Modesto Irrigation District
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January 15, 2011

Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
Mail Code: DHAC, PJ-12.3
888 First Street, NE
Washington, DC 20426

RE: Don Pedro Project (FERC Project No. 2299); Report of Turlock and Modesto Irrigation Districts on Oncorhynchus mykiss Monitoring pursuant to the Federal Energy Regulatory Commission's May 10, 2010 Order (131 FERC ¶ 62,097) Regarding Article 58

In its May 10, 2010 Order (131 FERC ¶ 62,097) modifying and approving in part Tuolumne River *Oncorhynchus mykiss* ten-year monitoring report pursuant to Article 58 ("Order"), the Federal Energy Regulatory Commission ("Commission" or "FERC") directed the Turlock and Modesto Irrigation Districts ("Districts") to file annual reports on the results of specified *Oncorhynchus mykiss* (*O. mykiss)* monitoring activities.

Specifically, Ordering Paragraph (C) of the Order states, in pertinent part, as follows:

(C) The licensee shall file annual reports of the results of all additional *O. mykiss* monitoring at the project. The annual reports shall be filed with the Commission by January 15, 2011 and January 15, 2012. The reports shall be prepared in consultation with the National Marine Fisheries Service, U.S. Fish and Wildlife Service, and California Department of Fish and Game. The Districts shall allow the agencies 30 days to provide comments on the reports prior to filing the reports with the Commission. The reports shall include the agencies' comments and the Districts' response to any received comments. These additional annual reports shall not replace the required Final 2005–2012 Fisheries Study Plan Summary Report, which is to be filed with the Commission, by July 1, 2013, pursuant to the Commission's April 3, 2008 Order on Ten-Year Summary Report Under Article 58.

The report provided as Attachment 1 reviews and summarizes the 2010 *O. mykiss* monitoring activities as a supplement to information submitted on January 10, 2010. The Districts distributed their draft *O. mykiss* report to the fisheries resource agencies above on November 30, 2010 for the 30-day agency comment period (see Attachment 2 for a copy of the transmittal letter). Comments and recommendations were provided by CDFG on January 3, 2011 (Attachment 3 hereto). The Friends of the Tuolumne (FOT) also provided informal comments via email in December 2010 (Attachment 4 hereto). The USFWS and NMFS did not provide any comments or recommendations. The Districts' response to the CDFG and FOT comments and recommendations are provided as Attachments 5 and 6 hereto.

The Districts will conduct the remaining *O. mykiss* monitoring studies under the Order during 2011, subject to any safety issues related to high flows or changes in permitting status, unless the studies are modified by the Commission.

Respectfully submitted,

MODESTO IRRIGATION DISTRICT

Greg Dias
Project Manager

TURLOCK IRRIGATION DISTRICT

Robert M. Nees
Director of Water Resources
and Regulatory Affairs

Attachments:
Attachment 1. Stillwater Sciences. 2011. Tuolumne River 2010 *Oncorhynchus mykiss* Monitoring Summary Report. Prepared for the Turlock Irrigation District and Modesto Irrigation District by Stillwater Sciences, Berkeley, California. January.
Attachment 2. Draft 2010 *O. mykiss* Monitoring Summary Report Transmittal Letter (dated November 30, 2010).
Attachment 3. CDFG Comments on Draft Tuolumne River 2010 *O. mykiss* Monitoring Summary Report (dated January 3, 2011).
Attachment 4. FOT Comments on Draft Tuolumne River 2010 *O. mykiss* Monitoring Summary Report (December 2010).
Attachment 5. Districts' Response to CDFG Comments on Draft 2010 *O. mykiss* Monitoring Summary Report.
Attachment 6. Districts' Response to FOT Comments on Draft 2010 *O. mykiss* Monitoring Summary Report.

Attachment #1
Final Tuolumne River 2010 *O. mykiss* Monitoring Summary Report
(January)

Tuolumne River 2010 *Oncorhynchus mykiss* Monitoring Summary Report

FINAL

Prepared for
Turlock Irrigation District
333 East Canal Drive
Turlock, CA 95380

and

Modesto Irrigation District
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January 2011

Suggested citation:
Stillwater Sciences. 2011. Tuolumne River 2010 *Oncorhynchus mykiss* Monitoring Summary Report. Prepared for the Turlock Irrigation District and Modesto Irrigation District by Stillwater Sciences, Berkeley, California. January.

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1 SUMMARY

This report to the Federal Energy Regulatory Commission (FERC) is submitted in compliance with Ordering Paragraph (C) of the May 10, 2010 Order Modifying and Approving in Part Tuolumne River *Oncorhynchus mykiss* Ten-Year Monitoring Report Pursuant to Article 58 for Project 2299. That order required the Modesto and Turlock Irrigation Districts (Districts) to file an annual monitoring report by January 15, 2011 on the results of specific Tuolumne River *O. mykiss* monitoring efforts for the year 2010. There were six monitoring efforts conducted during 2010 that were designed to either directly or indirectly include *O. mykiss* observations.

1. The newly established Tuolumne River counting weir was operational from September 22, 2009 through April 16, 2010. A single adult *O. mykiss* was detected on November 7, 2009. The primary objective of the counting weir is to provide information on fall-run Chinook salmon (*O. tshawytscha*) spawning migration (escapement), however the weir can also detect and identify other species, including *O. mykiss*, and provide additional monitoring data for this species.

2. Annual seine surveys have been conducted on a bi-weekly basis from January through May since 1986. The primary objective of the seine surveys is to monitor juvenile Chinook salmon abundance, size, distribution and their migration within and out of the river. During the surveys incidental captures of other species, including *O. mykiss*, can occur. During winter and spring 2010, a total of 29 juvenile *O. mykiss* ranging in size from 21–51 mm (fork length) were captured from February 17–May 11 at three sampling locations between river miles (RM) 50.5–42.3.

3. Rotary screw trap (RST) sampling continued at two sampling locations in the lower Tuolumne River from early January through mid-June, 2010. Trap locations were near Grayson (RM 5.2) and Waterford (RM 29.8). The primary objective of the RST study is to count outmigrating Chinook salmon smolts and quantify juvenile production. The RSTs capture other species, including *O. mykiss*, that are counted and measured prior to release. However, there were no recorded captures of *O. mykiss* at either trap location in 2010.

4. Annual reference count snorkel surveys were conducted in August and November 2010. High spring and early summer flows, due to above-normal rainfall and snowpack runoff, prevented sampling during the more typical sampling dates of June and September. The reference count snorkel surveys target salmonid species at specified sampling sites covering a variety of habitats extending from RM 50.7—31.5. A total of 268 *O. mykiss* was observed in August 2010, and 218 in November 2010.

5. There were two *O. mykiss* population estimate surveys completed in 2010. The first survey was conducted in March and the second in August. These surveys utilize a two-phase snorkel survey to obtain counts of young-of-year/juvenile (<150 mm total length [TL]) and adult (>150 mm total length [TL]) *O. mykiss* at specific habitat types within a specified study reach, then apply a bounded count estimator (BCE) to establish a population estimate and 95% confidence intervals (CI) for the lower Tuolumne River from RM 52–29. The March 2010 survey provided an estimate of 109 adults with a 95% CI of 50–168 from a total of 13 observations. There was no March estimate for juveniles due to the low number of observations (n=1). The August 2010 survey provided an estimate of 2,139 adults with a 95% CI of 717–3,552 from a total of 324 observations, and an estimate of 2,405 juveniles with a 95% CI of 625–4,185 from a total of 313 observations.

The August 2010 juvenile *O. mykiss* population estimates are within the 95% CI observed in all three years (2008–2010) during which these surveys have been conducted. The August 2010 adult *O. mykiss* population estimate of 2,139 was higher than both the July 2009 estimate of 963 and the July 2008 estimate of 643 and may relate to conditions in the river below La Grange dam that were greatly influenced by flood control releases occurring from April through July 2010 which may have resulted in fish being introduced from upstream reservoirs.

6. Permits required to initiate the adult *O. mykiss* tracking study were obtained and the study was conducted from March through November 2010. Adult *O. mykiss* which were captured by angling and then implanted with an acoustic tag. The tagged fish were monitored using both mobile and fixed-station antennae to detect movement and habitat use. A total of 20 *O. mykiss* were tagged during the study (6 in March, and 14 in October). Preliminary results show little movement of tagged fish beyond approximately 500 meters (0.31 miles) of their release location. No tagged fish were detected downstream of RM 44.

2 BACKGROUND AND PURPOSE

The Districts filed a Tuolumne River *O. mykiss* Monitoring Report on January 15, 2010 to meet requirements of the April 3, 2008 Order (123 FERC ¶ 62,012) on the Ten-Year Summary Report under Article 58. Study documents produced to date pursuant to the April 3, 2008 Order include:

- 2008 *O. mykiss* population estimate study plan (Stillwater Sciences 2008a) submitted to FERC on July 3, 2008 for the July 2008 survey;
- 2008 population size estimate (Stillwater Sciences 2008b) submitted as part of the Districts' 2008 annual report to FERC (TID/MID 2009);
- 2009 *O. mykiss* population estimate study plan (Stillwater Sciences 2009a) submitted to FERC on January 28, 2009;
- 2009 March and July *O. mykiss* population estimates (Stillwater Sciences 2009b) submitted to FERC on January 15, 2010;
- Tuolumne River 2008–2009 *O. mykiss* monitoring report (Ford and Kirihara 2010) submitted to FERC on January 15, 2010.

This report to FERC is submitted in compliance with Ordering Paragraph (C) of the FERC May 10, 2010 Order Modifying and Approving in Part Tuolumne River *Oncorhynchus mykiss* Ten-Year Monitoring Report Pursuant to Article 58 for Project 2299, which stated:

> *(C) The licensee shall file annual reports of the results of all additional O. mykiss monitoring at the project. The annual reports shall be filed with the Commission by January 15, 2011 and January 15, 2012. The reports shall be prepared in consultation with the National Marine Fisheries Service, U.S. Fish and Wildlife Service, and California Department of Fish and Game. The Districts shall allow the agencies 30 days to provide comments on the reports prior to filing the reports with the Commission. The reports shall include the agencies' comments and the Districts' response to any received comments. These additional annual reports shall not replace the required Final 2005-2012 Fisheries Study Plan Summary Report, which is to be filed with the Commission, by July 1, 2013, pursuant to the Commission's April 3, 2008 Order on Ten-Year Summary Report under Article 58*

This report contains *O. mykiss* records from 2010 monitoring results along with a summary update of previous monitoring for the following programs:

- Counting weir results from September 2009 through April 2010.
- Seining surveys conducted between January and May since 2001.
- Rotary screw trap monitoring conducted between January and May of most years since 1999.
- Reference count snorkel surveys conducted in June/July and at other times of year in most years since 2001.
- *O. mykiss* population estimate snorkel surveys conducted in March and August 2010.
- *O. mykiss* acoustic tag tracking study results from March through November, 2010.

