SONOMA COUNTY WATER AGENCY

CF/42-0.19-9 SWRCB Order Approving Temporary Urgency Change in Permits 12947A, 12949, 12950 & 16596 for 2010 (ID 2474)

January 25, 2012

Ms. Barbara Evoy
Deputy Director for Water Rights
State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

RE: Water Quality Monitoring Summary Report Relative to Water Rights Order 2010-0018-DWR

Dear Ms. Evoy:

Per Term 8 of Order WR 2010-0018-DWR please find attached the Water Quality Summary Report related to the 2010 Temporary Urgency Change for the Sonoma County Water Agency.

If you should have any questions related to this report please contact me at (707) 521-1808 or glincoln@scwa.ca.gov.

Sincerely,

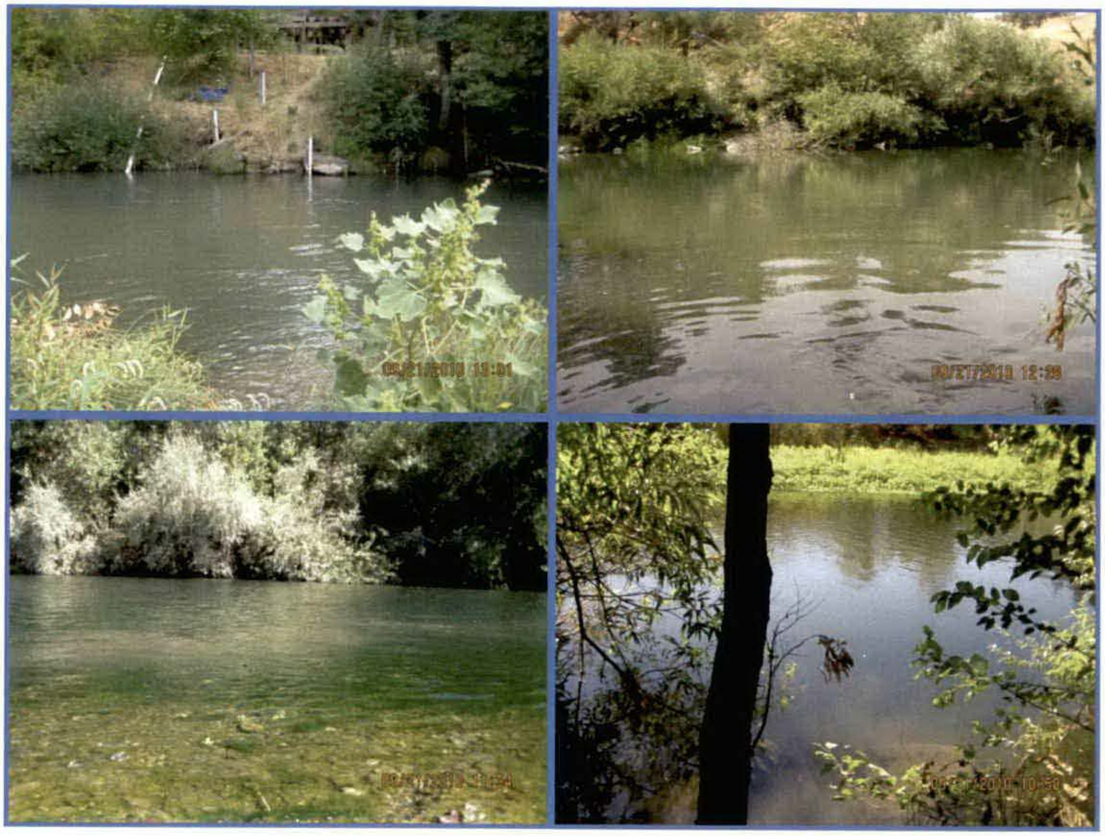
George Lincoln

George Lincoln

Attachment

Cc: Pamela Jeane, Jessica Martini-Lamb, Jeff Church, David Manning, Don Seymour, George Lincoln
Emily Wallace, State Water Resources Control Board, Division of Water Rights
Catherine Kuhlman, North Coast Regional Water Quality Control Board
Walt Kruse, Sonoma County Department of Health Services
Alan Lilly, Bartkiewicz, Kronick & Shanahan

Russian River Water Quality Summary for the Sonoma County Water Agency 2010 Temporary Urgency Change (TUC)



Prepared by

Sonoma County Water Agency
404 Aviation Boulevard
Santa Rosa, CA 95403-9019

SONOMA COUNTY WATER AGENCY

January 2012

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1.0 INTRODUCTION

On April 4, 2010, the Sonoma County Water Agency (Water Agency) petitioned the State Water Resources Control Board (SWRCB) to temporarily reduce minimum in-stream flows in the Russian River as required by the National Marine Fisheries Service's (NMFS) *Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed* (Russian River Biological Opinion, NMFS 2008).

The Water Agency requested that the SWRCB make the following temporary changes to the Decision 1610 (D1610) in-stream flow requirements:

- From May 1 through October 15, 2010, in-stream flow requirements for the upper Russian River (from the confluence with the East Fork of the Russian River to its Confluence with Dry Creek) be reduced from 185 cfs to 125 cfs,

- From May 1 through October 15, 2010, in-stream flow requirements for the lower Russian River (downstream of its confluence with Dry Creek) be reduced from 125 cfs to 70 cfs with the understanding that the Water Agency will typically maintain approximately 85 cfs at the Hacienda Gauge as practicably feasible.

The SWRCB issued Order WR 2010-0018-DWR (Order) approving the Water Agency's Temporary Urgency Change Petition (TUCP) on May 24, 2010. The Order included several terms and conditions, including requirements for the preparation of a water quality monitoring plan (Term 8). The Water Agency submitted a plan to meet the requirements of Term 8 on June 21, 2010. On August 30, 2010, the SWRCB responded and required changes to the proposed water quality monitoring plan. The Water Agency incorporated the changes and completed the water quality monitoring as required. This report provides and summarizes the data collected by the United States Geological Survey (USGS), the North Coast Regional Water Quality Control Board (NCRWQCB), the Sonoma County Department of Environmental Health, and the Water Agency during the term of the Order.

2.0 2010 RUSSIAN RIVER FLOW SUMMARY

As described in the Order, the Water Agency requested temporary changes to D1610 in-stream flow requirements including reductions from 185 cfs to 125 cfs in the upper Russian River (from its confluence with the East Fork of the Russian River to its confluence with Dry Creek) and from 125 cfs to 70 cfs in the lower Russian River (downstream of its confluence with Dry Creek). The purpose of the 2010 TUCP was to comply with the Biological Opinion which found that stream velocities under D1610 (D1610) flows reduced the amount of available summer rearing habitat in the upper mainstem of the Russian River.

Inflow into Lake Mendocino was sufficiently high enough to classify 2010 as a Normal year under D1610 and storage had improved tremendously over 2009 conditions. Despite the reduced Coyote Valley Dam releases authorized by the Order, flows were above D1610 minimum flows in some sections of the Russian River from tributary inflow due to a relatively wet spring. However, flows in early October were influenced by the need to release stored water from Lake Mendocino. 2010 Flows are summarized in Figure 2-1.

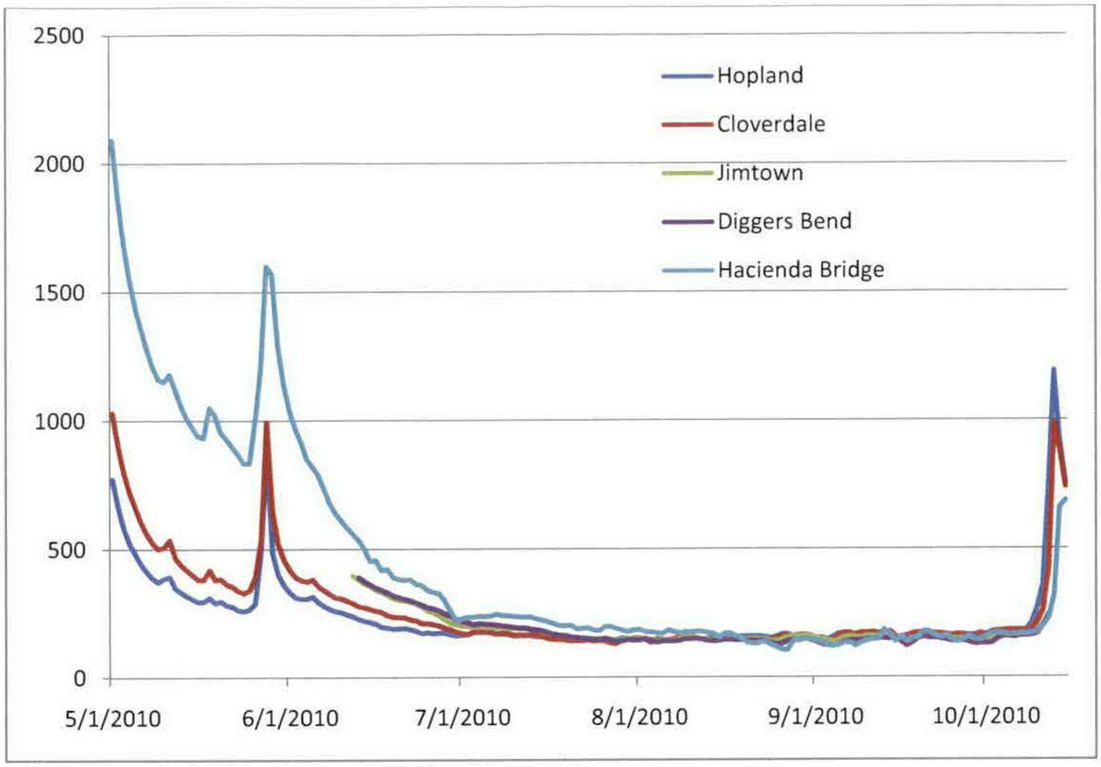

Figure 2-1. 2010 Average Daily Flows USGS Russian River gages, cubic feet per second (cfs)

