	1	75	149	17,078	0	0	35,920	0	0	0	0	0	0	75	52,998
03-Jun-2008	03-Jun-2009	1	75	149	17,226	0	0	35,920	0	0	0	0	0	0	75	53,146
04-Jun-2008	04-Jun-2008	1	75	149	17,375	0	0	35,920	0	0	0	0	0	0	75	53,295
05-Jun-2008	30-Jun-2008	26	75	3,868	21,243	0	0	35,920	0	0	0	0	0	0	75	57,163
01-Jul-2008	31-Jul-2008	31	75	4,612	25,855	0	0	35,920	0	0	0	0	0	0	75	61,775
01-Aug-2008	31-Aug-2008	31	75	4,612	30,466	0	0	35,920	0	0	0	0	0	0	75	66,386
01-Sep-2008	10-Sep-2008	10	75	1,488	31,954	0	0	35,920	0	0	0	0	0	0	75	67,874
11-Sep-2008	13-Sep-2008	3	75	446	32,400	0	0	35,920	0	0	0	0	0	0	75	68,320
14-Sep-2008	30-Sep-2008	17	75	2,529	34,929	0	0	35,920	0	0	0	0	0	0	75	70,849
01-Oct-2008	05-Oct-2008	5	180	1,785	36,714	0	0	35,920	0	0	0	0	0	0	180	72,634
06-Oct-2008	10-Oct-2008	5	180	1,785	38,499	169	1,676	37,596	0	0	0	0	0	0	349	76,095
11-Oct-2008	24-Oct-2008	14	180	4,998	43,498	0	0	37,596	0	0	0	0	0	0	180	81,094
25-Oct-2008	26-Oct-2008	2	180	714	44,212	0	0	37,596	0	0	0	0	0	0	180	81,808
27-Oct-2008	27-Oct-2008	1	180	357	44,569	0	0	37,596	0	0	0	0	0	0	180	82,165
28-Oct-2008	28-Oct-2008	1	180	357	44,926	0	0	37,596	0	0	0	0	0	0	180	82,522
29-Oct-2008	31-Oct-2008	3	180	1,071	45,997	0	0	37,596	0	0	0	0	0	0	180	83,593
01-Nov-2008	16-Nov-2008	16	180	5,712	51,709	0	0	37,596	0	0	0	0	0	0	180	89,305
17-Nov-2008	30-Nov-2008	14	180	4,998	56,707	0	0	37,596	0	0	0	0	0	0	180	94,303
01-Dec-2008	31-Dec-2008	31	180	11,068	67,775	0	0	37,596	0	0	0	0	0	0	180	105,371
01-Jan-2009	31-Jan-2009	31	180	11,068	78,843	0	0	37,596	0	0	0	0	0	0	180	116,439
01-Feb-2009	28-Feb-2009	28	180	9,997	88,840	0	0	37,596	0	0	0	0	0	0	180	126,436
01-Mar-2009	31-Mar-2009	31	180	11,068	99,907	0	0	37,596	0	0	0	0	0	0	180	137,503
01-Apr-2009	14-Apr-2009	14	180	4,998	104,906	0	0	37,596	0	0	0	0	0	0	180	142,502
No. of days		365	(April 15 through April 14)								20,647				Total =	163,149


2008-2009 FERC Flow Volumes (10%, 50% 90% exceedence values)
Acre Feet
300000
270000
240000
210000
180000
150000
120000
90000
Median BN
Interm D-BN
Median Dry
Interm C-D
Med. Critical
Crit. & Below
1-Feb
8-Feb
15-Feb
22-Feb
1-Mar
8-Mar
15-Mar
22-Mar
29-Mar
5-Apr
12-Apr
19-Apr
26-Apr
3-May
10-May
17-May
24-May
31-May
7-Jun
14-Jun
21-Jun
28-Jun
5-Jul
12-Jul
19-Jul
26-Jul
DWR Forecast Date

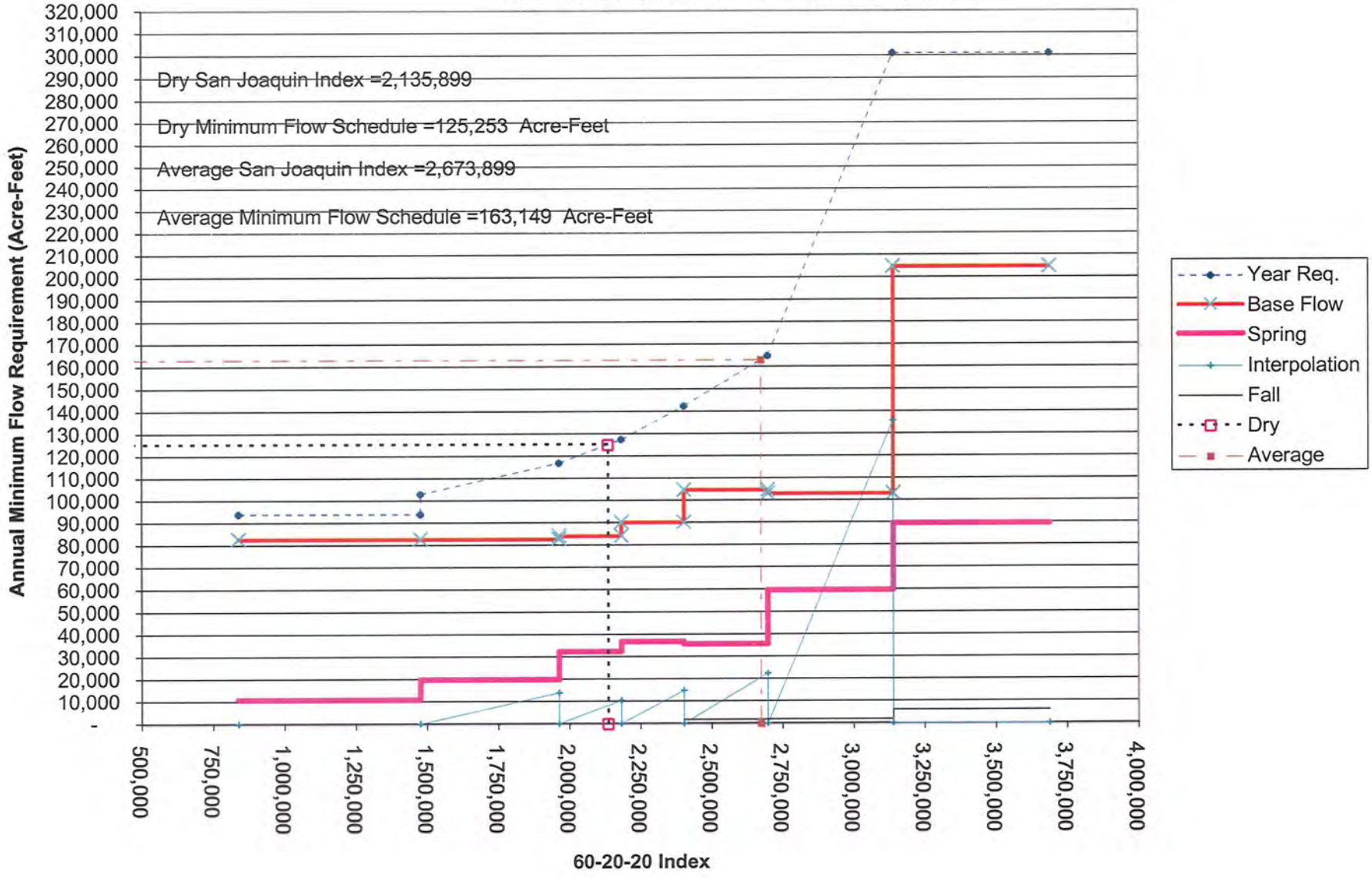
TUOLUMNE RIVER MINIMUM FLOW REQUIREMENT (Figure 2)

DWR March 10, 2009; FORECAST OF 2009-2010 FISH



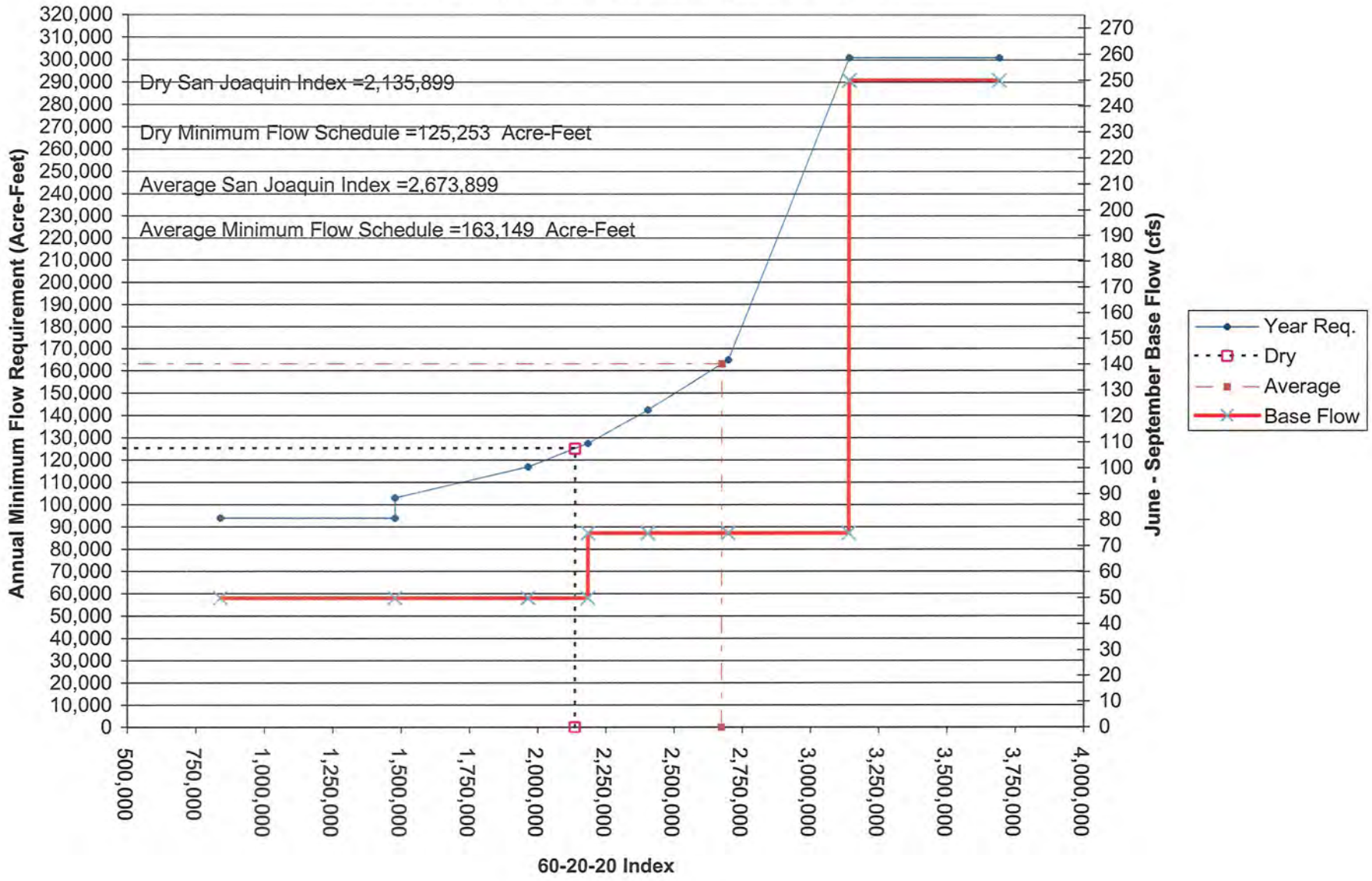
TUOLUMNE RIVER MINIMUM FLOW REQUIREMENT (Figure 3)

DWR March 10, 2009; FORECAST OF 2009-2010



TUOLUMNE RIVER MINIMUM FLOW REQUIREMENT (Summer Base Flow) (Figure 4)

DWR March 10, 2009; FORECAST OF 2009-2010 FISH YEAR



TURLOCK IRRIGATION DISTRICT
333 EAST CANAL DRIVE
POST OFFICE BOX 949
TURLOCK, CALIFORNIA 95381
(209) 883-8300

May 5, 2009

VIA E-MAIL

Tim Heyne
California Dept. of Fish and Game
P.O. Box 10
La Grange, CA 95329

Deborah Giglio
U.S. Fish and Wildlife Service
2800 Cottage Way, W-2605
Sacramento, CA 95825

RE: Project 2299 – Minimum Flow Coordination Process for 2009-2010 Fish Flow Year

Dear Fishery Agency Representatives:

The following information is presented to:

1. provide a chronological reference of the recent coordination actions regarding flow schedule development for the 2009-2010 Fish Flow Year;
2. document the agreed upon flow schedule being currently implemented; and
3. provide the latest DWR runoff projections and corresponding flow volume estimates.

Item 1:

- Our letter of March 25, 2009 provided preliminary information and two example flow schedules for the 2009-2010 fish flow year based on the March 17 DWR San Joaquin Basin 60-20-20 runoff forecast update.
- TID has continued tracking the DWR forecasts and providing your agencies with corresponding flow volume information in e-mails sent on March 31 and April 9.
- Mr. Heyne provided a draft flow schedule on April 10.
- Conference calls were held with your agencies and other VAMP parties on April 13 and April 15 to discuss flow allocations and flow schedule coordination in the basin.
- Mr. Heyne provided a revised flow schedule on April 15. TID confirmed on April 16 that schedule would be implemented.

Item 2:

Table 1 is the current flow schedule based on an annual volume of 151,222 AF.

Item 3:

Table 2 has the Feb-Apr DWR forecasts and corresponding annual volumes, including the April 14, 21, and 28 updates. The 50% and 10% forecasts have decreased since the April 1 forecast, with the latest 50% volume being about the same as in the current schedule and corresponding to an Article 37 Intermediate Dry-Below Normal year type.

As in the last two years, the final flow volume will not be known until August and TID will continue to provide forecast updates. DWR will next be issuing their May 1 forecast by about May 8.

TID appreciates the collective efforts on input and achieving consensus on the flow schedule. If you have any questions, please contact Wes Monier at 209-883-8321.

Sincerely,

Robert M. Nees
Director of Water Resources and Regulatory Affairs

C: Larry Weis - TID
Allen Short – MID
Michael Carlin - CCSF
Roger Guinee - USFWS
Maria Rea – NMFS
FERC Secretary

TABLE 1

Tuolumne River Flow Schedule

SCHEDULE FOR 2009 - 20010 Fish Flow Year

DATE		Number of	Flow for Average														
			Flow			Pulse Flows			Interpolation Flow			Other Adjusted Flow			Total FERC Flow		
From:	To:	DAYS	CFS	AF	ACCUM. A.F.	CFS	AF	ACCUM. A.F.	CFS	AF	ACCUM. A.F.	CFS	AF	ACCUM. A.F.	CFS	ACCUM. A.F.
15-Apr-2009	15-Apr-2009	1	180	357	357	0	0	0	0	0	0	0	0	0	180	357
16-Apr-2009	16-Apr-2009	1	180	357	714	10	20	20	0	0	0	0	0	0	190	734
17-Apr-2009	17-Apr-2009	1	180	357	1,071	80	159	179	0	0	0	0	0	0	260	1,250
18-Apr-2009	18-Apr-2009	1	180	357	1,428	210	417	595	0	0	0	0	0	0	390	2,023
19-Apr-2009	19-Apr-2009	1	180	357	1,785	350	694	1,289	100	198	198	0	0	0	630	3,273
20-Apr-2009	20-Apr-2009	1	180	357	2,142	360	714	2,003	100	198	397	0	0	0	640	4,542
21-Apr-2009	21-Apr-2009	1	180	357	2,499	360	714	2,717	100	198	595	0	0	0	640	5,812
22-Apr-2009	22-Apr-2009	1	180	357	2,856	360	714	3,431	100	198	793	0	0	0	640	7,081
23-Apr-2009	23-Apr-2009	1	180	357	3,213	360	714	4,145	100	198	992	0	0	0	640	8,350
24-Apr-2009	24-Apr-2009	1	180	357	3,570	360	714	4,860	100	198	1190	0	0	0	640	9,620
25-Apr-2009	25-Apr-2009	1	180	357	3,927	360	714	5,574	100	198	1388	0	0	0	640	10,889
26-Apr-2009	26-Apr-2009	1	180	357	4,284	360	714	6,288	100	198	1587	0	0	0	640	12,159
27-Apr-2009	27-Apr-2009	1	180	357	4,641	360	714	7,002	100	198	1785	0	0	0	640	13,428
28-Apr-2009	28-Apr-2009	1	180	357	4,998	180	357	7,359	100	198	1983	0	0	0	460	14,340
29-Apr-2009	29-Apr-2009	1	180	357	5,355	180	357	7,716	100	198	2182	0	0	0	460	15,253
30-Apr-2009	30-Apr-2009	1	180	357	5,712	180	357	8,073	100	198	2380	0	0	0	460	16,165
01-May-2009	01-May-2009	1	180	357	6,069	180	357	8,430	100	198	2579	0	0	0	460	17,078
02-May-2009	02-May-2009	1	180	357	6,426	180	357	8,787	100	198	2777	0	0	0	460	17,990
03-May-2009	03-May-2009	1	180	357	6,783	180	357	9,144	100	198	2975	0	0	0	460	18,902
04-May-2009	04-May-2009	1	180	357	7,140	180	357	9,501	100	198	3174	0	0	0	460	19,815
05-May-2009	05-May-2009	1	180	357	7,498	300	595	10,096	100	198	3372	0	0	0	580	20,965
06-May-2009	06-May-2009	1	180	357	7,855	500	992	11,088	100	198	3570	0	0	0	780	22,512
07-May-2009	07-May-2009	1	180	357	8,212	700	1,388	12,476	0	0	3570	0	0	0	880	24,258
08-May-2009	08-May-2009	1	180	357	8,569	700	1,388	13,864	0	0	3570	0	0	0	880	26,003
09-May-2009	09-May-2009	1	180	357	8,926	750	1,488	15,352	0	0	3570	0	0	0	930	27,848
10-May-2009	10-May-2009	1	180	357	9,283	750	1,488	16,840	0	0	3570	0	0	0	930	29,693
11-May-2009	11-May-2009	1	180	357	9,640	750	1,488	18,327	0	0	3570	0	0	0	930	31,537
12-May-2009	12-May-2009	1	180	357	9,997	750	1,488	19,815	0	0	3570	0	0	0	930	33,382
13-May-2009	13-May-2009	1	180	357	10,354	750	1,488	21,302	0	0	3570	0	0	0	930	35,226
14-May-2009	14-May-2009	1	180	357	10,711	750	1,488	22,790	0	0	3570	0	0	0	930	37,071
15-May-2009	15-May-2009	1	180	357	11,068	750	1,488	24,278	0	0	3570	0	0	0	930	38,916
16-May-2009	16-May-2009	1	180	357	11,425	750	1,488	25,765	0	0	3570	0	0	0	930	40,760
17-May-2009	17-May-2009	1	180	357	11,782	750	1,488	27,253	0	0	3570	0	0	0	930	42,605
18-May-2009	18-May-2009	1	180	357	12,139	700	1,388	28,641	0	0	3570	0	0	0	880	44,350
19-May-2009	19-May-2009	1	180	357	12,496	700	1,388	30,030	0	0	3570	0	0	0	880	46,096
20-May-2009	20-May-2009	1	180	357	12,853	650	1,289	31,319	0	0	3570	0	0	0	830	47,742
21-May-2009	21-May-2009	1	180	357	13,210	500	992	32,311	0	0	3,570	0	0	0	680	49,091
22-May-2009	22-May-2009	1	180	357	13,567	400	793	33,104	0	0	3,570	0	0	0	580	50,241
23-May-2009	23-May-2009	1	180	357	13,924	300	595	33,699	0	0	3,570	0	0	0	480	51,193
24-May-2009	24-May-2009	1	180	357	14,281	300	595	34,294	0	0	3,570	0	0	0	480	52,145
25-May-2009	25-May-2009	1	180	357	14,638	200	397	34,691	0	0	3,570	0	0	0	380	52,899
26-May-2009	26-May-2009	1	180	357	14,995	200	397	35,088	0	0	3,570	0	0	0	380	53,653
27-May-2009	27-May-2009	1	180	357	15,352	200	397	35,484	0	0	3,570	0	0	0	380	54,407
28-May-2009	28-May-2009	1	180	357	15,709	125	248	35,732	0	0	3,570	0	0	0	305	55,012
29-May-2009	29-May-2009	1	180	357	16,066	125	248	35,980	0	0	3,570	0	0	0	305	55,617
30-May-2009	30-May-2009	1	180	357	16,423	85	169	36,149	0	0	3,570	0	0	0	265	56,142
31-May-2009	31-May-2009	1	180	357	16,780	85	169	36,317	0	0	3,570	0	0	0	265	56,668
01-Jun-2009	01-Jun-2009	1	75	149	16,929	0	0	36,317	190	377	3,947	0	0	0	265	57,193
02-Jun-2009	02-Jun-2009	1	75	149	17,078	0	0	36,317	190	377	4,324	0	0	0	265	57,719
03-Jun-2009	07-Jun-2009	5	75	744	17,821	0	0	36,317	135	1,339	5,663	0	0	0	210	59,802
08-Jun-2009	15-Jun-2009	8	75	1,190	19,012	0	0	36,317	30	476	6,139	0	0	0	105	61,468
16-Jun-2009	30-Jun-2009	15	75	2,231	21,243	0	0	36,317	0	0	6,139	0	0	0	75	63,699
01-Jul-2009	31-Jul-2009	31	75	4,612	25,855	0	0	36,317	0	0	6,139	0	0	0	75	68,311
01-Aug-2009	31-Aug-2009	31	75	4,612	30,466	0	0	36,317	0	0	6,139	0	0	0	75	72,922
01-Sep-2009	10-Sep-2009	10	75	1,488	31,954	0	0	36,317	20	397	6,536	0	0	0	95	74,807
11-Sep-2009	13-Sep-2009	3	75	446	32,400	0	0	36,317	20	119	6,655	0	0	0	95	75,372
14-Sep-2009	30-Sep-2009	17	75	2,529	34,929	0	0	36,317	20	674	7,329	0	0	0	95	78,575
01-Oct-2009	01-Oct-2009	1	180	357	35,286	0	0	36,317	20	40	7,369	0	0	0	200	78,972
02-Oct-2009	07-Oct-2009	6	180	2,142	37,428	0	0	36,317	20	238	7,607	0	0	0	200	81,352
08-Oct-2009	13-Oct-2009	6	180	2,142	39,570	0	0	36,317	20	238	7,845	0	0	0	200	83,732
14-Oct-2009	19-Oct-2009	6	180	2,142	41,712	141	1,678	37,995	20	238	8,083	0	0	0	341	87,790
20-Oct-2009	25-Oct-2009	6	180	2,142	43,855	0	0	37,995	20	238	8,321	0	0	0	200	90,171
26-Oct-2009	26-Oct-2009	1	180	357	44,212	0	0	37,995	0	0	8,321	0	0	0	180	90,528
27-Oct-2009	31-Oct-2009	5	180	1,785	45,997	0	0	37,995	0	0	8,321	0	0	0	180	92,313
01-Nov-2009	16-Nov-2009	16	180	5,712	51,709	0	0	37,995	0	0	8,321	0	0	0	180	98,025
17-Nov-2009	30-Nov-2009	14	180	4,998	56,707	0	0	37,995	0	0	8,321	0	0	0	180	103,023
01-Dec-2009	31-Dec-2009	31	180	11,068	67,775	0	0	37,995	0	0	8,321	0	0	0	180	114,091
01-Jan-2010	31-Jan-2010	31	180	11,068	78,843	0	0	37,995	0	0	8,321	0	0	0	180	125,159
01-Feb-2010	28-Feb-2010	28	180	9,997	88,840	0	0	37,995	0	0	8,321	0	0	0	180	135,156
01-Mar-2010	31-Mar-2010	31	180	11,068	99,907	0	0	37,995	0	0	8,321	0	0	0	180	146,223
01-Apr-2010	14-Apr-2010	14	180	4,998	104,906	0	0	37,995	0	0	8,321	0	0	0	180	151,222
No. of days		365	(April 15 through April 14)												Total =	151,222

1 cfs day = 1.983471 acre-feet (af)

Notes: 1. Based on 60-20-20 Index

2. The pulse flows are a target that represents a daily average.

Table 2

SAN JOAQUIN VALLEY WATER YEAR HYDROLOGIC CLASSIFICATION

602020 INDEX

YEAR	APRIL-JULY RUNOFF (AF) STANISLAUS	TUOLUMNE	MERCED	FRIANT	TOTAL	OCTOBER-MARCH RUNOFF (AF) STANISLAUS	TUOLUMNE	MERCED	FRIANT	TOTAL	602020 INDEX	TUOLUMNE RIVER MINIMUM FLOW REQUIREMENT	San Joaquin Index (not the FERC Index) RANKING
Feb 1 Forecast													
Dry	200,000	400,000	180,000	400,000	1,180,000	150,000	305,000	130,000	210,000	795,000	1,279,899	94,000	Critical
Average	500,000	890,000	430,000	910,000	2,730,000	270,000	470,000	220,000	340,000	1,300,000	2,310,899	136,214	Dry
Wet	960,000	1,680,000	900,000	1,730,000	5,270,000	450,000	735,000	380,000	550,000	2,115,000	3,997,899	300,923	Wet
Feb 10 Update													
Dry	210,000	420,000	190,000	430,000	1,250,000	150,000	305,000	130,000	210,000	795,000	1,321,899	94,000	Critical
Average	490,000	870,000	430,000	910,000	2,700,000	270,000	470,000	220,000	340,000	1,300,000	2,292,899	134,989	Dry
Wet	930,000	1,610,000	850,000	1,660,000	5,050,000	450,000	735,000	380,000	550,000	2,115,000	3,865,899	300,923	Wet
Feb 17 Update													
Dry	260,000	540,000	260,000	530,000	1,590,000	150,000	305,000	130,000	210,000	795,000	1,525,899	104,430	Critical
Average	520,000	940,000	470,000	960,000	2,890,000	270,000	470,000	220,000	340,000	1,300,000	2,406,899	142,782	Dry
Wet	940,000	1,630,000	850,000	1,650,000	5,070,000	450,000	735,000	380,000	550,000	2,115,000	3,877,899	300,923	Wet
Feb 24 Update													
Dry	300,000	600,000	300,000	580,000	1,780,000	150,000	305,000	130,000	210,000	795,000	1,639,899	107,707	Critical
Average	540,000	960,000	500,000	990,000	2,990,000	270,000	470,000	220,000	340,000	1,300,000	2,466,899	147,359	Dry
Wet	940,000	1,610,000	840,000	1,620,000	5,010,000	450,000	735,000	380,000	550,000	2,115,000	3,841,899	300,923	Wet
Mar 1 Forecast													
Dry	350,000	670,000	320,000	620,000	1,960,000	230,000	410,000	190,000	285,000	1,115,000	1,811,899	112,652	Critical
Average	560,000	980,000	500,000	980,000	3,020,000	270,000	465,000	225,000	355,000	1,315,000	2,487,899	148,961	Dry
Wet	950,000	1,600,000	850,000	1,570,000	4,970,000	350,000	570,000	290,000	455,000	1,665,000	3,727,899	300,923	Above Normal
Mar 10 Update													
Dry	460,000	870,000	390,000	750,000	2,470,000	230,000	410,000	190,000	285,000	1,115,000	2,117,899	124,392	Dry
Average	650,000	1,150,000	550,000	1,060,000	3,410,000	270,000	465,000	225,000	355,000	1,315,000	2,721,899	172,308	Below Normal
Wet	1,000,000	1,700,000	870,000	1,570,000	5,140,000	350,000	570,000	290,000	455,000	1,665,000	3,829,899	300,923	Wet
Mar 17 Update													
Dry	480,000	880,000	390,000	750,000	2,500,000	230,000	410,000	190,000	285,000	1,115,000	2,135,899	125,253	Dry
Average	640,000	1,130,000	530,000	1,030,000	3,330,000	270,000	465,000	225,000	355,000	1,315,000	2,673,899	163,149	Below Normal
Wet	960,000	1,630,000	820,000	1,490,000	4,900,000	350,000	570,000	290,000	455,000	1,665,000	3,685,899	300,923	Above Normal
Mar 24 Update													
Dry	510,000	910,000	410,000	780,000	2,610,000	230,000	410,000	190,000	285,000	1,115,000	2,201,899	128,792	Dry
Average	650,000	1,130,000	530,000	1,030,000	3,340,000	270,000	465,000	225,000	355,000	1,315,000	2,679,899	163,606	Below Normal
Wet	940,000	1,580,000	800,000	1,430,000	4,750,000	350,000	570,000	290,000	455,000	1,665,000	3,595,899	300,923	Above Normal
Apr 1 Forecast													
Dry	500,000	890,000	420,000	760,000	2,570,000	340,000	545,000	250,000	375,000	1,510,000	2,256,899	132,537	Dry
Average	620,000	1,080,000	520,000	960,000	3,180,000	340,000	545,000	250,000	375,000	1,510,000	2,622,899	159,259	Below Normal
Wet	870,000	1,470,000	760,000	1,300,000	4,400,000	340,000	545,000	250,000	375,000	1,510,000	3,354,899	300,923	Above Normal
Apr 14 Update													
Dry	510,000	950,000	450,000	810,000	2,720,000	340,000	545,000	250,000	375,000	1,510,000	2,346,899	138,666	Dry
Average	620,000	1,090,000	530,000	980,000	3,220,000	340,000	545,000	250,000	375,000	1,510,000	2,646,899	161,089	Below Normal
Wet	810,000	1,380,000	710,000	1,250,000	4,150,000	340,000	545,000	250,000	375,000	1,510,000	3,204,899	300,923	Above Normal
Apr 21 Update													
Dry	500,000	930,000	440,000	790,000	2,660,000	340,000	545,000	250,000	375,000	1,510,000	2,310,899	136,214	Dry
Average	600,000	1,050,000	510,000	950,000	3,110,000	340,000	545,000	250,000	375,000	1,510,000	2,580,899	156,055	Below Normal
Wet	750,000	1,290,000	660,000	1,180,000	3,880,000	340,000	545,000	250,000	375,000	1,510,000	3,042,899	271,272	Below Normal
Apr 28 Update													
Dry	490,000	910,000	430,000	770,000	2,600,000	340,000	545,000	250,000	375,000	1,510,000	2,274,899	133,763	Dry
Average	590,000	1,020,000	490,000	920,000	3,020,000	340,000	545,000	250,000	375,000	1,510,000	2,526,899	151,936	Below Normal
Wet	710,000	1,210,000	610,000	1,110,000	3,640,000	340,000	545,000	250,000	375,000	1,510,000	2,898,899	226,877	Below Normal