Additional details on each of these studies may be found in the individual study reports, posted at the Tuolumne River Technical Advisory Committee website at: http://tuolumnerivertac.com and submitted with the Districts annual FERC Reports in March 2011.

3 MONITORING RESULTS AND DISCUSSION

3.1 Tuolumne River Counting Weir

Annual spawning surveys have been conducted by California Department of Fish and Game (CDFG) on the Tuolumne River since 1971. Beginning in September 2009, escapement monitoring for fall-run Chinook salmon has incorporated a counting weir established at RM 24.5 (TID/MID 2010, Report 2009-8 and Figure 1). The counting weir uses infrared and digital photo-video technology to distinguish and enumerate individual fish passing upstream through the weir. Although the primary objectives of the counting weir are to provide information pertaining to salmon, the weir is able to detect and identify other fish species, including *O. mykiss*.

During the initial operation of the weir between September 22, 2009 and January 31, 2010, a total of 282 adult Chinook salmon were detected, along with various numbers of 11 other fish species (3 native and 8 introduced). One *O. mykiss* was recorded passing the weir on November 7, 2009, with an estimated length of 276 mm (TID/MID 2010, Report 2009-8). The operational period of the weir coincides with the period of peak adult upstream migration for anadromous (non-resident) *O. mykiss* as deduced from the generalized life history timing for the Stanislaus River (Table 1). Operation of the weir continued through April 16, 2010 with some additional counts of Chinook, but no additional *O. mykiss* passage detected (FISHBIO 2010a). Final counting weir results and study details will be provided with the Districts annual FERC Report submittal in March 2011 and posted at the Tuolumne River Technical Advisory Committee website at: http://tuolumnerivertac.com.

Table 1. Generalized *O. mykiss* life stage timing for Stanislaus River—darker shading indicates peak use.

Life stage	Fall			Winter			Spring			Summer		
	September	October	November	December	January	February	March	April	May	June	July	August
Central Valley Steelhead												
Adult upstream migration	▒	▓	▓	▓	▓	▓	▒				▒	▒
Adult spawning				▒	▓	▓	▓					
Egg incubation and fry emergence					▓	▓	▓	▓	▒			
Juvenile rearing	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓
Yearling smolt emigration					▒	▓	▓	▓	▓	▒		

Notes:
Adapted with modifications from NMFS 2009 (Figure. 5-21, pg 200)
Dark shading–Peak activity; Medium shading–Potential activity

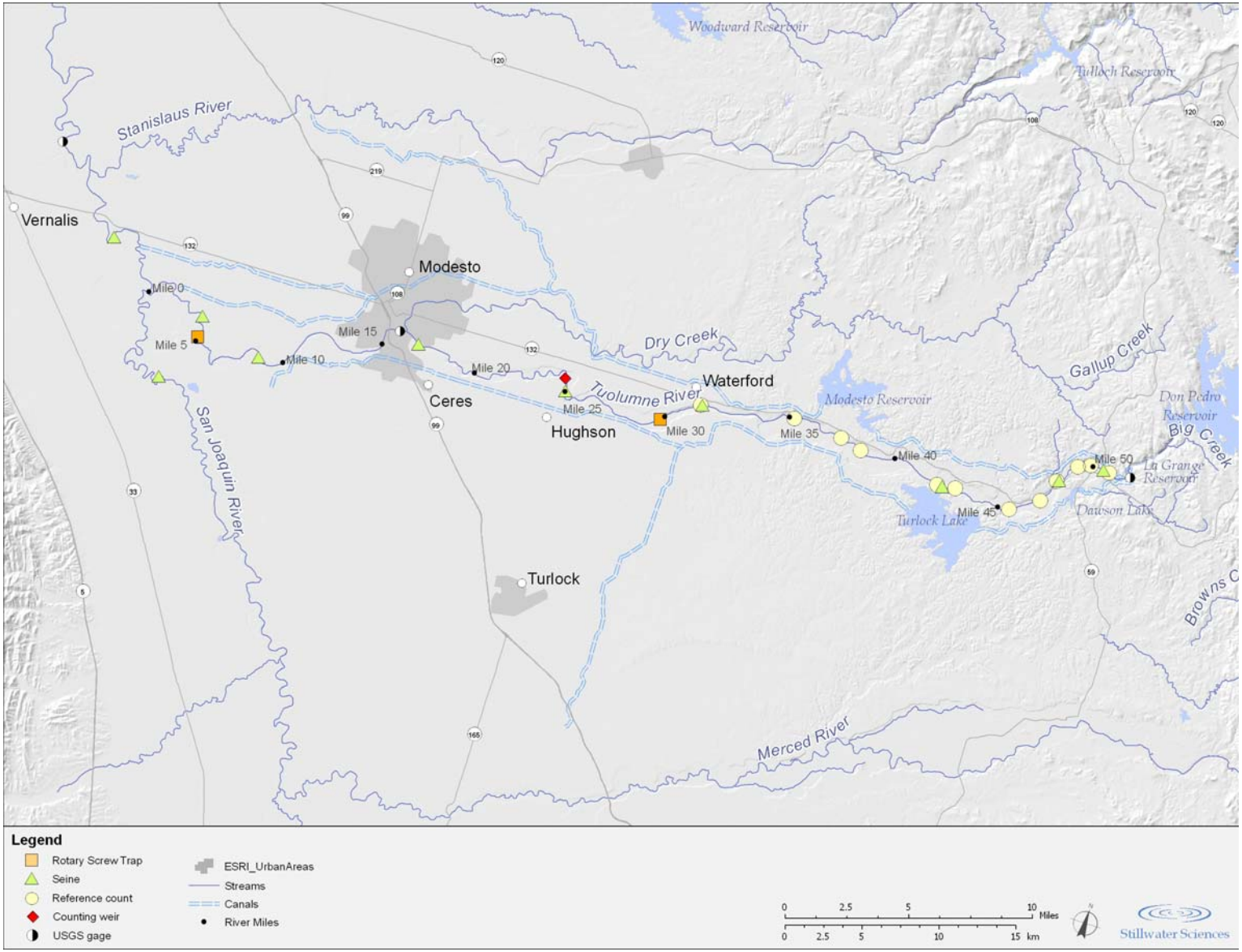

Figure 1. Lower Tuolumne River monitoring locations.

3.2 Tuolumne River Seine Surveys

Annual seine surveys have been conducted on the Tuolumne River since 1986, with methodology and results summarized in Ford and Kirihara (2010). Surveys in recent years were conducted at two-week intervals mainly from January through May. A total of eight Tuolumne River sites (Figure 1) were sampled each survey period. In the 2010 seine surveys, a total of 29 *O. mykiss* fry (21–51 mm FL) were caught between February 17 and May 11 at Old La Grange Bridge (RM 50.5), Riffle R5 (RM 48.0), and the Tuolumne River Resort (TRR) (RM 42.3). Low catch numbers of young-of-year (YOY) and juvenile (<150 mm) *O. mykiss* upstream of RM 42 are typical in the seine monitoring. For comparative purposes, seine captures for the 2001–2010 period of record are presented in Table 2 and Figure 2.

Table 2. Tuolumne River seining locations (2001–2010) with total number of YOY/juvenile *O. mykiss* captured annually.

Site	Location	River mile	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	Old La Grange Bridge	50.5	1	2	X	1	1	2	X	4	3	19
2	Riffle 4B	48.4						2				
3	Riffle 5	47.9	42	1	X	3	X		8	X	4	9
4	Tuolumne River Resort	42.4	2	X	1	3	X	4	14	X	X	1
5	Hickman Bridge	31.6	X	X	X	X	X	X	X	X	X	X
6	Charles Road	24.9	X	X	X	X	X	X	X	X	X	X
7	Legion Park	17.2	X	X	X	X	X	X	X	X	X	X
8	Riverdale Park/ Venn	12.3/7.4	X	X	X	X	X	X	X	X	X	X
9	Shiloh Bridge	3.4	X	X	X	X	X	X	X	X	X	X
Total			45	3	1	7	1	8	22	4	7	29

X – Locations that were sampled with no *O. mykiss* captured.

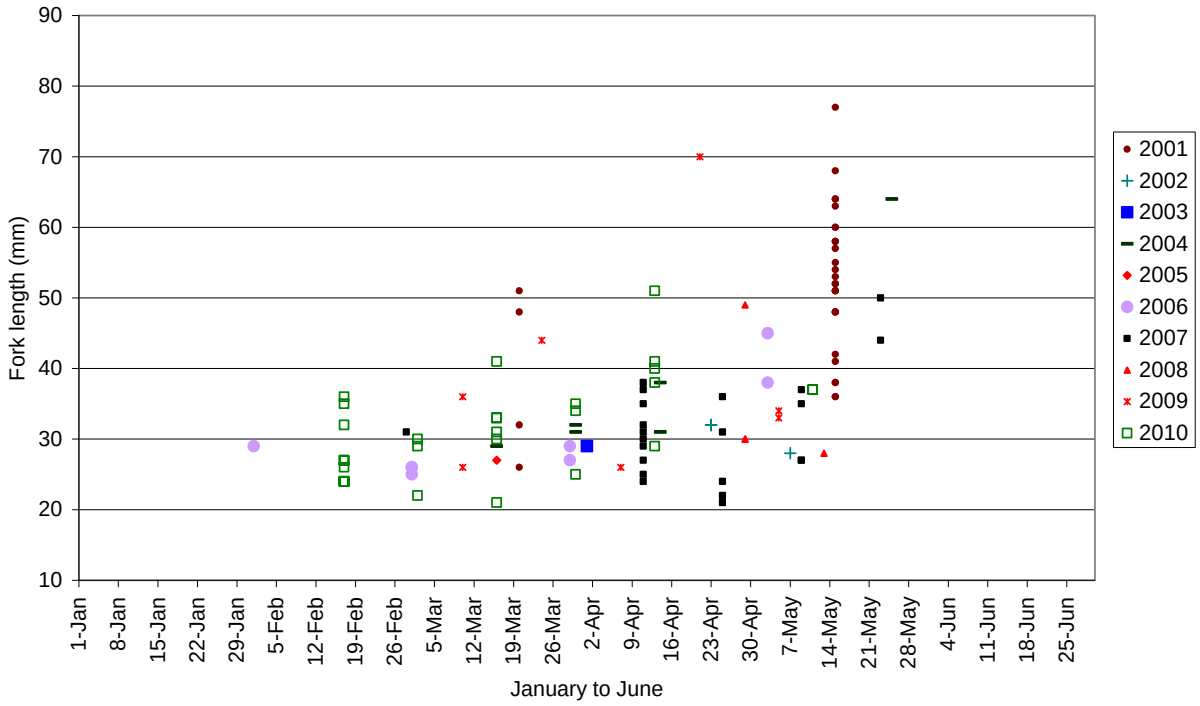

Figure 2. All measured *O. mykiss* caught from Old La Grange Br. (RM 50.5) to Tuolumne River Resort (RM 42.3) during the 2001 to 2010 Tuolumne seining surveys.