In the section of the Russian River from Ukiah to the mouth of Dry Creek (upper Russian River) flows dropped below D1610 minimum flow, but remained above minimum flows authorized by the Order. Figure 2-2 shows that flows in the upper Russian River above the Dry Creek confluence did not drop below 185 cfs until mid-June but remained under until early October.

However, flows in the lower Russian River (downstream of the confluence with Dry Creek) were higher than D1610 minimum flows during the entire Order with the exception of a few isolated days (Figure 2-3). This was due to late rains, tributary inflows, and relatively cool summer temperatures. Since sustained flows in the lower river did not drop below D1610 minimum stream flows in 2010 the Water Agency did not analyze the potential impacts of water quality as there was no impact related to the Order. However water quality in the lower Russian River is frequently referenced and discussed in this report.

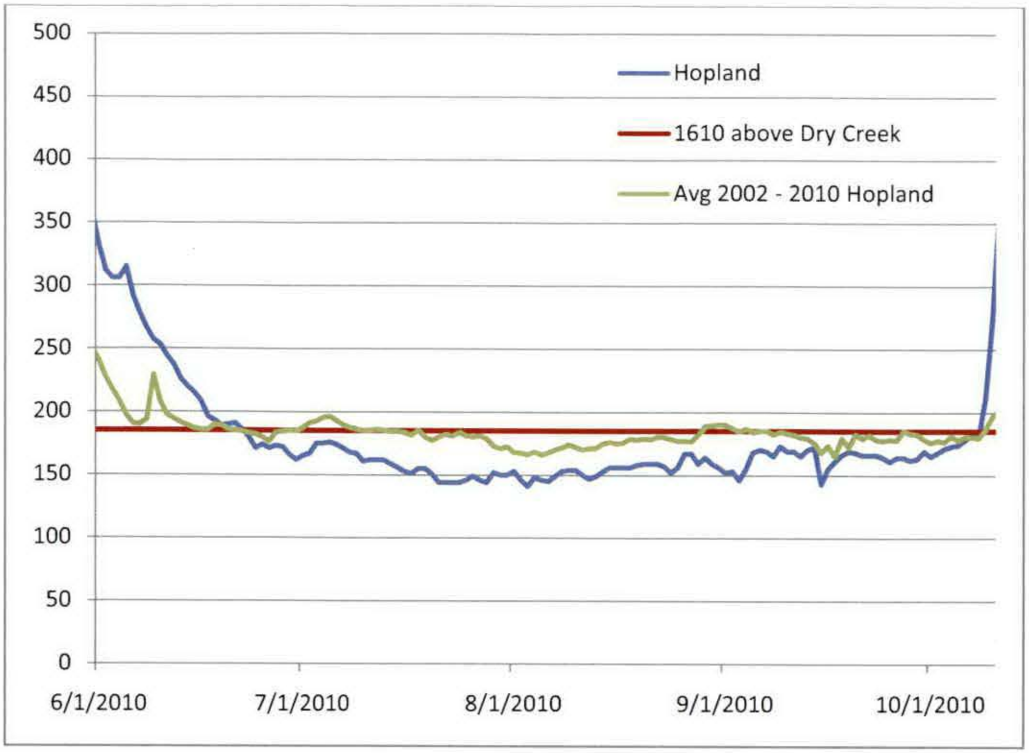

Figure 2-2. 2010 average daily flow above Dry Creek confluence

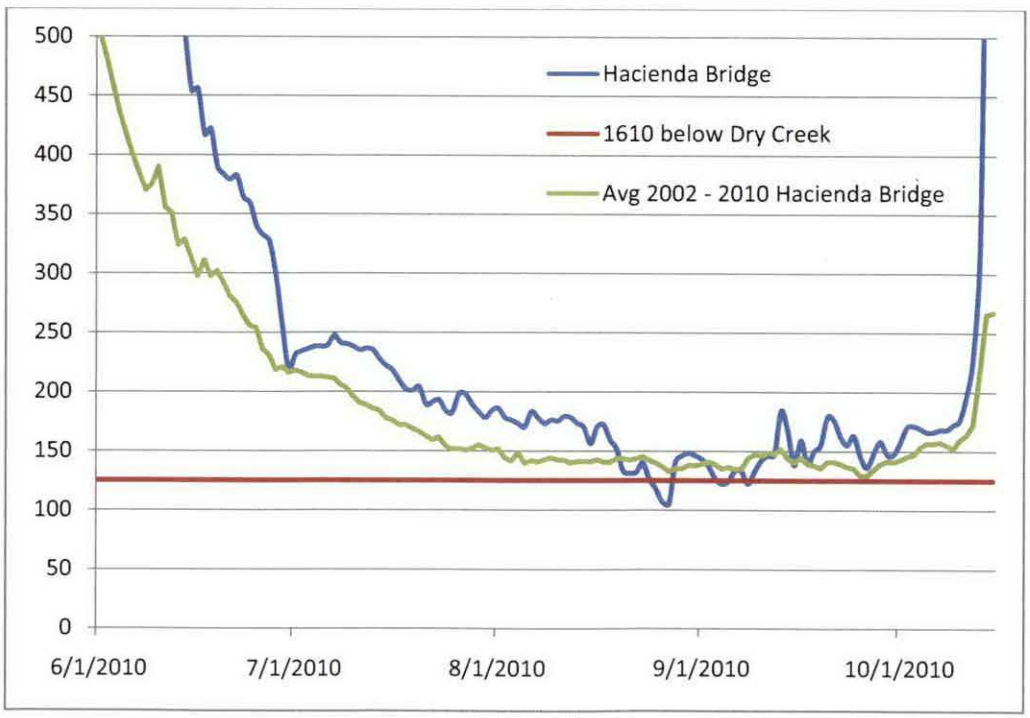

Figure 2-3. 2010 average daily flow below Dry Creek confluence

3.0 WATER QUALITY MONITORING

The collection of water quality data was conducted to supplement existing data to provide a more complete basis for analyzing spatial and temporal water quality trends due to Biological Opinion-stipulated changes in river flow and estuary management. The resulting data will help provide information to evaluate potential changes to water quality and availability of habitat for aquatic resources resulting from the proposed permanent changes to D1610 minimum in-stream flows that are mandated by the Biological Opinion. A complete analysis and evaluation of the water quality data is being conducted as part of the CEQA requirements associated with establishing permanent changes to D1610 and management of the estuary.

3.1 Mainstem Russian River Water Quality Monitoring

Several agencies conducted water quality monitoring in the mainstem of the Russian River during the term of the Order. The USGS conducted two sampling events; the first in June and the second in September. The NCRWQCB conducted weekly bacteriological sampling in cooperation with the Sonoma County Environmental Health Department at beaches that experience recreational activities involving the greatest body contact. And finally, per the request of the SWRCB and to supplement the USGS and NCRWQCB sampling programs, the Water Agency conducted weekly grab samples from September 21 through October 12 for both pathogens and nutrients.

The California Department of Public Health (CDPH) developed the "Draft Guidance for Fresh Water Beaches," which describes bacteria levels that, if exceeded, may require posted warning signs in order to protect public health. The CDPH draft guideline for total coliform is 10,000 most probable numbers (MPN) per 100 milliliters (ml), 400 MPN per 100 ml for fecal coliforms and 235 MPN per 100 ml for *e coli*. The USGS and Water Agency did not sample for *e coli*. The MPN for Enterococcus is 61 per 100 ml. Exceedances of the draft guidance are highlighted in Table 3-1. However, it must be emphasized that these are draft guidelines, not adopted standards, and are therefore both subject to change (if it is determined that the guidelines are not accurate indicators) and are not currently enforceable. In addition, these draft guidelines were established for and are only applicable to fresh water beaches. Currently, there are no numeric guidelines that have been developed for estuarine areas.