TURLOCK IRRIGATION DISTRICT
333 EAST CANAL DRIVE
POST OFFICE BOX 949
TURLOCK, CALIFORNIA 95381
(209) 883-8300

October 19, 2009

Tim Heyne
California Dept. of Fish and Game
P.O. Box 10
La Grange, CA 95329

Deborah Giglio
U.S. Fish and Wildlife Service
2800 Cottage Way, W-2605
Sacramento, CA 95825

Maria Rea
National Marine Fisheries Service
650 Capitol Mall, Suite 8-300
Sacramento, CA 95814-4708

RE: Project 2299 – Update of Water Year Classification Index and Flow Schedule

Dear Fishery Agency representatives:

The 1996 FERC Order, Amended Article 37, contained a Water Year Classification Index for determining the volume of scheduled stream flows for each fish flow year. The classifications were based on the San Joaquin Basin 60-20-20 Indices for water years 1906-1995. The order stated, "60-20-20 index numbers used each year shall be updated to incorporate subsequent water years pursuant to standard Department of Water Resources (DWR) procedures so as to maintain approximately the same frequency distribution of water year types." The index is now updated to incorporate water years through 2009 (Table 1). While the frequency distribution remains the same, some index numbers may change slightly with each annual update to maintain the frequency distribution.

Since the flow schedule letter of May 5, 2009, TID provided e-mail transmittals on basin index updates and corresponding Article 37 volumes as follows:

- May 15, 2009 based on DWR forecast update of May 12
- May 29, 2009 based on DWR forecast update of May 26
- July 22, 2009 based on DWR forecast update of July 21

On August 18, 2009, TID sent you by e-mail the final Index (2,733,195) and corresponding Article 37 volume (175,791 AF) as shown in Table 2. That amount was 24,569 AF more than initially scheduled in April due to wetter conditions which resulted in a "Median Below Normal" year type. After that notification, phone and e-mail coordination continued with your agencies that included:

- September 3, 2009 e-mail – TID provided a draft schedule utilizing 175,791 AF
- September 16, 2009 e-mail – USFWS provided a draft schedule focusing on allocation of part of the additional water to the fall pulse flow (in coordination with other pulse flows in the basin) and following base flows

- September 30, 2009 e-mail – TID provided a schedule for the remainder of the fish flow year utilizing the USFWS flow proposal, indicating that 10,558 AF remained to be allocated
- September 30, 2009 e-mail – USFWS requested refinements to the schedule that scheduled additional water through December 31
- October 1, 2009 e-mail - USFWS identified that water still remained to be allocated for the January 1 – April 14 period
- October 9, 2009 e-mail – TID confirmed following no further input that the USFWS schedule would be implemented, including the fall pulse flow from October 12-23 followed by 225 cfs through December 31 and 200 cfs for the January 1-April 14 period

Attached is the current flow schedule (Table 3) using the latest values provided by the USFWS in the above coordination process. Further coordination will be needed in determining the disposition of the remaining unallocated volume of 7,049 AF.

If you have any questions, please contact Wes Monier at 209-883-8321.

Sincerely,

Robert M. Nees
Director of Water Resources and Regulatory Affairs

C: Larry Weis - TID
Allen Short – MID
Michael Carlin – CCSF
FERC Secretary

TABLE 1
DETERMINATION OF WATER YEAR CLASSIFICATION THRESHOLDS
Water Year Classification

Water Year Classification	Cumulative Occurrence				2006	2007	2008	2009
Critical Water Year and Below	0.0%	-	6.4%	<	1,476	1,476	1,476	1,476
Median Critical Water Year	6.4%	-<	14.4%	>=	1,476	1,476	1,476	1,476
Intermediate Critical Dry Water Year	14.4%	-<	20.5%	>=	2,002	1,973	1,973	1,973
Median Dry	20.5%	-<	31.3%	>=	2,187	2,183	2,183	2,183
Intermediate Dry-Below Normal	31.3%	-<	40.4%	>=	2,441	2,403	2,403	2,403
Median Below Normal	40.4%	-<	50.7%	>=	2,720	2,720	2,698	2,720
* Intermediate Below Normal-Above Normal	50.7%	-<	66.2%	>=	3,183	3,139	3,139	3,080
Median Above Normal	66.2%	-<	71.3%	>=	3,689	3,689	3,689	3,669
Intermediate Above Normal-Wet	71.3%	-<	86.7%	>=	4,028	3,903	3,903	3,903
Median Wet/Maximum	86.7%	-<	100.0%	>=	4,730	4,730	4,730	4,730

* Maximum index value for fish flow year is not to go above value shown in this row.

Table 2

SAN JOAQUIN VALLEY WATER YEAR HYDROLOGIC CLASSIFICATION

602020 INDEX

YEAR	APRIL-JULY RUNOFF (AF) STANISLAUS	TUOLUMNE	MERCED	FRIANT	TOTAL	OCTOBER-MARCH RUNOFF (AF) STANISLAUS	TUOLUMNE	MERCED	FRIANT	TOTAL	602020 INDEX	TUOLUMNE RIVER MINIMUM FLOW REQUIREMENT
Feb 1 Forecast												
Dry	200,000	400,000	180,000	400,000	1,180,000	150,000	305,000	130,000	210,000	795,000	1,279,196	94,000
Average	500,000	890,000	430,000	910,000	2,730,000	270,000	470,000	220,000	340,000	1,300,000	2,310,196	136,167
Wet	960,000	1,680,000	900,000	1,730,000	5,270,000	450,000	735,000	380,000	550,000	2,115,000	3,997,196	300,923
Feb 10 Update												
Dry	210,000	420,000	190,000	430,000	1,250,000	150,000	305,000	130,000	210,000	795,000	1,321,196	94,000
Average	490,000	870,000	430,000	910,000	2,700,000	270,000	470,000	220,000	340,000	1,300,000	2,292,196	134,941
Wet	930,000	1,610,000	850,000	1,660,000	5,050,000	450,000	735,000	380,000	550,000	2,115,000	3,865,196	300,923
Feb 17 Update												
Dry	260,000	540,000	260,000	530,000	1,590,000	150,000	305,000	130,000	210,000	795,000	1,525,196	104,383
Average	520,000	940,000	470,000	960,000	2,890,000	270,000	470,000	220,000	340,000	1,300,000	2,406,196	142,728
Wet	940,000	1,630,000	850,000	1,650,000	5,070,000	450,000	735,000	380,000	550,000	2,115,000	3,877,196	300,923
Feb 24 Update												
Dry	300,000	600,000	300,000	580,000	1,780,000	150,000	305,000	130,000	210,000	795,000	1,639,196	107,599
Average	540,000	960,000	500,000	990,000	2,990,000	270,000	470,000	220,000	340,000	1,300,000	2,466,196	147,305
Wet	940,000	1,610,000	840,000	1,620,000	5,010,000	450,000	735,000	380,000	550,000	2,115,000	3,841,196	300,923
Mar 1 Forecast												
Dry	350,000	670,000	320,000	620,000	1,960,000	230,000	410,000	190,000	285,000	1,115,000	1,811,196	112,452
Average	560,000	980,000	500,000	980,000	3,020,000	270,000	465,000	225,000	355,000	1,315,000	2,487,196	148,907
Wet	950,000	1,600,000	850,000	1,570,000	4,970,000	350,000	570,000	290,000	455,000	1,665,000	3,727,196	300,923
Mar 10 Update												
Dry	460,000	870,000	390,000	750,000	2,470,000	230,000	410,000	190,000	285,000	1,115,000	2,117,196	124,219
Average	650,000	1,150,000	550,000	1,060,000	3,410,000	270,000	465,000	225,000	355,000	1,315,000	2,721,196	172,091
Wet	1,000,000	1,700,000	870,000	1,570,000	5,140,000	350,000	570,000	290,000	455,000	1,665,000	3,829,196	300,923
Mar 17 Update												
Dry	480,000	880,000	390,000	750,000	2,500,000	230,000	410,000	190,000	285,000	1,115,000	2,135,196	125,118
Average	640,000	1,130,000	530,000	1,030,000	3,330,000	270,000	465,000	225,000	355,000	1,315,000	2,673,196	163,095
Wet	960,000	1,630,000	820,000	1,490,000	4,900,000	350,000	570,000	290,000	455,000	1,665,000	3,685,196	300,923
Mar 24 Update												
Dry	510,000	910,000	410,000	780,000	2,610,000	230,000	410,000	190,000	285,000	1,115,000	2,201,196	128,744
Average	650,000	1,130,000	530,000	1,030,000	3,340,000	270,000	465,000	225,000	355,000	1,315,000	2,679,196	163,553
Wet	940,000	1,580,000	800,000	1,430,000	4,750,000	350,000	570,000	290,000	455,000	1,665,000	3,595,196	300,923
Apr 1 Forecast												
Dry	500,000	890,000	420,000	760,000	2,570,000	340,000	545,000	250,000	375,000	1,510,000	2,256,196	132,489
Average	620,000	1,080,000	520,000	960,000	3,180,000	340,000	545,000	250,000	375,000	1,510,000	2,622,196	159,205
Wet	870,000	1,470,000	760,000	1,300,000	4,400,000	340,000	545,000	250,000	375,000	1,510,000	3,354,196	300,923
Apr 14 Update												
Dry	510,000	950,000	450,000	810,000	2,720,000	340,000	545,000	250,000	375,000	1,510,000	2,346,196	138,618
Average	620,000	1,090,000	530,000	980,000	3,220,000	340,000	545,000	250,000	375,000	1,510,000	2,646,196	161,036
Wet	810,000	1,380,000	710,000	1,250,000	4,150,000	340,000	545,000	250,000	375,000	1,510,000	3,204,196	300,923
Apr 21 Update												
Dry	500,000	930,000	440,000	790,000	2,660,000	340,000	545,000	250,000	375,000	1,510,000	2,310,196	136,167
Average	600,000	1,050,000	510,000	950,000	3,110,000	340,000	545,000	250,000	375,000	1,510,000	2,580,196	156,001
Wet	750,000	1,290,000	660,000	1,180,000	3,880,000	340,000	545,000	250,000	375,000	1,510,000	3,042,196	271,055
Apr 28 Update												
Dry	490,000	910,000	430,000	770,000	2,600,000	340,000	545,000	250,000	375,000	1,510,000	2,274,196	133,715
Average	590,000	1,020,000	490,000	920,000	3,020,000	340,000	545,000	250,000	375,000	1,510,000	2,526,196	151,882
Wet	710,000	1,210,000	610,000	1,110,000	3,640,000	340,000	545,000	250,000	375,000	1,510,000	2,898,196	226,660
May 1 Forecast												
Dry	490,000	910,000	420,000	750,000	2,570,000	340,000	545,000	250,000	375,000	1,510,000	2,256,196	132,489
Average	580,000	1,010,000	480,000	900,000	2,970,000	340,000	545,000	250,000	375,000	1,510,000	2,496,196	149,594
Wet	680,000	1,180,000	590,000	1,070,000	3,520,000	340,000	545,000	250,000	375,000	1,510,000	2,826,196	204,463
May 12 Update												
Dry	570,000	1,030,000	490,000	850,000	2,940,000	340,000	545,000	250,000	375,000	1,510,000	2,478,196	148,220
Average	640,000	1,110,000	540,000	970,000	3,260,000	340,000	545,000	250,000	375,000	1,510,000	2,670,196	162,866
Wet	720,000	1,260,000	630,000	1,100,000	3,710,000	340,000	545,000	250,000	375,000	1,510,000	2,940,196	239,609
May 19 Update												
Dry	580,000	1,040,000	500,000	870,000	2,990,000	340,000	545,000	250,000	375,000	1,510,000	2,508,196	150,509
Average	640,000	1,110,000	540,000	970,000	3,260,000	340,000	545,000	250,000	375,000	1,510,000	2,670,196	162,866
Wet	710,000	1,240,000	610,000	1,080,000	3,640,000	340,000	545,000	250,000	375,000	1,510,000	2,898,196	226,660
May 26 Update												
Dry	580,000	1,000,000	490,000	880,000	2,950,000	340,000	545,000	250,000	375,000	1,510,000	2,484,196	148,678
Average	630,000	1,100,000	530,000	950,000	3,210,000	340,000	545,000	250,000	375,000	1,510,000	2,640,196	160,578
Wet	690,000	1,210,000	580,000	1,030,000	3,510,000	340,000	545,000	250,000	375,000	1,510,000	2,820,196	202,613
June 2 Forecast												
Dry	580,000	1,000,000	500,000	890,000	2,970,000	339,493	545,114	252,434	375,366	1,512,407	2,496,677	149,630
Average	630,000	1,100,000	530,000	950,000	3,210,000	339,493	545,114	252,434	375,366	1,512,407	2,640,677	160,615
Wet	680,000	1,200,000	570,000	1,020,000	3,470,000	339,493	545,114	252,434	375,366	1,512,407	2,796,677	195,362
June 09 Update												
Dry	590,000	1,010,000	510,000	910,000	3,020,000	339,493	545,114	252,434	375,366	1,512,407	2,526,677	151,919
Average	630,000	1,100,000	540,000	970,000	3,240,000	339,493	545,114	252,434	375,366	1,512,407	2,658,677	161,988
Wet	670,000	1,190,000	580,000	1,040,000	3,480,000	339,493	545,114	252,434	375,366	1,512,407	2,802,677	197,212
July 21 Meeting With DWR												
Average	658,081	1,111,727	555,524	1,050,095	3,375,427	339,493	545,114	252,434	375,366	1,512,407	2,741,456	178,338
Final Numbers as Reported by DWR												
Average	655,694	1,104,952	561,036	1,042,315	3,364,197	339,493	545,114	252,434	375,366	1,512,407	2,733,195	175,791

TABLE 3

Tuolumne River Flow Schedule

SCHEDULE FOR 2009 - 20010 Fish Flow Year

DATE		Number of	Flow for Average														
			Base Flow			Pulse Flows			Interpolation Flow			Other Adjusted Flow			Total FERC Flow		
From:	To:	DAYS	CFS	AF	ACCUM. A.F.	CFS	AF	ACCUM. A.F.	CFS	AF	ACCUM. A.F.	CFS	AF	ACCUM. A.F.	CFS	ACCUM. A.F.	
15-Apr-2009	15-Apr-2009	1	180	357	357	0	0	0	0	0	0	0	0	0	180	357	
16-Apr-2009	16-Apr-2009	1	180	357	714	10	20	20	0	0	0	0	0	0	190	734	
17-Apr-2009	17-Apr-2009	1	180	357	1,071	80	159	179	0	0	0	0	0	0	260	1,250	
18-Apr-2009	18-Apr-2009	1	180	357	1,428	210	417	595	0	0	0	0	0	0	390	2,023	
19-Apr-2009	19-Apr-2009	1	180	357	1,785	350	694	1,289	100	198	198	0	0	0	630	3,273	
20-Apr-2009	20-Apr-2009	1	180	357	2,142	360	714	2,003	100	198	397	0	0	0	640	4,542	
21-Apr-2009	21-Apr-2009	1	180	357	2,499	360	714	2,717	100	198	595	0	0	0	640	5,812	
22-Apr-2009	22-Apr-2009	1	180	357	2,856	360	714	3,431	100	198	793	0	0	0	640	7,081	
23-Apr-2009	23-Apr-2009	1	180	357	3,213	360	714	4,145	100	198	992	0	0	0	640	8,350	
24-Apr-2009	24-Apr-2009	1	180	357	3,570	360	714	4,860	100	198	1190	0	0	0	640	9,620	
25-Apr-2009	25-Apr-2009	1	180	357	3,927	360	714	5,574	100	198	1388	0	0	0	640	10,889	
26-Apr-2009	26-Apr-2009	1	180	357	4,284	360	714	6,288	100	198	1587	0	0	0	640	12,159	
27-Apr-2009	27-Apr-2009	1	180	357	4,641	360	714	7,002	100	198	1785	0	0	0	640	13,428	
28-Apr-2009	28-Apr-2009	1	180	357	4,998	180	357	7,359	100	198	1983	0	0	0	460	14,340	
29-Apr-2009	29-Apr-2009	1	180	357	5,355	180	357	7,716	100	198	2182	0	0	0	460	15,253	
30-Apr-2009	30-Apr-2009	1	180	357	5,712	180	357	8,073	100	198	2380	0	0	0	460	16,165	
01-May-2009	01-May-2009	1	180	357	6,069	180	357	8,430	100	198	2579	0	0	0	460	17,078	
02-May-2009	02-May-2009	1	180	357	6,426	180	357	8,787	100	198	2777	0	0	0	460	17,990	
03-May-2009	03-May-2009	1	180	357	6,783	180	357	9,144	100	198	2975	0	0	0	460	18,902	
04-May-2009	04-May-2009	1	180	357	7,140	180	357	9,501	100	198	3174	0	0	0	460	19,815	
05-May-2009	05-May-2009	1	180	357	7,498	300	595	10,096	100	198	3372	0	0	0	580	20,965	
06-May-2009	06-May-2009	1	180	357	7,855	500	992	11,088	100	198	3570	0	0	0	780	22,512	
07-May-2009	07-May-2009	1	180	357	8,212	700	1,388	12,476	0	0	3570	0	0	0	880	24,258	
08-May-2009	08-May-2009	1	180	357	8,569	700	1,388	13,864	0	0	3570	0	0	0	880	26,003	
09-May-2009	09-May-2009	1	180	357	8,926	750	1,488	15,352	0	0	3570	0	0	0	930	27,848	
10-May-2009	10-May-2009	1	180	357	9,283	750	1,488	16,840	0	0	3570	0	0	0	930	29,693	
11-May-2009	11-May-2009	1	180	357	9,640	750	1,488	18,327	0	0	3570	0	0	0	930	31,537	
12-May-2009	12-May-2009	1	180	357	9,997	750	1,488	19,815	0	0	3570	0	0	0	930	33,382	
13-May-2009	13-May-2009	1	180	357	10,354	750	1,488	21,302	0	0	3570	0	0	0	930	35,226	
14-May-2009	14-May-2009	1	180	357	10,711	750	1,488	22,790	0	0	3570	0	0	0	930	37,071	
15-May-2009	15-May-2009	1	180	357	11,068	750	1,488	24,278	0	0	3570	0	0	0	930	38,916	
16-May-2009	16-May-2009	1	180	357	11,425	750	1,488	25,765	0	0	3570	0	0	0	930	40,760	
17-May-2009	17-May-2009	1	180	357	11,782	750	1,488	27,253	0	0	3570	0	0	0	930	42,605	
18-May-2009	18-May-2009	1	180	357	12,139	700	1,388	28,641	0	0	3570	0	0	0	880	44,350	
19-May-2009	19-May-2009	1	180	357	12,496	700	1,388	30,030	0	0	3570	0	0	0	880	46,096	
20-May-2009	20-May-2009	1	180	357	12,853	650	1,289	31,319	0	0	3570	0	0	0	830	47,742	
21-May-2009	21-May-2009	1	180	357	13,210	500	992	32,311	0	0	3570	0	0	0	680	49,091	
22-May-2009	22-May-2009	1	180	357	13,567	400	793	33,104	0	0	3570	0	0	0	580	50,241	
23-May-2009	23-May-2009	1	180	357	13,924	300	595	33,699	0	0	3570	0	0	0	480	51,193	
24-May-2009	24-May-2009	1	180	357	14,281	300	595	34,294	0	0	3570	0	0	0	480	52,145	
25-May-2009	25-May-2009	1	180	357	14,638	200	397	34,691	0	0	3570	0	0	0	380	52,899	
26-May-2009	26-May-2009	1	180	357	14,995	200	397	35,088	0	0	3570	0	0	0	380	53,653	
27-May-2009	27-May-2009	1	180	357	15,352	200	397	35,484	0	0	3570	0	0	0	380	54,407	
28-May-2009	28-May-2009	1	180	357	15,709	125	248	35,732	0	0	3570	0	0	0	305	55,012	
29-May-2009	29-May-2009	1	180	357	16,066	125	248	35,980	0	0	3570	0	0	0	305	55,617	
30-May-2009	30-May-2009	1	180	357	16,423	85	169	36,149	0	0	3570	0	0	0	265	56,142	
31-May-2009	31-May-2009	1	180	357	16,780	85	169	36,317	0	0	3570	0	0	0	265	56,668	
01-Jun-2009	01-Jun-2009	1	75	149	16,929	0	0	36,317	190	377	3947	0	0	0	265	57,193	
02-Jun-2009	02-Jun-2009	1	75	149	17,078	0	0	36,317	190	377	4324	0	0	0	265	57,719	
03-Jun-2009	07-Jun-2009	5	75	744	17,821	0	0	36,317	135	1,339	5663	0	0	0	210	59,802	
08-Jun-2009	15-Jun-2009	8	75	1,190	19,012	0	0	36,317	30	476	6139	0	0	0	105	61,468	
16-Jun-2009	30-Jun-2009	15	75	2,231	21,243	0	0	36,317	0	0	6139	0	0	0	75	63,699	
01-Jul-2009	31-Jul-2009	31	75	4,612	25,855	0	0	36,317	0	0	6139	0	0	0	75	68,311	
01-Aug-2009	31-Aug-2009	31	75	4,612	30,466	0	0	36,317	0	0	6139	0	0	0	75	72,922	
01-Sep-2009	10-Sep-2009	10	75	1,488	31,954	0	0	36,317	20	397	6536	0	0	0	95	74,807	
11-Sep-2009	13-Sep-2009	3	75	446	32,400	0	0	36,317	20	119	6655	0	0	0	95	75,372	
14-Sep-2009	30-Sep-2009	17	75	2,529	34,929	0	0	36,317	20	674	7329	0	0	0	95	78,575	
01-Oct-2009	11-Oct-2009	11	200	4,364	39,293	0	0	36,317		0	7329	0	0	0	200	82,939	
12-Oct-2009	12-Oct-2009	1	200	397	39,689	175	347	36,664		0	7329	0	0	0	375	83,683	
13-Oct-2009	13-Oct-2009	1	200	397	40,086	250	496	37,160		0	7329	0	0	0	450	84,575	
14-Oct-2009	14-Oct-2009	1	200	397	40,483	400	793	37,954		0	7329	0	0	0	600	85,765	
15-Oct-2009	15-Oct-2009	1	200	397	40,879	500	992	38,945		0	7329	0	0	0	700	87,154	
16-Oct-2009	20-Oct-2009	5	175	1,736	42,615	525	5,207	44,152		0	7329	0	0	0	700	94,096	
21-Oct-2009	21-Oct-2009	1	175	347	42,962	425	843	44,995		0	7329	0	0	0	600	95,286	
22-Oct-2009	22-Oct-2009	1	175	347	43,309	275	545	45,540		0	7329	0	0	0	450	96,179	
23-Oct-2009	23-Oct-2009	1	175	347	43,656	65	129	45,669		0	7329	0	0	0	240	96,655	
24-Oct-2009	31-Oct-2009	8	175	2,777	46,433	0	0	45,669	25	401	7730	25	397	397	225	100,229	
01-Nov-2009	16-Nov-2009	16	175	5,554	51,987	0	0	45,669	25	802	8532	25	793	1,190	225	107,378	
17-Nov-2009	30-Nov-2009	14	175	4,860	56,846	0	0	45,669	25	702	9234	25	694	1,884	225	113,634	
01-Dec-2009	31-Dec-2009	31	175	10,760	67,607	0	0	45,669	25	1,554	10788	25	1,537	3,421	225	127,486	
01-Jan-2010	31-Jan-2010	31	175	10,760	78,367	0	0	45,669		0	10788	25	1,537	4,959	200	139,783	
01-Feb-2010	28-Feb-2010	28	175	9,719	88,086	0	0	45,669		0	10788	25	1,388	6,347	200	150,890	
01-Mar-2010	31-Mar-2010	31	175	10,760	98,846	0	0	45,669		0	10788	25	1,537	7,884	200	163,188	
01-Apr-2010	14-Apr-2010	14	175	4,860	103,706	0	0	45,669		0	10788	25	694	8,579	200	168,742	
No. of days		365 (April 15 through April 14)															

1 cfs day = 1.983471 acre-feet (af)

Notes: 1. Based on 60-20-20 Index

2. The pulse flows are a target that represents a daily average.

Attachment -B-

2009 Tuolumne River
Technical Advisory Committee Materials:

- List of 2009 TRTAC Activities/Materials

- March Meeting
- June Meeting
- September Meeting
- December Meeting

TUOLUMNE RIVER TECHNICAL ADVISORY COMMITTEE

DON PEDRO PROJECT - FERC LICENSE 2299

MODESTO IRRIGATION DISTRICT
TURLOCK IRRIGATION DISTRICT
CITY & COUNTY OF SAN FRANCISCO
CALIFORNIA DEPARTMENT OF FISH & GAME
U. S. FISH & WILDLIFE SERVICE

333 East Canal Drive
Turlock, CA 95381-0949
Phone: (209) 883-8275
Fax: (209) 656-2180
Email: tjford@tid.org

TECHNICAL ADVISORY COMMITTEE MEETING

12 March 2009 at 9:30 AM

Turlock Irrigation District, Lunch Room (2nd floor)

DRAFT AGENDA

1. INTRODUCTION AND ANNOUNCEMENTS

2. ADMINISTRATIVE ITEMS:
   - Review/revise agenda
   - Approve notes from December 2008 meeting
   - Items since last meeting

3. MONITORING/REPORTS:
   - Fall salmon run and ongoing monitoring
   - 2008 FERC Report material
   - Other planned 2009 studies

4. FLOW OPERATIONS:
   - Forecast of basin index and annual fish flow volume
   - Potential flow schedule for spring

5. RESTORATION UPDATE

6. AGENCY/NGO UPDATES

7. ADDITIONAL ITEMS

8. NEXT MEETING DATES – JUNE 11, SEPTEMBER 10, DECEMBER 10

TUOLUMNE RIVER TECHNICAL ADVISORY COMMITTEE

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TECHNICAL ADVISORY COMMITTEE MEETING

12 March 2009 at 9:30 AM

Turlock Irrigation District, Lunch Room (2nd floor)

Summary

1. INTRODUCTION AND ANNOUNCEMENTS
   - No fishery agencies were present.

2. ADMINISTRATIVE ITEMS:
   - Review/Revise agenda – no changes
   - Review notes from Dec meeting – Yoshiyama identified a couple of changes for the final summary and noted the link to the 2009 *O. mykiss* Study Plan led to the wrong document (has been fixed)
   - Items produced since last meeting – the handout listing the material posted at http://tuolumnerivertac.com/ was reviewed. It was noted that the 2008 VAMP Report did not include results of the acoustic tag study; USGS would be providing those later - there were significant problems associated with tag/equipment failure that year.