3.3 Tuolumne River Rotary Screw Trap

Tuolumne River rotary screw trap (RST) monitoring began in April 1995 at Shiloh Road (RM 3.4). In 1998, additional upstream traps began to be utilized. Trap locations and sampling duration have varied over the years and are summarized in the annual TID/MID FERC report (TID/MID 2010, Report 2009-4). The trap sites have been located near Waterford (RM 29.8) and at Grayson (RM 5.2) since 2006. Similar to the seine monitoring, there are relatively few *O. mykiss* caught in the RST sampling. Preliminary data for 2010 show no *O. mykiss* captures at either trap location during the operational period from early January through mid-June (FISHBIO 2010b). Figure 3 shows the size and timing of the RST catches of all *O. mykiss* from 1999–2010.

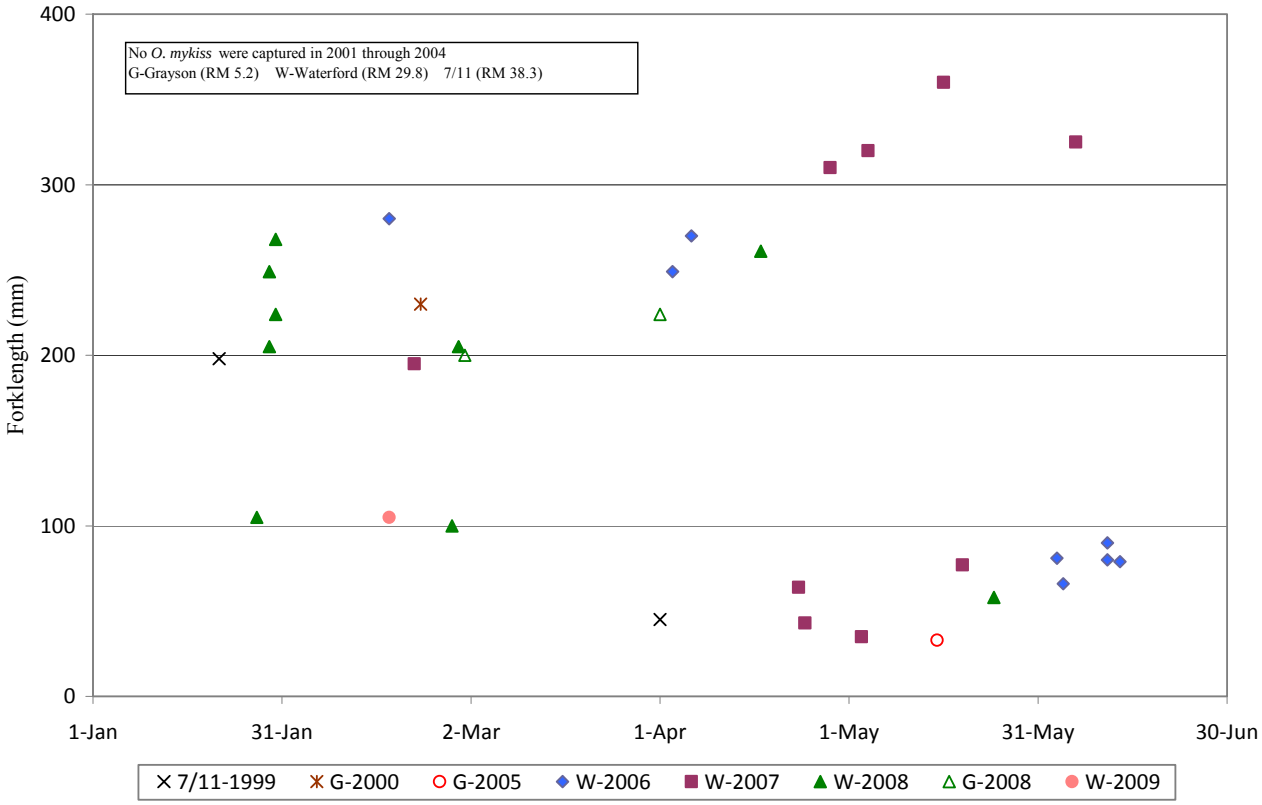

Figure 3. Tuolumne River rotary screw trap captures of all *O. mykiss* captured from 1999-2010.

3.4 Tuolumne River Reference Count Snorkel Surveys

Tuolumne River reference snorkel surveys began in 1982, providing most of the *O. mykiss* information prior to 2008 (Kirihara 2010). Since 2001, methods have been standardized and paired early summer (June) and late summer (September) snorkel surveys have been conducted in most years, except in years with high flows (2005, 2006, 2010), when high flows precluded the early summer surveys. In 2010, high flows precluded sampling in June and an August sampling effort was conducted. Additionally, a fall snorkel survey was conducted in November 2010 to document *O. mykiss* presence and distribution in the river. Table 3 shows the month and locations surveyed, along with the *O. mykiss* counts for the 2001–2010 period of record. These reference count surveys also are used to obtain fish density for YOY/juveniles (<150 mm TL) and adults (≥150 mm TL) using the area searched at each snorkeling site. For the years with paired early and late summer surveys, Figure 4 shows that June density of YOY/juvenile *O. mykiss* was consistently much higher than adult density, whereas in September of some years the adult density was higher than the juvenile density. The highest observed *O. mykiss* density indices have generally occurred upstream of RM 42 (Figure 5).

Water temperatures recorded at most snorkel locations with *O. mykiss* have ranged from about 51.8–68.0ºF (11–20ºC) (Figure 6) during the September surveys. Temperatures generally increase moving downstream and are also dependent on the time of day the measurements are taken. Water temperatures observed in September are normally much cooler than those measured in the June surveys probably due to lower air temperatures.

Table 3. Tuolumne River reference count snorkel survey locations (2001–2010) with number of *O. mykiss* observed.

Location	River Mile	2001		2002		2003		2004			2005	2006	2007		2008	2009	2010	
		June	September	June	September	June	September	June	August	September	September	September	June	September	June	June	August	November
Riffle A3/A4	51.6								5									
Riffle A7	50.7	7	3	5	1	66	16	12	6	11	10	115	106	75	76	80	35	33
Riffle 1A	50.4								4									
Riffle 2	49.9	3	3	1	4	8	2	23	2	7	7	15	34	16	9	12	58	67
Riffle 3B	49.1	8	1	11	1	5	21	22	5	7	6	66	45	12	78	27	73	67
Riffle 4B	48.4								8									
Riffle 5B	48.0	4	2	3	X	6	10	11	15	6	36	54	92	10	21	11	26	16
Riffle 7	46.9	4	X	5	2	14	9	13	5	2	2	106	22	7	13	6	25	6
Riffle 9	46.4								3									
Riffle 13A–B	45.6	3	X	2	4	1	6	5	13	X	46	103	15	57	24	4	33	14
Riffle 21	42.9	2	3	1	X	X	6	5	9	7	15	32	10	10	11	X	8	2
Riffle 23B–C	42.3	X	X	X	X	1	1	X	1	X	14	27	5	7	X	2	9	10
Riffle 30B	38.5			X	X													
Riffle 31	38.1	X	X			X	X	X	X	X	1	21	12	4	X	X	1	X
Riffle 35A	37.0			X	X	X	X	X	X	X	2		X	X	X	X	X	X
Riffle 36A	36.7											4						
Riffle 37	36.2	X	X															
Riffle 41A	35.3	X	X	X	X	X	X	X	X	X	X	X	2	X	X	X	X	3
Riffle 57–58	31.5	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
Total *O. mykiss*		**31**	**12**	**28**	**12**	**101**	**71**	**91**	**76**	**40**	**139**	**543**	**343**	**198**	**232**	**142**	**268**	**218**

