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
UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Turlock Irrigation District

and

Modesto Irrigation District

Project No. 2299

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 2009-2: Spawning Survey Summary Update

Report 2009-3: 2009 Seine Report and Summary Update


Report 2009-7: Aquatic Invertebrate Monitoring and Summary Update

2009 ANNUAL SUMMARY REPORT
Turlock and Modesto Irrigation Districts

By
Tim Ford
Aquatic Biologist

Introduction ................................................................. 1
1 - Fishery Monitoring ......................................................... 1
   1.1. Fall-run Salmon Counts and Estimates
   1.2. Seine Sampling
   1.3. Screw Trapping
   1.4. June Reference Count Snorkeling
   1.5. *O. mykiss* Population Estimate Surveys
2 - Other Monitoring ......................................................... 5
   2.1. Aquatic Invertebrates
   2.2. Temperature
   2.3. Sedimentation
3 – Downstream Issues ....................................................... 5
   3.1. Ocean Conditions
   3.2. Delta Issues
4 – Hydrology, Flow Schedules, and River Operations ......................... 8
5 – TRTAC Habitat Restoration Activities ................................... 9
6 – Tuolumne River Technical Advisory Committee (TRTAC) ...................... 9
7 – References .................................................................... 10
8 – General List of Acronyms and Abbreviations ................................ 11

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_acl_c/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.
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](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


### 8 - General List of Acronyms and Abbreviations

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<tr>
<th>Acronym</th>
<th>Definition</th>
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<tbody>
<tr>
<td>ACOE</td>
<td>Army Corps of Engineers</td>
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<tr>
<td>AF</td>
<td>acre-feet, a measure of water volume</td>
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<td>AFRP</td>
<td>Anadromous Fish Restoration Program (part of USFWS)</td>
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<td>Adaptive Management Forum</td>
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<td>CDEC</td>
<td>California Data Exchange Center</td>
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<td>CDFG or DFG</td>
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<td>CDRR</td>
<td>combined differential recovery rate</td>
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<td>cfs</td>
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<td>Young of Year</td>
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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

Salmon Spawning Surveys
1992 Appdx. 3: Tuolumne River Salmon Spawning Surveys 1971-88
  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
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
2007-2: 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. 20: Juvenile Salmon Pilot Temperature Observation Experiments

#### Report 1996-2: Juvenile Salmon Summary Report

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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


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


1997-3: 1997 Screw Trap and Smolt Monitoring Report


1999-5: 1999 Tuolumne River Upper Rotary Screw Trap Report


2001-4: 2001 Grayson Screw Trap Report


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
2008-4: 2008 Rotary Screw Trap Report
2009-4: 2009 Rotary Screw Trap Report

Fluctuation Assessments
1992 Appdx. 15: Fluctuation Flow Study Plan: Draft
Report 2000-6: Tuolumne River Chinook Salmon Fry and Juvenile Stranding Report

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
1998-5: CWT Summary Update
1999-7: Coded-wire Tag Summary Update
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
  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
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
  - 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
2008-7: Aquatic Invertebrate Monitoring (2005, 2007, 2008) and Summary Update
2009-7: 2009 Aquatic Invertebrate Monitoring and Summary Update

**Delta Salmon Salvage**

**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
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
2004-10: 2004 Water Quality Report

IFIM Assessment
1992 Appdx. 4: Instream Flow Data Processing, Tuolumne River
1992 Appdx. 5: Analysis of 1981 Lower Tuolumne River IFIM Data

Flow and Delta Exports
1997-4: Streamflow and Delta Water Export Data Report
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
2001-7: Adaptive Management Forum Report
2004-12: Coarse Sediment Management Plan
2005 Ten-Year Summary Report Appdx. D: Salmonid Habitat Maps
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
2005 Ten-Year Summary Report
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
Exhibit 3 – January-June 2009 Basin salmon rearing/ouutmigration data

Tuolumne screw trap catch of unmarked juvenile Chinook salmon

Merced screw trap catch of unmarked juvenile Chinook salmon
Daily average forklength of unmarked juvenile Chinook salmon

Mossdale Kodiak trawl individual daily forklengths of juvenile Chinook salmon, January through June 2009
### State Water Project