3. MONITORING/REPORTS:
   - Salmon run data: Ford reviewed draft salmon run estimates for the Tuolumne, Merced and Stanislaus Rivers. Preliminary Petersen estimates for the Tuolumne River were 372 in 2008 vs. 211 in 2007. Stanislaus weir counts were 923 in 2008 vs. 408 in 2007, whereas Merced estimate was 464 in 2008 vs. 571 in 2007.
   - Screw Trapping: Handouts on catch and size at Waterford screw trap were reviewed. Catches were low to date, with peak catch associated with recent runoff and turbidity in early March. Size of early larger salmon indicated other than fall run timing. Few salmon had been caught at Grayson.
   - Turbidity data handout reviewed recurrence of excessive sediment runoff from orchard development into Peaslee Creek and the river.
   - Technical Reports for 2008 FERC Report: Ford distributed a revised Table of Contents for the 2008 FERC Report and indicated a number of reports were available on the TRTAC website (http://tuolumnerivertac.com/). Still waiting on 2008 Spawning Survey Report (CDFG) and was finalizing the 2008 Snorkel Survey Report and Summary Update.
   - *O. mykiss* Studies: Hume stated that habitat typing for the March 2009 population estimate was complete and snorkel surveys would be conducted from 16-25 March. Ford reported that work on otolith and tracking studies was not proceeding since requested 4d permits had not been issued. Sears indicated that the California Urban Water Agencies (CUWA) had switched support from valley-wide tracking studies to

focusing on pelagic organism declines (POD) in the delta.

- VAMP Studies: Planned use of bubble curtain barrier at Head of Old River and 7 acoustic tagged smolt releases totaling about 1000 salmon. The 31-day flow period for Vernalis will likely run from April 20-May 20.

4. FLOW OPERATIONS:
   - The SJ Basin Index forecast of March 1 and resultant estimates of FERC flow volume were discussed. The 50% and 90% exceedance estimates (used due to dry year conditions) had about 149 and 113 TAF. The 50% forecast corresponded to a spring pulse flow volume of about 36 TAF and summer base flow requirement of 75 cfs. April forecasts will determine the initial volume and schedule utilized.

5. RESTORATION:
   - No changes from Dec2008 update by Fryer.

6. AGENCY/NGO UPDATES
   - SFPUC
     - Sears indicated that the CCSF has allocated $16M to the SFPUC Watershed and Environmental Improvement Program (WEIP) in the 2009–2010 budget for a range of habitat programs in the upper watershed and other locations
   - TRT
     - Roseman discussed funding status for the Dos Rios project due to the State Bond Fund freeze. Other sources may include Federal and State fiscal stimulus finds as well as NRCS flood easement funds. TRT has re-initiated the Tuolumne River Coalition, which held its first meeting in February and will hold another one in May. Current initiatives include the development of a map for public access to the Tuolumne River and a public awareness campaign "Paddle to the Sea" which is planned from Clavey River to SF Bay in May and June.

7. ADDITIONAL ITEMS
   - None.

8. NEXT MTG DATES – QUARTERLY ON 2ND THURSDAY: JUNE 11, SEPTEMBER 10, DECEMBER 10

TRTAC Meeting Attendees

	Name	Organization
1.	Tim Ford	TID/MID
2.	Robert Nees	TID
3.	Roger Masuda	TID
4.	Walter Ward	MID
5.	Ron Yoshiyama	CCSF
6.	Bill Sears	SFPUC
7.	Noah Hume	Stillwater Sciences
8.	Jesse Roseman	Tuolumne River Trust

2009 TRTAC Activities & Materials

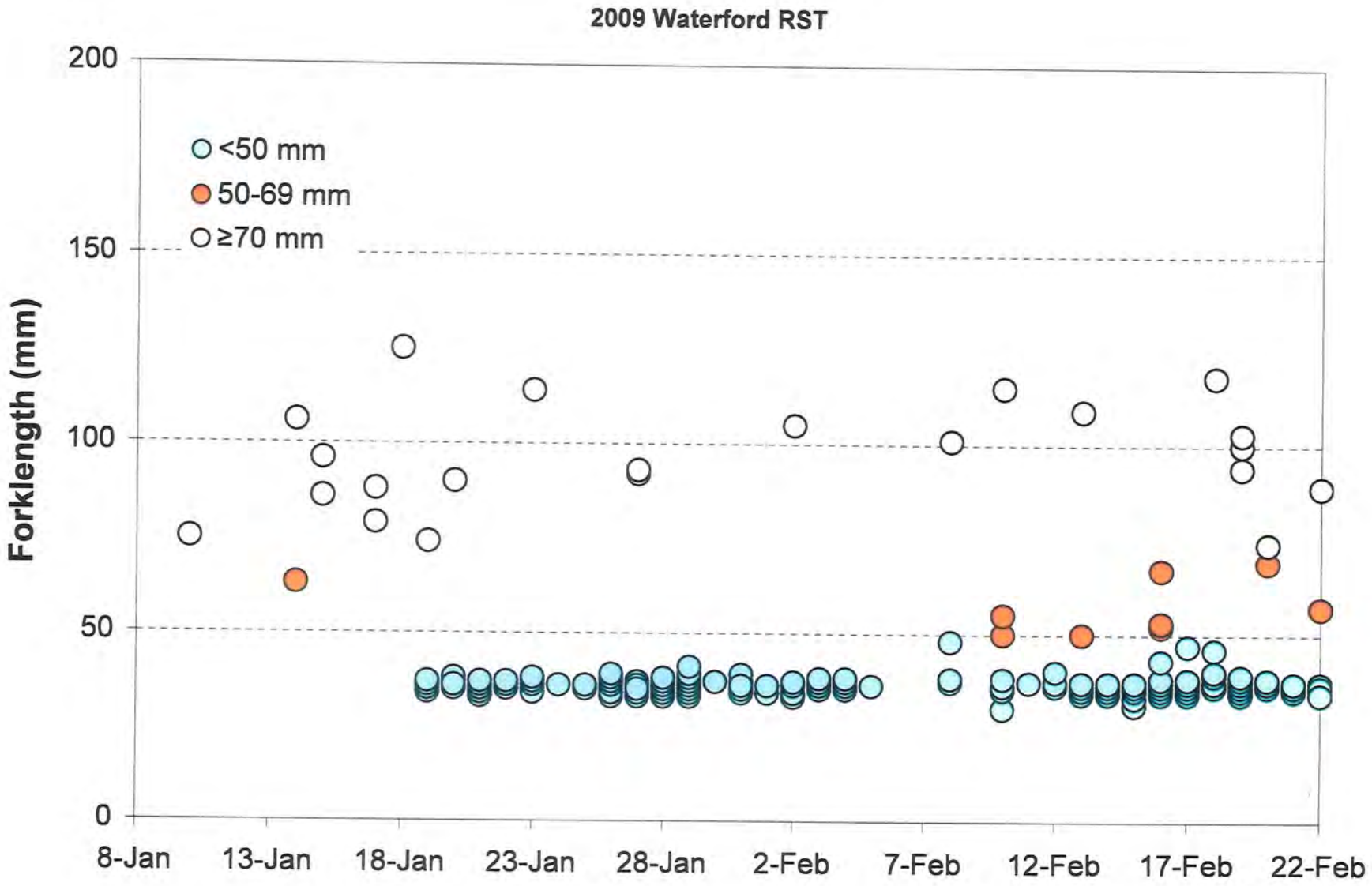
12Dec2008-12Mar2009 Postings to TRTAC website http://tuolumnerivertac.com/

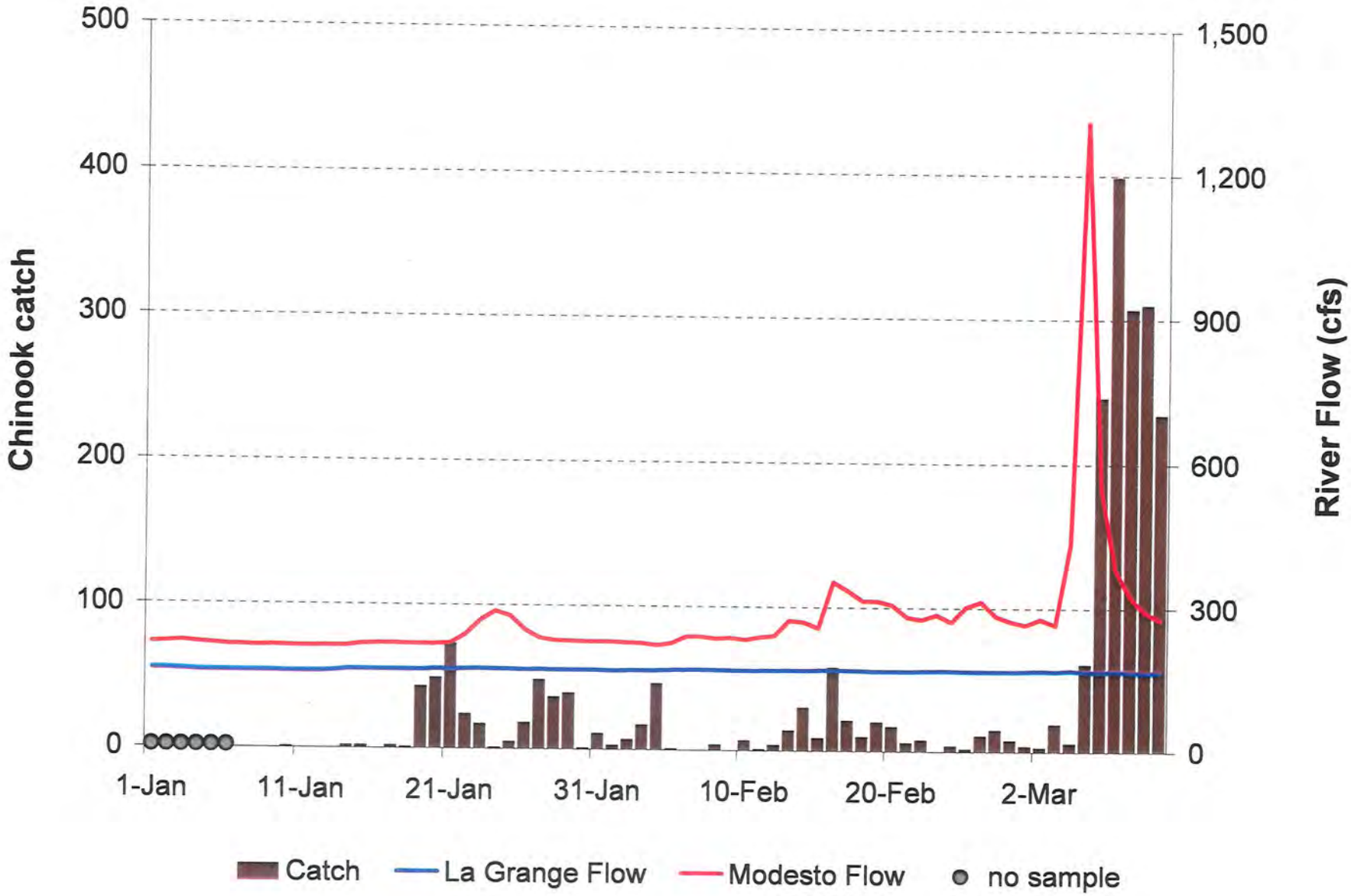
- Meetings
  - December 2008 TRTAC meeting summary and handouts
  - March 2009 TRTAC meeting agenda

- Correspondence
  - Letter re: 45-day Period and Fall Pulse Flow Requirements dated January 21, 2009

- Documents
  - Annual Benthic Macroinvertebrate Monitoring (2005, 2007, 2008) and Summary Update
  - 2008 VAMP Report
  - 2008 Summer Flow Operations Report
  - 2009 Study Plan for Population Size Estimates of O. mykiss

- Data/Monitoring/Maps/Photos
  - 2009 seine data
  - Thermograph data through 08Oct2008
  - File with river miles, study sites, habitat reaches, and GPS readings
  - Updates of basin monitoring newsletter


2009 Waterford RST
Forklength (mm)
200
150
100
50
0
<50 mm
50-69 mm
≥70 mm
8-Jan
13-Jan
18-Jan
23-Jan
28-Jan
2-Feb
7-Feb
12-Feb
17-Feb
22-Feb


Chinook catch
River Flow (cfs)
500
400
300
200
100
0
1,500
1,200
900
600
300
0
1-Jan
11-Jan
21-Jan
31-Jan
10-Feb
20-Feb
2-Mar
Catch
La Grange Flow
Modesto Flow
no sample

	Turbidity measurements		Tributary NTU measurements		Other river NTU measurements with River Mile (blue shading on seine data)											
	Tuolumne River screw traps			Graded land												
	Waterford River Mile	Grayson River Mile	Peaslee at Rd	runoff at Lake Rd	OLGB	R5	Basso	TRR	TLSRA	RFB	HB	Fox G	Chas Rd	Legion	Service	Shiloh
	30	5			50.5	48.0	47.5	42.3	42.0	39.4	31.6	26.4	24.9	17.2	8.7	3.4
1-Jan-2009	ns	ns														
2-Jan-2009	ns	ns														
3-Jan-2009	ns	ns														
4-Jan-2009	ns	ns														
5-Jan-2009	ns	ns														
6-Jan-2009	ns	ns														
7-Jan-2009	0.9	ns														
8-Jan-2009	0.6	0.6														
9-Jan-2009	0.3	0.2														
10-Jan-2009	0.9	0.5														
11-Jan-2009	1.6	0.7														
12-Jan-2009	5.1	2.0														
13-Jan-2009	0.8	1.4			1.4	1.2		1.3			3.8		2.0	2.1	1.5	1.3
14-Jan-2009	0.5	0.9														
15-Jan-2009	0.9	0.8														
16-Jan-2009	0.6	0.5														
17-Jan-2009	1.3	1.1														
18-Jan-2009	1.0	0.8														
19-Jan-2009	0.8	0.5														
20-Jan-2009	0.7	62.0														
21-Jan-2009	1.6	1.9														
22-Jan-2009	1.3	1.2														
23-Jan-2009	0.8	1.4														
24-Jan-2009	2.5	9.2														
25-Jan-2009	1.1	3.5														
26-Jan-2009	0.6	1.8														
27-Jan-2009	2.8	1.9			2.0	1.3		3.1			3.8		3.7	3.2	2.6	3.1
28-Jan-2009	1.9	2.3														
29-Jan-2009	1.3	1.1														
30-Jan-2009	1.2	2.2														
31-Jan-2009	1.4	1.8														
1-Feb-2009	1.0	1.6														
2-Feb-2009	1.0	1.2														
3-Feb-2009	0.6	0.4														
4-Feb-2009	1.4															
5-Feb-2009	0.5	1.6														
6-Feb-2009	1.1	2.0														
7-Feb-2009	0.8	3.1														
8-Feb-2009	0.9	1.8														
9-Feb-2009	0.8	1.6			1.2	1.3		1.8			1.9		2.7	5.0	2.0	3.8
10-Feb-2009	1.1	0.9														
11-Feb-2009	0.6	1.4														
12-Feb-2009	1.5	2.5														
13-Feb-2009	2.3	2.5														
14-Feb-2009	3.9	2.5														
15-Feb-2009	18.9	5.8														
16-Feb-2009	7.7	3.9														
17-Feb-2009	2.9	5.5														
18-Feb-2009	3.7	9.2														
19-Feb-2009	2.7	10.6														
20-Feb-2009	2.7	8.8														
21-Feb-2009	2.1	4.8														
22-Feb-2009	2.4	4.0														
23-Feb-2009	1.3	3.8														
24-Feb-2009	1.7	6.4			1.2	2.7		1.6			2.9		3.1	5.3	6.8	10.2
25-Feb-2009	1.4	1.9														
26-Feb-2009	2.0	9.7														
27-Feb-2009	1.2	6.5														
28-Feb-2009	3.4	4.2														
1-Mar-2009	0.6	2.0														
2-Mar-2009	5.4	9.1														
3-Mar-2009	2.8	ns														
4-Mar-2009	7.0	9.3	44.9	3504.0			20.3		162.0	15.1		2.9				
5-Mar-2009	69.9	256.0	34.7	1047.0			12.2		49.4	77.0		5.4				
6-Mar-2009	111.0	82.9	34.1	589.0			2.7		6.3	7.2		12.3				
7-Mar-2009	17.6	22.6														
8-Mar-2009	9.9	26.0														
9-Mar-2009	6.1	52.6														
10-Mar-2009	4.5	31.7			1.6	1.5		2.1			6.0		6.4	11.5	15.5	19.0
11-Mar-2009																

TUOLUMNE RIVER TECHNICAL ADVISORY COMMITTEE

DON PEDRO PROJECT - FERC LICENSE 2299

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TECHNICAL ADVISORY COMMITTEE MEETING

11 June 2009 at 9:30 AM

Turlock Irrigation District, Lunch Room (2nd floor)

DRAFT AGENDA

1. INTRODUCTION AND ANNOUNCEMENTS

2. ADMINISTRATIVE ITEMS:
   - Review/revise agenda
   - Approve notes from March 2009 meeting
   - Items since last meeting

3. MONITORING/REPORTS:
   - Review winter/spring monitoring
   - Planned summer studies
   - 2008 FERC Report distribution

4. FLOW OPERATIONS:
   - Review spring flows and current schedule/operations
   - Latest forecast of basin index and annual fish flow volume

6. AGENCY/NGO UPDATES

7. ADDITIONAL ITEMS

8. NEXT MEETING DATES – SEPTEMBER 10, DECEMBER 10

TUOLUMNE RIVER TECHNICAL ADVISORY COMMITTEE

DON PEDRO PROJECT - FERC LICENSE 2299

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TECHNICAL ADVISORY COMMITTEE MEETING

11 June 2009 at 9:30 AM

Turlock Irrigation District, Lunch Room (2nd floor)

Summary

1. INTRODUCTION AND ANNOUNCEMENTS
   - No fishery agencies were present.

2. ADMINISTRATIVE ITEMS:
   - Review/Revise agenda – no changes
   - Review notes from March meeting – no changes were identified
   - Items since last meeting – the handout listing the material posted at http://tuolumnerivertac.com/ was reviewed. Those included the annual report to FERC, two flow schedule letters, and a letter to FERC notifying that two of the steelhead studies would not be done due to lack of agency permits. The RM 30-40 mapping was an extension of the habitat typing done in 2008 from RM 40-52.

3. MONITORING/REPORTS: Handouts were reviewed
   - Screw Trapping: Handouts on catch and size at Waterford and Grayson screw trap sites were reviewed. Catches were low at Grayson (153) relative to Waterford (3,680) and mainly only smolts; peak catches were associated with turbid conditions in March and May at Waterford and in May at Grayson. Fry were also caught at Waterford in Apr-May and some salmon from 70-130 mm were caught in Jan-Feb.
   - Turbidity data was reviewed showing recurrent excessive sediment conditions in the river in 2008-2009. The early May 2009 event occurred during pulse flows and (1) was the highest of the season at Waterford and (2) resulted in the Tuolumne River increasing the turbidity of the San Joaquin River as the Peaslee Creek sediment plume was conveyed far downstream.
   - Seining size and catch data was reviewed. An unusually large number of salmon were captured in early June.
   - *O. mykiss* pop. estimate: Stillwater observed only 13 trout in their March survey, with a preliminary expansion to about 100-200 fish. Effort was spread over the longer RM 30-52 reach. About 5,000 juvenile salmon were seen, which may have complicated ID of trout, with an expanded estimate of about 25,000. A report including both the March and July surveys will be done later this year.

4. FLOW OPERATIONS:
   - The SJ Basin Index forecast range had narrowed to about 2.5-2.8 MAF with corresponding FERC flow volume ranging from 149,206-197,392 AF.

- Pulse flows had met or exceeded scheduled amounts in the period starting April 16; summer requirement starting June 16 would be 75 cfs.
- Reservoir storage status from CDEC was in the handouts and was much improved over prior year.
- Basin flows and delta CVP/SWP exports graphs were reviewed. Vernalis flows during VAMP varied, in part due to Merced flow changes; delta export was higher than usual during VAMP at those flow conditions.

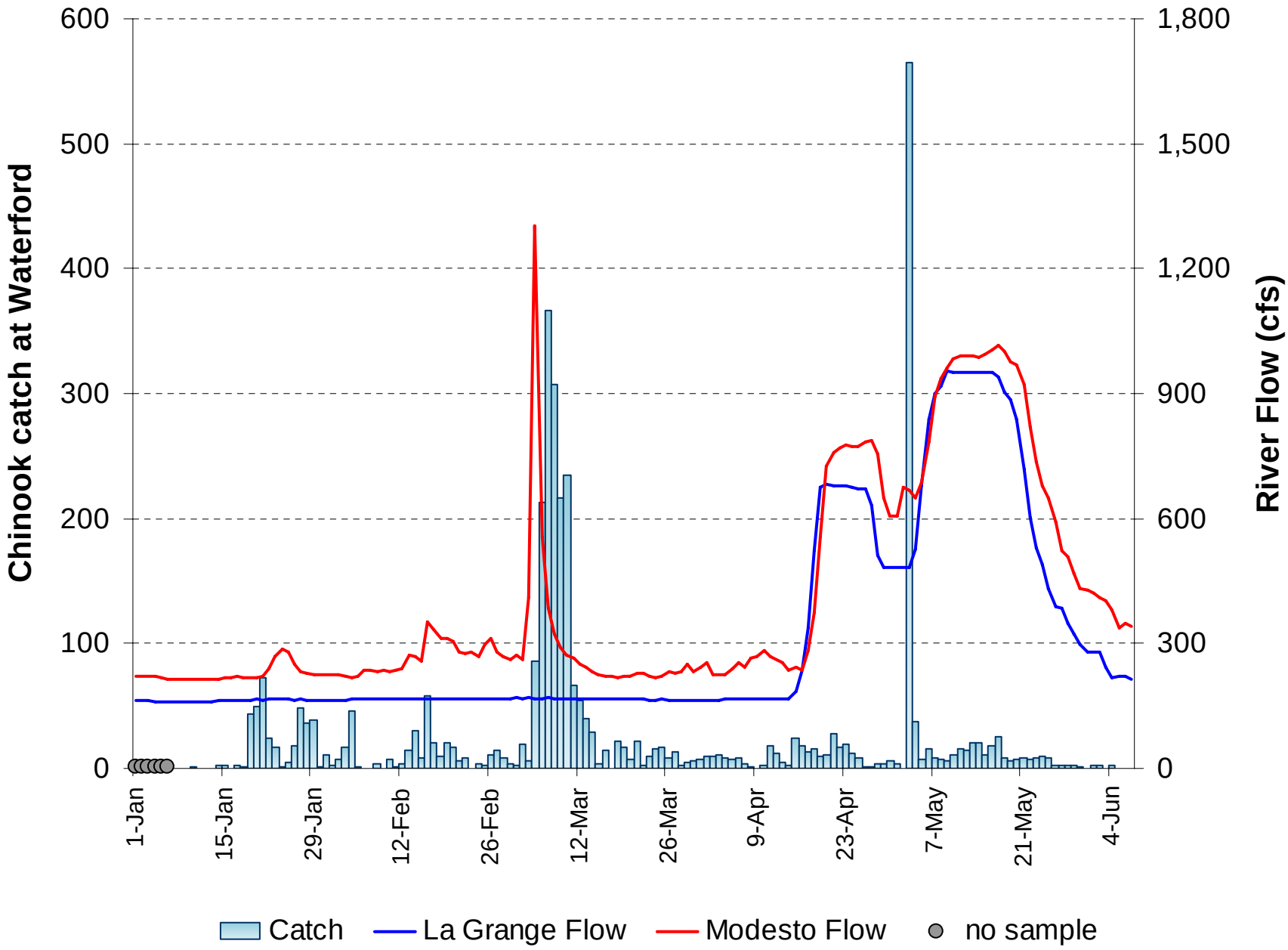
5. AGENCY/NGO UPDATES
   - SFPUC
     - Sears reported on a 5-year time extension agreement with the East Stanislaus RCD for remaining expenses of Article 19 funds. There will be $2M from the SFPUC Watershed and Environmental Improvement Program (WEIP) for Lower Tuolumne projects yet to be selected.
   - TRT
     - Roseman reported on their Green on the Stream event with over 500 attendees and their Paddle to the Sea event that had over 200 participants. Some problems were encountered in the power boating down the San Joaquin River due to shallow water.