X - Locations that were sampled with no *O. mykiss* observed

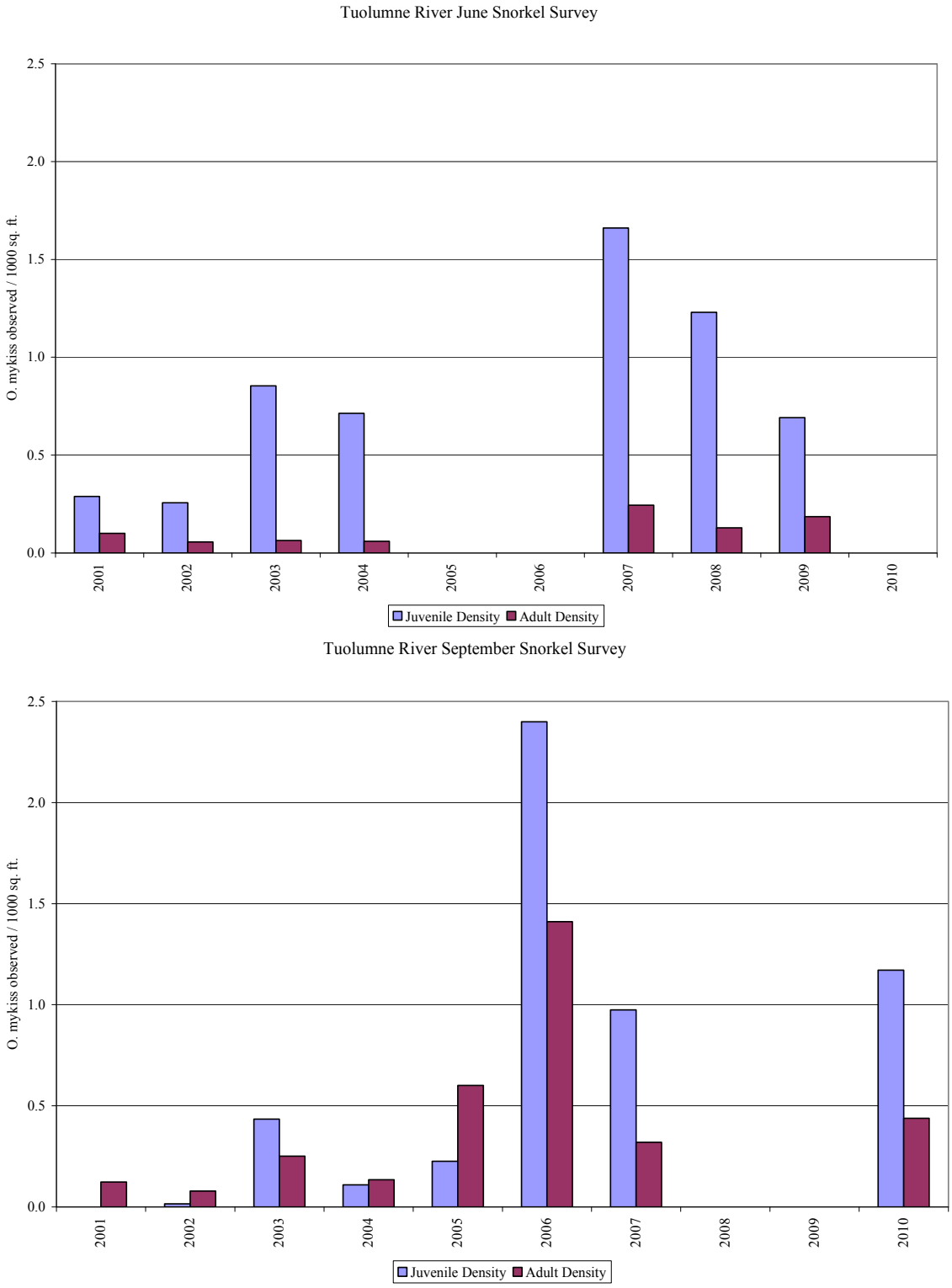

Figure 4. Density of YOY/juvenile (<150 mm TL) and adult (≥150 mm TL) *O. mykiss* in Tuolumne River June and September reference count snorkel surveys. No surveys were conducted in June 2005–2006, June 2010, and September 2008-2009 due to high flows. The 2010 data were collected in August 2010.

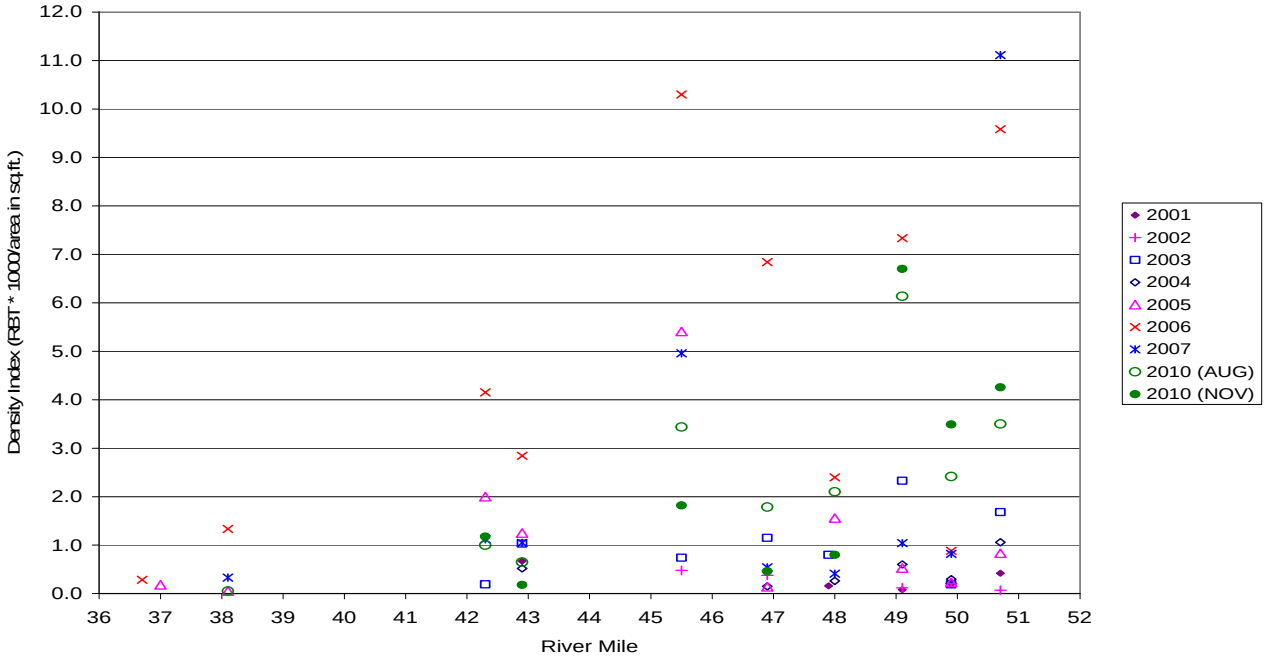

Figure 5. Density indices of *O. mykiss* in 2001-2010 Tuolumne River September snorkel surveys.

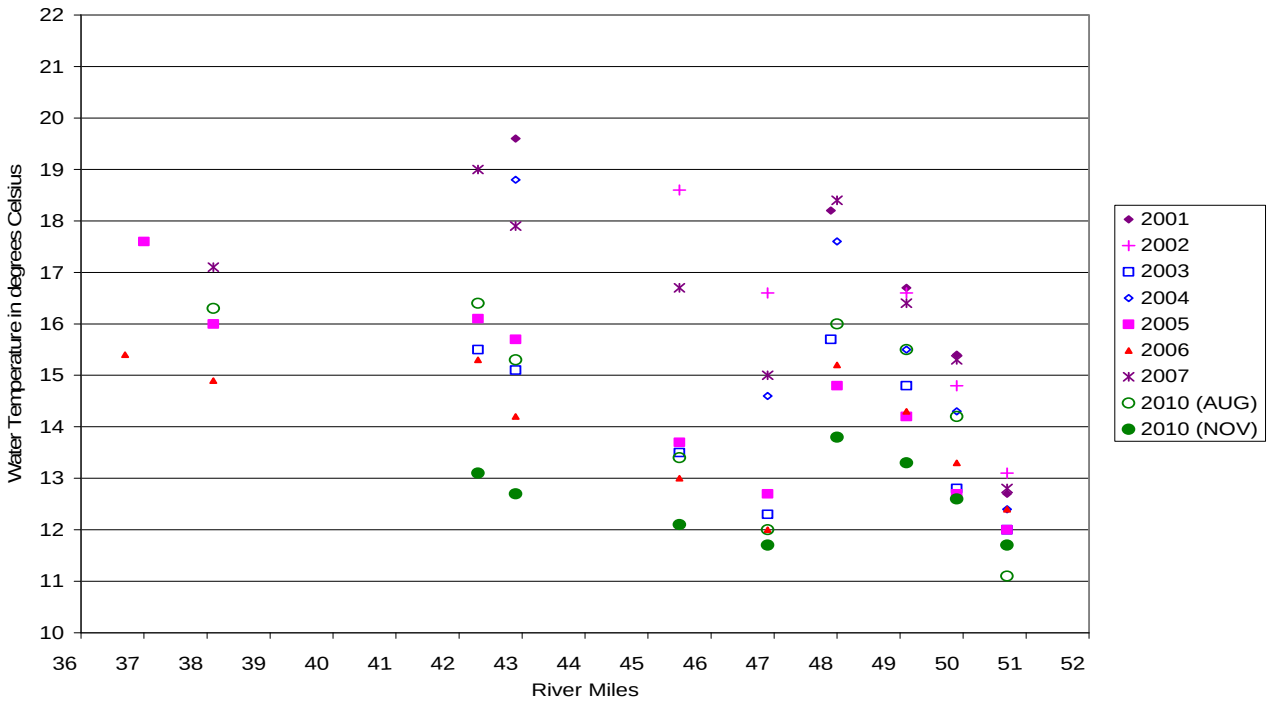

Figure 6. Water temperature where *O. mykiss* were observed in 2001-2010 Tuolumne River September snorkel surveys.

In 2010, the number of *O. mykiss* observed by location in November was similar to the pattern seen during the August surveys (Table 3) with corresponding density indices exhibiting the same trend (Figure 5). *O. mykiss* were observed from Riffle A7 (RM 50.7) to Riffle 31 (RM 38.1) during the August surveys and from Riffle A7 to Riffle 41A (RM 35.3) during the November 2010 surveys. The 2010 summer flows averaged approximately 2,500 cfs in June, 815 cfs in July, and 310 cfs in August, as measured at La Grange (Figure 7). Flow during the November survey was approximately 360 cfs. Water temperature ranged from 11.1°C (52 °F) to 20.1°C (68.2 °F) during the August surveys and from 11.7°C (53.1 °F) to 14.3°C (57.7 °F) during the November surveys.

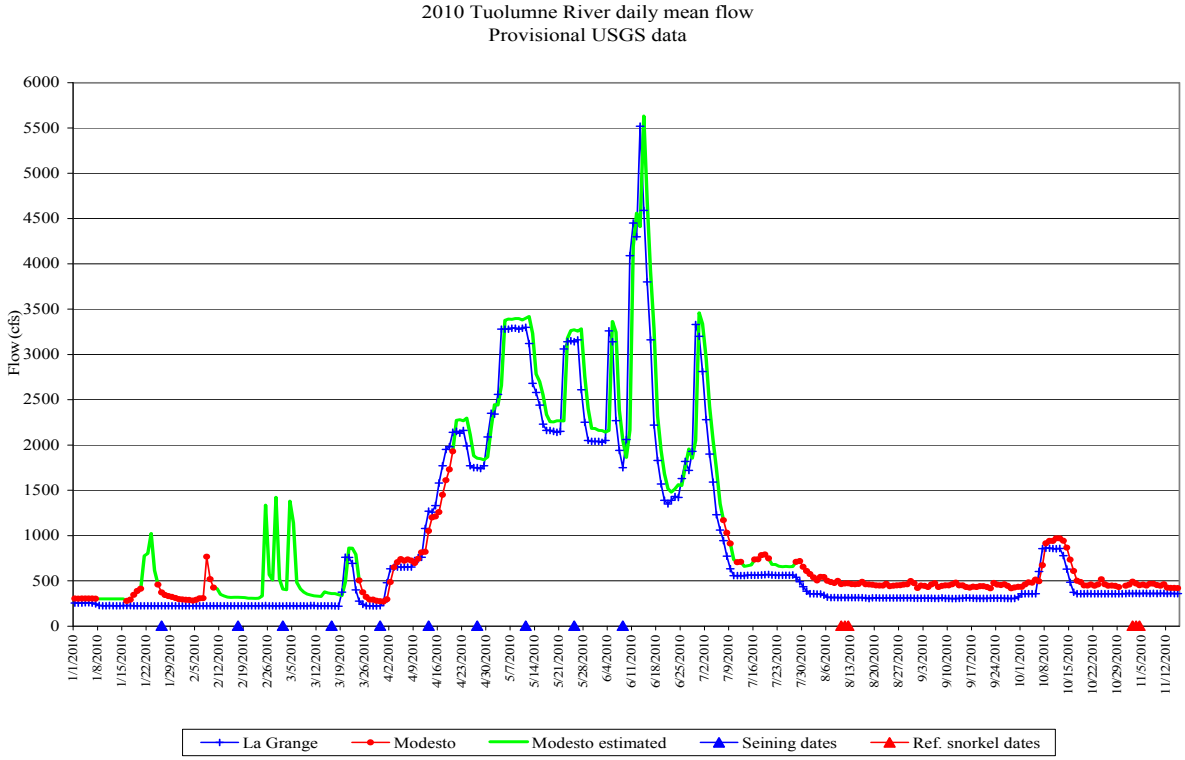

Figure 7. Tuolumne River flow as measured by USGS stations at La Grange and Modesto.