<table>
<thead>
<tr>
<th>Week ending date</th>
<th>Total chinook salvage</th>
<th>Combined Ave. cfs Acre ft. salvage / export rate</th>
<th>Export Export 1000 ac.ft.</th>
<th>1000 ac.ft.</th>
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### Central Valley Project

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<th>Export Export 1000 ac.ft.</th>
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| Tot & avg        | 517                   | 2,028                                         | 1,677                     | 3,705       | 2,262 |
OBSERVED CHINOOK SALVAGE AT THE SWP & CVP
DELTA FISH FACILITIES 8/1/2008 THROUGH 7/31/2009

Note: “Delta Model” size/date categories by run designation are approximate
2009 San Joaquin Basin Flows and Rainfall

Flow in cubic feet per second

Rainfall at Don Pedro
Stan. at Ripon
Tuol. at Modesto
Merced at Stevinson
SJR at Vernalis

Inches of precipitation
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
1. Graphs of flows, flow schedule, reservoir status, and precipitation data
2. Graphs of water temperature and air temperature

Daily average water temperatures in the Tuolumne River

October 2008 to September 2009

- La Grange gage (RM 51.8)
- Riffle A7 (RM 50.8)
- Riffle 3B (RM 49.0)
- Riffle 13B (RM 45.5)
- Riffle 21 (RM 42.9)

Daily average water temperatures in the Tuolumne River

October 2008 to September 2009

- Riffle 21 (RM 42.9)
- RFB (RM 39.6)
- Ruddy (RM 36.7)
- Hughson (RM 23.6)
- Shiloh (RM 3.4)
Daily average water temperatures in San Joaquin R. & Tuolumne R. at Shiloh Road

October 2008 to September 2009

Modesto Airport Air Temperature - Max, Min, Avg (Water Year 2009)
Daily average water temperatures in the Tuolumne River

October 2009 to September 2010

La Grange gage (RM 51.8)  Riffle A7 (RM 50.8)  Riffle 3B (RM 49.0)  Riffle 13B (RM 45.5)  Riffle 21 (RM 42.9)

Daily average water temperatures in the Tuolumne River

October 2009 to September 2010

Riffle 21 (RM 42.9)  RFB (RM 39.6)  Ruddy (RM 36.7)  Hughson (RM 23.6)  Shiloh (RM 3.4)
Daily average water temperatures in San Joaquin R. and Tuolumne R. at Shiloh Road

October 2009 to September 2010

Modesto Airport Air Temperature - Max, Min, Avg (Water Year 2010)
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,

[Signature]

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
# SAN JOAQUIN VALLEY WATER YEAR HYDROLOGIC CLASSIFICATION

## 602020 INDEX

| YEAR     | STANISLAUS | TUMULUMNE | MERCEDE | PRINANT | TOTAL  | STANISLAUS | TUMULUMNE | MERCEDE | PRINANT | TOTAL  |
|----------|------------|-----------|---------|---------|--------|------------|-----------|---------|---------|--------|-------|
| 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 | 2,279,899  | 94,000 Critical |
| Average  | 500,000    | 850,000   | 430,000 | 910,000 | 2,730,000 | 270,000    | 470,000   | 220,000 | 340,000 | 1,380,000 | 2,310,899  | 136,214 Dry |
| Wet      | 980,000    | 1,680,000 | 900,000 | 1,730,000 | 5,270,000 | 450,000    | 735,000   | 380,000 | 550,000 | 2,115,000 | 3,097,899  | 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 | 755,000 | 1,321,699  | 94,000 Critical |
| Average  | 490,000    | 870,000   | 430,000 | 910,000 | 2,700,000 | 270,000    | 470,000   | 220,000 | 340,000 | 1,360,000 | 2,292,699  | 134,989 Dry |
| Wet      | 930,000    | 1,610,000 | 850,000 | 1,660,000 | 5,090,000 | 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   | 200,000 | 530,000 | 1,530,000 | 150,000    | 305,000   | 130,000 | 210,000 | 795,000 | 1,525,699  | 104,439 Critical |
| Average  | 520,000    | 940,000   | 470,000 | 960,000 | 2,990,000 | 270,000    | 470,000   | 220,000 | 340,000 | 1,360,000 | 2,456,899  | 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 | 755,000 | 1,639,699  | 107,707 Critical |
| Average  | 540,000    | 960,000   | 500,000 | 960,000 | 2,990,000 | 270,000    | 470,000   | 220,000 | 340,000 | 1,360,000 | 2,466,899  | 147,859 Dry |
| Wet      | 940,000    | 1,810,000 | 840,000 | 1,820,000 | 5,490,000 | 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 | 1,990,000 | 230,000    | 410,000   | 193,000 | 285,000 | 1,115,000 | 1,811,699  | 112,652 Critical |
| Average  | 580,000    | 980,000   | 500,000 | 960,000 | 3,090,000 | 270,000    | 465,000   | 225,000 | 355,000 | 1,315,000 | 2,467,699  | 145,961 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   | 199,000 | 285,000 | 1,115,000 | 2,117,699  | 124,392 Dry |
| Average  | 650,000    | 1,130,000 | 580,000 | 1,060,000 | 3,210,000 | 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 | 670,000 | 1,270,000 | 5,210,000 | 261,304    | 443,544   | 218,333 | 360,063 | 1,283,245 | 3,763,548  | 300,923 Above Normal |
| Mar 17 Forecast |
| Dry      | 480,000    | 880,000   | 350,000 | 750,000 | 2,450,000 | 230,000    | 410,000   | 199,000 | 285,000 | 1,115,000 | 2,135,699  | 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    | 1,830,000 | 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
SCHEDULES FOR 2009 - 2010 FISH FLOW YEAR