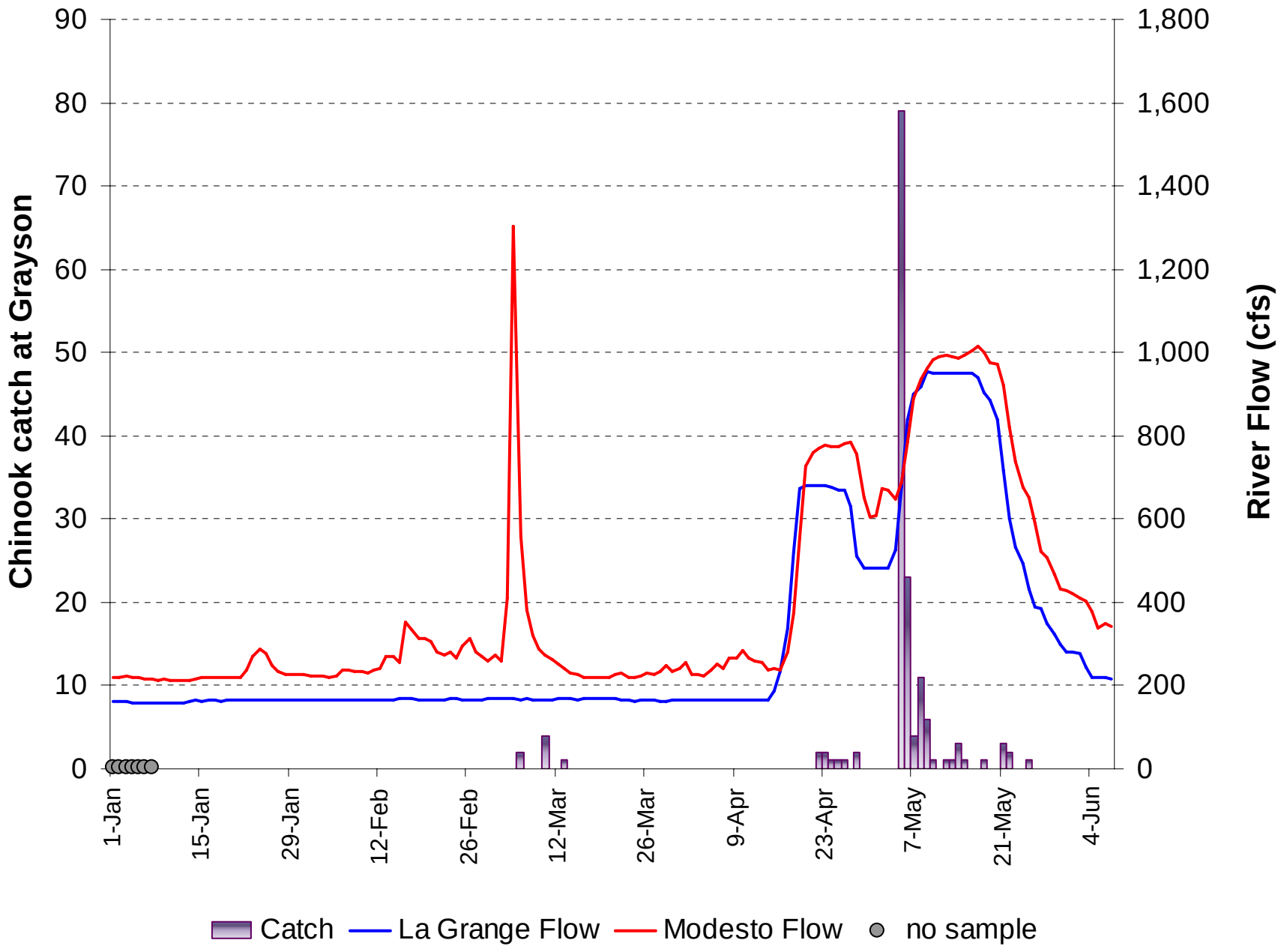
6. ADDITIONAL ITEMS
   - None.

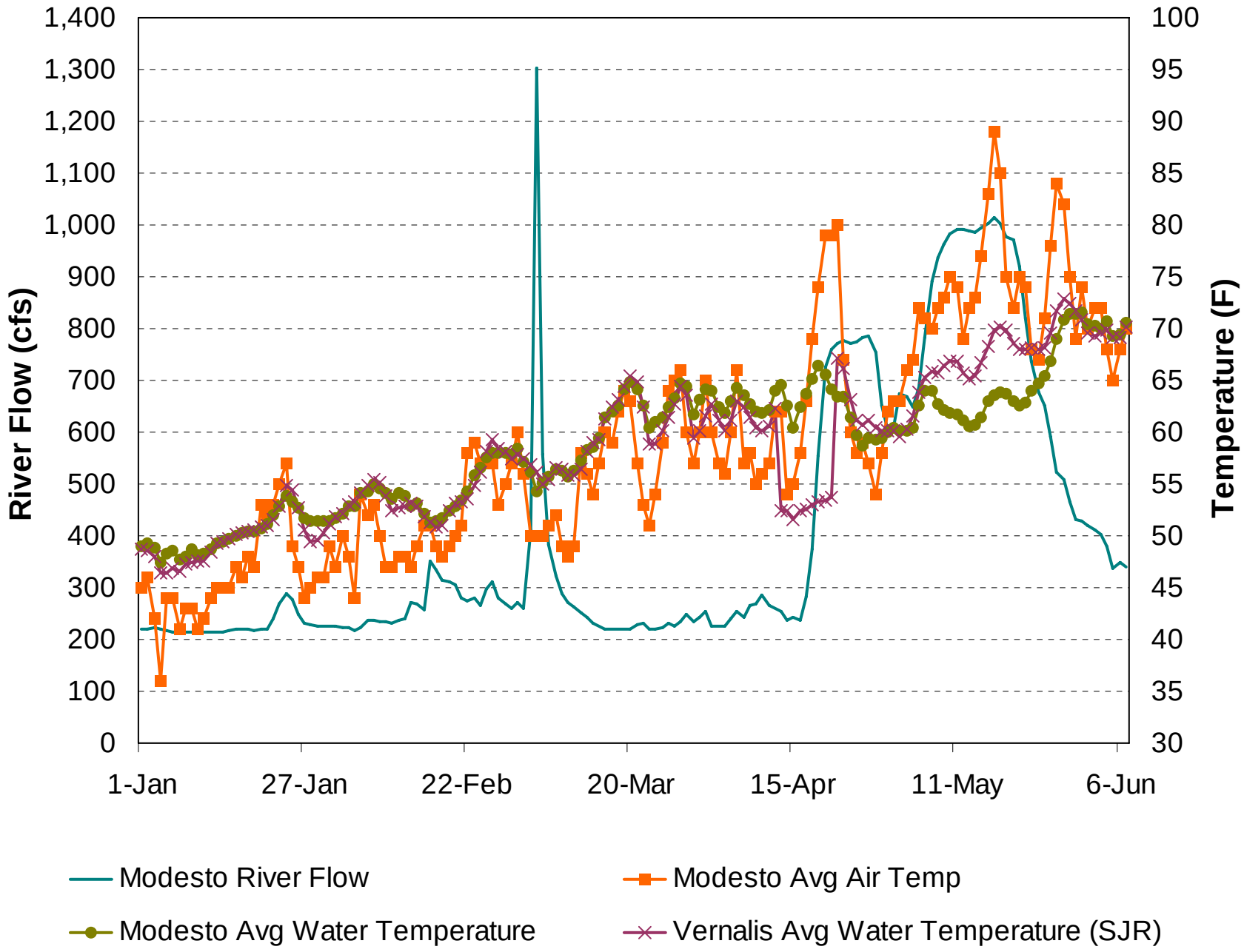
7. NEXT MTG DATES – QUARTERLY ON 2ND THURSDAY: SEPTEMBER 10, DECEMBER 10

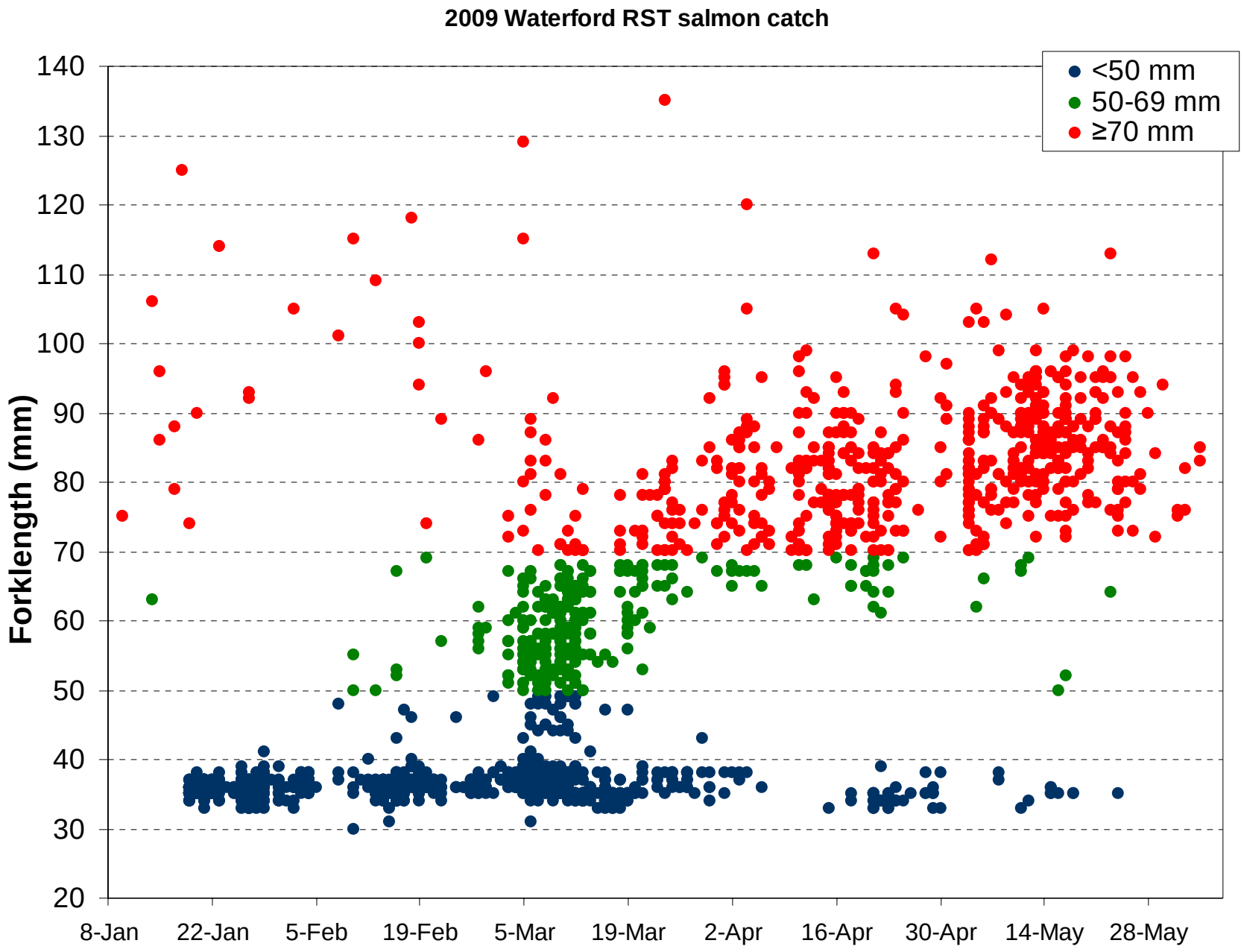
TRTAC Meeting Attendees

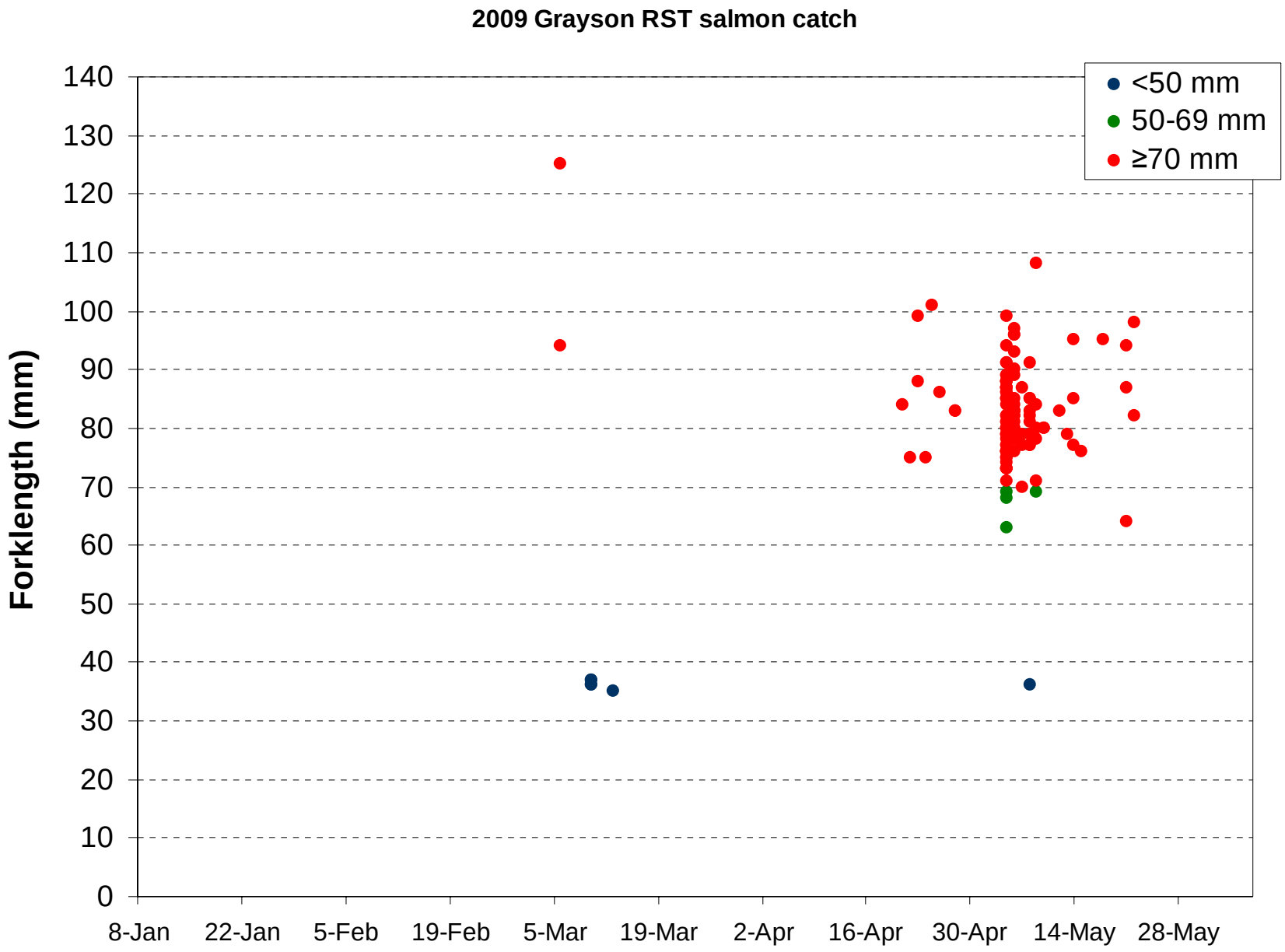
	Name	Organization
1.	Tim Ford	TID/MID
2.	Robert Nees	TID
3.	Roger Masuda	TID
4.	Walter Ward	MID
5.	Bill Sears	SFPUC
6.	Andie Irons	SFPUC
7.	Jesse Roseman	Tuolumne River Trust

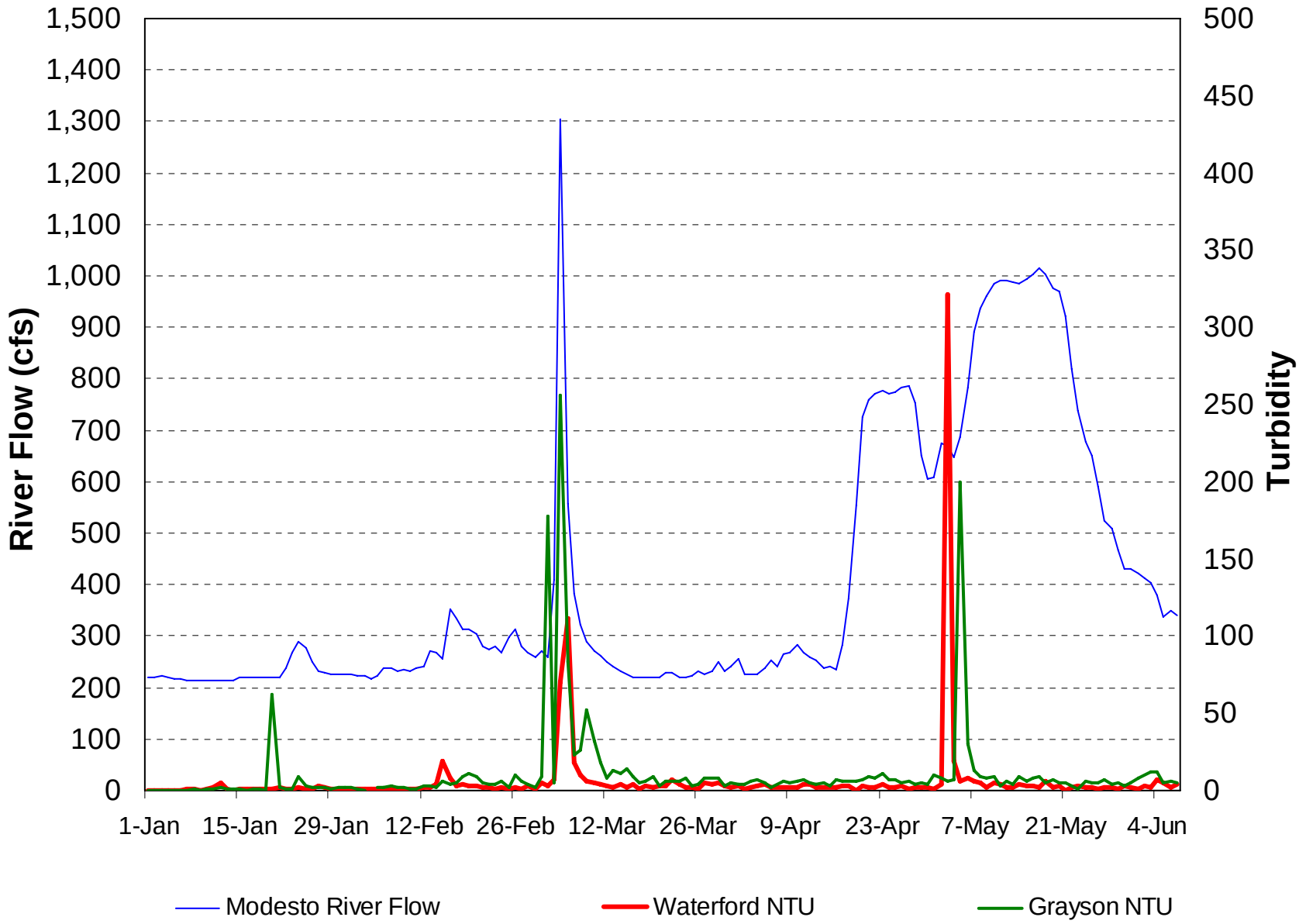

Chinook catch at Waterford
River Flow (cfs)
600
500
400
300
200
100
0
1,800
1,500
1,200
900
600
300
0
1-Jan
15-Jan
29-Jan
12-Feb
26-Feb
12-Mar
26-Mar
9-Apr
23-Apr
7-May
21-May
4-Jun
Catch
La Grange Flow
Modesto Flow
no sample


Chinook catch at Grayson
River Flow (cfs)
90
80
70
60
50
40
30
20
10
0
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
1-Jan
15-Jan
29-Jan
12-Feb
26-Feb
12-Mar
26-Mar
9-Apr
23-Apr
7-May
21-May
4-Jun
Catch
La Grange Flow
Modesto Flow
no sample

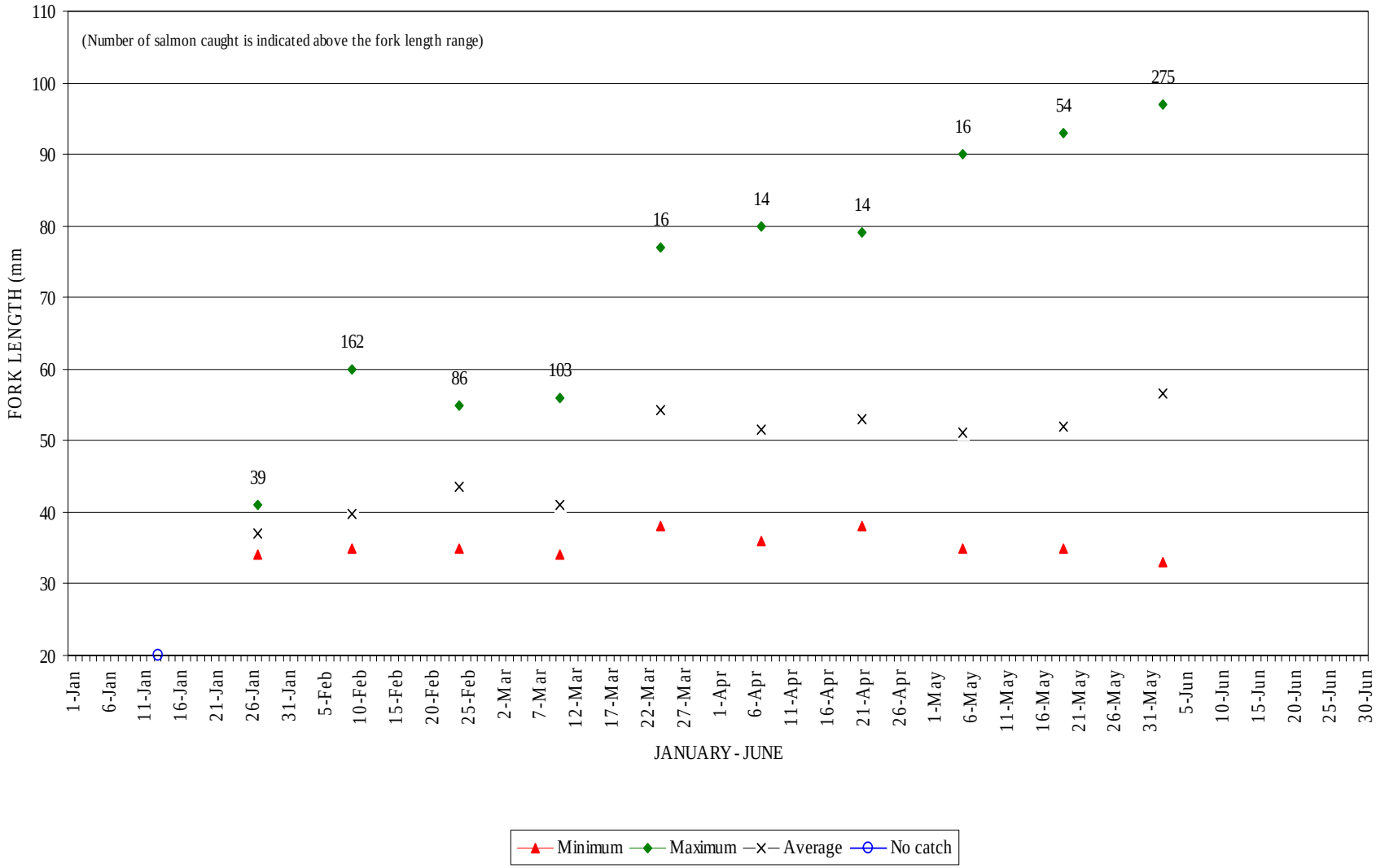

River Flow (cfs)
Temperature (F)
1,400
1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
1-Jan
27-Jan
22-Feb
20-Mar
15-Apr
11-May
6-Jun
Modesto River Flow
Modesto Avg Air Temp
Modesto Avg Water Temperature
Vernalis Avg Water Temperature (SJR)


2009 Waterford RST salmon catch
<50 mm
50-69 mm
≥70 mm
Forklength (mm)
140
130
120
110
100
90
80
70
60
50
40
30
20
8-Jan
22-Jan
5-Feb
19-Feb
5-Mar
19-Mar
2-Apr
16-Apr
30-Apr
14-May
28-May

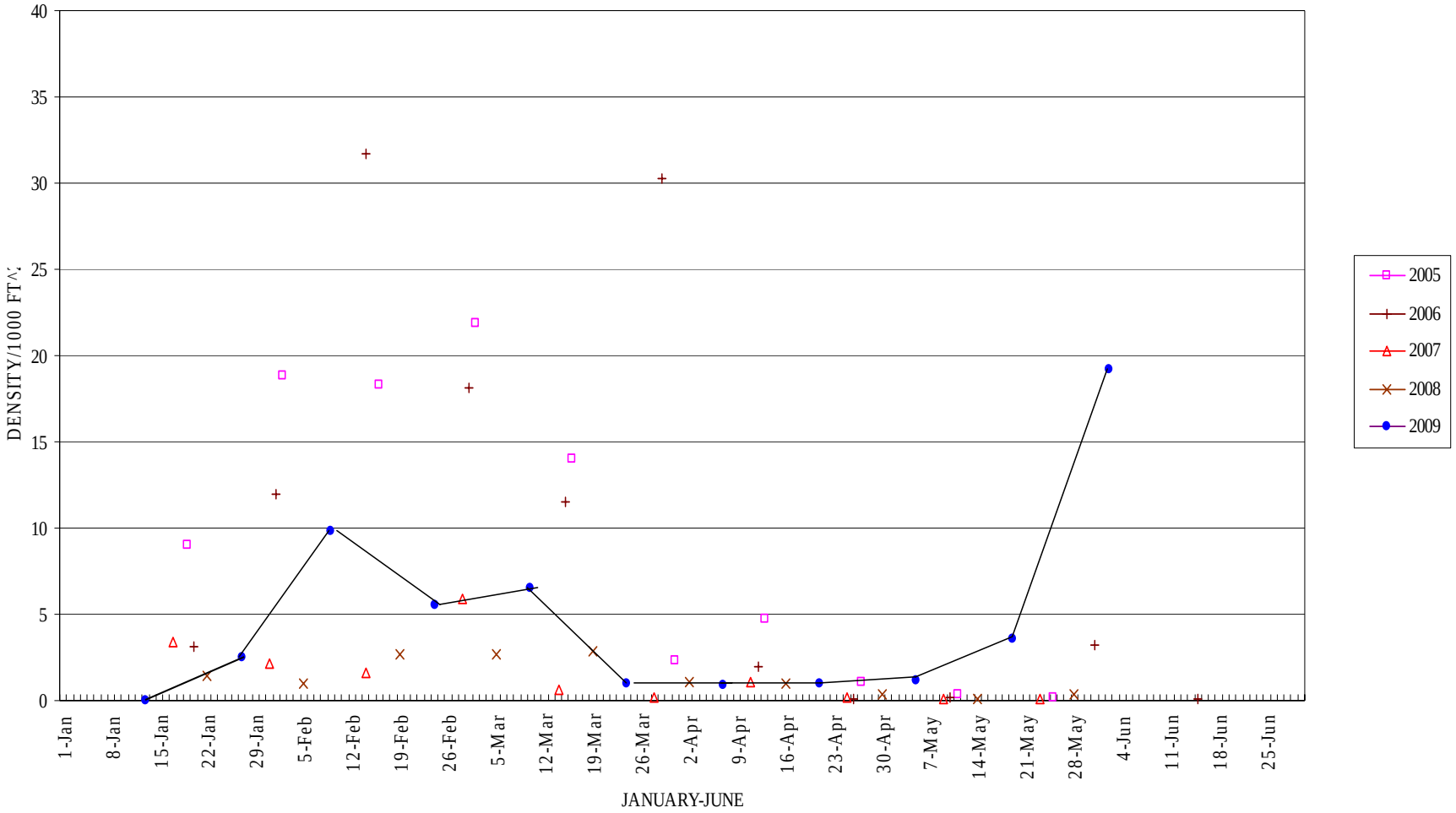

2009 Grayson RST salmon catch
Forklength (mm)
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
8-Jan
22-Jan
5-Feb
19-Feb
5-Mar
19-Mar
2-Apr
16-Apr
30-Apr
14-May
28-May
<50 mm
50-69 mm
≥70 mm