3.1.1 2010 USGS Water Quality Sampling

As described in the monitoring plan, the USGS conducted a large sampling program at eleven surface water sites and four groundwater sites. All samples were analyzed for nutrients, major ions, trace metals, total and dissolved organic carbon, a broad suite of organic compounds (polyaromatic hydrocarbons, disinfection-by-products, selected pesticides and herbicides, and personal care and household products such as fragrances and detergents), by laboratories operated by the USGS. In addition, water samples collected at surface-water sites located at Russian River near Hopland, Russian River at Digger Bend near Healdsburg, Russian River near Guerneville and at Russian River at Casini Ranch were analyzed for human-use pharmaceuticals. The USGS was originally scheduled to conduct three sample events, one sampling event in late spring and two sampling events in summer and early fall. Sampling during the third event was drastically reduced as it occurred during the coordinated effort to release water from Lake Mendocino to reduce levels in the flood pool before the wet season. Flows in the river were too high to conduct in-stream sampling. Table 3-1 provides the results from the USGS pathogen samples collected at the eleven surface water sites. The complete dataset from 2010 is included as Appendix A.

The USGS completed their data report in October 2011. "DS610, Water-Quality Data for the Russian River Basin, Mendocino and Sonoma Counties, California, 2005-2010" is a compilation of the hydrologic and water-quality data collected from 14 Russian River sites, 8 tributary sites, 1 gravel-terrace pit site, 14 groundwater wells, and a wastewater treatment plant between the city of Ukiah and the town of Duncans Mills for the period August 2005 through October 2010. DS610 can be found at both the USGS publication website: http://pubs.usgs.gov/ds/610/ and at Water Agency's website: http://www.scwa.ca.gov/tucp/ . The USGS data report is being evaluated as part of the CEQA requirements associated with establishing permanent changes to D1610 and should be referred to for the complete 2010 water quality dataset.

Bacteria analysis for the USGS and Water Agency was conducted by Alpha Laboratories in Ukiah, California. Bacteria samples were analyzed by Alpha Labs using multiple tube fermentation. This analysis takes several days to complete and thus is not used for public beach posting. The methods utilized by the NCRWQCB as discussed in Section 3.1.2 can provide a result in as little as 18 hours and therefore are more commonly used to provide public beach postings. The two methods, while both approved, may not provide comparative results. As shown in Table 3-1, the sample results did not include an absolute value for high counts of bacteria and were reported by the lab as being greater than 1,600 MPN (>1,600).

Table 3-1. Bacteria concentrations for samples collected by USGS in 2010 using multiple tube fermentation analysis. Highlighted values indicate those values exceeding the California Department of Public Health Draft Guidance for Fresh Water Beaches.

USGS station no.	Station name	Date	Total coliform, (MPN/100 mL)	Enterococci, (MPN/100 mL)	Fecal coliform (MPN/100 mL)
11462500	Russian River near Hopland CA	06/14/2010	>1600	11	30
		08/23/2010	170	24	130
11463000	Russian River near Cloverdale CA	06/14/2010	>1600	14	50
		08/23/2010	350	8.0	50
11463980	Russian River at Digger Bend near Healdsburg CA	06/15/2010	>1600	4.0	70
		08/24/2010	240	22	22
11465400	Russian River at Wohler Bridge	06/16/2010	>1600	27	50
		08/25/2010	170	240	50
11467000	Russian River near Guerneville	06/17/2010	500	90	26
		08/26/2010	280	90	70
11467002	Russian River at Johnsons Beach	06/17/2010	1600	17	17
		08/26/2010	500	8.0	9.0
		10/14/2010	>1600	900	500
382754123030501	Russian River at Casini Ranch	06/18/2010	900	4.0	17
		08/27/2010	140	8.0	2.0
382757123003801	Russian River at Monte Rio	06/17/2010	300	2.0	4.0
		08/26/2010	80	7.0	8.0
382959122535601	Russian River at Steelhead Beach	06/16/2010	300	33	22
		08/25/2010	34	50	17
383132122514901	Russian River at River Front Park	06/15/2010	250	4.0	13
		08/24/2010	500	49	30
11466800	Mark West Creek near Mirabel Heights	06/16/2010	>1600	17	80
		08/25/2010	>1600	>1600	900

3.1.2 2010 Seasonal Bacterial Sampling (Beach Sampling)

The NCRWQCB, in cooperation with the Sonoma County Environmental Health Department (DEH) conducts seasonal bacteriological sampling at Russian River beaches which experience the greatest body contact recreation.

The NCRWQCB seasonal sampling locations consist of: Camp Rose Beach; Healdsburg Veterans Memorial Beach; Steelhead Beach; Forestville Access Beach; Johnson's Beach; and Monte Rio Beach. Bacteriological samples were collected weekly beginning in June and continuing through September. The samples were analyzed using the Colilert quantitray MPN method for total coliform and e. *coli* and the Enterolert quantitray method for Enterococcus. Results from the sampling program are reported by the NCRWQCB and the DEH at their respective websites and on the DEH Beach Sampling Hotline. The 2010 seasonal results are shown in Table 3-2 and Figures 3-1 through Figure 3-3.

The analysis resulting from the 2010 beach sampling program and prior years are being evaluated as part of the CEQA requirements associated with establishing permanent changes to D1610.

Table 3-2. Sonoma County Seasonal Beach Results collected by the NCRWQCB. Highlighted values indicate those values exceeding the California Department of Public Health Draft Guidance for Fresh Water Beaches.

	Camp Rose Beach			Healdsburg Vet's Beach			Steelhead Beach			Forestville Access			Johnson's Beach			Monte Rio Beach		
	T. coli	*e. coli*	Entero.	T. coli	*e. coli*	Entero.	T. coli	*e. coli*	Entero.	T. coli	*e. coli*	Entero.	T. coli	*e. coli*	Entero.	T. coli	*e. coli*	Entero.
6/4/2010	7270	<10	10	4611	20	10	2481	30	20	2755	20	20	2481	52	10	1354	63	<10
6/8/2010 *	10462	10	<10	17329	63	<10	5475	10	<10	3654	10	<10	3873	10	<10	2359	10	30
6/8/2010 *				7,270	31	20												
6/15/2010	3076	10	<10	2359	20	10	1076	20	10	1126	31	<10	1989	10	<10	2359	20	<10
6/22/2010	2046	41	<10	2247	63	31	1054	20	<10	1607	10	10	1450	110	<10	1017	<10	<10
6/29/2010	2481	<10	10	2359	108	41	1918	52	10	1607	31	10	2143	10	<10	2143	20	10
7/6/2010	2247	10	<10	2247	20	31	1935	52	30	1720	10	20	1670	<10	10	2481	31	20
7/13/2010	1266	41	30	2909	161	20	1670	52	20	1054	20	<10	1565	75	20	2613	30	20
7/20/2010	2046	41	10	1616	41	41	2613	10	10	1607	<10	10	1850	<10	<10	1872	10	<10
7/27/2010	2902	20	10	1860	<10	20	1935	<10	20	1314	41	52	1989	173	50	4611	<10	<10
8/3/2010	2247	10	20	2613	97	30	1467	52	132	1401	20	<10	2723	<10	10	5794	20	20
8/10/2010	1935	31	10	1918	31	20	657	10	<10	1291	<10	<10	1616	<10	31	1850	<10	<10
8/17/2010	1722	20	<10	1785	41	20	1081	10	10	1162	10	10	1050	52	<10	1178	31	<10
8/24/2010	2014	10	52	2187	10	20	1019	10	86	1529	10	41	733	10	10	2014	10	10
8/31/2010	2755	<10	41	2187	31	<10	1106	<10	10	2046	<10	20	932	20	20	1725	20	<10
9/7/2010	4106	10	10	3448	30	20	1333	<10	63	1017	20	20	933	20	<10	1860	10	<10

* Note that Healdsburg Veterans Memorial Beach was posted on June 10, 2010 due to the average of both samples taken on June 8, 2010: an average of 12,300 MPN which is greater than the state guidelines for an exceedance of Total Coliform.