3.5 Tuolumne River *O. mykiss* Population Estimate Surveys

Population estimates for juvenile and adult *O. mykiss* have been conducted on the lower Tuolumne River since July 2008. The surveys incorporate a two-phase snorkel survey design adapted from Hankin and Mohr (2001) to sample within different habitats found downstream of La Grange Dam (Stillwater Sciences 2008b, 2009b). Table 4 lists the date, survey reach, and sampling units for all surveys completed to date. In 2010, both the March and August surveys extended from RM 51.8–38.4 and consisted of 181 potential sampling units, with 36 and 31 units actually chosen for sampling in each of the two 2010 surveys, respectively.

Table 4. Date, survey reach, and sampling units for population estimate surveys from July 2008 through August 2010.

Date	Survey reach	Total # of sampling units	# of units sampled
July 2008	RM 51.8–39.6	155	42
March 2009	RM 51.8–29.0	340	66
July 2009	RM 51.8–41.7	136	31
March 2010	RM 51.8–38.4	181	36
August 2010	RM 51.8–38.4	181	31

The *O. mykiss* observed were recorded in 50 mm increments and classified as YOY/juveniles of < 150 mm total length (TL) or as adults ≥ 150 mm TL. Table 5 contains the counts and estimates, grouped by life stage and habitat type; Figure 8 includes the counts and estimates with the 95% confidence intervals.

In March 2010, based upon the maximum count obtained over all dive passes in each sampled unit, only one YOY/juvenile and 13 adult (sum total of 14) *O. mykiss* were observed. During the August 2010 surveys, 313 YOY/juveniles and 324 adults (sum total of 687) were observed. Both juvenile and adult *O. mykiss* were observed along the entire study reach. Based on the bounded counts population estimator (BCE), an estimated total of approximately 109 adult *O. mykiss* were present in March 2010 within the study reach (RM 51.8–38.4). No estimate was made for juvenile *O. mykiss* due to the low count of only one individual. Applying the same estimator to the August 2010 data, an estimated 2,405 juvenile and 2,139 adult *O. mykiss* were present within the study reach (RM 51.8–38.4).

The August 2010 juvenile *O. mykiss* population estimate of 2,405 was lower than the July 2009 estimate of 3,475 and similar to the July 2008 estimate of 2,472 juveniles. However, these summer population estimates are within the 95% CI for juvenile *O. mykiss* for all three years (2008–2010). The August 2010 adult *O. mykiss* population estimate of 2,139 was higher than both the July 2009 estimate of 963 and the July 2008 estimate of 643 and falls outside the 95% CI for the July 2008 and 2009 estimates.

Although the unexplained increases in the adult O. mykiss population between March and August 2010 may have resulted from upstream migration of fish from downstream locations, conditions in the river below La Grange dam were greatly influenced by flood control releases occurring from April thru July 2010. These releases extend cooler water temperatures farther downstream. These releases also were large enough to spill over the La Grange dam and may have resulted in the introduction of *O. mykiss* into the river from upstream reservoirs. In August 2010, small groups of larger sized (>250 mm) adult *O. mykiss* were observed in run body and pool body habitats downstream of where they were observed in previous survey years (2008 and 2009). These adults appeared to be similar in size, coloration, and condition and were observed schooling together in circular patterns. Larger numbers of smaller sized (150–200 mm) adult fish were also observed in August 2010 (Figure 5). Fish of this size are not part of the 2010 year class and, similarly, may indicate introduction from upstream reservoirs due to flood control releases, possibly arriving from downstream locations in the Tuolumne River or other San Joaquin Basin tributaries.

Table 5. *O. mykiss* bounded count population estimates by fish length and habitat type from July 2008 through August 2010.

July 2008								
Habitat	***O. mykiss* < 150 mm**				***O. mykiss* ≥ 150 mm**			
	Obs.[1]	**Est.**	**St. dev.**	**95% CI[2]**	**Obs.[1]**	**Est.**	**St. dev.**	**95% CI[2]**
Pool head	12	20	8.2	12–36	17	45	13.8	18–72
Pool body	0	--	--	--	3	24	21.5	3–66
Pool tail	1	2	1.9	1–6	0	--	--	--
Riffle	65	1,428	263.6	911–1,944	13	226	142.5	13–505
Run head	45	162	243.6	45–639	2	30	19.8	2–68
Run body	5	860	501.6	5–1,843	6	319	161.4	6–635
Run tail	0	--	--	--	0	--	--	--
Total	**128**	**2,472**	**616.9**	**1,263–3681**	**41**	**643**	**217.7**	**217–1,070**
March 2009								
Habitat	***O. mykiss* < 150 mm**				***O. mykiss* ≥ 150 mm**			
	Obs.[1]	**Est.[3]**	**St. dev.**	**95% CI[2]**	**Obs.[1]**	**Est.[4]**	**St. dev.**	**95% CI[2]**
Pool head	0	--	--	--	1	≥1	--	--
Pool body	0	--	--	--	0	--	--	--
Pool tail	0	--	--	--	0	--	--	--
Riffle	5	63	--	--	6	170	86.3	6–339
Run head	0	--	--	--	0	--	--	--
Run body	0	--	--	--	0	--	--	--
Run tail	0	--	--	--	0	--	--	--
Total	**5**	**63**	**--**	**--**	**7**	**170**	**86.3**	**7–339**
July 2009								
Habitat	***O. mykiss* < 150 mm**				***O. mykiss* ≥ 150 mm**			
	Obs.[1]	**Est.[4]**	**St. dev.**	**95% CI[2]**	**Obs.[1]**	**Est.**	**St. dev.**	**95% CI[2]**
Pool head	4	≥4	---	--	23	26	0.0	26–26
Pool body/tail	304	1,382	898.2	304–3,143	16	147	56.8	36–259
Riffle	279	1,528	893.5	279–3,279	48	428	131.0	171–684
Run head	35	265	49.8	168–363	10	206	123.4	10–448
Run body/tail	19	299	240.5	19–771	8	156	170.6	8–490
Total	**641**	**3,475**	**1,290.5**	**945–6,004**	**105**	**963**	**254.4**	**464–1,461**
March 2010								
Habitat	***O. mykiss* < 150 mm**				***O. mykiss* ≥ 150 mm**			
	Obs.[1]	**Est.[4]**	**St. dev.**	**95% CI[2]**	**Obs.[1]**	**Est.**	**St. dev.**	**95% CI[2]**
Pool head	1	1	0.3	1–2	3	6	2.6	3–11
Pool body/tail	0	--	--	--	4	14	6.2	4–26
Riffle	0	--	--	--	4	37	14.1	9–64
Run head	0	--	--	--	2	53	25.6	3–103
Run body/tail	0	--	--	--	0	--	--	--
Total	**1**	**1**	**0.3**	**1–2**	**13**	**109**	**30.0**	**50–168**
August 2010								
Habitat	***O. mykiss* < 150 mm**				***O. mykiss* ≥ 150 mm**			
	Obs.[1]	**Est.[4]**	**St. dev.**	**95% CI[2]**	**Obs.[1]**	**Est.**	**St. dev.**	**95% CI[2]**
Pool head	24	42	8.4	26–58	72	90	6.3	78–102
Pool body/tail	4	12	4.9	4–22	32	136	109.5	32–351
Riffle	139	756	178.0	407–1,105	78	412	118.9	179–645
Run head	12	163	86.8	12–333	26	286	185.3	26–649
Run body/tail	134	1,432	886.2	134–3,169	116	1,215	677.3	116–2,542
Total	**313**	**2,405**	**908.1**	**625–4,185**	**324**	**2,139**	**720.6**	**727–3,552**