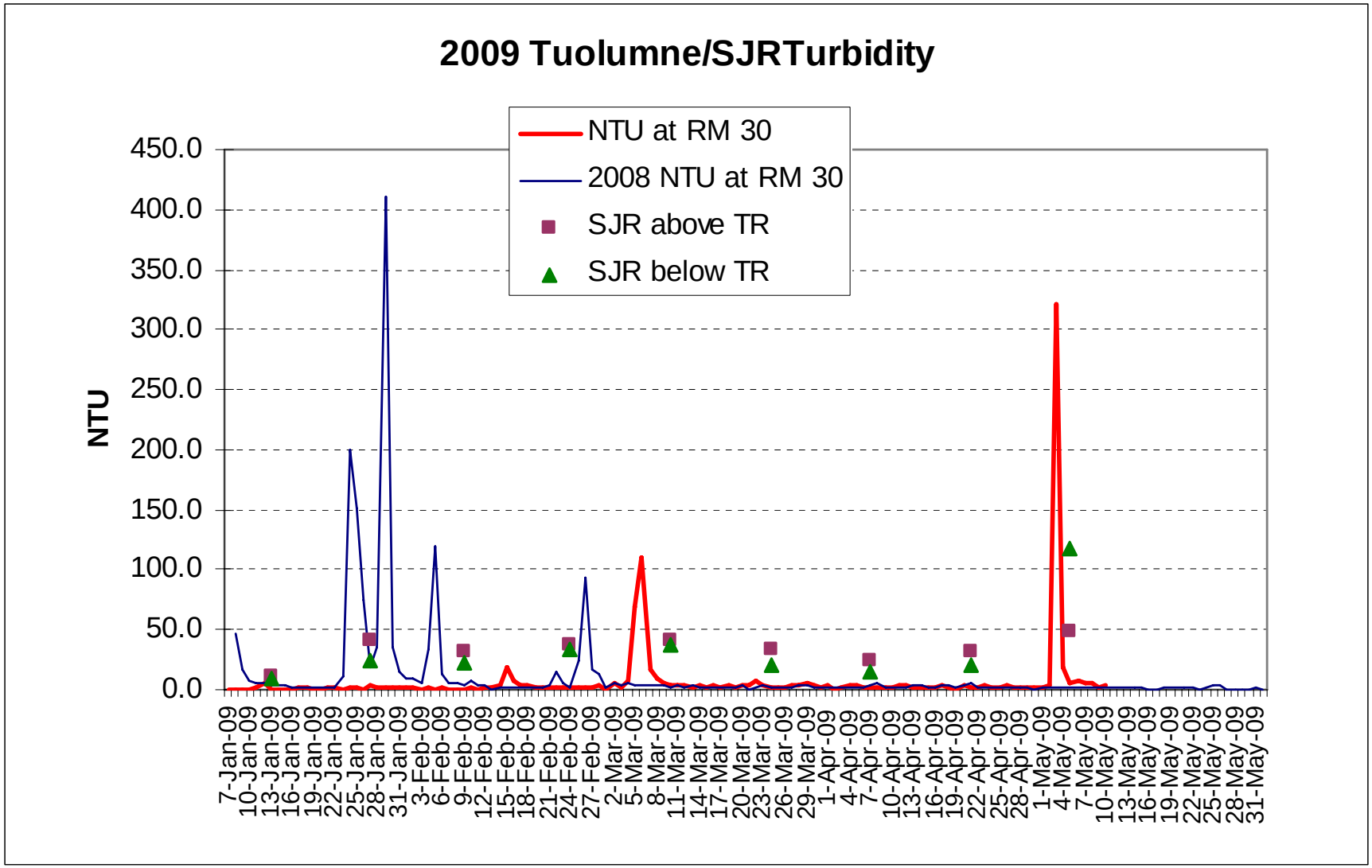

River Flow (cfs)
Turbidity
1,500
1,400
1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
500
450
400
350
300
250
200
150
100
50
0
1-Jan
15-Jan
29-Jan
12-Feb
26-Feb
12-Mar
26-Mar
9-Apr
23-Apr
7-May
21-May
4-Jun
Modesto River Flow
Waterford NTU
Grayson NTU

2009 TUOLUMNE RIVER JUVENILE SALMON SEINING STUDY



2005-2009 TUOLUMNE RIVER SEINING
COMBINED FRY AND JUVENILE SALMON DENSITY INDEX




2009 Tuolumne/SJRTurbidity
NTU at RM 30
2008 NTU at RM 30
SJR above TR
SJR below TR
NTU
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
7-Jan-09
10-Jan-09
13-Jan-09
16-Jan-09
19-Jan-09
22-Jan-09
25-Jan-09
28-Jan-09
31-Jan-09
3-Feb-09
6-Feb-09
9-Feb-09
12-Feb-09
15-Feb-09
18-Feb-09
21-Feb-09
24-Feb-09
27-Feb-09
2-Mar-09
5-Mar-09
8-Mar-09
11-Mar-09
14-Mar-09
17-Mar-09
20-Mar-09
23-Mar-09
26-Mar-09
29-Mar-09
1-Apr-09
4-Apr-09
7-Apr-09
10-Apr-09
13-Apr-09
16-Apr-09
19-Apr-09
22-Apr-09
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28-Apr-09
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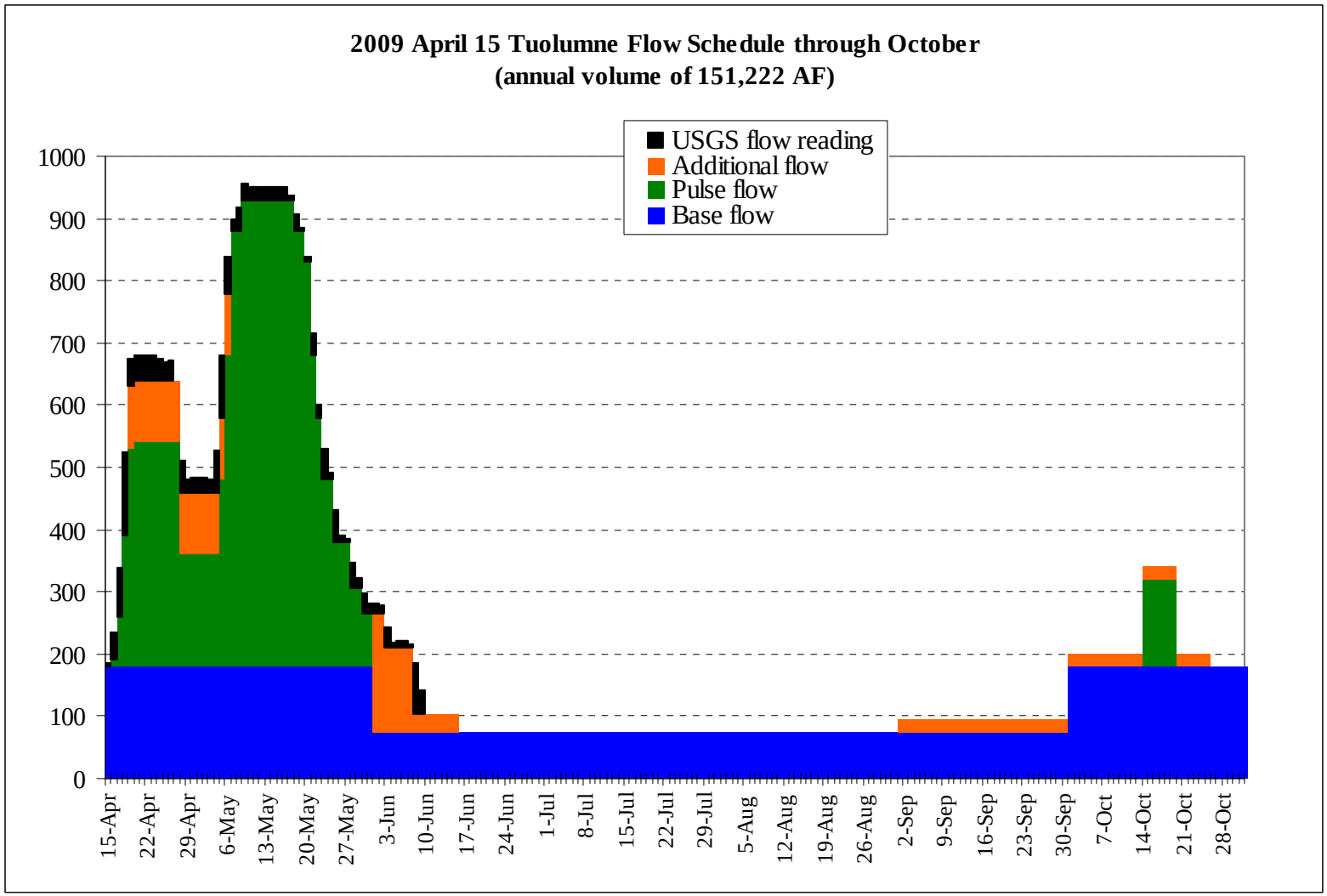
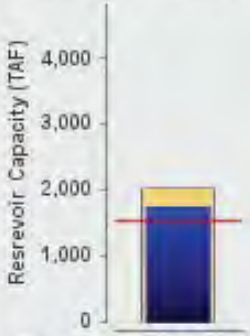

2009 April 15 Tuolumne Flow Schedule through October
(annual volume of 151,222 AF)
USGS flow reading
Additional flow
Pulse flow
Base flow
1000
900
800
700
600
500
400
300
200
100
0
15-Apr
22-Apr
29-Apr
6-May
13-May
20-May
27-May
3-Jun
10-Jun
17-Jun
24-Jun
1-Jul
8-Jul
15-Jul
22-Jul
29-Jul
5-Aug
12-Aug
19-Aug
26-Aug
2-Sep
9-Sep
16-Sep
23-Sep
30-Sep
7-Oct
14-Oct
21-Oct
28-Oct

Reservoir Conditions - Don Pedro

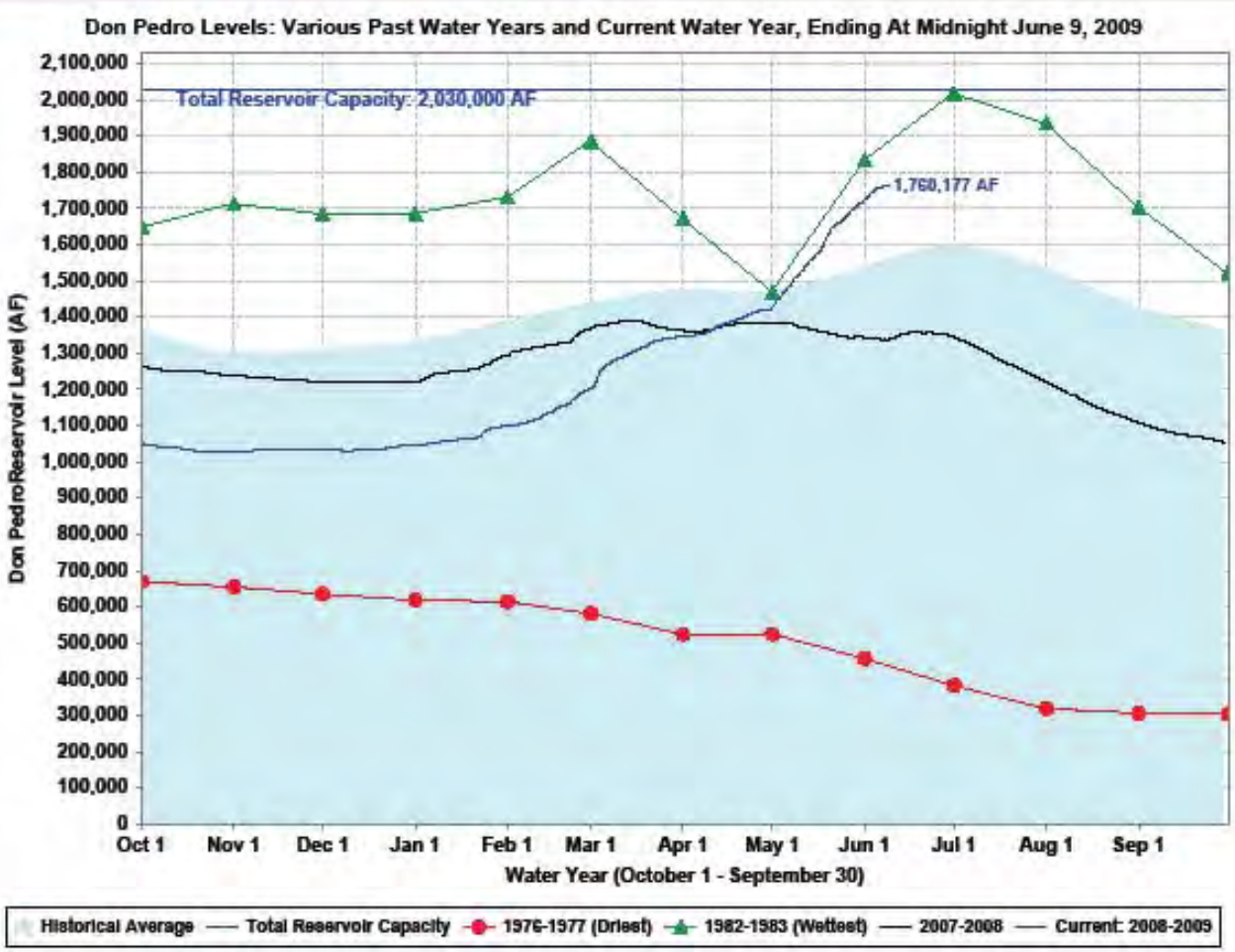
Don Pedro Conditions

(as of Midnight - June 9, 2009)

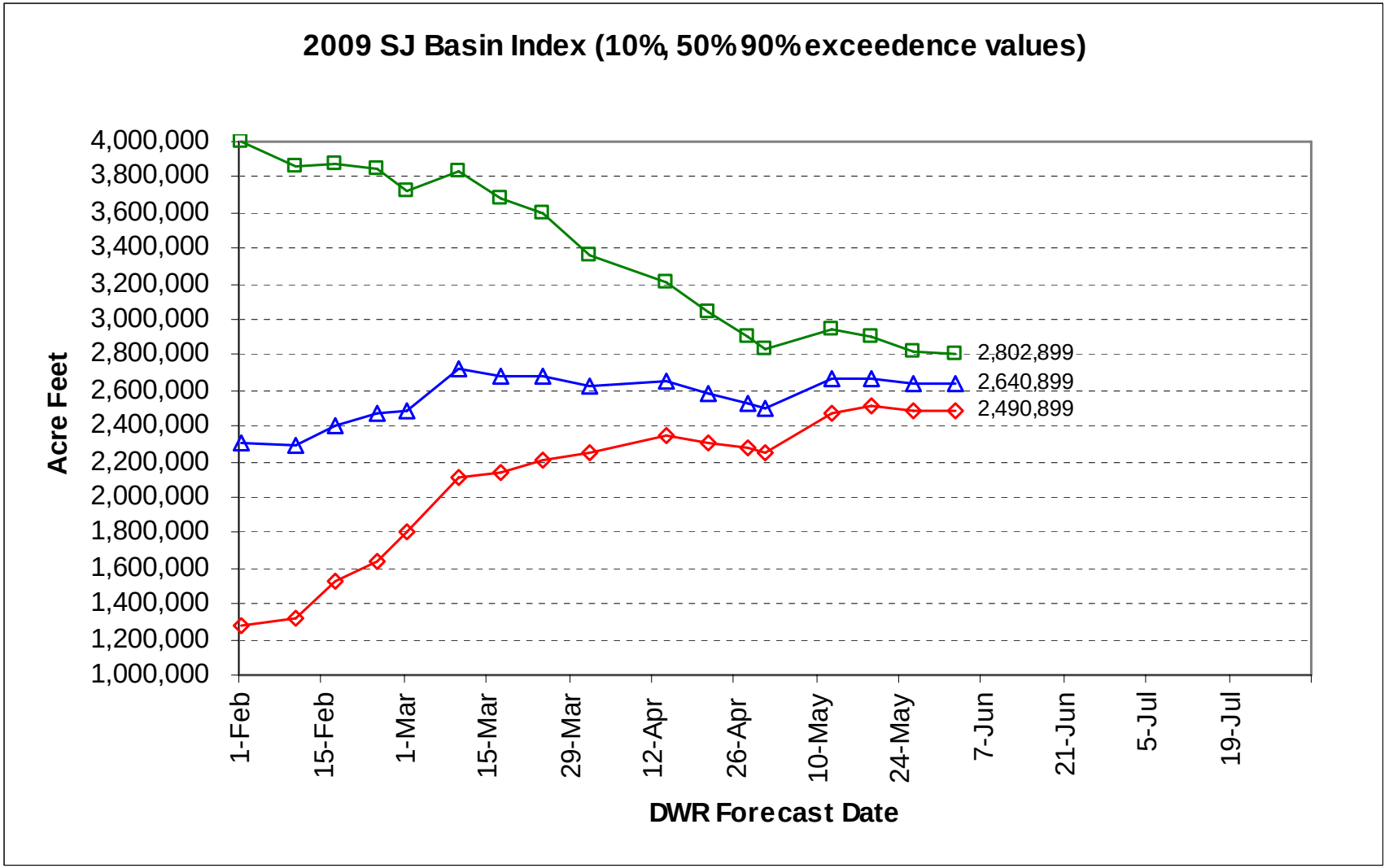


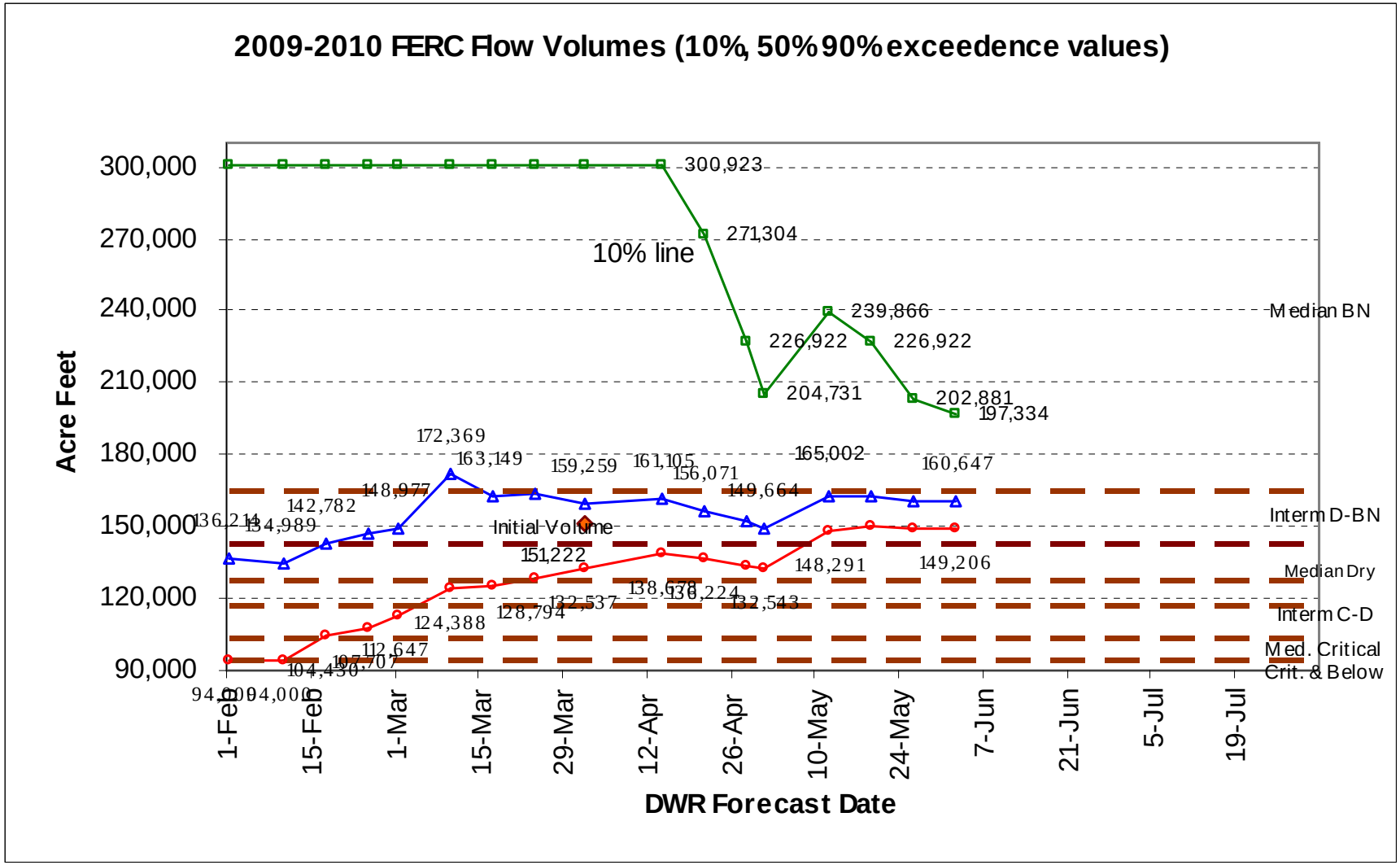
Current Level: 1,760,177 AF

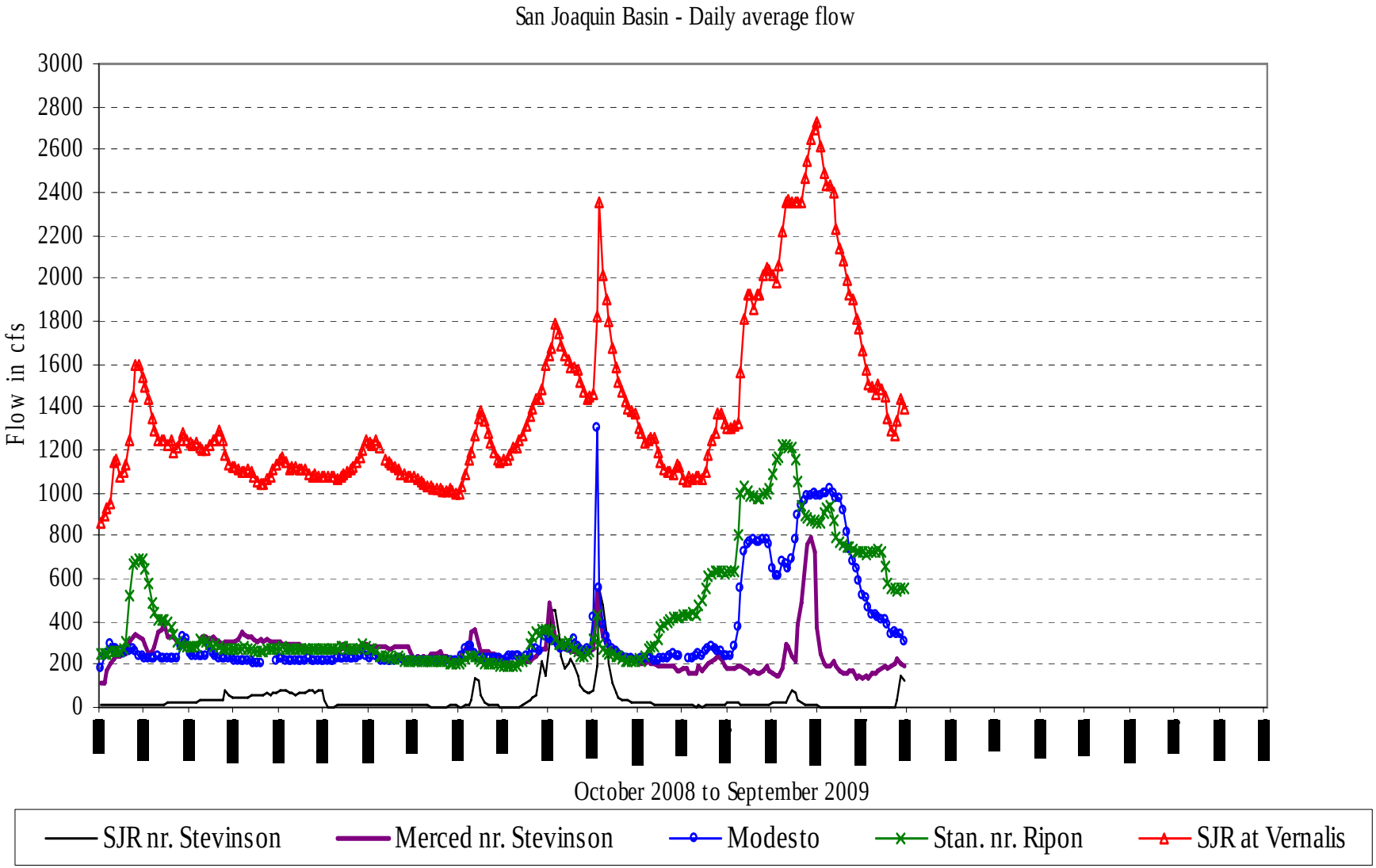
87% (Total Capacity) | 113% (Historical Avg.)