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<th>Other Adjusted Flow</th>
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Minimum Flow Schedule.xls Page 1 of 2 204/477 Total = 163,890
TUOLUMNE RIVER MINIMUM FLOW REQUIREMENT (Figure 2)
DWR March 10, 2009; FORECAST OF 2009-2010 FISH

- Dry San Joaquin Index = 2,135,899
- Dry Minimum Flow Schedule = 125,253 Acre-Feet
- Average San Joaquin Index = 2,673,899
- Average Minimum Flow Schedule = 163,149 Acre-Feet

Year Req.
Base Flow
Spring
Fall
Dry
Average

sanjoaqn 2009003.xls
TUOLUMNE RIVER MINIMUM FLOW REQUIREMENT (Summer Base Flow) (Figure 4)

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

Dry San Joaquin Index = 2,135,899
Partial Minimum Flow Schedule = 125,253 Acre-Feet
Average San Joaquin Index = 2,673,899
Average Minimum Flow Schedule = 163,149 Acre-Feet
May 5, 2009

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

VIA E-MAIL

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
| DATE       | Number of Days | CES | AF | ACCUM. A.F. | CES | AF | ACCUM. A.F. | CES | AF | ACCUM. A.F. | CES | AF | ACCUM. A.F. | CES | AF | ACCUM. A.F. | CES | AF | ACCUM. A.F. | CES | AF | ACCUM. A.F. |
|------------|----------------|-----|----|-------------|-----|----|-------------|-----|----|-------------|-----|----|-------------|-----|----|-------------|-----|----|-------------|-----|----|-------------|-----|----|-------------|
| 15-Jul-2009| 1              | B80 | 307| 317         |     |    |             | B80 | 307| 317         |     |    |             | B80 | 307| 317         |     |    |             |
| 16-Jul-2009| 1              | B80 | 307| 317         |     |    |             | B80 | 307| 317         |     |    |             | B80 | 307| 317         |     |    |             |
| 17-Jul-2009| 1              | B80 | 307| 317         |     |    |             | B80 | 307| 317         |     |    |             | B80 | 307| 317         |     |    |             |
| 18-Jul-2009| 1              | B80 | 307| 317         |     |    |             | B80 | 307| 317         |     |    |             | B80 | 307| 317         |     |    |             |
| 19-Jul-2009| 1              | B80 | 307| 317         |     |    |             | B80 | 307| 317         |     |    |             | B80 | 307| 317         |     |    |             |
| 20-Jul-2009| 1              | B80 | 307| 317         |     |    |             | B80 | 307| 317         |     |    |             | B80 | 307| 317         |     |    |             |
| 21-Jul-2009| 1              | B80 | 307| 317         |     |    |             | B80 | 307| 317         |     |    |             | B80 | 307| 317         |     |    |             |
| 22-Jul-2009| 1              | B80 | 307| 317         |     |    |             | B80 | 307| 317         |     |    |             | B80 | 307| 317         |     |    |             |
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| 28-Jul-2009| 1              | B80 | 307| 317         |     |    |             | B80 | 307| 317         |     |    |             | B80 | 307| 317         |     |    |             |