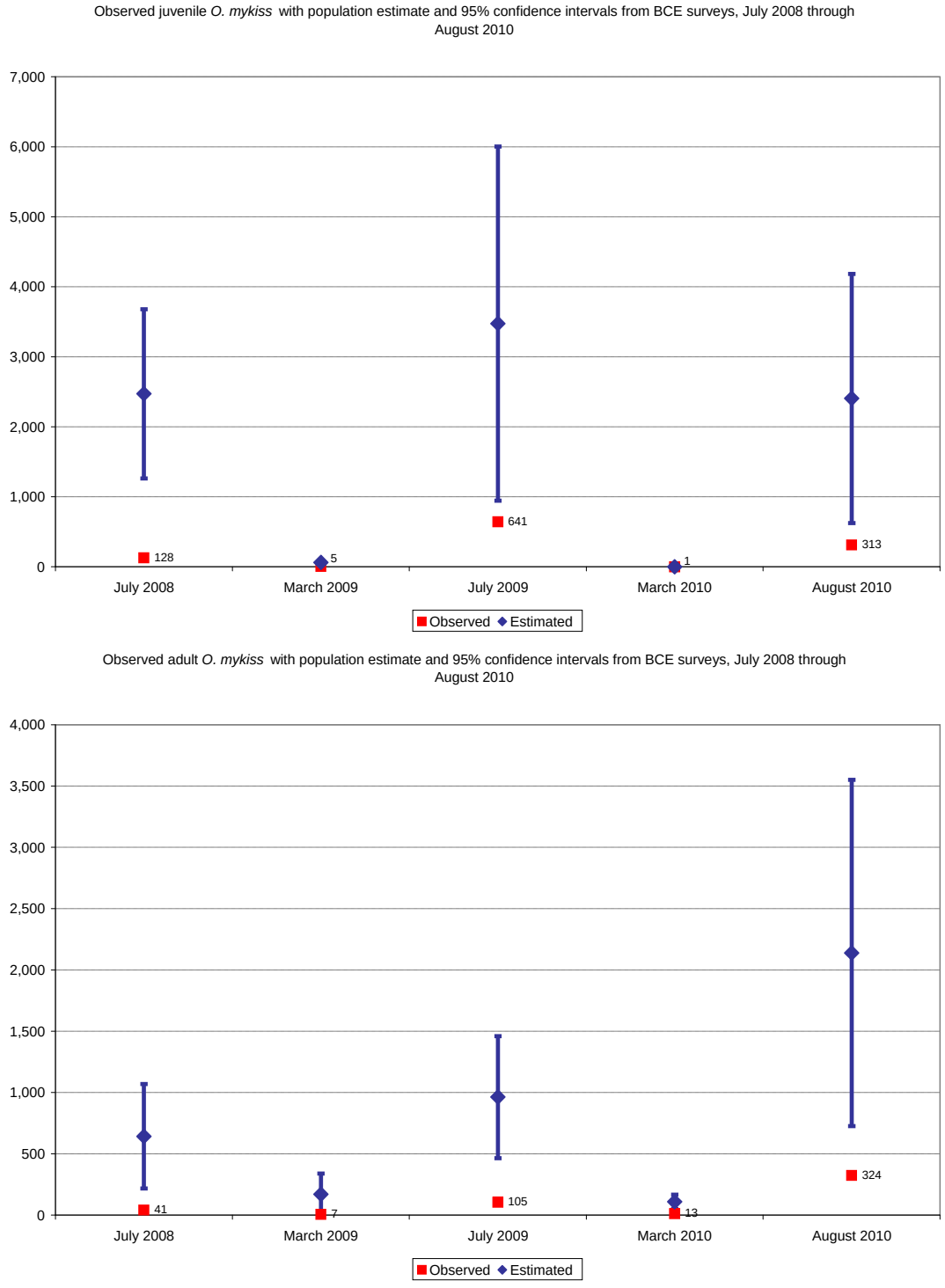

Figure 8. Observed numbers of juvenile and adult *O. mykiss* and population estimates, July 2008 through August 2010.

Additional information on *O. mykiss* and juvenile Chinook salmon densities and distribution, temperature conditions, and comparison with other population estimate snorkel studies are presented in Stillwater Sciences (2010).

3.6 Tuolumne River *O. mykiss* Acoustic Tag Tracking

An adult *O. mykiss* tracking study using acoustic tags was initiated in March 2010, with monitoring continuing through November 2010 (FISHBIO 2010c). The study consisted of angling captures of adult *O. mykiss* that were implanted with an acoustic transmitter and monitored by fixed station and mobile tracking antenna systems. The angling captures occurred seasonally during spring (March 23 –April 7) and fall (October 15–28) between RM 52-47. A total of six fish were tagged in the spring and 14 fish in the fall (sum total of 20 fish). Tagged fish ranged in size from 314–540 mm fork length and weighed between 313 and 1,619 grams. Table 6 summarizes the capture details for all tagged fish. Only fish meeting the specified requirement for a tag-to-body weight ratio of less than 4% were considered for implanting an acoustic tag.

Table 6. *O. mykiss* capture details for tagged fish in 2010 acoustic tag tracking study.

Capture date	Capture location (RM)	Reach	River miles	Length (mm)	Weight (grams)	Tag code
23-Mar	50.0	La Grange	RM 50-47	425	>600	7054.8
23-Mar	50.5	La Grange	RM 50-47	450	>600	7068.8
23-Mar	49.2	La Grange	RM 50-47	505	>600	7012.8
29-Mar	47.0	Basso	RM 47-42	368	479	7110.8
29-Mar	45.0	Basso	RM 47-42	360	395	7194.8
29-Mar	45.0	Basso	RM 47-42	353	395.7	7124.8
15-Oct	51.6	La Grange	RM 50-47	314	313	7138.8
19-Oct	47.0	Basso	RM 47-42	463	1,128	7026.8
19-Oct	46.0	Basso	RM 47-42	370	508	7222.8
19-Oct	45.0	Basso	RM 47-42	360	552	7208.8
19-Oct	44.2	Basso	RM 47-42	382	650	7166.8
20-Oct	52.1	La Grange	RM 50-47	350	520	7236.8
20-Oct	50.0	La Grange	RM 50-47	400	908	7040.8
20-Oct	49.3	La Grange	RM 50-47	360	492	7250.8
27-Oct	46.8	Basso	RM 47-42	320	420	7264.8
27-Oct	46.8	Basso	RM 47-42	350	477	7320.8
28-Oct	52.1	La Grange	RM 50-47	502	1,207	7292.8
28-Oct	51.4	La Grange	RM 50-47	450	887	7152.8
28-Oct	49.2	La Grange	RM 50-47	380	690	7180.8
28-Oct	49.2	La Grange	RM 50-47	540	1,619	7278.8

A total of 13 mobile tracking surveys were conducted between April 1 and November 1, 2010, with fixed station monitoring occurring throughout the study period at three locations. Mobile tracking was done on

an approximately monthly schedule (Figure 9) using boat surveys within the reach from RM 50–42. Fixed stations were established at Grayson (RM 5), Waterford (RM 30), and either Basso Bridge (RM 47) during the spring, or Zanker Ranch (RM 45.5) during the fall.

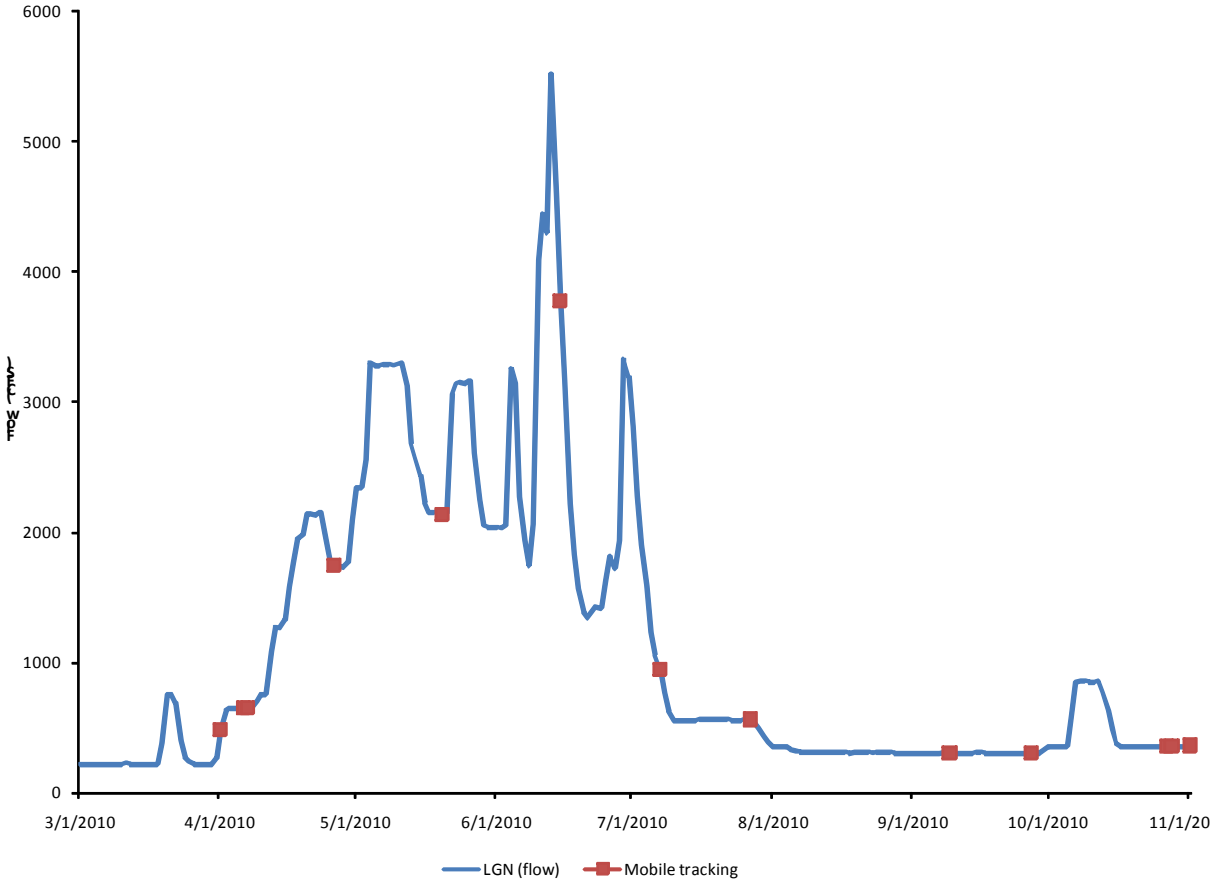

Figure 9. Tuolumne River flow at La Grange (LGN) and dates of mobile tracking surveys through November 2010 (from FISHBIO 2010c).

Preliminary results indicate that all acoustically tagged *O. mykiss* remained within the Tuolumne River during the study, with no tagged fish detected downstream of RM 44. Generally, most tagged fish were detected within 500 meters (0.31 miles) of their release location. However, one individual (Tag code 7250.8) had moved downstream 6,100 meters (3.79 miles) between October 20 and October 27, 2010. On November 8, 2010 this tag was detected moving back upstream past the Zanker Ranch (RM 45.5) fixed station.

There was one acoustically tagged fish detected passing upstream at the Grayson (RM 5) receiver on May 15, 2010. This fish was later determined to be an adipose fin-clipped hatchery steelhead yearling released downstream in Old River as part of a DWR study. The fish was released on April 16, 2010 and had a fork length of 265 mm and a weight of 194.4 grams at the time of release.

There was also one fall angling recapture of a spring tagged fish (Tag code 7012.8) on October 20, 2010 where the acoustic tag was not detected at the time of recapture. This tag was detected near its release location on April 1 and June 15, 2010. The last detection prior to recapture was on July 7, 2010 approximately 570 meters (0.35 miles) upstream of the previous detections. The fish was identified based

on size and a remaining suture near the tag incision. The inability to detect a signal from the fish indicates that the battery on the tag expired or the tag malfunctioned. For future tracking study years, an updated tag type (as used during the fall tagging) is recommended. It is also recommended that future tracking studies be conducted during the fall due to concern of potential negative health effects on individual fish from handling and implanting tags during the winter/spring spawning season.

Complete acoustic tag tracking details and results to be presented pending completion of the study report to be included with the Districts annual FERC Report submittal in March 2011 and posted at the Tuolumne River Technical Advisory Committee website at: http://tuolumnerivertac.com.