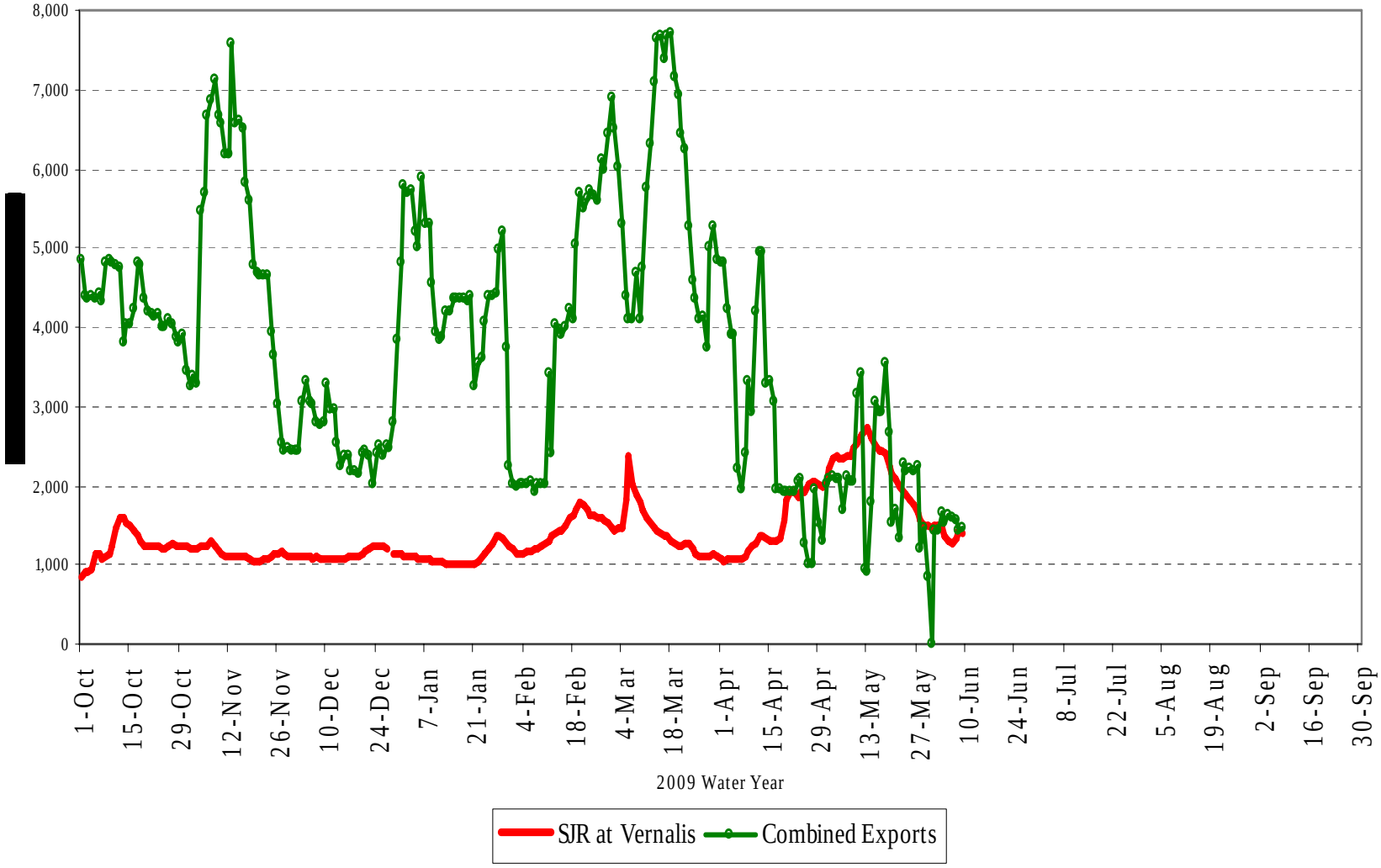


Data Updated 06/11/2009 08:45 AM


2009 SJ Basin Index (10%, 50% 90% exceedence values)
Acre Feet
4,000,000
3,800,000
3,600,000
3,400,000
3,200,000
3,000,000
2,800,000
2,600,000
2,400,000
2,200,000
2,000,000
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
1-Feb
15-Feb
1-Mar
15-Mar
29-Mar
12-Apr
26-Apr
10-May
24-May
7-Jun
21-Jun
5-Jul
19-Jul
DWR Forecast Date
2,802,899
2,640,899
2,490,899


2009-2010 FERC Flow Volumes (10%, 50% 90% exceedence values)
Acre Feet
DWR Forecast Date
300,000
270,000
240,000
210,000
180,000
150,000
120,000
90,000
1-Feb
15-Feb
1-Mar
15-Mar
29-Mar
12-Apr
26-Apr
10-May
24-May
7-Jun
21-Jun
5-Jul
19-Jul
10% line
Median BN
Interm D-BN
Median Dry
Interm C-D
Med. Critical
Crit. & Below
Initial Volume
300,923
271,304
239,866
226,922
226,922
204,731
202,881
197,334
172,369
163,149
159,259
161,105
156,071
165,002
160,647
148,977
149,664
142,782
136,214
134,989
151,222
148,291
149,206
138,678
136,224
132,543
132,537
128,794
124,388
112,647
107,707
104,450
94,000
94,000


San Joaquin Basin - Daily average flow
Flow in cfs
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
October 2008 to September 2009
SJR nr. Stevinson
Merced nr. Stevinson
Modesto
Stan. nr. Ripon
SJR at Vernalis


8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1-Oct
15-Oct
29-Oct
12-Nov
26-Nov
10-Dec
24-Dec
7-Jan
21-Jan
4-Feb
18-Feb
4-Mar
18-Mar
1-Apr
15-Apr
29-Apr
13-May
27-May
10-Jun
24-Jun
8-Jul
22-Jul
5-Aug
19-Aug
2-Sep
16-Sep
30-Sep
2009 Water Year
SJR at Vernalis
Combined Exports

2009 TRTAC Activities & Materials

12Dec2008-12Mar2009 Postings to TRTAC website http://tuolumnerivertac.com/

- Meetings
  - December 2008 TRTAC meeting summary and handouts
  - March 2009 TRTAC meeting agenda

- Correspondence
  - Letter re: 45-day Period and Fall Pulse Flow Requirements dated January 21, 2009

- Documents
  - Annual Benthic Macroinvertebrate Monitoring (2005, 2007, 2008) and Summary Update
  - 2008 VAMP Report
  - 2008 Summer Flow Operations Report
  - 2009 Study Plan for Population Size Estimates of O. mykiss

- Data/Monitoring/Maps/Photos/Other
  - 2009 seine data
  - Thermograph data through 08Oct2008
  - File with river miles, study sites, habitat reaches, and GPS readings
  - Updates of basin monitoring newsletter

13Mar – 11Jun2009 Postings to TRTAC website http://tuolumnerivertac.com/

- Meetings
  - March 2009 TRTAC meeting information and handouts
  - June 2009 TRTAC meeting agenda

- Correspondence
  - Letters re: Flow Schedule dated March 25 and May 5, 2009
  - Letter dated March 31, 2009 from TID/MID to FERC re: Fishery Study

- Documents
  - 2008 Annual Report to FERC

- Data/Monitoring/Maps/Photos/Other
  - 2009 seine data
  - Thermograph data through 11Mar2009
  - Updates of basin monitoring newsletter (includes screw trap results)
  - Current flow schedule
  - River Mile 30-40 Habitat map file

TUOLUMNE RIVER TECHNICAL ADVISORY COMMITTEE

DON PEDRO PROJECT - FERC LICENSE 2299

MODESTO IRRIGATION DISTRICT
TURLOCK IRRIGATION DISTRICT
CITY & COUNTY OF SAN FRANCISCO
CALIFORNIA DEPARTMENT OF FISH & GAME
U. S. FISH & WILDLIFE SERVICE

333 East Canal Drive
Turlock, CA 95381-0949
Phone: (209) 883-8275
Fax: (209) 656-2180
Email: tjford@tid.org

TECHNICAL ADVISORY COMMITTEE MEETING

10 September 2009 at 9:30 AM

Turlock Irrigation District, Lunch Room (2nd floor)

DRAFT AGENDA

1. INTRODUCTION AND ANNOUNCEMENTS

2. ADMINISTRATIVE ITEMS:
   - Review/revise agenda
   - Approve notes from June 2009 meeting
   - Items since last meeting

3. MONITORING/REPORTS:
   - June snorkel survey and July population estimate survey results
   - Posted 2009 seine and snorkel reports
   - Discuss fall monitoring and other study plans

4. FLOW OPERATIONS:
   - Review status of final basin index, annual fish flow volume, and flow schedule
   - Review summer flow operation

5. AGENCY/NGO UPDATES

6. ADDITIONAL ITEMS

7. NEXT MEETINGS – QUARTERLY ON 2ND THURSDAY: DECEMBER 10; MARCH 11, 2010

TUOLUMNE RIVER TECHNICAL ADVISORY COMMITTEE

DON PEDRO PROJECT - FERC LICENSE 2299

MODESTO IRRIGATION DISTRICT
TURLOCK IRRIGATION DISTRICT
CITY & COUNTY OF SAN FRANCISCO
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TECHNICAL ADVISORY COMMITTEE MEETING

10 September 2009 at 9:30 AM

Turlock Irrigation District, Lunch Room (2nd floor)

Summary

1. INTRODUCTION AND ANNOUNCEMENTS
   - See attendee list at end (no fishery agencies were present)

2. ADMINISTRATIVE ITEMS:
   - Review/Revise agenda – No changes
   - Approve notes from June meeting – No changes were identified. Notes for the last meeting are posted to the TRTAC website: http://tuolumnerivertac.com/
   - Items since last meeting – the handout listing the material posted at http://tuolumnerivertac.com/ was reviewed. Those included correspondence regarding the potential rehearing on the 2005 10-Year Summary Report, July 15 FERC Order, preliminary Bobcat Flat West Restoration Plans by FOT, a letter from CDFG to FERC regarding fall 2008 water diversion at La Grange Powerhouse, transmittal letter and draft FERC Ordered study plans on Instream Flow and Water Temperature Modeling, draft 2009 seine and snorkel reports, June snorkel, thermograph data through July 20, updates of the basin monitoring newsletter (including RST results), and an updated participant list.

3. MONITORING/REPORTS:
   - June snorkel survey and July population estimate results: Discussed June snorkel survey and preliminary findings of July population survey. *O. mykiss* were observed from approximately RM 52–42 with greater proportions of adult-sized fish upstream. About 3,480 juvenile and 960 adult *O. mykiss* were estimated within the study reach, in comparison to 2,470 juveniles and 770 adults in July 2008 (preliminary numbers). A report including both the March 2009 and July 2009 surveys will be done later this year.
   - 2009 seine and snorkel reports – located on TRTAC website for review.
   - Other Summer/Fall monitoring and other study plans: Thermographs were downloaded through 20Jul2009 and would be downloaded again in early fall. Invertebrate sample collections were completed in July and being analyzed, with report completion in early 2010. Plans to install a counting weir for fall 2009 are pending permit approvals.

4. FLOW OPERATIONS:
   - Reviewed final annual flow volume of 179,581 AF which corresponds to a "Median-

Below Normal" Fish Flow Year Type with only a 2–3 day fall pulse planned.

- Ford and Masuda described how the higher "True-Up" volume resulting from the increased final basin index could be allocated in the fall and winter for the first time since 2003.
- Ford reviewed the summer flow operations, which averaged 105 cfs from mid-June through August, and had higher releases with hotter air temperature forecasts.

5. AGENCY/NGO UPDATES
   - ESRCD (East Stanislaus Resource Conservation District)
     - Nolan discussed his salmonid research and work history on North Coast rivers
     - Recently accepted position as watershed coordinator is attending TRTAC and Tuolumne River Coalition (TRC) meetings – would also be involved on Stanislaus River. Roseman indicated the next TRC meeting will be in October.
     - Discussed salmon festival planning at Knights Ferry. Ford suggested reviewing Stanislaus counting weir data for run timing.
   - TRT (Tuolumne River Trust)
     - Roseman discussed the local cleanup day planned at Legion Park on Saturday September 12th
     - Roseman discussed plans for the removal of remaining portions of Dennett Dam near the 9th St. Bridge in Modesto. TRT is applying for funding through NOAA Open Rivers initiative and the CDFG Sport Fishing Stamp Program to remove the dam as a migratory barrier (and safety concern). Potential concerns discussed by the group included small changes in the channel profile as well as liability during demolition. He will be requesting support letters for the proposal.

6. ADDITIONAL ITEMS
   - None.

7. NEXT MTG DATES – QUARTERLY ON 2ND THURSDAY: DECEMBER 10, MARCH 11

TRTAC Meeting Attendees

	Name	Organization
1.	Greg Deas (Phone)	MID
2.	Tim Ford	TID/MID
3.	Noah Hume	Stillwater
4.	Roger Masuda	TID
5.	Galileo Morales	TID
6.	Jesse Nolan	East Stanislaus RCD
7.	Jesse Roseman	Tuolumne River Trust
8.	Bill Sears	SFPUC

12Jun-10Sep2009 Postings to TRTAC website http://tuolumnerivertac.com/

- Meetings
  - June 2009 TRTAC meeting information and handouts
  - September 2009 TRTAC meeting agenda

- Correspondence
  - Conservation groups' motion for decision regarding rehearing of order on ten-year summary report and leave to adduce to additional evidence dated June 17, 2009.
  - Friends of the Tuolumne's Bobcat Flat West Restoration Plans (Google Earth) dated July 16, 2000.
  - Order on rehearing, amending license, denying late intervention, denying petition, and directing appointment of a presiding judge for a proceeding on interim conditions dated July 16, 2009.
  - CDFG letter on Fall 2008 Tuolumne River water diversion at La Grange Powerhouse dated August 19, 2009.
  - Transmittal letter for draft instream flow and water temperature modeling study plans dated September 3, 2009

- Documents
  - 2009 Seine Report
  - 2009 Snorkel Report
  - 2009Sep Draft Instream Flow Study Plan
  - 2009Sep Draft Water Temperature Modeling Study Plan

- Data/Monitoring/Maps/Photos/Other
  - 2009 seine data
  - 2009 June snorkel data
  - Thermograph data through 20Jul2009
  - Updates of basin monitoring newsletter (includes screw trap results)
  - Current flow schedule
  - Updated participant list

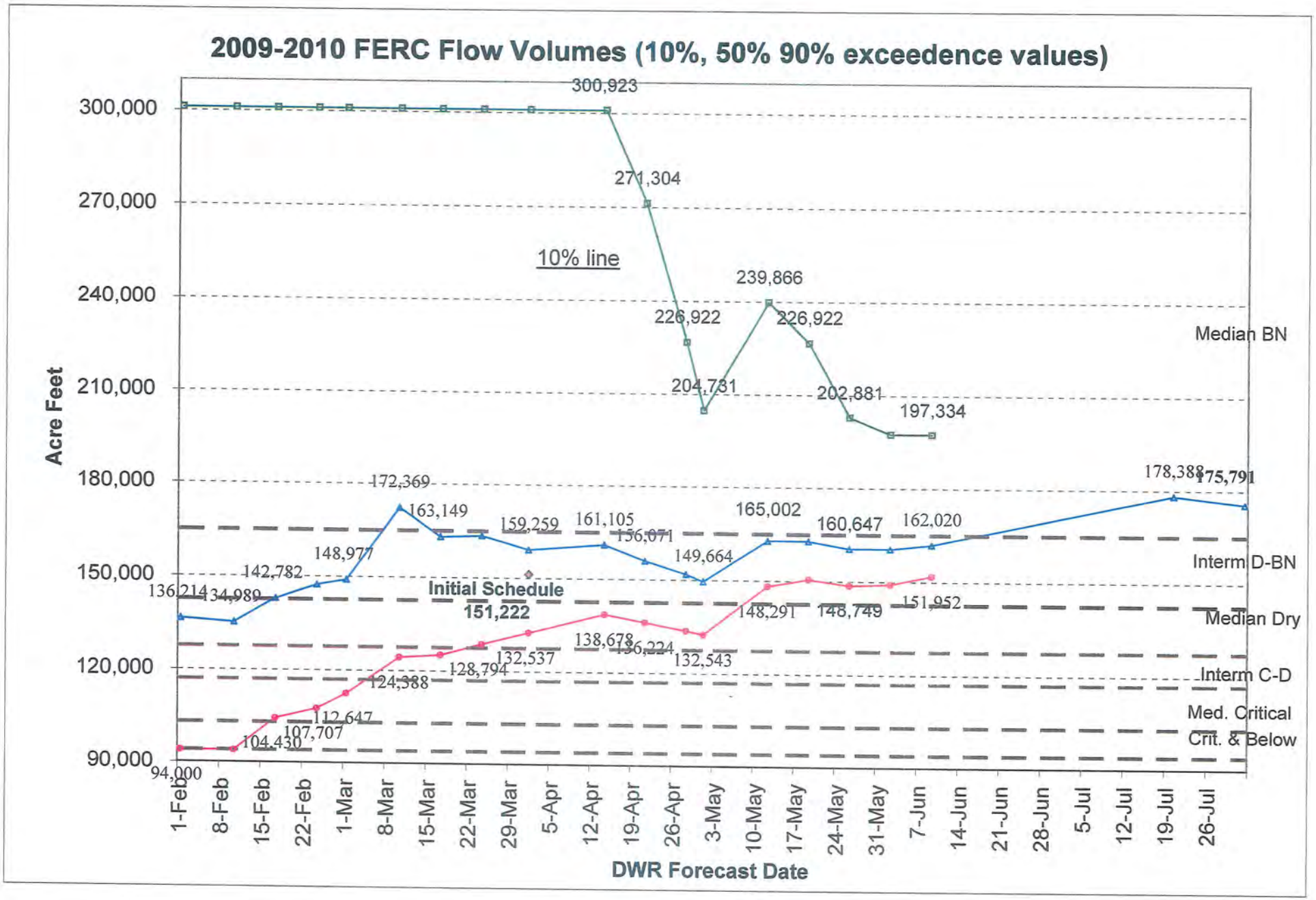
2009-2010 FERC Flow Volumes (10%, 50% 90% exceedence values)
Acre Feet
DWR Forecast Date
300,000
270,000
240,000
210,000
180,000
150,000
120,000
90,000
1-Feb
8-Feb
15-Feb
22-Feb
1-Mar
8-Mar
15-Mar
22-Mar
29-Mar
5-Apr
12-Apr
19-Apr
26-Apr
3-May
10-May
17-May
24-May
31-May
7-Jun
14-Jun
21-Jun
28-Jun
5-Jul
12-Jul
19-Jul
26-Jul
10% line
300,923
271,304
226,922
204,731
239,866
226,922
202,881
197,334
Median BN
Interm D-BN
Median Dry
Interm C-D
Med. Critical
Crit. & Below
Initial Schedule
151,222
136,214
134,989
142,782
148,977
172,369
163,149
159,259
161,105
156,071
149,664
165,002
160,647
162,020
178,388
175,791
94,000
104,430
107,707
112,647
124,388
128,794
132,537
138,678
136,224
132,543
148,291
148,749
151,952

TABLE 1

Tuolumne River Flow Schedule — Proposed

SCHEDULE FOR 2009 - 20010 Fish Flow Year

DATE		Number of	Flow for Average														
			Base Flow			Pulse Flows			Interpolation Flow			Other Adjusted Flow			Total FERC Flow	
From:	To:	DAYS	CFS	AF	ACCUM. A.F.	CFS	AF	ACCUM. A.F.	CFS	AF	ACCUM. A.F.	CFS	AF	ACCUM. A.F.	CFS	ACCUM. A.F.
15-Apr-2009	15-Apr-2009	1	180	357	357	0	0	0	0	0	0	0	0	0	180	357
16-Apr-2009	16-Apr-2009	1	180	357	714	10	20	20	0	0	0	0	0	0	190	734
17-Apr-2009	17-Apr-2009	1	180	357	1,071	80	159	179	0	0	0	0	0	0	260	1,250
18-Apr-2009	18-Apr-2009	1	180	357	1,428	210	417	595	0	0	0	0	0	0	390	2,023
19-Apr-2009	19-Apr-2009	1	180	357	1,785	350	694	1,289	100	198	198	0	0	0	630	3,273
20-Apr-2009	20-Apr-2009	1	180	357	2,142	360	714	2,003	100	198	397	0	0	0	640	4,542
21-Apr-2009	21-Apr-2009	1	180	357	2,499	360	714	2,717	100	198	595	0	0	0	640	5,812
22-Apr-2009	22-Apr-2009	1	180	357	2,856	360	714	3,431	100	198	793	0	0	0	640	7,081
23-Apr-2009	23-Apr-2009	1	180	357	3,213	360	714	4,145	100	198	992	0	0	0	640	8,350
24-Apr-2009	24-Apr-2009	1	180	357	3,570	360	714	4,860	100	198	1190	0	0	0	640	9,620
25-Apr-2009	25-Apr-2009	1	180	357	3,927	360	714	5,574	100	198	1388	0	0	0	640	10,889
26-Apr-2009	26-Apr-2009	1	180	357	4,284	360	714	6,288	100	198	1587	0	0	0	640	12,159
27-Apr-2009	27-Apr-2009	1	180	357	4,641	360	714	7,002	100	198	1785	0	0	0	640	13,428
28-Apr-2009	28-Apr-2009	1	180	357	4,998	180	357	7,359	100	198	1983	0	0	0	460	14,340
29-Apr-2009	29-Apr-2009	1	180	357	5,355	180	357	7,716	100	198	2182	0	0	0	460	15,253
30-Apr-2009	30-Apr-2009	1	180	357	5,712	180	357	8,073	100	198	2380	0	0	0	460	16,165
01-May-2009	01-May-2009	1	180	357	6,069	180	357	8,430	100	198	2579	0	0	0	460	17,078
02-May-2009	02-May-2009	1	180	357	6,426	180	357	8,787	100	198	2777	0	0	0	460	17,990
03-May-2009	03-May-2009	1	180	357	6,783	180	357	9,144	100	198	2975	0	0	0	460	18,902
04-May-2009	04-May-2009	1	180	357	7,140	180	357	9,501	100	198	3174	0	0	0	460	19,815
05-May-2009	05-May-2009	1	180	357	7,498	300	595	10,096	100	198	3372	0	0	0	580	20,965
06-May-2009	06-May-2009	1	180	357	7,855	500	992	11,088	100	198	3570	0	0	0	780	22,512
07-May-2009	07-May-2009	1	180	357	8,212	700	1,388	12,476	0	0	3570	0	0	0	880	24,258
08-May-2009	08-May-2009	1	180	357	8,569	700	1,388	13,864	0	0	3570	0	0	0	880	26,003
09-May-2009	09-May-2009	1	180	357	8,926	750	1,488	15,352	0	0	3570	0	0	0	930	27,848
10-May-2009	10-May-2009	1	180	357	9,283	750	1,488	16,840	0	0	3570	0	0	0	930	29,693
11-May-2009	11-May-2009	1	180	357	9,640	750	1,488	18,327	0	0	3570	0	0	0	930	31,537
12-May-2009	12-May-2009	1	180	357	9,997	750	1,488	19,815	0	0	3570	0	0	0	930	33,382
13-May-2009	13-May-2009	1	180	357	10,354	750	1,488	21,302	0	0	3570	0	0	0	930	35,226
14-May-2009	14-May-2009	1	180	357	10,711	750	1,488	22,790	0	0	3570	0	0	0	930	37,071
15-May-2009	15-May-2009	1	180	357	11,068	750	1,488	24,278	0	0	3570	0	0	0	930	38,916
16-May-2009	16-May-2009	1	180	357	11,425	750	1,488	25,765	0	0	3570	0	0	0	930	40,760
17-May-2009	17-May-2009	1	180	357	11,782	750	1,488	27,253	0	0	3570	0	0	0	930	42,605
18-May-2009	18-May-2009	1	180	357	12,139	700	1,388	28,641	0	0	3570	0	0	0	880	44,350
19-May-2009	19-May-2009	1	180	357	12,496	700	1,388	30,030	0	0	3570	0	0	0	880	46,096
20-May-2009	20-May-2009	1	180	357	12,853	650	1,289	31,319	0	0	3570	0	0	0	830	47,742
21-May-2009	21-May-2009	1	180	357	13,210	500	992	32,311	0	0	3,570	0	0	0	680	49,091
22-May-2009	22-May-2009	1	180	357	13,567	400	793	33,104	0	0	3,570	0	0	0	580	50,241
23-May-2009	23-May-2009	1	180	357	13,924	300	595	33,699	0	0	3,570	0	0	0	480	51,193
24-May-2009	24-May-2009	1	180	357	14,281	300	595	34,294	0	0	3,570	0	0	0	480	52,145
25-May-2009	25-May-2009	1	180	357	14,638	200	397	34,691	0	0	3,570	0	0	0	380	52,899
26-May-2009	26-May-2009	1	180	357	14,995	200	397	35,088	0	0	3,570	0	0	0	380	53,653
27-May-2009	27-May-2009	1	180	357	15,352	200	397	35,484	0	0	3,570	0	0	0	380	54,407
28-May-2009	28-May-2009	1	180	357	15,709	125	248	35,732	0	0	3,570	0	0	0	305	55,012
29-May-2009	29-May-2009	1	180	357	16,066	125	248	35,980	0	0	3,570	0	0	0	305	55,617
30-May-2009	30-May-2009	1	180	357	16,423	85	169	36,149	0	0	3,570	0	0	0	265	56,142
31-May-2009	31-May-2009	1	180	357	16,780	85	169	36,317	0	0	3,570	0	0	0	265	56,668
01-Jun-2009	01-Jun-2009	1	75	149	16,929	0	0	36,317	190	377	3,947	0	0	0	265	57,193
02-Jun-2009	02-Jun-2009	1	75	149	17,078	0	0	36,317	190	377	4,324	0	0	0	265	57,719
03-Jun-2009	07-Jun-2009	5	75	744	17,821	0	0	36,317	135	1,339	5,663	0	0	0	210	59,802
08-Jun-2009	15-Jun-2009	8	75	1,190	19,012	0	0	36,317	30	476	6,139	0	0	0	105	61,468
16-Jun-2009	30-Jun-2009	15	75	2,231	21,243	0	0	36,317	0	0	6,139	0	0	0	75	63,699
01-Jul-2009	31-Jul-2009	31	75	4,612	25,855	0	0	36,317	0	0	6,139	0	0	0	75	68,311
01-Aug-2009	31-Aug-2009	31	75	4,612	30,466	0	0	36,317	0	0	6,139	0	0	0	75	72,922
01-Sep-2009	10-Sep-2009	10	75	1,488	31,954	0	0	36,317	20	397	6,536	0	0	0	95	74,807
11-Sep-2009	13-Sep-2009	3	75	446	32,400	0	0	36,317	20	119	6,655	0	0	0	95	75,372
14-Sep-2009	30-Sep-2009	17	75	2,529	34,929	0	0	36,317	20	674	7,329	0	0	0	95	78,575
01-Oct-2009	01-Oct-2009	1	200	397	35,326	0	0	36,317	20	40	7,369	0	0	0	220	79,012
02-Oct-2009	07-Oct-2009	6	200	2,380	37,706	0	0	36,317	20	238	7,607	0	0	0	220	81,630
08-Oct-2009	15-Oct-2009	8	200	3,174	40,879	0	0	36,317	20	317	7,924	0	0	0	220	85,121
16-Oct-2009	25-Oct-2009	10	175	3,471	44,350	38	1,736	38,053	212	4,214	12,138	-10	(198)	(198)	465	94,343
26-Oct-2009	26-Oct-2009	1	175	347	44,698	0	0	38,053	65	128	12,266	75	149	(50)	315	94,967
27-Oct-2009	27-Oct-2009	1	175	347	45,045	0	0	38,053	65	128	12,394	25	50	0	265	95,492
28-Oct-2009	31-Oct-2009	4	175	1,388	46,433	0	0	38,053	65	512	12,906	0	0	0	240	97,393
01-Nov-2009	16-Nov-2009	16	175	5,554	51,987	0	0	38,053	65	2,049	14,955	0	0	0	240	104,995
17-Nov-2009	30-Nov-2009	14	175	4,860	56,846	0	0	38,053	65	1,792	16,747	0	0	0	240	111,647
01-Dec-2009	31-Dec-2009	31	175	10,760	67,607	0	0	38,053	65	3,969	20,716	0	0	0	240	126,376
01-Jan-2010	31-Jan-2010	31	175	10,760	78,367	0	0	38,053	65	3,969	24,685	0	0	0	240	141,106
01-Feb-2010	28-Feb-2010	28	175	9,719	88,086	0	0	38,053	65	3,585	28,270	0	0	0	240	154,410
01-Mar-2010	31-Mar-2010	31	175	10,760	98,846	0	0	38,053	65	3,969	32,239	0	0	0	240	169,139
01-Apr-2010	14-Apr-2010	14	175	4,860	103,706	0	0	38,053	65	1,792	34,032	0	0	0	240	175,791
No. of days		365	(April 15 through April 14)													

1 cfs day = 1.983471 acre-feet (af)

Notes: 1. Based on 60-20-20 Index

2. The pulse flows are a target that represents a daily average

Case	60-20-20 Index		Base Total		Pulse Total		Interpolation Total		FERC Total
Average	2,733,195	60-20-20 Index	103,240		61,763		10,788		175,791
		Scheduled Above	103,706		38,053		34,032		175,791
		Difference	(466)		23,710		(23,244)		(0)

TUOLUMNE RIVER TECHNICAL ADVISORY COMMITTEE

DON PEDRO PROJECT - FERC LICENSE 2299

MODESTO IRRIGATION DISTRICT
TURLOCK IRRIGATION DISTRICT
CITY & COUNTY OF SAN FRANCISCO
CALIFORNIA DEPARTMENT OF FISH & GAME
U. S. FISH & WILDLIFE SERVICE

333 East Canal Drive
Turlock, CA 95381-0949
Phone: (209) 883-8275
Fax: (209) 656-2180
Email: tjford@tid.org

TECHNICAL ADVISORY COMMITTEE MEETING

10 December 2009 at 9:30 AM

Turlock Irrigation District, Lunch Room (2nd floor)

DRAFT AGENDA

1. INTRODUCTION AND ANNOUNCEMENTS

2. ADMINISTRATIVE ITEMS:
   - Review/revise agenda
   - Approve notes from Sep 2009 meeting
   - Items since last meeting

3. MONITORING/REPORTS:
   - Fall run information – weir; river surveys
   - O. mykiss reports posted
   - Technical reports for 2009 FERC report
   - Discuss winter monitoring and other studies

4. FLOW OPERATIONS:
   - Review status of flow schedule/watershed conditions

5. AGENCY/NGO UPDATES

6. ADDITIONAL ITEMS

7. NEXT MEETING – QUARTERLY ON 2ND THURSDAY: MARCH 11, 2010

TUOLUMNE RIVER TECHNICAL ADVISORY COMMITTEE

DON PEDRO PROJECT - FERC LICENSE 2299

MODESTO IRRIGATION DISTRICT
TURLOCK IRRIGATION DISTRICT
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TECHNICAL ADVISORY COMMITTEE MEETING

10 December 2009 at 9:30 AM

Turlock Irrigation District, Lunch Room (2nd floor)

Summary

1. INTRODUCTION AND ANNOUNCEMENTS
   - No fishery agencies or NGOs were present.

2. ADMINISTRATIVE ITEMS:
   - Review/Revise agenda – No changes
   - Approve notes from September meeting – No changes were identified. Notes for the last meeting are posted to the TRTAC website: http://tuolumnerivertac.com/
   - Items since last meeting – the handout listing the material posted at http://tuolumnerivertac.com/ was reviewed. Those included:
     - correspondences regarding the study plans for FERC required temperature modeling and instream flow studies, minimum flow coordination process for the 2009–2010 Fish Flow Year, Districts letter to CDFG responding on their August letter regarding 2008 Tuolumne River Diversion at the La Grange Powerhouse, the final report of the Presiding Judge on Interim Measures prior to relicensing, and transmittal to fishery agencies about the FERC required *O. mykiss* Monitoring Report due in January, 2010
     - the draft *O. mykiss* monitoring report, a recent report on the population genetic structure of Central Valley *O. mykiss*, final report and appendices on the March and July 2009 *O. mykiss* population size estimates, and the final temperature modeling and instream flow study plans with comments/responses
     - counting weir data and photos, thermograph data, basin monitoring newsletter, and current flow schedule