Single Sample Values

Beach posting is recommended when indicator organisms exceed any of the following levels:

Total coliforms: 10,000 per 100 ml

e coli: 235 per 100 ml

Enterococcus: 61 per 100 ml

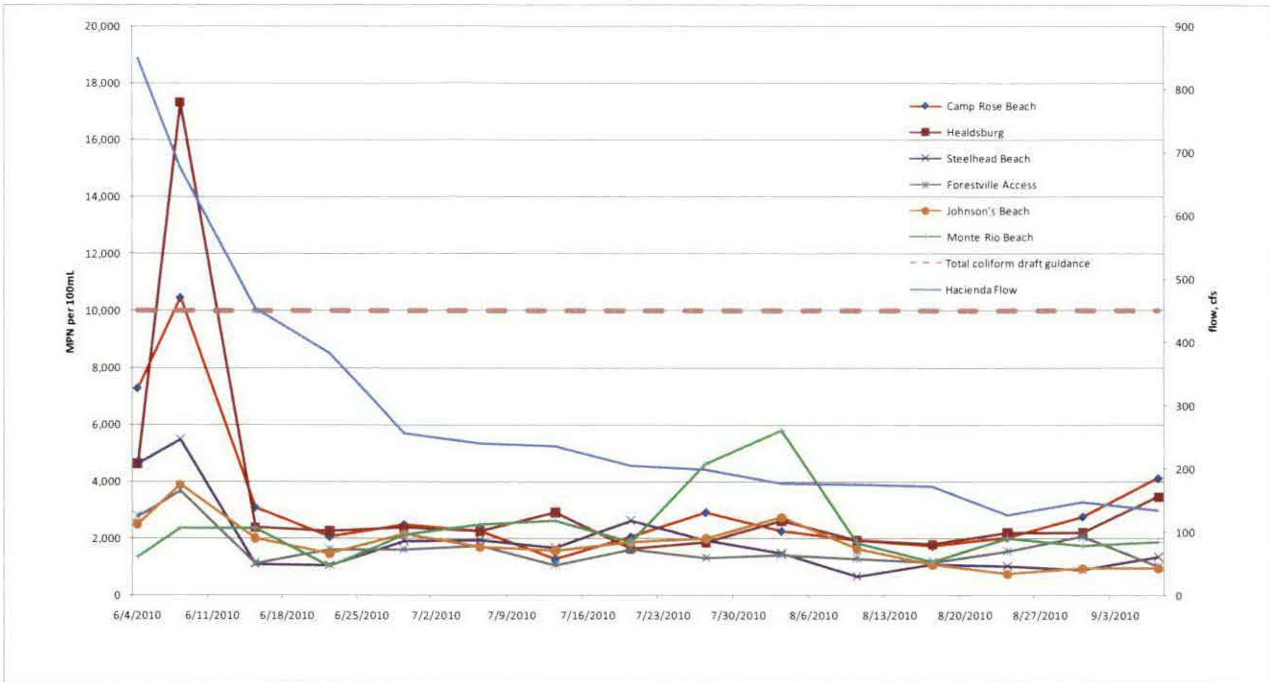

Figure 3-1. Sonoma County Beach Bacteria Sample Results for Total Coliform

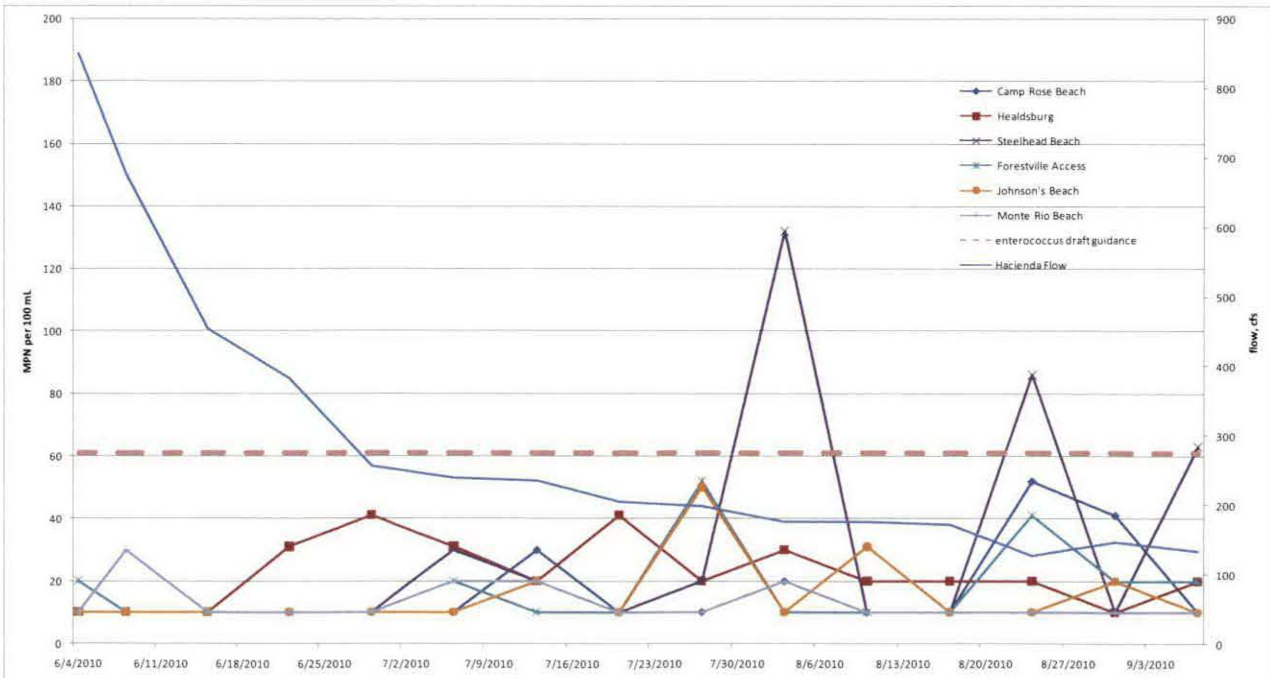

Figure 3-2 - Sonoma County Beach Pathogen Sample Results for Enterococcus

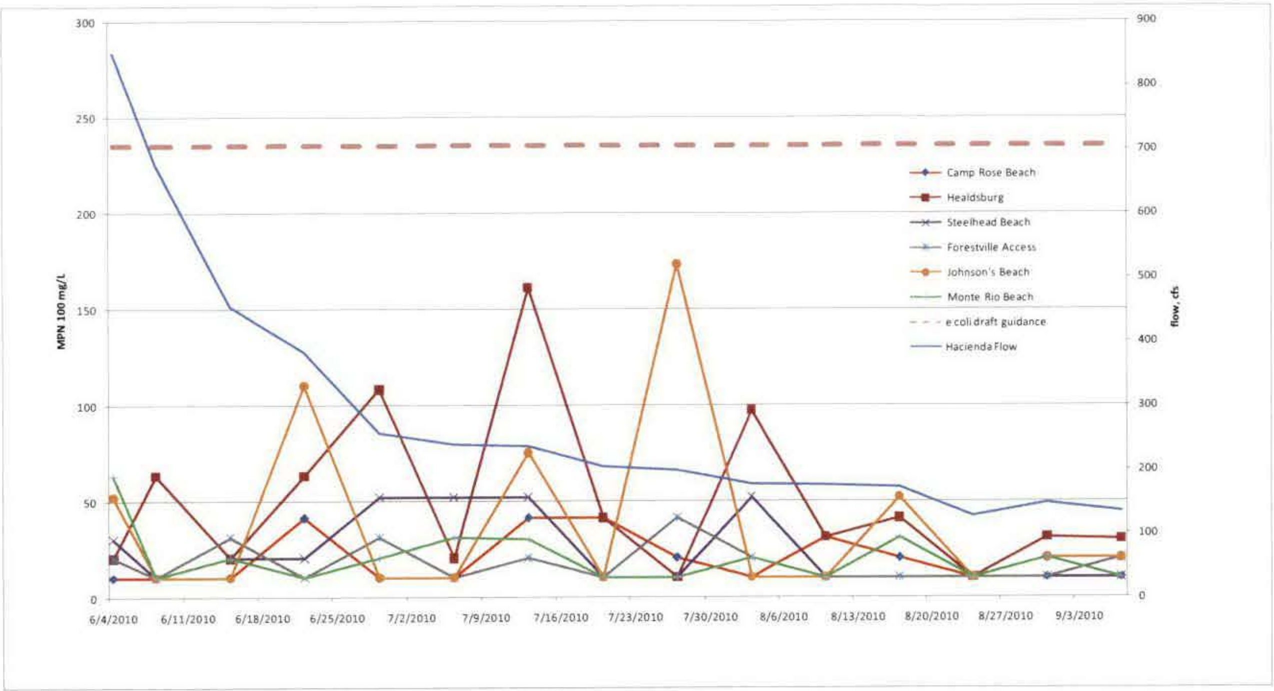

Figure 3-3. Sonoma County Beach Pathogen Sample Results for *e coli*

3.1.3 2010 Seasonal Sampling (Water Agency)

At the request of the SWRCB the Water Agency supplemented its Water Quality Monitoring Plan to include water temperature, pH, dissolved oxygen, specific conductance, bacteria, nutrients, and algae at the five permanent USGS sonde stations described below. From September 21 through October 12, 2010, the Water Agency collected weekly grab samples from the USGS sonde stations (further described in Section 4.1) at Hopland, Diggers Bend, RDS (Water Agency's diversion facility at Mirabel), Hacienda Bridge and Johnsons Beach, plus the stations at Cloverdale and Jimtown (Figure 3-4). The resulting data is provided in Tables 3-3 and 3-4.