4 CONCLUSIONS

Observations of *O. mykiss* have been recorded in the Tuolumne River since 1981 in various river monitoring programs, including those presented in this report. These programs generally have found *O. mykiss* most frequently within the upper 5–10 river miles below La Grange Dam (RM 42–52), with very low numbers of individuals found at locations farther downstream. Water temperatures in this reach are generally suitable for *O. mykiss*, typically ranging from 11.8°C (53.2°F) to 23.1°C (70.3°F) in summer (Stillwater Sciences 2009b), and from 10.2°C (50.4°F) to 14.4°C (58°F) in winter (Stillwater Sciences 2010). Other habitat conditions (e.g., spawning gravel) are also suitable for *O. mykiss* in this portion of the river and suitability declines downstream. Although low numbers of *O. mykiss* carcasses have been identified during fall spawning surveys conducted since 1997, only one adult *O. mykiss* (276 mm FL) has been identified at the counting weir and very little active spawning by *O. mykiss* or steelhead has been documented to date by CDFG or other parties.

This report will be updated annually in 2011 and 2012 pursuant to Ordering Paragraph (C) of the May 10, 2010 Order, with results included in the Final Fisheries Summary Report, to be filed with FERC by July 1, 2013.

5 REFERENCES

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FISHBIO 2010b. I*n prep*. Outmigrant Trapping of Juvenile Salmonids in the Lower Tuolumne River, 2010. Prepared by FISHBIO Environmental, Oakdale, California for Turlock Irrigation District and Modesto Irrigation District.

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Stillwater Sciences. 2009b. March and July 2009 population size estimates of *Oncorhynchus mykiss* in the lower Tuolumne River. Prepared by Stillwater Sciences, Berkeley, California for Turlock Irrigation District and Modesto Irrigation District.
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http://tuolumnerivertac.com/Documents/2008_Annual_Report_Part_1.pdf

TID/MID. 2010a. Report 2009-8 2009 Counting Weir Report. Prepared by FISHBIO Environmental, Oakdale, California for Turlock Irrigation District and Modesto Irrigation District.

TID/MID. 2010b. Report 2009-4 Outmigrant Trapping of Juvenile Salmonids in the Lower Tuolumne River, 2009. Prepared by FISHBIO Environmental, Oakdale, California for Turlock Irrigation District and Modesto Irrigation District.

Attachment #2
Draft 2010 *O. mykiss* Monitoring Summary Report Transmittal Letter (dated November 30, 2010).

WATER & POWER
Serving Central California since 1887

November 30, 2010 (via e-mail)

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

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

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

RE: DRAFT Tuolumne River 2010 *Oncorhynchus mykiss* Monitoring Summary Report for Don Pedro Project (P-2299)

Dear Fisheries Agency Representatives:

The attached DRAFT Tuolumne River 2010 *Oncorhynchus mykiss* Monitoring Summary Report is presented to you in compliance with Ordering Paragraph (C) of the May 10, 2010 FERC *Order Modifying and Approving in Part Tuolumne River Oncorhynchus mykiss Ten-Year Monitoring Report Pursuant to Article 58* (Order). In accordance with the May 10, 2010 Order, please send your comments to me within 30 days of this transmittal. The Order requires the Districts to file this report with agency comments by January 15, 2011.

The draft report is also available at: http://www.tuolumnerivertac.com/documents.htm

This transmittal, along with the draft report, is also being sent electronically to parties of the Project No. 2299 proceeding identified in the July 16, 2009 FERC Order (page 8, Paragraph 13).

If you have any questions, please contact me at (209) 883-8214.

Sincerely,

Robert M. Nees by mss

Robert M. Nees
Director of Water Resources and Regulatory Affairs

Cc: Casey Hashimoto (TID), Allen Short (MID), Michael Carlin (CCSF), FERC Secretary, U.S. Department of the Interior, San Francisco Bay Area Water Users Association, Stanislaus Flyfishermen, Friends of the Tuolumne, Conservation Groups

Attachment #3
CDFG Comments on Draft Tuolumne River 2010 *O. mykiss* Monitoring Summary Report (dated January 3, 2011).

State of California –The Natural Resources Agency
DEPARTMENT OF FISH AND GAME
Central Region
1234 East Shaw Ave.
Fresno, CA 93710
www.dfg.ca.gov

JERRY BROWN, Governor
JOHN McCAMMAN, Director

January 3, 2011

Robert Nees
Turlock Irrigation District
333 East Canal Drive
Turlock, CA 95380

Subject: Comments for FERC Project 2299 – Tuolumne River 2010 *Oncorhynchus mykiss* Monitoring Summary Report

Dear Mr. Nees:

The California Department of Fish and Game (Department) has reviewed the Turlock and Modesto Irrigation District's (Districts) Tuolumne River 2010 *Oncorhynchus mykiss* (*O. mykiss*) Monitoring Summary Report which was prepared in compliance with ordering paragraph (C) of the May 10, 2010 FERC *Order Modifying and Approving in Part Tuolumne River Oncorhynchus mykiss Ten-Year Monitoring Report Pursuant to Article* 58 (Order). The Department provides the following comments.

The Department believes that the monitoring resulting in the December 2010 Tuolumne River *Oncorhynchus mykiss* Monitoring Summary was not adequate for generating a statistically valid population estimate. The 2010 population estimate was generated through snorkel surveys that were conducted during March and August. The Department believes that the intensity and frequency of snorkel surveys must be increased to adequately monitor the *O. mykiss* population throughout the year.

The Department believes that the Districts' did not demonstrate a clear relationship between river temperatures and *O. mykiss* density and distribution within the 2010 monitoring report. The Department requests that the Districts' compare population densities and river temperature data throughout the year at each survey site for the current study year and include this data within the monitoring reports.

The *O. mykiss* Monitoring Summary Report mentioned the results of the 2009 Tuolumne River counting weir, stating that 282 Chinook salmon were detected between September 22, 2009 and January 31, 2010. The Tuolumne weir remained in operation until April 16, 2010; however, the adult Chinook salmon that passed through the weir after January 31st were not reported in the *O. mykiss* Monitoring Summary Report. The weir detected nineteen Chinook salmon between February 1, 2010 and March 16, 2010 according to Fishbio's Tuolumne River weir weekly updates. The Department requests that the number of Chinook detected after January 31, 2010 along with the date of passage for each fish be included in the Tuolumne River 2010 *O. mykiss* Monitoring Summary Report. In addition, the Department recommends extending the duration of the Districts' Alaskan weir monitoring through June each year to monitor *O. mykiss* migration.

The Department feels that the *O. mykiss* Acoustic Tag Tracking summary was inadequate, because it did not provide a detailed description of the methods and results of the study. For example, the methods portion did not include basic information such as the type and longevity of the acoustic tags that were used, nor did it include a description of surgery and release protocols. Capture locations were only described as being "La Grange" (RM 50-47) or "Basso" (RM 47-42). The Department requests specific capture locations for each fish included in the summary. *The O. mykiss* Acoustic Tag Tracking summary also did not include specific information regarding the timing and locations of each tag detection. The Department requests that a table with all tag detection information be included in the *O. mykiss* Monitoring Summary Report. The Acoustic Tag Tracking summary mentions that all fish were tagged between RM 52-47 and that mobile tracking was conducted between RM 50-47. The Department recommends future tagging and mobile tracking efforts to be conducted all the way down to Robert's Ferry Bridge (RM 39.7).

The Department feels that the Districts' current monitoring efforts are inadequate for determining the population size and habitat needs of *O. mykiss* in the Tuolumne River. The Department strongly encourages the implementation of **monthly** snorkel surveys in order to get an accurate representation of the river population throughout the year.

The Department appreciates the opportunity to provide comments to the 2010 Tuolumne River *Oncorhynchus mykiss* Monitoring Summary Report. If you have any questions regarding these comments, please contact Ms. Jennifer O'Brien, Fisheries Biologist at (209) 853-2533 ext. 3#.

Sincerely,

Tim Heyne
Senior Environmental Scientist

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

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

Tuolumne River Technical Advisory Committee
Via email

Attachment #4
Friends of the Tuolumne Comments on the Draft 2010 *O. mykiss* Monitoring Summary Report (December 2010 e-mail transcript).

From: Noah Hume
Sent: Monday, December 06, 2010 10:00 AM
To: 'Dave Boucher'
Cc: Zac Jackson; Michelle Workman; Bob Nees; Allison Boucher
Subject: RE: 2010 Oncorhynchus mykiss Monitoring Report

Attachments: RE: 2010 Oncorhynchus mykiss Monitoring Report
Hi Dave

We have no problems with the qualifications you'd like to see and will add those. Please understand this is just a summary of monitoring activities in 2010. We can include an inferred life history table from Stanislaus data in this report and will definitely include any data you provide regarding anadromous life history use of the river in the Final summary report to be completed in January 2012. Lastly, if there are more comments, it would help our process if you could consolidate them and speak to specific locations in the document so we don't miss anything.

Thanks very much
Noah

ps. Michele and Zac, you did not have the benefit of the prior reply about Don Pedro bypassed flows which is attached for you only

---

From: Dave Boucher [mailto:anadromous@bendbroadband.com]
Sent: Monday, December 06, 2010 9:47 AM
To: Noah Hume
Cc: Zac Jackson; Michelle Workman; Bob Nees; Allison Boucher
Subject: Re: 2010 Oncorhynchus mykiss Monitoring Report

Hi Noah,

Thanks.

I have a problem with a few other items of omission in the document that may be misleading.

What data do you have that leads you to assert that trout originate from upstream reservoirs? Please include support.

Your characterization of the trout and steelhead being sedentary does not address the fact that your surveys were not done during migratory months. Please make note of that in your document.

Your document infers the river does not host migratory steelhead when contemporary data positively identified saltwater life history steelhead traversing the entire river length up to La Grange Dam. Please make reference to known migratory saltwater life history O *mykiss* in the river.

I want to be sure your filing is a document we don't have any issues with.

Thanks,
Dave and Allison

----- Original Message -----
From: Noah Hume
To: Dave Boucher ; aboucher@bendbroadband.com
Cc: Scott Wilcox ; rmnees@tid.org ; Wayne Swaney
Sent: Monday, December 06, 2010 9:00 AM
Subject: RE: 2010 Oncorhynchus mykiss Monitoring Report

Hi Dave

We will clarify the duration of the bypassed flows for the Final versions of both the 2010 O. mykiss population estimate report and the above-referenced O mykiss monitoring report.

Thanks
Noah

From: Dave Boucher [mailto:anadromous@bendbroadband.com]
Sent: Sunday, December 05, 2010 11:44 PM
To: Noah Hume
Subject: Fw: 2010 Oncorhynchus mykiss Monitoring Report

See Below -

Dave
----- Original Message -----
From: Dave Boucher
To: Bob Nees
Cc: Allison Boucher ; Noah Hume ; scott@stillwatersci.com
Sent: Sunday, December 05, 2010 8:09 PM
Subject: 2010 Oncorhynchus mykiss Monitoring Report

Dear Bob,

Thanks for the quick response to my recent inquiry.