3. MONITORING/REPORTS: Several handouts were reviewed
   - fall 2009 counting weir and flow data for Tuolumne and Stanislaus Rivers, including trend in salmon with adipose fin clips; CDFG required some Tuolumne weir panels to be removed temporarily because of concerns over spawning and counts downstream of the weir.
   - preliminary CDFG salmon survey numbers (live, redds)
   - Results of the 2008-09 *O. mykiss* and Chinook salmon snorkel surveys/population estimates were discussed, including observations of few fish downstream of Roberts Ferry Bridge during both the March and July surveys
   - Flow and temperature trends from mid-June through August were reviewed
   - draft Table of Contents for 2009 FERC Report was reviewed with a number of

reports available on the TRTAC website (seine, snorkel, March/July 2009 Population estimate).
- Other winter monitoring plans: seining surveys, screwtrapping, March population estimate snorkel surveys, and FERC required winter adult *O. mykiss* tracking study (permit applications are submitted to fishery agencies)

4. FLOW OPERATIONS:
   - Ford identified that winter base flow were 225 cfs with 200 cfs after December 31
   - approximately 7,000 AF of water remained to be allocated for the current Fish Flow Year through April 14, 2010
   - variable summer flow operations averaged 105 cfs during the 75 cfs requirement period by additional releases depending upon temperature forecasts

5. AGENCY/NGO UPDATES -- NONE

6. ADDITIONAL ITEMS -- NONE

7. 2010 MEETING DATES – MARCH 18, JUNE 10, SEPTEMBER 9, DECEMBER 9

TRTAC Meeting Attendees

	Name	**Organization**
1.	Tim Ford	TID/MID
2.	Robert Nees	TID
3.	Noah Hume	Stillwater
4.	Galileo Morales	TID

2009 TRTAC Materials/Postings to Website

12Dec2008-12Mar2009 Postings to TRTAC website http://tuolumnerivertac.com/

- Meetings
  - December 2008 TRTAC meeting summary and handouts
  - March 2009 TRTAC meeting agenda

- Correspondence
  - Letter re: 45-day Period and Fall Pulse Flow Requirements dated January 21, 2009

- Documents
  - Annual Benthic Macroinvertebrate Monitoring (2005, 2007, 2008) and Summary Update
  - 2008 VAMP Report
  - 2008 Summer Flow Operations Report
  - 2009 Study Plan for Population Size Estimates of O. mykiss

- Data/Monitoring/Maps/Photos/Other
  - 2009 seine data
  - Thermograph data through 08Oct2008
  - File with river miles, study sites, habitat reaches, and GPS readings
  - Updates of basin monitoring newsletter

13Mar – 11Jun2009 Postings to TRTAC website http://tuolumnerivertac.com/

- Meetings
  - March 2009 TRTAC meeting information and handouts
  - June 2009 TRTAC meeting agenda

- Correspondence
  - Letters re: Flow Schedule dated March 25 and May 5, 2009
  - Letter dated March 31, 2009 from TID/MID to FERC re: Fishery Study

- Documents
  - 2008 Annual Report to FERC

- Data/Monitoring/Maps/Photos/Other
  - 2009 seine data
  - Thermograph data through 11Mar2009
  - Updates of basin monitoring newsletter (includes screw trap results)
  - Current flow schedule
  - River Mile 30-40 Habitat map file

12Jun-10Sep2009 Postings to TRTAC website http://tuolumnerivertac.com/

- Meetings
  - June 2009 TRTAC meeting information and handouts
  - September 2009 TRTAC meeting agenda

- Correspondence
  - Conservation groups' motion for decision regarding rehearing of order on ten-year summary report and leave to adduce to additional evidence dated June 17, 2009.
  - Friends of the Tuolumne's Bobcat Flat West Restoration Plans (Google Earth) dated July 16, 2000.
  - Order on rehearing, amending license, denying late intervention, denying petition, and directing appointment of a presiding judge for a proceeding on interim conditions dated July 16, 2009.
  - CDFG letter on Fall 2008 Tuolumne River water diversion at La Grange Powerhouse dated August 19, 2009.
  - Transmittal letter for draft instream flow and water temperature modeling study plans dated September 3, 2009

- Documents
  - 2009 Seine Report
  - 2009 Snorkel Report
  - 2009 Sep Draft Instream Flow Study Plan
  - 2009 Sep Draft Water Temperature Modeling Study Plan

- Data/Monitoring/Maps/Photos/Other
  - 2009 seine data
  - 2009 June snorkel data
  - Thermograph data through 20Jul2009
  - Updates of basin monitoring newsletter (includes screw trap results)
  - Current flow schedule
  - Updated participant list

11Sep-10Dec2009 Postings to TRTAC website http://tuolumnerivertac.com/

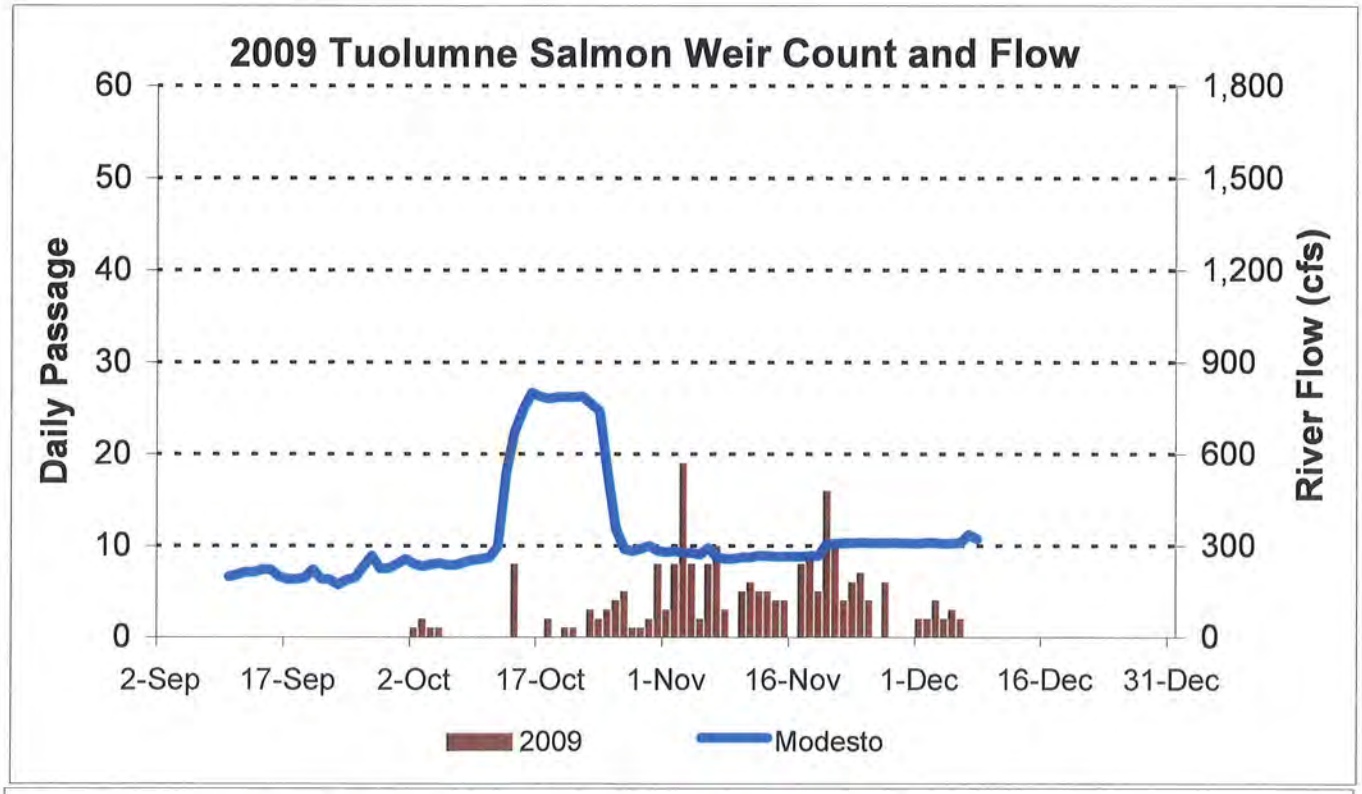
- Meetings
  - Sep 2009 TRTAC meeting information and handouts
  - December 2009 TRTAC meeting agenda

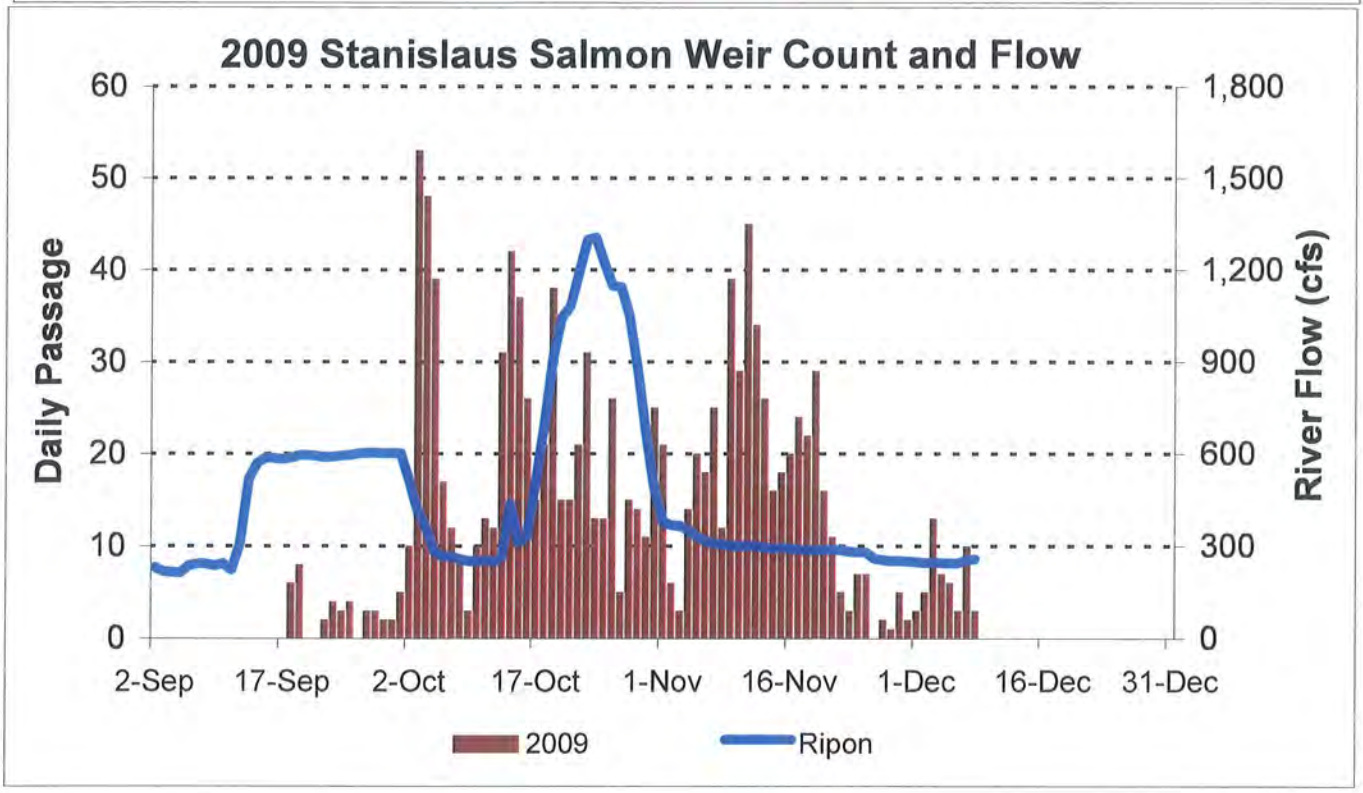
- Correspondence
  - Transmittal letter to fishery agency representatives re: Tuolumne River O. mykiss Monitoring Report dated December 7, 2009.
  - Final Report of the Presiding Judge on Interim Measures issued November 20, 2009.
  - Letter to CDFG re: August 19, 2009 DFG Correspondence-Tuolumne River Diversion at La Grange Powerhouse dated November 12, 2009.

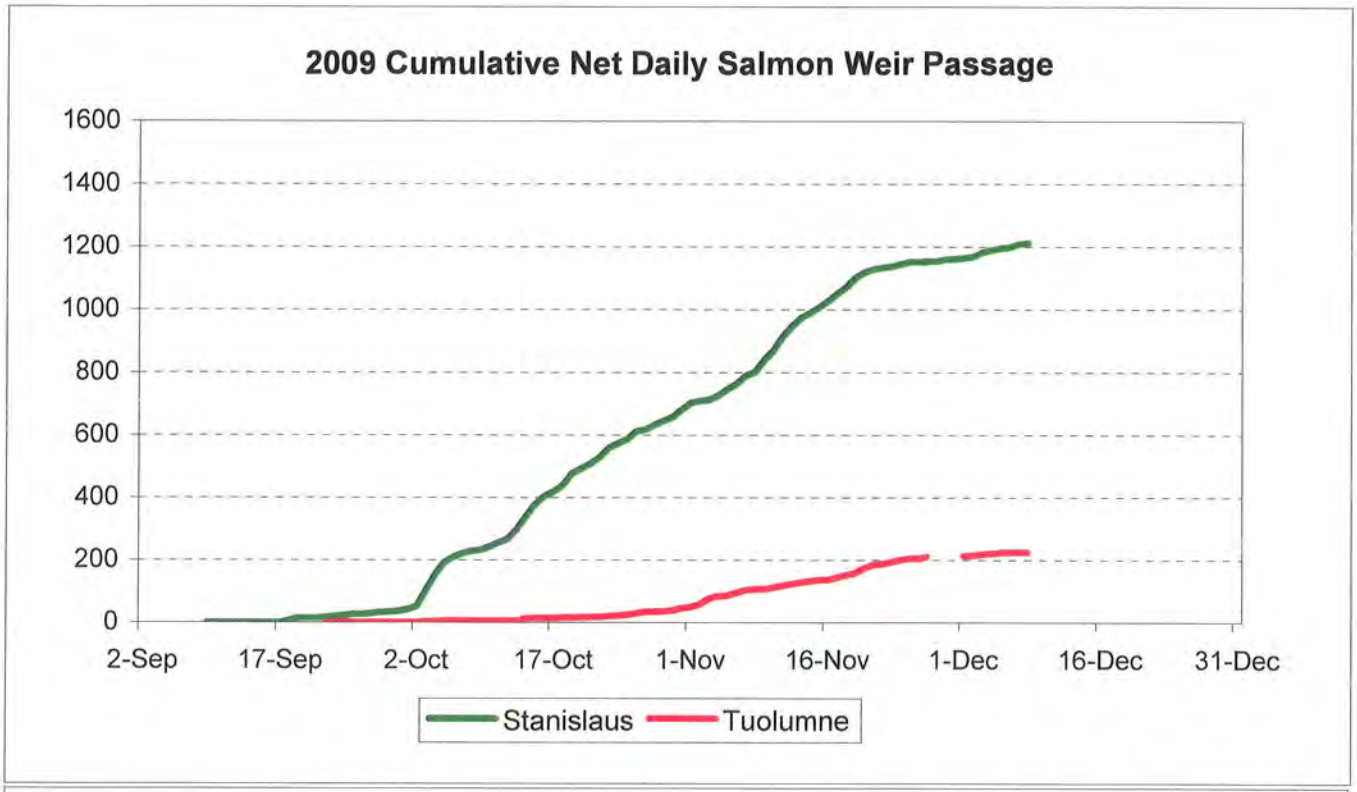
- Letter to FERC re: USFWS's Comments on IFIM and Water Temperature Study Plan dated November 5, 2009.
- Letter to Fishery Agency Representatives re: Minimum Flow Coordination Process for 2009-2010 Fish Flow Year dated October 19, 2009.
- Letter to FERC re: NOAA's Comments on IFIM and Water Temperature Study Plan dated October 14, 2009.
- Letter to FERC re: Districts' Response to July 16, 2009 FERC Order Regarding IFIM and Water Temperature Plan dated October 14, 2009.

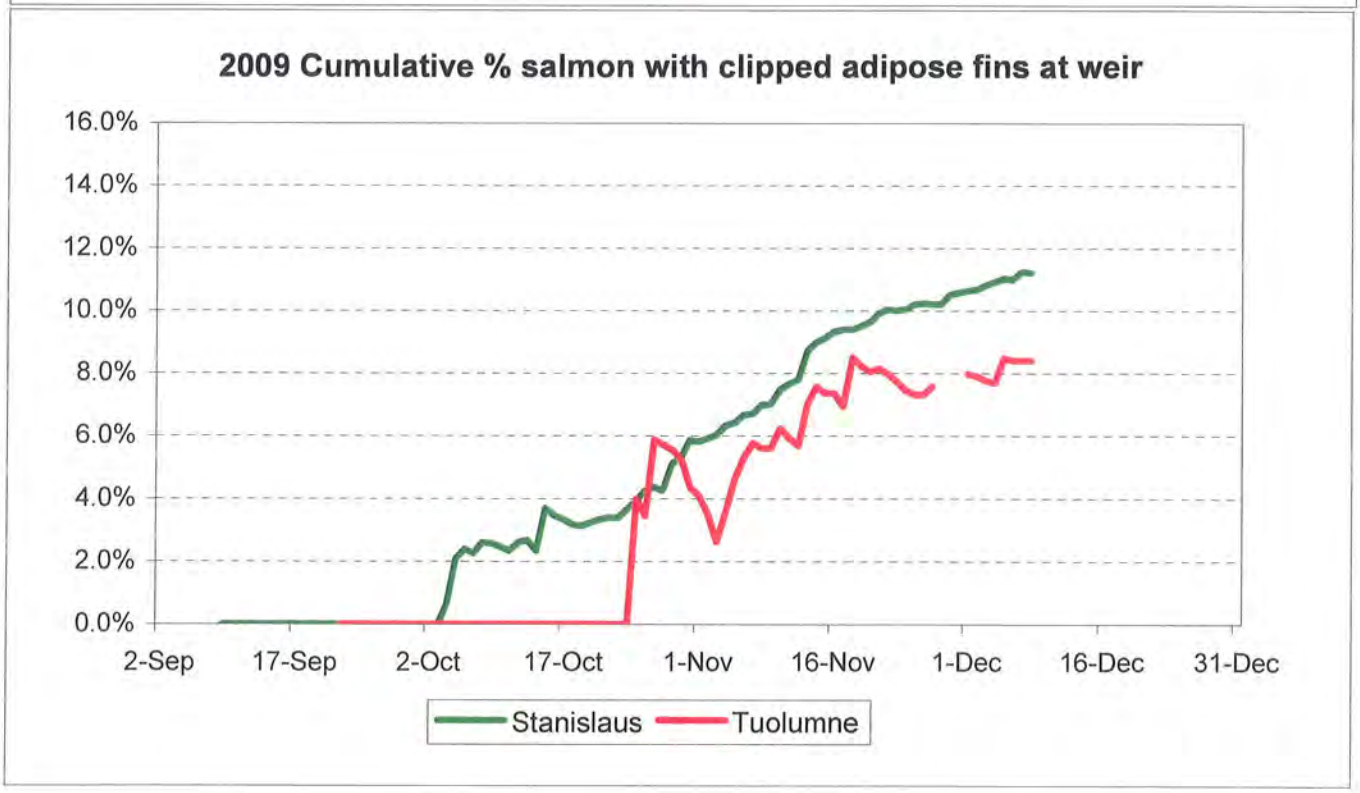
- Documents
  - Draft Tuolumne River O. mykiss Monitoring Report
  - Population Genetic Structure of O. mykiss in the California Central Valley
  - March and July 2009 Population Size Estimate of O. mykiss in the Lower Tuolumne River
  - Appendices for March and July 2009 Population Size Estimate of O. mykiss in the Lower Tuolumne River
  - Comments and responses to Draft Instream Flow and Water Temperature Modeling Study Plans
  - Districts response to FERC re: Lower Tuolumne River Water Temperature Modeling Study Plan
  - Lower Tuolumne River Water Temperature Modeling Final Study Plan
  - Lower Tuolumne River Instream Flow Studies - Final Study Plan

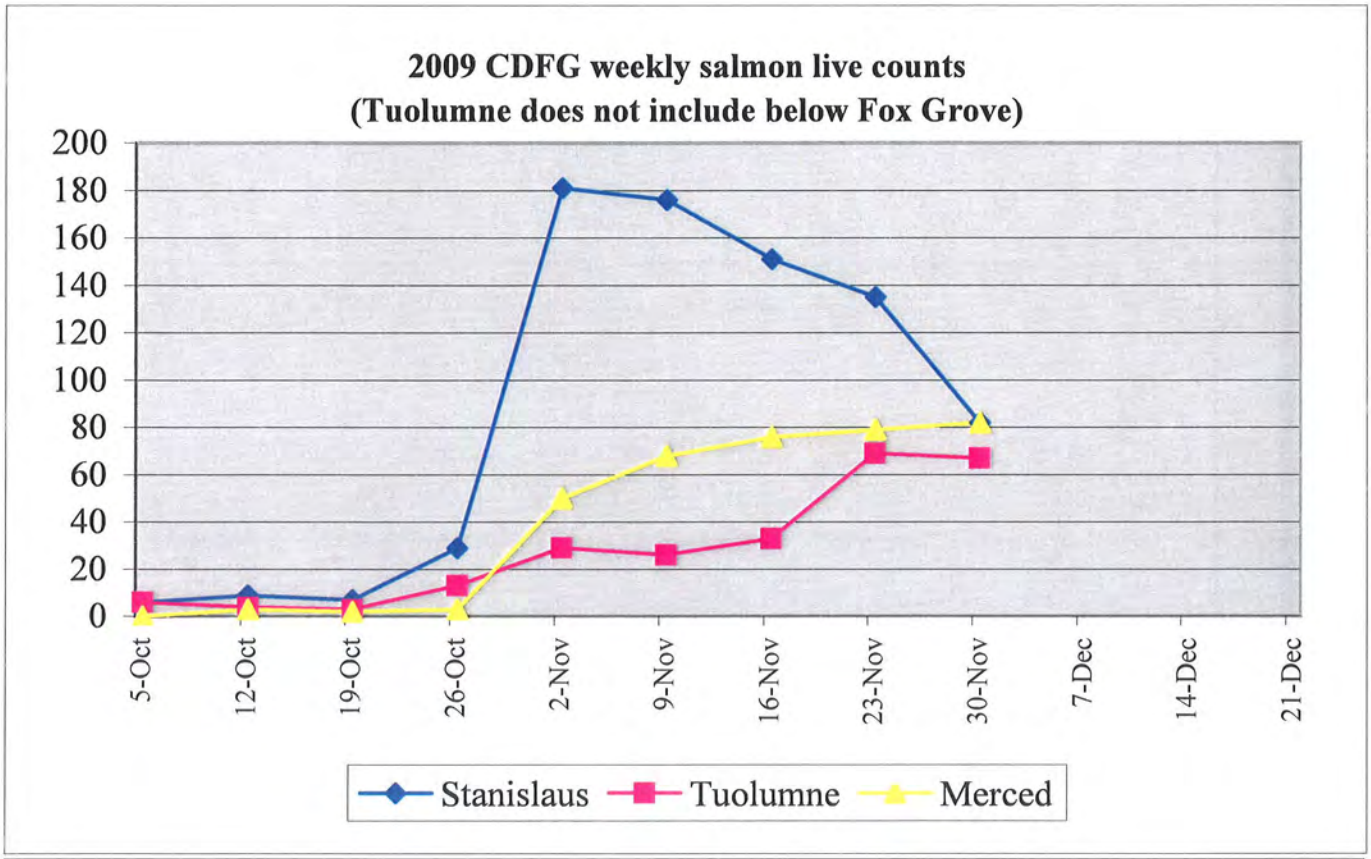
- Data/Monitoring/Maps/Photos
  - 2009 fall counting weir data and photos
  - Thermograph data through Oct 04
  - Updates of basin monitoring newsletter
  - Current flow schedule

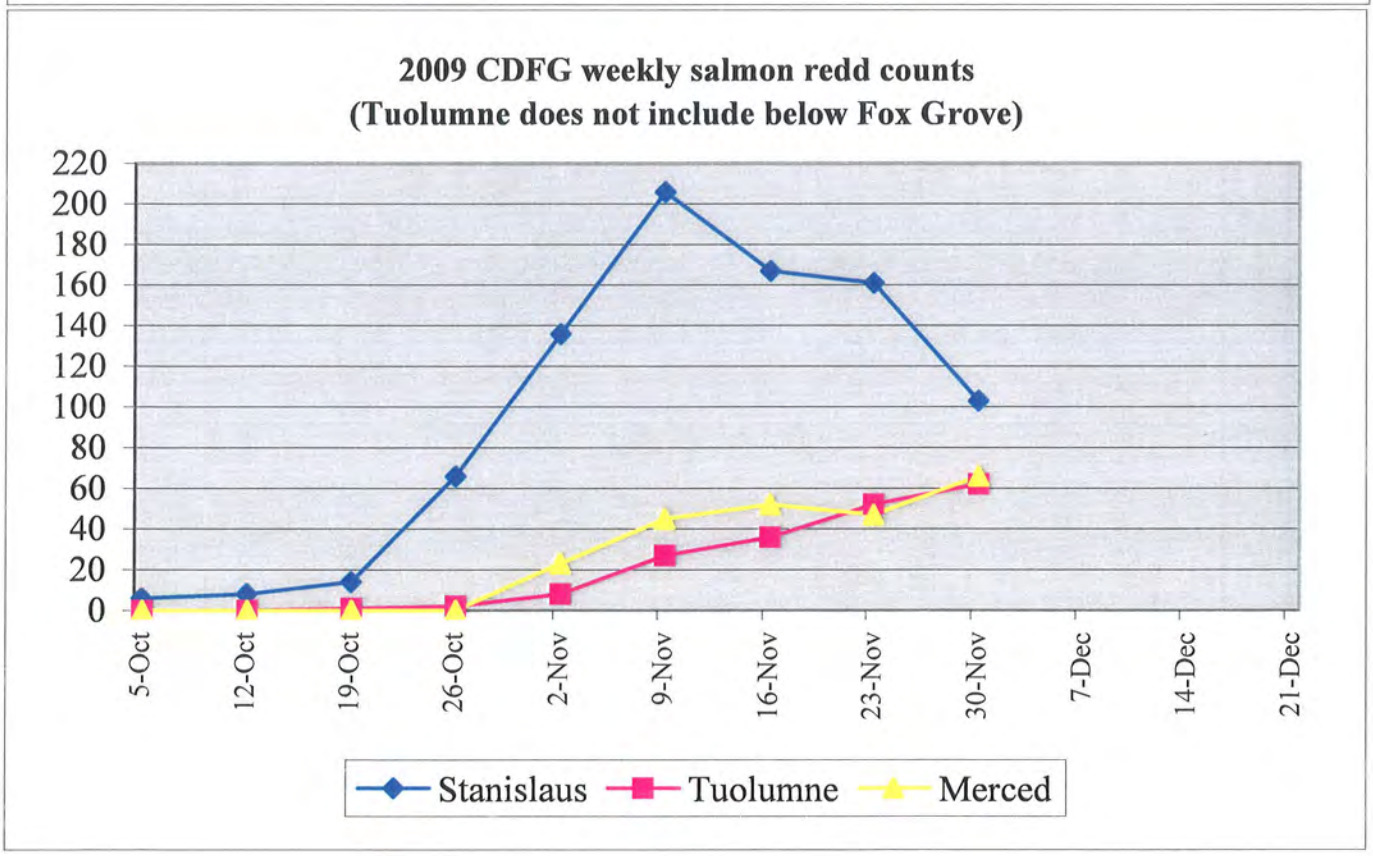

2009 Tuolumne Salmon Weir Count and Flow
Daily Passage
River Flow (cfs)
60
50
40
30
20
10
0
1,800
1,500
1,200
900
600
300
0
2-Sep
17-Sep
2-Oct
17-Oct
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
2009
Modesto