3.1.4 Seasonal Sampling Summary

Based upon the CDPH guidance for fresh water beaches, Enterococcus exceedances varied throughout the term of the Order, regardless of which organization collected the sample. However, as the season progressed it appears that CDPH guidance for Enterococcus was exceeded more often. As the flows increased in early October the results from the upper Russian River gage samples appear to indicate bacteria exceedances for all pathogens. This may be indicative of a "first flush" and the resulting re-suspension of colloidal deposition. Nutrient and algae results collected in late September through the term of the Order were varied, with exceedances of EPA criteria for Total Phosphorus in most samples at all sample sites.

Table 3-3. 2010 Water Agency Bacteria Sample Results. Highlighted values indicate those values exceeding the California Department of Public Health Draft Guidance for Fresh Water Beaches.

	Flow	Temperature	pH	Total Coliforms (MTF)	Fecal Coliforms (MTF)	Enterococcus (MTF)
Method Detection Limit (MDL)				2.0	2.0	2.0
Date	cfs	°C		MPN/100mL	MPN/100mL	MPN/100mL
Hopland*						
9/21/2010	166	14.3	7.96	> 1600	110	50
9/28/2010	162	15.2	8.49	900	50	23
10/5/2010	174	13.6	7.61	900	50	50
10/12/2010	749	13.6	7.25	> 1600	900	> 1600
Cloverdale Commisky*						
9/21/2010	173	15.9	8.06	1600	280	26
9/28/2010	158	18	8.28	1600	70	12
10/5/2010	183	14.5	7.73	900	23	70
10/12/2010	424	14	7.41	> 1600	500	> 1600
RR @ Jimtown*						
9/21/2010	158	18.4	7.82	280	11	9
9/28/2010	145	NA	8.14	300	13	30
10/5/2010	161	16.6	7.77	240	17	33
10/12/2010	246	16.3	7.84	1600	170	30
Diggers Bend*						
9/21/2010	152	18.6	7.91	900	11	70
9/28/2010	135	19.8	8.35	500	50	14
10/5/2010	158	16.7	7.82	240	8	14
10/12/2010	239	17.2	7.75	500	50	120
RDS*						
9/21/2010	176	18.9	7.99	240	50	300
9/28/2010	158	19.5	7.70	300	110	130
10/5/2010	166	16.8	7.87	220	30	110
10/12/2010	228	18.2	7.55	500	50	30
Hacienda Bridge*						
9/21/2010	176	18.2	7.91	130	17	70
9/28/2010	158	18.4	7.79	240	23	300
10/5/2010	166	16.3	7.52	500	30	130
10/12/2010	228	17.3	7.53	300	110	33
Johnsons Beach*						
9/21/2010	176	19.6	7.37	220	130	50
9/28/2010	158	19.5	7.26	240	11	50
10/5/2010	166	16.9	7.48	500	50	170
10/12/2010	228	17.1	7.57	1600	70	500

* results are preliminary and subject to final revision.
MTF - multiple tube fermentation

Single Sample Values
Beach posting is recommended when indicator organisms exceed any of the following levels:
Total coliforms: 10,000 per 100 ml
Fecal coliforms: 400 per 100 ml
Enterococcus: 61 per 100 ml

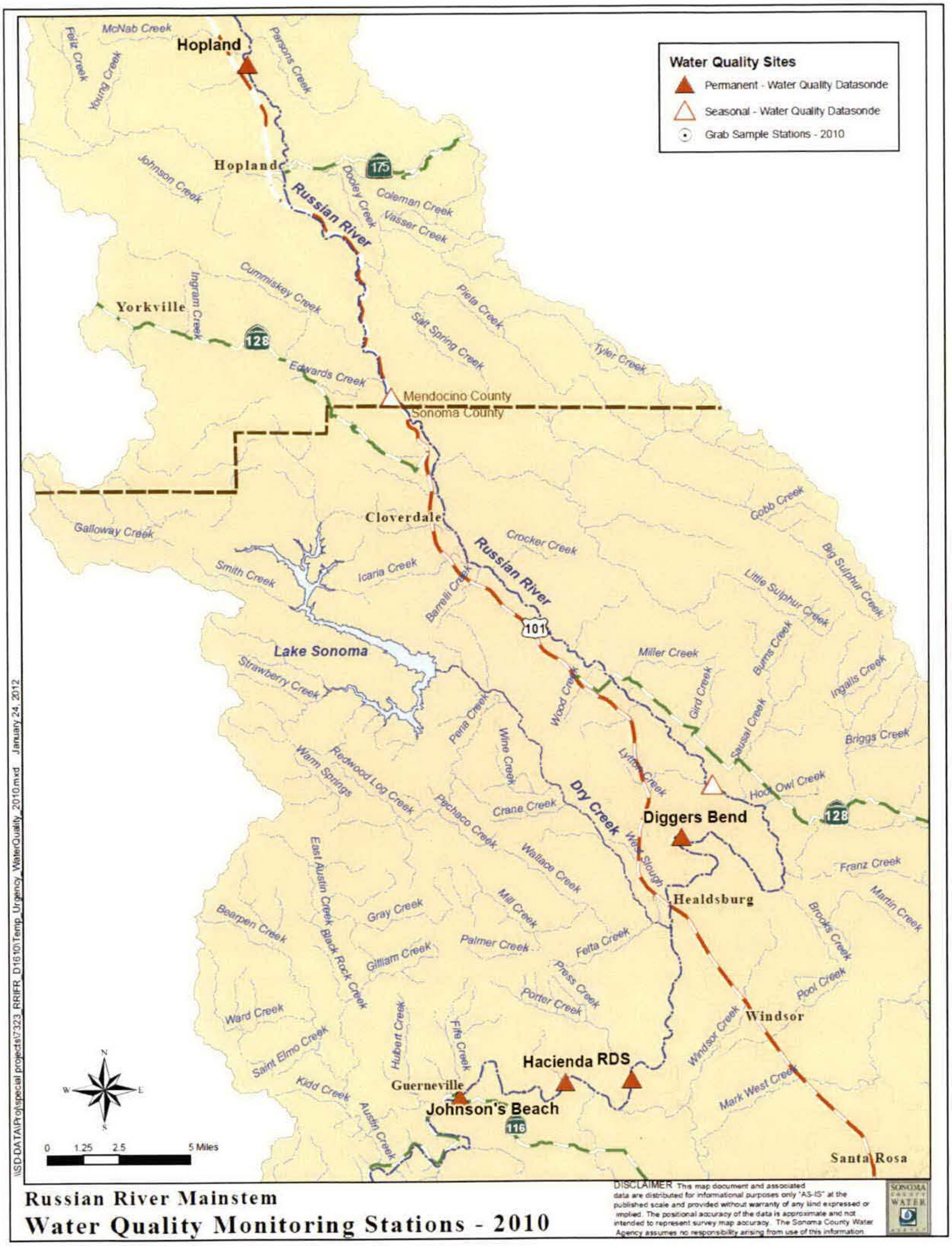

Figure 3-4. 2010 Water Agency Sample Site Locations

Table 3-4. 2010 Water Agency Nutrient Sample Results. Highlighted values indicate those values exceeding the recommended EPA criteria based on Aggregate Ecoregion III.