**Note:** This table represents the Tuolumne River Flow Schedule for 2009-2010 Fish Flow Year.
## Table 2

### SAN JOAQUIN VALLEY WATER YEAR HYDROLOGIC CLASSIFICATION

#### 602020 INDEX

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### San Joaquin Index

- Dry: Critical
- Wet: Below Normal
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
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* Maximum index value for fish flow year is not to go above value shown in this row.
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<th>JUNE</th>
<th>JULY</th>
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**Table 2**

SANDO VALLEY WATER YEAR HYDROLOGIC CLASSIFICATION

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**Notes:**
1. CFS = cubic feet per second
2. ACCUM. CFS = cumulative cubic feet
3. Total YFC Flow is the sum of all flows.
Attachment -B-
2009 Tuolumne River
Technical Advisory Committee Materials:

• List of 2009 TRTAC Activities/Materials

• March Meeting

• June Meeting

• September Meeting

• December Meeting
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
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://tuolumneriververtac.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://tuolumneriververtac.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**

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
</tr>
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<tr>
<td>1. Tim Ford</td>
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<td>2. Robert Nees</td>
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<td>8. Jesse Roseman</td>
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2009 TRTAC Activities & Materials


- 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
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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
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
     o 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
     o 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**

<table>
<thead>
<tr>
<th>Name</th>
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<tbody>
<tr>
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<td>5. Bill Sears</td>
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<td>6. Andie Irons</td>
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<tr>
<td>7. Jesse Roseman</td>
<td>Tuolumne River Trust</td>
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</tbody>
</table>
2009 Waterford RST salmon catch

- <50 mm
- 50-69 mm
- ≥70 mm

Forklength (mm)

- 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

- <50 mm
- 50-69 mm
- ≥70 mm

Forklength (mm)
2009 TUOLUMNE RIVER JUVENILE SALMON SEINING STUDY

(Number of salmon caught is indicated above the fork length range)

JANUARY - JUNE

FORK LENGTH (mm)

- Minimum
- Maximum
- Average
- No catch
2009 Tuolumne/SJRTurbidity

- NTU at RM 30
- 2008 NTU at RM 30
- SJR above TR
- SJR below TR

NTU

- 0.0
- 50.0
- 100.0
- 150.0
- 200.0
- 250.0
- 300.0
- 350.0
- 400.0
- 450.0

Dates:
- 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
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- 16-May-09
- 19-May-09
- 22-May-09
- 25-May-09
- 28-May-09
- 31-May-09
2009 April 15 Tuolumne Flow Schedule through October
(annual volume of 151,222 AF)
2009 SJ Basin Index (10%, 50%, 90% exceedence values)

Acre Feet

DWR Forecast Date

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
2009-2010 FERC Flow Volumes (10%, 50%, 90% exceedance values)

Acre Feet

DWR Forecast Date
2009 TRTAC Activities & Materials


- 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
  - 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
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
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

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<tr>
<th>Name</th>
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<td>1. Greg Deas (Phone)</td>
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<td>8. Bill Sears</td>
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</table>
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.
- 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
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**Notes:**
1. All data is in cubic feet per second (cfs).
2. The data above was collected from the Tuolumne River at Merced.
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
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:
     o 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
     o 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
     o 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

<table>
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<tr>
<td>Tim Ford</td>
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<td>Robert Nees</td>
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<td>Noah Hume</td>
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<td>Galileo Morales</td>
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2009 TRTAC Materials/Postings to Website


- 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
  - 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.
  - 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

• 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 Cumulative Net Daily Salmon Weir Passage

2009 Cumulative % salmon with clipped adipose fins at weir

DRAFT
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

- **July 2008**: 96 observed, 2,636 estimated
- **March 2009**: 4,281 observed, 39,563 estimated
- **July 2009**: 4,696 observed, 29,389 estimated

Legend: □ Observed, ■ Estimated
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 2009-2: Spawning Survey Summary Update
Report 2009-3: 2009 Seine Report and Summary Update
Report 2009-7: Tuolumne River *Oncorhynchus mykiss* Monitoring Report
Report 2009-8: Aquatic Invertebrate Monitoring and Summary Update

March 2009