We have been reviewing the DRAFT Tuolumne 2010 Oncorhynchus mykiss Monitoring
Summary Report. We were requested to address questions about the report to you.

It contains reference to trout populations that may have resulted from this year's flood release spills from May through June of 2010 that did not go through generators. My check of USGS stream flows indicates that river gage flows exceeded 4,500 CFS for only a couple of days during that period. During those two days the flows were only 5,500 CFS.

My question now is: Did spills occur that bypassed generating facilities at any time during that time period other than the approximate 1,000 CFS for a couple of days?

Thanks once again,

Dave Boucher
Friends of the Tuolumne, Inc.
Anadromous@bendbroadband.com

Attachment #5
Districts' Response to CDFG Comments on Draft 2010 *O. mykiss* Monitoring Summary Report.

Comment 1. ***"The Department believes that the monitoring resulting in the December 2010 Tuolumne River Oncorhynchus mykiss Monitoring report was not adequate for generating a statistically valid population estimate."***

Response: This comment is similar to the comment received on the previous summary report, dated January 2010 and submitted to FERC on January 15, 2010. As was the case previously, we respectfully disagree that the estimates are not statistically valid and affirm that the stated estimates accurately reflect, with appropriate confidence bounds, the reach-wide population sizes for the sampled periods. We again acknowledge that although potential violations of Hankin and Mohr (2001) assumptions were noted for larger pool and run-type habitats in the population size estimate reports, including the 2010 report, other methodologies such as mark-recapture were discarded in the 2007 FERC Study Planning process due to sampling permit restrictions under the Endangered Species Act (ESA) for Central Valley Steelhead. As a consequence, the potential bias and resulting confidence intervals may be seen as the best available methodology that maintains existing ESA protections of California Central Valley Steelhead while meeting the intent of the FERC approved Study Plan. We once again note that CDFG did not provide alternative methodologies for development of population estimates in their comments on the 2007 FERC Study Plan. Nor has the increased take limits required for planned electrofishing calibration surveys been permitted to date, so the methods employed have been limited to those allowed by the resource agencies.

Comment 2. ***"The 2010 population estimate was generated through snorkel surveys that were conducted during March and August. The Department believes that the intensity and frequency of snorkel surveys must be increased to adequately monitor the O. mykiss population throughout the year."***

Response: This comment is similar to the comment received on the previous summary report, dated January 2010 and submitted to FERC on January 15, 2010. As was the case previously, the meaning of "adequately monitor" is not clear. While we continue to agree that increasing the sampling frequency could potentially improve (narrow) the confidence bounds and provide other useful information, we disagree that the sampling effort and frequency should be increased. Potentially improving the estimates would require a large and very expensive expansion in these survey events that might reduce the resulting confidence intervals and a survey was already required in each of the March and July time frames under the April 3, 2008 FERC Order. For example, as a general indication, narrowing the existing confidence intervals by one-half would require an expansion in the winter (or summer) surveys by at least a factor of four, which would represent a large number of dive days in the river and would also likely extend outside the targeted sampling conditions in practice in order to complete additional field efforts. Additionally, the intensive March population estimate surveys completed in 2010 again found extremely few *O. mykiss*, limiting the effectiveness for producing a population estimate. Alternatively, as proposed in the previous summary report, the Districts initiated an expansion of the reference count snorkel surveys to document river-wide distribution and habitat use with a

reference count survey conducted in November 2010. The Districts' proposal is to expand the reference count snorkel surveys from twice annually (typically June and September) to include 1–2 surveys conducted between January and April at historical snorkeling sites, pending flow conditions that would postpone or cancel as needed for safety purposes.

Comment 3. ***"The Department believes that the Districts' did not demonstrate a clear relationship between river temperatures and O. mykiss density and distribution within the 2009 monitoring report. The Department requests that the Districts' compare population densities and river temperature data at each survey site for the current study year and include this data within the monitoring reports."***

Response: This comment is similar to the comment received on the previous summary report, dated January 2010 and submitted to FERC on January 15, 2010. As was the case previously, we note that the primary purpose of these surveys was to provide a population estimate under the April 3, 2008 FERC Order. As noted in the monitoring summary report, additional information on *O. mykiss* and juvenile Chinook salmon densities and distribution, temperature conditions, and comparison with other population estimate snorkel studies are presented in current population estimate report[1]. This information is also presented and discussed in each of the previous population estimate reports. These reports are included in the annual FERC reports and also accessible from the Tuolumne Technical Advisory Committee website at http://tuolumnerivertac.com/documents.htm. The monitoring summary report also contains information on water temperature, distribution, and density results from reference count snorkel surveys conducted since 1996 (Figures 5 and 6). Study results continue to show that while a general decrease in fish density with increasing water temperature was observed for the August 2010 population estimate surveys, other potential factors related to density and distribution such as microhabitat and spawning gravel availability were also discussed. It should be noted that once again, the March 2010 population estimate survey also recorded the same general distribution and decreasing density with distance from La Grange Dam at a time when higher water temperatures were presumably not a limiting factor. The raw data on fish captures, areas, and corresponding river temperatures in each sampling unit are provided as technical appendices in each of the population estimate reports should CDFG wish to conduct independent analyses.

Comment 4. ***"The Department requests that the number of Chinook detected after January 31, 2010 along with the date of passage for each fish be included in the Tuolumne River 2010 O. mykiss Monitoring Summary Report."***

Response: The 2010 Monitoring Summary Report will be revised to include text referencing the most updated Chinook passage from the counting weir study. Text will reflect the actual final counts for Chinook, as available, or will include text to mention that the operation of the weir continued through April 2011 with additional Chinook passage occurring. The report will also be revised as to the number of *O. mykiss* counted thru April 2011, if necessary. Note that the final

[1] Stillwater Sciences. 2010. March and August 2010 population size estimates of Oncorhynchus mykiss in the Lower Tuolumne River. Prepared for the Turlock Irrigation District and the Modesto Irrigation District by Stillwater Sciences, Berkeley, CA. November.

version of the Counting Weir report is not scheduled for completion until the annual FERC Report date of April 1, 2011.

Comment 5. ***"The feels that the O. mykiss Acoustic Tag Tracking summary was inadequate, because it did not provide a detailed description of the methods and results of the study. For example, the methods portion did not include basic information such as the type and longevity of the acoustic tags that were used, nor did it include a description of the surgery and release protocols. Capture locations were only described as being 'La Grange' (RM 50-47) or 'Basso' (RM 47-42). The Department requests that a table with all tag detection information be included in the O. mykiss Monitoring Summary Report ."***

Response: The 2010 Monitoring Summary Report will be revised to include a column in Table 6 to include capture location to the nearest one-tenth river mile. Other details requested are to be found pending completion of the acoustic tag tracking study report to be included with the annual FERC Report submittal on April 1, 2011.

Comment 6. ***"The Acoustic Tag Tracking summary mentions that all fish were tagged between RM 52-47 and that mobile tracking was conducted between RM 50-47. The Department recommends future tagging and mobile tracking efforts to be conducted all the way down to Robert's Ferry Bridge (RM 39.7)."***

Response: The statement that mobile tracking was conducted between 'RM 50-47' was a typographical error that has been corrected to read 'RM 50-42'. This reach was identified in the study plan as reach where most past occurrences of *O. mykiss* were made and as such, would most likely provide the best opportunity to capture and tag fish. Mobile tracking of fish during 2010 would have extended downstream if all tagged fish had not been located. The Districts are not opposed to extending the tagging and mobile tracking efforts downstream to Robert's Ferry Bridge (RM 39.7) providing temperature conditions warrant the likely capture of fish and when tracking of tagged fish do not account for all tagged releases.

Comment 7. ***"The Department feels that the Districts' current monitoring efforts are inadequate for determining the population size and habitat needs of O. mykiss in the Tuolumne River. The Department strongly encourages the implementation of monthly snorkel surveys in order to get an accurate representation of the river population throughout the year."***

Response: This comment is similar to the comment received on the previous summary report, dated January 2010 and submitted to FERC on January 15, 2010. This comment is also reflective of Comments 1 and 2 listed above. As such, please see Districts' responses to Comments 1 and 2 above.

Attachment #6
Districts' Response to FOT Comments on Draft 2010 O. mykiss Monitoring Summary Report.

Comment 1. ***"What data do you have that leads you to assert that trout originate from upstream reservoirs? Please include support.***

Response: Any flow in the lower Tuolumne River as measured at the La Grange USGS gaging station (#11289650) that exceeds approximately 1,200 cubic feet per second (cfs) results in spill over the top of the La Grange Dam and can introduce fish from the La Grange Reservoir. Specific operations at Don Pedro powerhouse where the use of "side gate" releases from Don Pedro reservoir can introduce fish into the lower river via the La Grange Reservoir. Both of these conditions occurred during the spring and summer of 2010 and therefore form the basis of the text in question (Section 3.5 of summary report, as taken from Section 4.2.2 of the 2010 population estimate report[1] and in Section 4.2 of the reference count snorkel report[2]). Flow over the top of La Grange Dam in 2010 occurred from approximately April 15—July 5. Operation of side gate releases at Don Pedro has not been fully documented, but is known to have occurred for several days from April to June 2010.

Comment 2. ***"Your characterization of the trout and steelhead being sedentary does not address the fact that your surveys were not done during migratory months. Please make note of that in your document."***

Response: Although the population estimate and reference count snorkel surveys do not coincide entirely within the potential upstream migration period of anadromous adult *O. mykiss*,[3] the counting weir was operational during almost the entire migration period.

Comment 3. ***"Your document infers the river does not host migratory steelhead when contemporary data positively identified saltwater life history steelhead traversing the entire river length up to La Grange Dam. Please make reference to known migratory saltwater life history O mykiss in the river."***

Response: The absence of *O. mykiss* detections at the counting weir during September 2009 – April 2010 along with the low counts from the March 2010 population estimate surveys and the general size and condition of the *O. mykiss* observed during the August 2010 population estimate surveys, and the extended reservoir spills that occurred during spring 2010 allow the explanation that increased *O. mykiss* numbers observed in July 2010 may have been introduced from upstream. Since it is also possible that these fish arrived in the lower Tuolumne River from downstream without detection, text revisions have been made in the summary report and will be included in the final 2010 population estimate and reference snorkel survey reports for submittal to FERC by April 1, 2011.

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[1] 2010. Stillwater Sciences. March and August.
[2] 2010. Stillwater Sciences. 2010 Snorkel Report and Summary Update
[3] Table 1 in the monitoring summary report provides inferred *O. mykiss* life history timing from Stanislaus River data.