	Flow	Temperature	pH	Total Organic Nitrogen	Ammonia as N (NH_4^+)	Ammonia as N Unionized	Nitrate as N (NO_3^-)	Nitrite as N	Nitrate/Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen (calculated)	Phosphorus, Total	Total Orthophosphate	Dissolved Organic Carbon	Total Organic Carbon	Total Dissolved Solids	Chlorophyll-a
Method Detection Limit (MDL)				0.200	0.10	0.00010	0.030	0.020	0.013	0.10		0.020	0.020	0.0400	0.0400	4.2	0.00050
Date	cfs	°C		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Hopland*																	
9/21/2010	166	14.3	7.96	ND	ND	ND	0.150	ND	0.150	0.14	0.29	0.043	0.100	2.40	3.14	110	0.00100
9/28/2010	162	15.2	8.49	0.224	ND	0.00280	0.130	ND	0.130	0.26	0.39	0.054	0.120	2.12	2.74	100	0.00150
10/5/2010	174	13.6	7.61	ND	0.19	0.00069	0.170	0.044	0.210	0.26	0.43	0.079	0.160	2.50	3.32	100	0.00270
10/12/2010	749	13.6	7.25	0.455	0.10	0.00045	0.150	ND	0.150	0.56	0.71	0.130	0.240	2.39	3.48	110	0.01300
Cloverdale Commisky*																	
9/21/2010	173	15.9	8.06	ND	0.14	0.00430	0.120	ND	0.120	0.22	0.34	0.031	0.075	2.24	2.95	120	0.00130
9/28/2010	158	18	8.28	ND	ND	0.00210	0.110	ND	0.110	0.21	0.32	0.040	0.044	1.88	2.46	120	0.00039
10/5/2010	183	14.5	7.73	ND	0.14	0.00097	0.170	0.044	0.210	0.21	0.38	0.051	0.110	2.38	3.02	110	0.00094
10/12/2010	424	14	7.41	ND	0.25	0.00043	0.210	ND	0.210	0.32	0.53	0.073	0.180	2.31	3.51	120	0.00220
RR @ Jimtown*																	
9/21/2010	158	18.4	7.82	ND	ND	0.00074	0.110	ND	0.110	0.20	0.31	ND	0.029	1.67	2.16	120	0.00092
9/28/2010	145	NA	8.14	ND	ND	0.00170	0.110	ND	0.110	0.17	0.28	ND	0.021	1.38	1.82	140	0.00077
10/5/2010	161	16.6	7.77	ND	0.10	0.00062	0.100	ND	0.100	0.14	0.24	0.023	0.022	1.76	2.33	140	0.00130
10/12/2010	246	16.3	7.84	0.210	ND	0.00027	0.130	ND	0.130	0.22	0.35	0.034	0.069	1.89	2.87	130	0.00240
Diggers Bend*																	
9/21/2010	152	18.6	7.91	ND	ND	0.00098	0.074	ND	0.074	0.14	0.21	ND	0.021	14.4	14.9	130	0.00014
9/28/2010	135	19.8	8.35	ND	ND	ND	0.077	ND	0.077	0.17	0.25	0.020	ND	1.27	1.95	140	0.00039
10/5/2010	158	16.7	7.82	ND	ND	0.00069	0.075	ND	0.075	0.11	0.19	0.023	ND	1.69	2.31	120	0.00047
10/12/2010	239	17.2	7.75	ND	ND	ND	0.120	ND	0.120	0.18	0.30	0.027	ND	1.77	2.67	180	0.00170
RDS*																	
9/21/2010	176	18.9	7.99	0.718	ND	0.00120	0.078	ND	0.078	0.75	0.83	0.076	ND	1.55	1.79	130	0.00014
9/28/2010	158	19.5	7.70	ND	ND	0.00039	0.075	ND	0.075	0.13	0.21	ND	ND	1.08	1.63	110	0.00019
10/5/2010	166	16.8	7.87	ND	ND	ND	0.076	ND	0.076	ND	0.08	ND	ND	1.53	1.98	130	0.00019
10/12/2010	228	18.2	7.55	0.490	0.10	0.00120	0.120	ND	0.120	0.60	0.72	ND	ND	1.39	2.18	140	0.00092
Hacienda Bridge*																	
9/21/2010	176	18.2	7.91	ND	ND	0.00091	0.075	ND	0.075	0.18	0.26	0.027	0.037	1.38	1.78	130	0.00025
9/28/2010	158	18.4	7.79	ND	ND	ND	0.076	ND	0.076	0.15	0.23	0.024	ND	1.00	1.42	130	0.00029
10/5/2010	166	16.3	7.52	ND	ND	0.00032	0.076	ND	0.076	ND	0.08	0.025	ND	1.46	1.87	140	0.00100
10/12/2010	228	17.3	7.53	ND	ND	0.00071	0.110	ND	0.110	0.18	0.29	ND	0.025	1.15	1.71	160	0.00110
Johnsons Beach*																	
9/21/2010	176	19.6	7.37	ND	ND	ND	0.076	ND	0.076	ND	0.08	0.024	0.041	1.34	1.81	130	0.00014
9/28/2010	158	19.5	7.26	ND	ND	0.00017	0.290	ND	0.290	ND	0.29	ND	ND	0.982	1.46	130	0.00010
10/5/2010	166	16.9	7.48	ND	ND	0.00032	0.078	ND	0.078	ND	0.08	0.087	0.034	1.33	1.75	140	0.00009
10/12/2010	228	17.1	7.57	ND	ND	0.00078	0.120	ND	0.120	ND	0.12	ND	0.025	1.16	1.70	130	0.00073

* results are preliminary and subject to final revision.

Recommended EPA Criteria based on Aggregate Ecoregion III:
Total Phosporus: 0.02188 mg/L (21.88 ug/L)
Total Nitrogen: 0.38 mg/L
Chlorophyll *a* : 0.00178 mg/L (1.78 ug/L)

3.2 Russian River Estuary Water Quality Monitoring

Although flows in the lower Russian River did not reach allowable miniumu flows as noted in the Order and they did not drop below D1610 flows as discussed in Section 2, water quality monitoring continued to be conducted in the lower, middle, and upper reaches of the Russian River Estuary between the mouth of the river at Jenner and Monte Rio, including in two tributaries. Water Agency staff collected data to establish baseline information on water quality in the Estuary to gain a better understanding of the longitudinal and vertical water quality profile during the ebb and flow of the tide, and to track changes to the water quality profile that may occur during periods of barrier beach closure and reopening.

Saline water is denser than freshwater and a salinity "wedge" forms as freshwater outflow passes over the denser tidal inflow. During the lagoon management period (May 15 to October 15), the lower and middle reaches of the Estuary up to Sheephouse Creek are predominantly saline environments with a thin freshwater layer that flows over the denser saltwater. The upper reach of the Estuary transitions to a predominantly freshwater environment, which is periodically underlain by a denser, saltwater layer that migrates upstream to Duncans Mills during summer low flow conditions and barrier beach closure. Additionally, river flows, tides, topography, and wind action affect the amount of mixing of the water column at various longitudinal and vertical positions within the Estuary.

In 2010, the Estuary experienced three closures during the lagoon management period. The barrier beach formed and the Estuary closed for a period of 7 days from 4 July to 11 July, 10 days from 21 September to 1 October, and 9 days from 3 October to 12 October. During these closures, the Water Agency was able to monitor the partial development of a freshwater lagoon system as freshwater inflows increased the depth of the surface layer and the volume of denser saltwater in the lower layer of the water column began to decline, presumably as it seeped through the barrier beach.

The Water Agency submits an annual report to the National Marine Fisheries Service and California Department of Fish and Game, documenting the status updates of the Water Agency's efforts in implementing the Biological Opinion. The water quality monitoring data for 2010 was compiled and is discussed in the "Russian River Biological Opinion Status and Data Report Year 2010-11". The Water Quality Monitoring section begins on page 16 of the annual report and can be found on the Water Agency's website: http://www.scwa.ca.gov/bo-annual-report/ and is included as Appendix B. As with the other datasets, the estuary data was evaluated as part of the CEQA requirements associated with revised management of the estuary. The grab sample sites are shown in Figure 3-5, the results are summarized in Tables 3-5 through 3-9 and the entire dataset can be found as noted, in the 2010-2011 Russian River Biological Opinion Status and Data Report.

Figure 3-5. 2010 Estuary Sample Sites

Table 3-5. 2010 Monte Rio Station Grab Sample Results. Highlighted values indicate those values exceeding the California Department of Public Health Draft Guidance for Fresh Water Beaches.

Monte Rio*	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N (NO_3^-)	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen (calculated)	Phosphorus, Total	Chlorophyll-a	Total Coliforms	Fecal Coliforms	Enterococcus	
MDL**	0.200	0.10	0.00010	0.030	0.020	0.10		0.020	0.000050	2.0	2.0	2.0	Estuary
Unit of Measure	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	MPN/100mL	MPN/100mL	MPN/100mL	Condition
6/22/2010	0.203	ND	--	0.20	ND	0.21	0.41	0.047	0.0012	130	8.0	30	open
7/6/2010	ND	ND	0.0029	0.13	ND	0.16	0.29	0.035	0.0025	900	170	130	closed
7/20/2010	ND	ND	0.0024	0.13	ND	ND	0.13	0.042	0.0018	30	23	7.0	open
8/3/2010	ND	ND	0.0019	0.073	ND	0.14	0.21	0.026	0.00099	170	50	9.0	open
8/17/2010	ND	ND	ND	0.074	ND	0.18	0.25	0.024	0.00071				open
8/19/2010										170	13	13	open
8/31/2010	ND	ND	ND	0.076	ND	0.17	0.25	0.030	0.00019	140	17	8.0	open
9/14/2010	ND	ND	0.00096	0.073	ND	0.18	0.25	0.028	0.00025	280	90	33	open
9/28/2010	ND	ND	0.0015	0.081	ND	0.16	0.24	0.027	0.00019	300	130	130	closed
9/30/2010	ND	ND	0.0018	0.075	ND	0.20	0.28	0.027	0.000097	>1600	350	210	closed
10/5/2010	ND	ND	0.0016	0.076	ND	0.18	0.26	0.025	ND	80	17	30	closed
10/7/2010	ND	0.14	0.0046	0.076	ND	0.25	0.33	0.029	0.00037	240	50	240	closed
10/12/2010	0.520	0.18	0.0048	0.13	ND	0.70	0.83	0.021	0.00027	300	80	300	closed
10/14/2010	ND	ND	0.0011	0.12	ND	0.20	0.32	0.027	0.0015	500	240	240	open