2009 Stanislaus Salmon Weir Count and Flow
Daily Passage
River Flow (cfs)
60
50
40
30
20
10
0
1,800
1,500
1,200
900
600
300
0
2-Sep
17-Sep
2-Oct
17-Oct
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
2009
Ripon

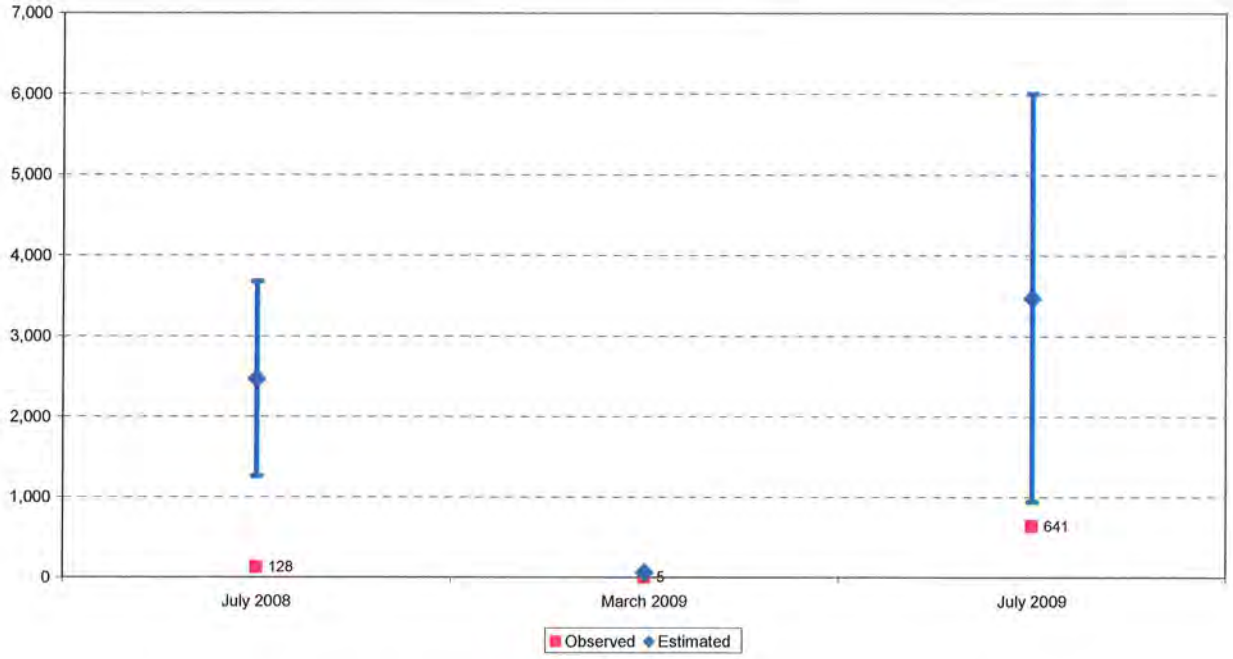

2009 Cumulative Net Daily Salmon Weir Passage
1600
1400
1200
1000
800
600
400
200
0
2-Sep
17-Sep
2-Oct
17-Oct
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
Stanislaus
Tuolumne


2009 Cumulative % salmon with clipped adipose fins at weir
16.0%
14.0%
12.0%
10.0%
8.0%
6.0%
4.0%
2.0%
0.0%
2-Sep
17-Sep
2-Oct
17-Oct
1-Nov
16-Nov
1-Dec
16-Dec
31-Dec
Stanislaus
Tuolumne


2009 CDFG weekly salmon live counts
(Tuolumne does not include below Fox Grove)
200
180
160
140
120
100
80
60
40
20
0
5-Oct
12-Oct
19-Oct
26-Oct
2-Nov
9-Nov
16-Nov
23-Nov
30-Nov
7-Dec
14-Dec
21-Dec
Stanislaus
Tuolumne
Merced


2009 CDFG weekly salmon redd counts
(Tuolumne does not include below Fox Grove)
220
200
180
160
140
120
100
80
60
40
20
0
5-Oct
12-Oct
19-Oct
26-Oct
2-Nov
9-Nov
16-Nov
23-Nov
30-Nov
7-Dec
14-Dec
21-Dec
Stanislaus
Tuolumne
Merced

Observed juvenile *O. mykiss* with population estimate and 95% confidence intervals from BCE surveys for July 2008, March 2009 and July 2009



Observed adult O. mykiss with population estimate and 95% confidence intervals from BCE surveys for July 2008, March 2009 and July 2009

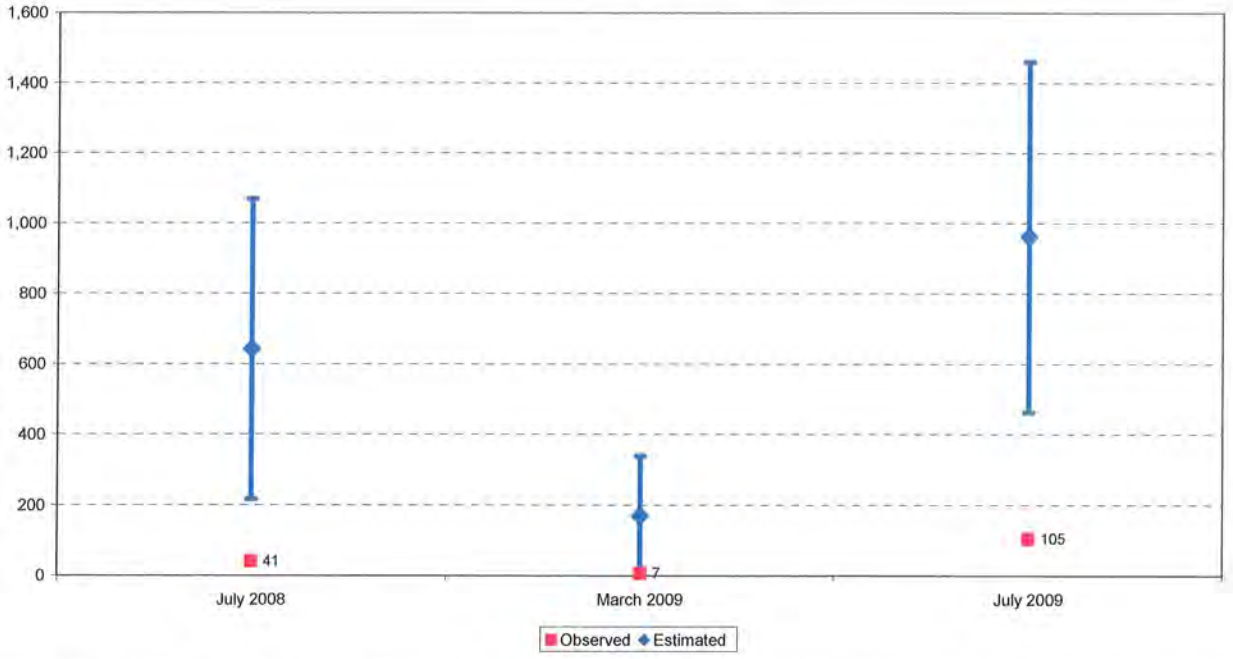


Figure X. Juvenile and adult *O. mykiss* observed number and population estimates for July 2008, and March and July 2009.

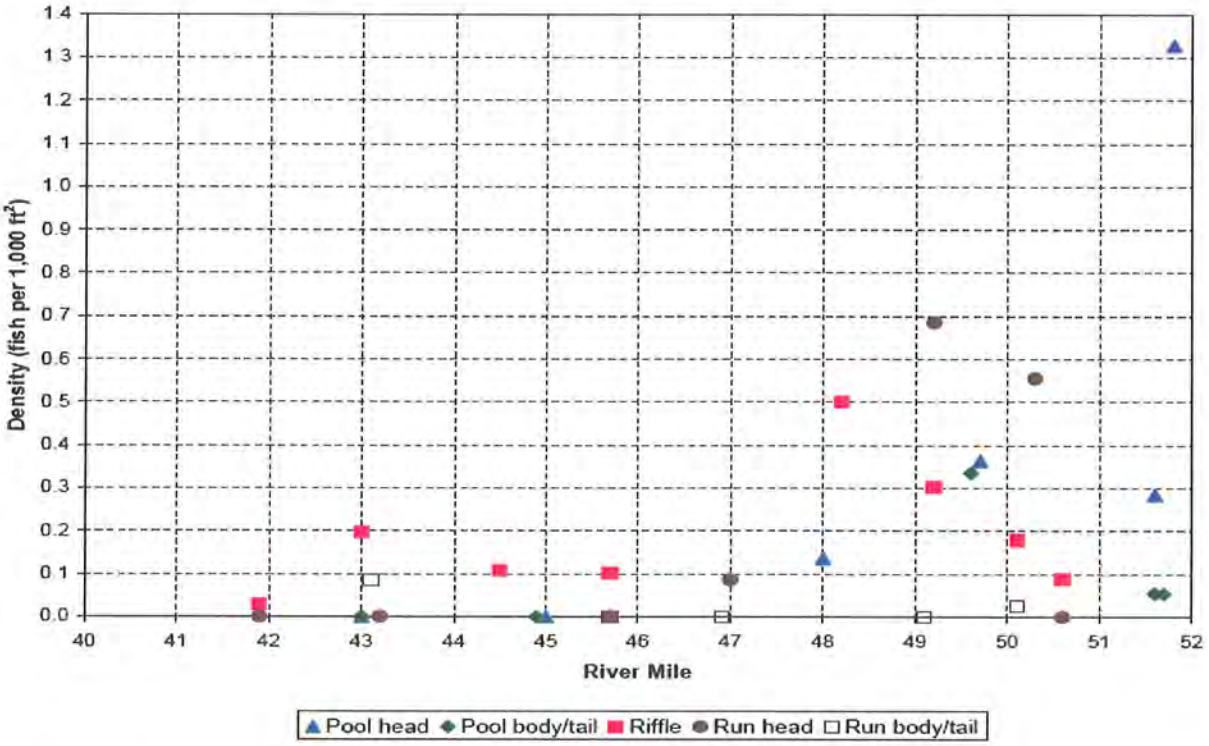


Figure 7. July 2009 adult *O. mykiss* density by river mile based upon maximum count in sampling units of each habitat type.

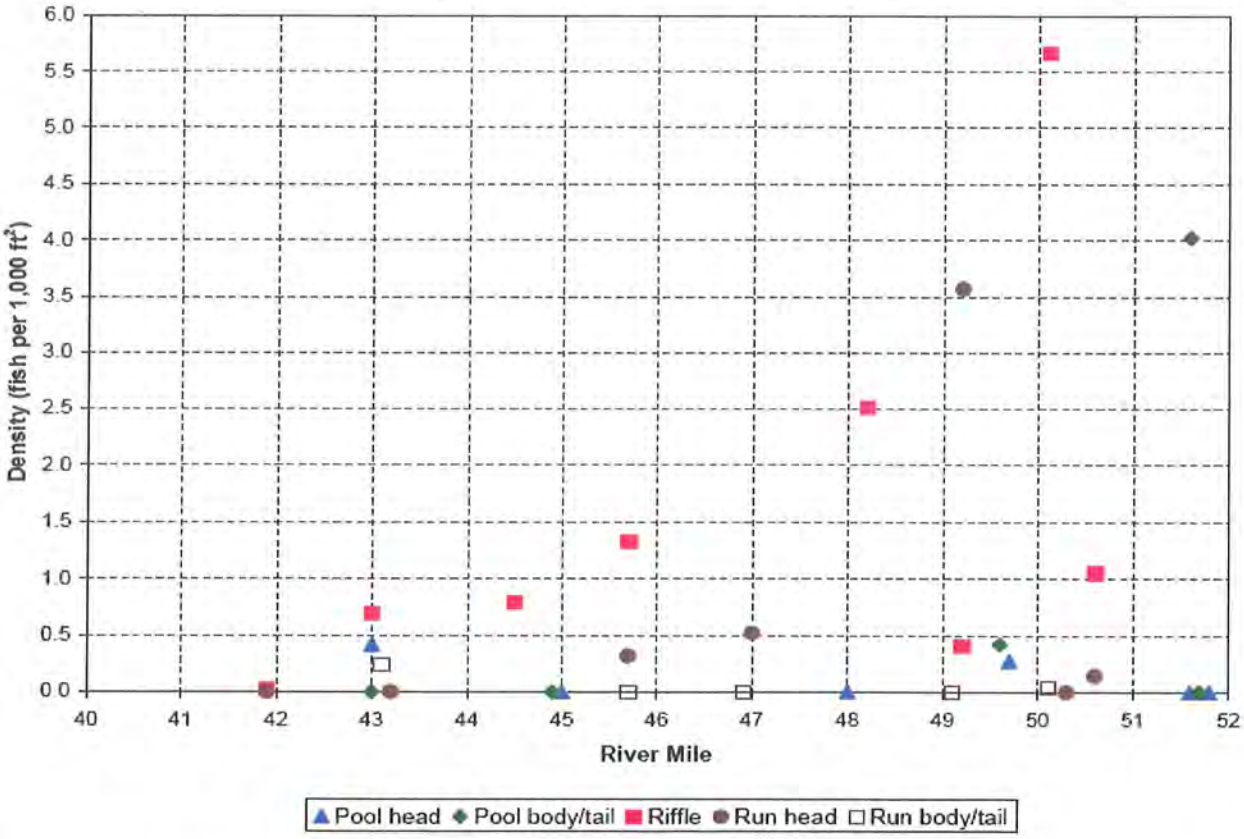
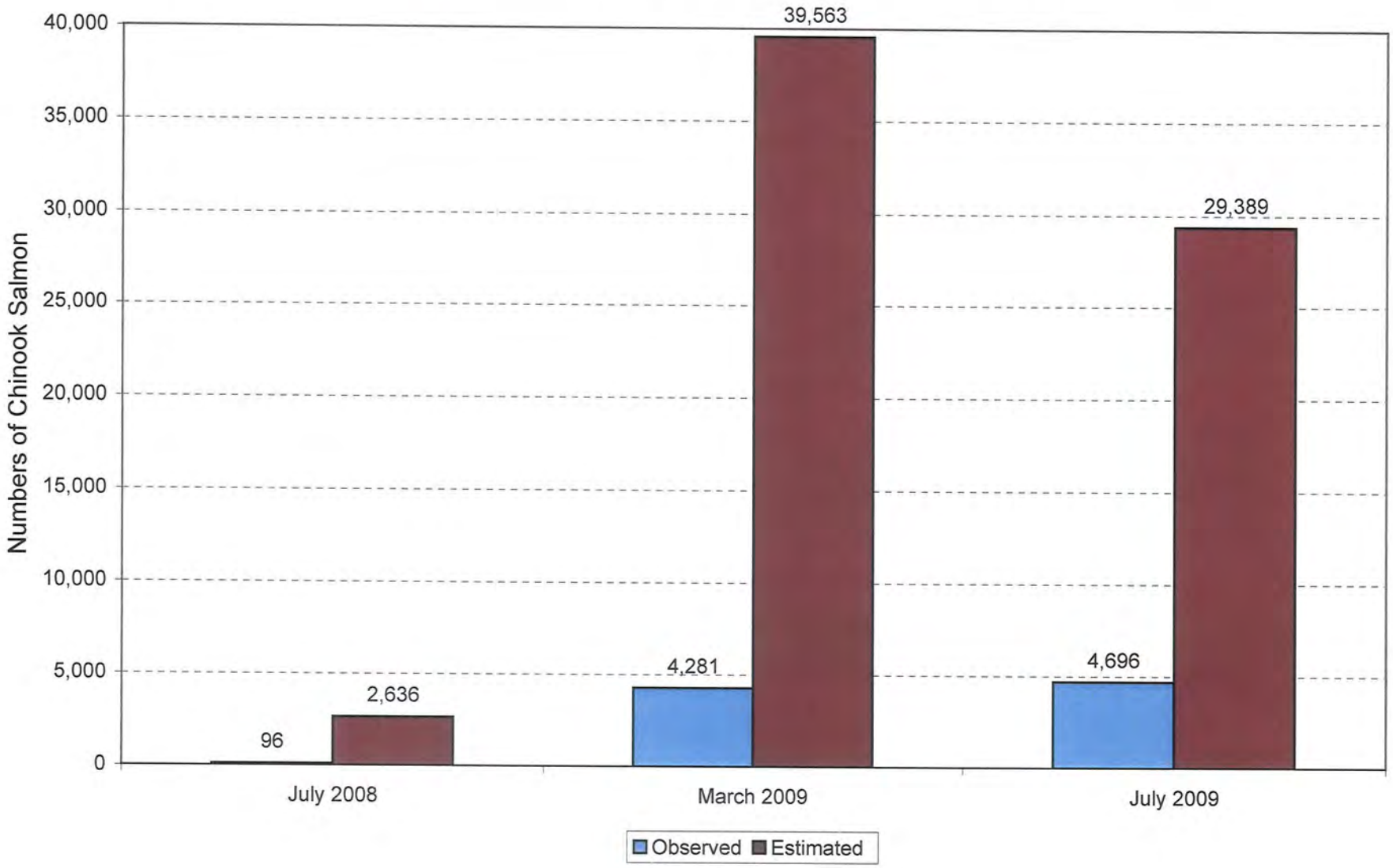


Figure 8. July 2009 juvenile *O. mykiss* density by river mile based upon maximum count in sampling units of each habitat type.


Chinook Salmon juveniles observed and estimated during the BCE surveys
Numbers of Chinook Salmon
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
96
2,636
4,281
39,563
4,696
29,389
July 2008
March 2009
July 2009
Observed
Estimated

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Turlock Irrigation District	)	
	)	
and	)	Project No. 2299
	)	
Modesto Irrigation District	)	

DRAFT COVER

2009 LOWER TUOLUMNE RIVER ANNUAL REPORT

2009 Annual Summary Report

Exhibits: Spawning runs, Ocean catch, rearing/outmigration data, Delta salvage and survival

Attachment A: Water Conditions, Flows, Temperature, and Flow Schedule Correspondence

Attachment B: 2009 Technical Advisory Committee Materials

Report 2009-1: 2008 & 2009 Spawning Survey Reports

Report 2009-2: Spawning Survey Summary Update

Report 2009-3: 2009 Seine Report and Summary Update

Report 2009-4: 2009 Rotary Screw Trap Report

Report 2009-5: 2009 Snorkel Report and Summary Update

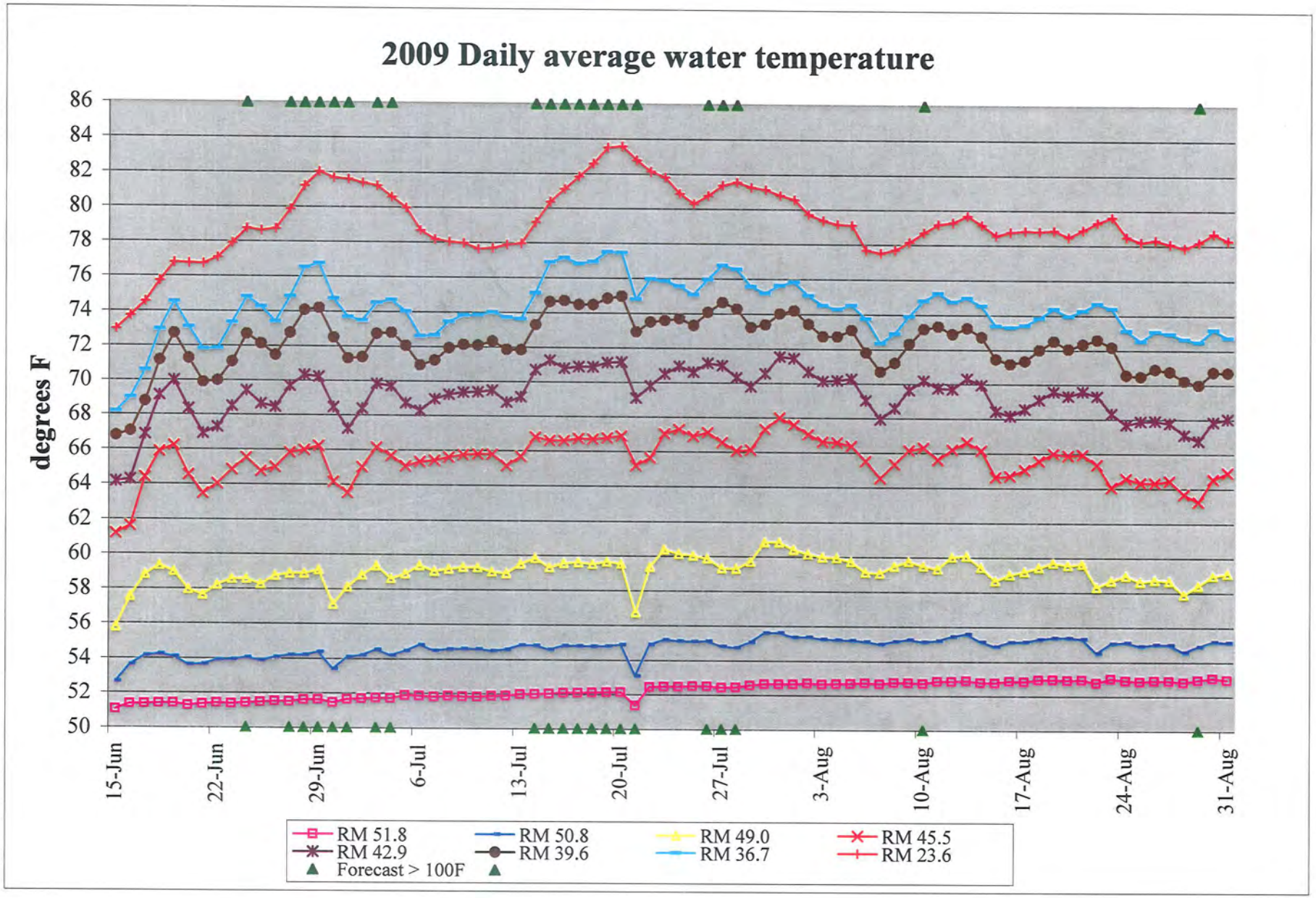
Report 2009-6: 2009 *Oncorhynchus mykiss* Population Estimate Report

Report 2009-7: Tuolumne River *Oncorhynchus mykiss* Monitoring Report

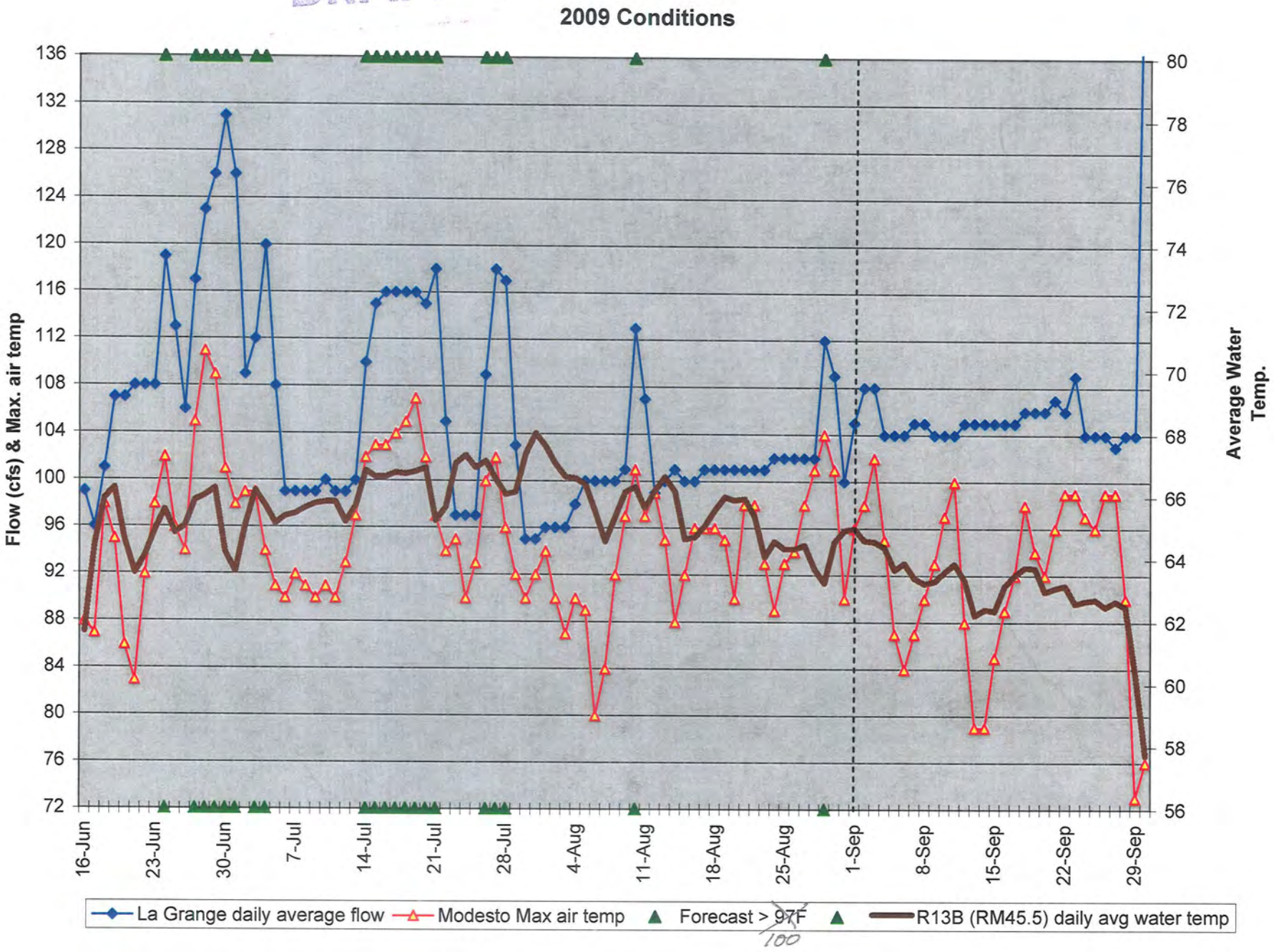
Report 2009-8: Aquatic Invertebrate Monitoring and Summary Update

Report 2008-9: Review of 2009 Summer Flow Operation

March 2009


2009 Daily average water temperature
degrees F
86
84
82
80
78
76
74
72
70
68
66
64
62
60
58
56
54
52
50
15-Jun
22-Jun
29-Jun
6-Jul
13-Jul
20-Jul
27-Jul
3-Aug
10-Aug
17-Aug
24-Aug
31-Aug
RM 51.8
RM 50.8
RM 49.0
RM 45.5
RM 42.9
RM 39.6
RM 36.7
RM 23.6
Forecast > 100F

DRAFT


2009 Conditions
Flow (cfs) & Max. air temp
Average Water Temp.
136
132
128
124
120
116
112
108
104
100
96
92
88
84
80
76
72
80
78
76
74
72
70
68
66
64
62
60
58
56
16-Jun
23-Jun
30-Jun
7-Jul
14-Jul
21-Jul
28-Jul
4-Aug
11-Aug
18-Aug
25-Aug
1-Sep
8-Sep
15-Sep
22-Sep
29-Sep
La Grange daily average flow
Modesto Max air temp
Forecast > 97F
100
R13B (RM45.5) daily avg water temp