* results are preliminary and subject to final revision.
** Method Detection Limit

Recommended EPA Criteria based on Aggregate Ecoregion III:
Total Phosporus: 0.02188 mg/L (21.88 ug/L)
Total Nitrogen: 0.38 mg/L
Chlorophyll *a*: 0.00178 mg/L (1.78 ug/L)
Turbidity: 2.34 FTU/NTU

Single Sample Values
Beach posting is recommended when indicator organisms exceed any of the following levels:
Total coliforms: 10,000 per 100 ml
Fecal coliforms: 400 per 100 ml
Enterococcus: 61 per 100 ml

Table 3-6. 2010 Casini Ranch Station Grab Sample Results. Highlighted values indicate those values exceeding the California Department of Public Health Draft Guidance for Fresh Water Beaches. However, estuarine conditions may exist at this site when in closed conditions and currently there are no numeric guidelines that have been developed for estuarine areas

Casini Ranch*	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N (NO_3^-)	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen (calculated)	Phosphorus, Total	Chlorophyll-a	Total Coliforms	Fecal Coliforms	Enterococcus	
MDL**	0.200	0.10	0.00010	0.030	0.020	0.10		0.020	0.000050	2.0	2.0	2.0	Estuary
Unit of Measure	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	MPN/100mL	MPN/100mL	MPN/100mL	Condition
6/22/2010	ND	ND	--	0.19	ND	0.21	0.40	0.055	0.0026	240	17	4.0	open
7/6/2010	ND	ND	ND	0.13	ND	0.18	0.31	0.037	0.0023	300	30	23	closed
7/20/2010	ND	ND	0.0066	0.13	ND	0.25	0.38	0.046	0.00080	240	17	17	open
8/3/2010	ND	ND	ND	0.074	ND	ND	0.07	0.028	0.00069	80	2.0	7.0	open
8/17/2010	ND	ND	ND	0.076	ND	0.1	0.18	0.032	0.0011				open
8/19/2010										900	2.0	ND	open
8/31/2010	ND	ND	0.018	0.092	ND	0.13	0.22	0.034	0.00028	33	7.0	8.0	open
9/14/2010	ND	ND	ND	0.074	ND	0.14	0.21	0.025	0.00047	140	23	140	open
9/28/2010	ND	ND	0.0022	0.097	ND	0.10	0.20	0.026	0.00039	>1600	140	900	closed
9/30/2010	ND	ND	ND	0.076	ND	0.18	0.26	0.027	0.00077	>1600	70	1600	closed
10/5/2010	ND	ND	ND	0.074	ND	0.14	0.21	0.026	0.00028	900	17	17	closed
10/7/2010	ND	0.10	0.0034	0.077	ND	0.20	0.28	0.028	0.000091	500	21	30	closed
10/12/2010	ND	ND	0.0011	0.11	ND	0.14	0.25	ND	0.000091	1600	70	30	closed
10/14/2010	ND	ND	0.00097	0.12	ND	ND	0.12	0.021	0.0037	>1600	60	80	open

* results are preliminary and subject to final revision.
** Method Detection Limit

Recommended EPA Criteria based on Aggregate Ecoregion III:
Total Phosporus: 0.02188 mg/L (21.88 ug/L)
Total Nitrogen: 0.38 mg/L
Chlorophyll *a*: 0.00178 mg/L (1.78 ug/L)
Turbidity: 2.34 FTU/NTU

Single Sample Values
Beach posting is recommended when indicator organisms exceed any of the following levels:
Total coliforms: 10,000 per 100 ml
Fecal coliforms: 400 per 100 ml
Enterococcus: 61 per 100 ml

Table 3-7. 2010 Duncans Mills Station Grab Sample Results. Highlighted values indicate those values exceeding the California Department of Public Health Draft Guidance for Fresh Water Beaches. However, estuarine conditions may exist at this site when in closed conditions and currently there are no numeric guidelines that have been developed for estuarine areas.

Duncans Mills*	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N (NO_3^-)	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen (calculated)	Phosphorus, Total	Chlorophyll-a	Total Coliforms	Fecal Coliforms	Enterococcus	
MDL**	0.200	0.10	0.00010	0.030	0.020	0.10		0.020	0.000050	2.0	2.0	2.0	Estuary
Unit of Measure	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	MPN/100mL	MPN/100mL	MPN/100mL	Condition
6/22/2010	ND	ND	--	0.18	ND	0.21	0.39	0.047	0.0005	300	8.0	4.0	open
7/6/2010	ND	ND	0.0018	0.14	ND	0.20	0.34	0.038	0.0027	50	50	30	closed
7/20/2010	ND	0.14	0.020	0.14	ND	0.14	0.28	0.041	0.00092	300	8.0	6.0	open
8/3/2010	ND	ND	0.0034	0.096	ND	0.14	0.24	0.032	0.00059	50	13	2.0	open
8/17/2010	ND	ND	0.0082	0.078	ND	0.14	0.22	0.023	0.00059				open
8/19/2010										140	13	4.0	open
8/31/2010	ND	ND	ND	0.077	ND	0.17	0.25	0.030	0.00028	47	32	4.0	open
9/14/2010	0.245	ND	ND	0.082	ND	0.24	0.32	0.034	0.0013	170	23	14	open
9/28/2010	ND	ND	0.0046	0.10	ND	0.16	0.26	0.034	0.00087	430	140	80	closed
9/30/2010	ND	ND	0.0056	0.075	ND	0.16	0.24	ND	0.0011	>1600	500	240	closed
10/5/2010	0.683	ND	0.0031	0.075	ND	0.75	0.83	0.025	0.00056	500	30	22	closed
10/7/2010	ND	ND	0.0023	0.076	ND	0.25	0.33	0.032	0.00027	130	23	17	closed
10/12/2010	ND	ND	0.0024	0.15	ND	0.21	0.36	ND	0.00055	1600	23	17	closed
10/14/2010	ND	ND	0.00089	0.12	ND	0.11	0.23	ND	0.0037	170	23	23	open

* results are preliminary and subject to final revision.
** Method Detection Limit

Recommended EPA Criteria based on Aggregate Ecoregion III:
Total Phosporus: 0.02188 mg/L (21.88 ug/L)
Total Nitrogen: 0.38 mg/L
Chlorophyll *a*: 0.00178 mg/L (1.78 ug/L)
Turbidity: 2.34 FTU/NTU

Single Sample Values
Beach posting is recommended when indicator organisms exceed any of the following levels:
Total coliforms: 10,000 per 100 ml
Fecal coliforms: 400 per 100 ml
Enterococcus: 61 per 100 ml

Table 3-8. 2010 Bridgehaven Station Grab Sample Results. Estuarine conditions exist at this site, currently, there are no numeric guidelines that have been developed for estuarine areas.

Jenner Boat Ramp*	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N (NO_3^-)	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen (calculated)	Phosphorus, Total	Chlorophyll-a	Total Coliforms	Fecal Coliforms	Enterococcus	
MDL**	0.200	0.10	0.00010	0.030	0.020	0.10		0.020	0.000050	2.0	2.0	2.0	Estuary
Unit of Measure	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	MPN/100mL	MPN/100mL	MPN/100mL	Condition
6/22/2010	0.35	ND	--	0.15	ND	0.35	0.50	0.05	0.001	110	23	8.0	open
7/6/2010	0.273	ND	0.0086	0.13	ND	0.28	0.41	0.035	0.0033	500	240	50	closed
7/20/2010	ND	ND	ND	0.13	ND	0.40	0.53	0.041	0.00023	170	30	4.0	open
8/3/2010	0.210	ND	ND	ND	ND	0.21	0.21	0.043	0.0017	220	50	4.0	open
8/17/2010	ND	ND	ND	ND	ND	0.18	0.18	0.032	0.00071				open
8/19/2010										70	22	ND	open
8/31/2010	0.203	ND	0.0036	0.097	ND	0.24	0.34	0.039	0.0014	27	11	ND	open
9/14/2010	0.224	ND	ND	0.53	ND	0.22	0.75	0.029	0.0013	140	13	6.0	open
9/28/2010	0.231	ND	0.0032	0.081	ND	0.27	0.35	0.031	0.0015	>1600	80	500	closed
9/30/2010	ND	ND	0.0037	ND	ND	0.20	0.20	0.027	0.00097	>1600	240	1600	closed
10/5/2010	ND	ND	0.0015	ND	ND	0.18	0.18	0.033	0.00028	>1600	500	1600	closed
10/7/2010	0.217	ND	0.0010	0.084	ND	0.25	0.33	0.036	0.0017	>1600	300	1600	closed
10/12/2010	ND	ND	0.0034	0.13	ND	0.18	0.31	ND	0.0015	>1600	70	130	closed
10/14/2010	ND	ND	0.00062	0.22	ND	0.18	0.40	0.024	0.00046	300	23	8.0	open

* results are preliminary and subject to final revision.
** Method Detection Limit

Recommended EPA Criteria based on Aggregate Ecoregion III:
Total Phosporus: 0.02188 mg/L (21.88 ug/L)
Total Nitrogen: 0.38 mg/L
Chlorophyll *a*: 0.00178 mg/L (1.78 ug/L)
Turbidity: 2.34 FTU/NTU

Single Sample Values
Beach posting is recommended when indicator organisms exceed any of the following levels:
Total coliforms: 10,000 per 100 ml
Fecal coliforms: 400 per 100 ml
Enterococcus: 61 per 100 ml

Table 3-9. 2010 Jenner Boat Ramp Station Grab Sample Results. Estuarine conditions exist at this site, currently, there are no numeric guidelines that have been developed for estuarine areas.

Jenner Boat Ramp*	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N (NO_3^-)	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen (calculated)	Phosphorus, Total	Chlorophyll-a	Total Coliforms	Fecal Coliforms	Enterococcus	
MDL**	0.200	0.10	0.00010	0.030	0.020	0.10		0.020	0.000050	2.0	2.0	2.0	Estuary
Unit of Measure	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	MPN/100mL	MPN/100mL	MPN/100mL	Condition
6/22/2010	0.35	ND	--	0.15	ND	0.35	0.50	0.05	0.001	110	23	8.0	open
7/6/2010	0.273	ND	0.0086	0.13	ND	0.28	0.41	0.035	0.0033	500	240	50	closed
7/20/2010	ND	ND	ND	0.13	ND	0.40	0.53	0.041	0.00023	170	30	4.0	open
8/3/2010	0.210	ND	ND	ND	ND	0.21	0.21	0.043	0.0017	220	50	4.0	open
8/17/2010	ND	ND	ND	ND	ND	0.18	0.18	0.032	0.00071				open
8/19/2010										70	22	ND	open
8/31/2010	0.203	ND	0.0036	0.097	ND	0.24	0.34	0.039	0.0014	27	11	ND	open
9/14/2010	0.224	ND	ND	0.53	ND	0.22	0.75	0.029	0.0013	140	13	6.0	open
9/28/2010	0.231	ND	0.0032	0.081	ND	0.27	0.35	0.031	0.0015	>1600	80	500	closed
9/30/2010	ND	ND	0.0037	ND	ND	0.20	0.20	0.027	0.00097	>1600	240	1600	closed
10/5/2010	ND	ND	0.0015	ND	ND	0.18	0.18	0.033	0.00028	>1600	500	1600	closed
10/7/2010	0.217	ND	0.0010	0.084	ND	0.25	0.33	0.036	0.0017	>1600	300	1600	closed
10/12/2010	ND	ND	0.0034	0.13	ND	0.18	0.31	ND	0.0015	>1600	70	130	closed
10/14/2010	ND	ND	0.00062	0.22	ND	0.18	0.40	0.024	0.00046	300	23	8.0	open

* results are preliminary and subject to final revision.
** Method Detection Limit

Recommended EPA Criteria based on Aggregate Ecoregion III:
Total Phosporus: 0.02188 mg/L (21.88 ug/L)
Total Nitrogen: 0.38 mg/L
Chlorophyll *a*: 0.00178 mg/L (1.78 ug/L)
Turbidity: 2.34 FTU/NTU

Single Sample Values
Beach posting is recommended when indicator organisms exceed any of the following levels:
Total coliforms: 10,000 per 100 ml
Fecal coliforms: 400 per 100 ml
Enterococcus: 61 per 100 ml

4.0 ADDITIONAL MONITORING

4.1 Permanent Datasondes

In coordination with the USGS the Water Agency maintains five multi-parameter water quality sondes on the Russian River located at Russian River near Hopland, Russian River at Diggers Bend near Healdsburg and Russian River near Guerneville (aka Hacienda Bridge), the Water Agency's water supply facility at Mirabel (RDS), and Johnson's Beach. These five sondes are referred to as "permanent" because the Water Agency maintains them as part of its early warning detection system for use year-round. The sondes take real time readings of water pH, temperature, dissolved oxygen content (DO), specific conductivity, turbidity, and depth, every 15 minutes.

In addition to the permanent sondes, the Water Agency in cooperation with the USGS installed seasonal sondes with real-time telemetry at the USGS river gage station at Russian River near Cloverdale (north of Cloverdale at Commisky Station Road) and at the gage station at Russian River at Jimtown (Alexander Valley Road Bridge). These two additional sondes are included by the USGS on its "Real-time Data for California" website.

The data collected by the sondes described above are evaluated in Section 4.2 in response to the SWRCB request to evaluate whether and to what extent, the reduced flows authorized by the Order caused any impacts to water quality or availability of aquatic habitat for salmonids. In addition, the 2010 dataset and historical sonde data will be evaluated to support the Water Agency's future CEQA compliance documents.

4.2 Aquatic Habitat for Salmonids

4.2.1 Introduction

Altered flow regimes in rivers have the potential to change the environmental conditions experienced by salmonids occupying mainstem habitats. NMFS (2008) found that high summer time flows related to reservoir releases can increase velocities to the point that there is a reduction in the amount of optimal habitat available to summer rearing salmonids. However summer flows can be reduced to the point that water temperature could increase and dissolved oxygen could decrease, thereby degrading summer salmonid rearing habitat. In the State Water Resource Control Board's (SWRCB) Order WR 2010-0018-DWR (Order) the Water Agency was tasked with evaluating impacts to water quality and the availability of aquatic habitat for salmonids in the Russian River associated with reductions in minimum in-stream flows in the Order. The period covered by the Order is May 25 through October 15, 2010. In this report the Water Agency summarizes Russian River flow, temperature, dissolved oxygen, and salmonid monitoring data in order to evaluate the potential effect of reducing minimum in-stream flows on salmonid habitat.

4.2.2 Life stages

Salmonids in the Russian River can be affected by flow, temperature, and dissolved oxygen changes at multiple life stages. There are three species of salmonids, coho salmon, steelhead, and Chinook salmon found in the Russian River (Martini-Lamb and Manning 2011). These species follow a similar life history where adults migrate from the ocean to the river and move upstream to spawn in the fall and winter. Females dig nests called redds in the stream substrate on riffles and pool tail crests. As eggs are deposited into the nest they are fertilized by males. The eggs are covered with gravel by the female and the eggs remain in the nest for 8-10 weeks before hatching. After hatching the larval fish, identified as alevins, remain in the gravel for another 4-10 weeks before emerging. After emerging these young salmonids are identified first as fry and then later as parr once they have undergone some freshwater growth. Parr, rear for from a few months (Chinook) to 3 years (steelhead) in freshwater before undergoing a physiological change identified as smoltification. At this stage, fish are identified as smolts meaning their organs and tissues can handle exposure to sea water and are ready for ocean entry (Quinn 2005). In the Russian River smolts move downstream to the ocean in the spring (Chase et al. 2005 and 2007, Obedzinski et al. 2006). Salmonids spend 1 to 3 years at sea before returning to the river to spawn as adults (Moyle 2002). Because all life stages of all three species of Russian River salmonids spend a period of time in the Russian River watershed, they must cope with the freshwater conditions they encounter including flow, temperature, and dissolved oxygen levels. While broadly all three species follow a similar life history, each species tends to spawn and rear in different locations and are present in the Russian River watershed at slightly different times; consequently, these subtle but important differences may expose each species to a different set of freshwater conditions.

Coho timing

Wild coho have become scarce in the Russian River and monitoring data relies mainly on fish released from the hatchery as part of the Russian River Coho Salmon Captive Broodstock Program (RRCSCBP). Data collected on the Mirabel dam video camera system in 2011 indicate that the adult coho salmon run may start in late October and continue through at least January (SCWA unpublished data) and that spawning and rearing occurs in the tributaries to the Russian River (NMFS 2008). Downstream migrant trapping in tributaries of the Russian River indicate that the coho smolt out-migration starts before April and continues through mid-June (Obedzinski et al. 2006). Coho salmon have been detected as late as mid-July in the mainstem Russian River downstream migrant traps operated by the Water Agency (Martini-Lamb and Manning 2011). For coho, only the temperature and dissolved oxygen data relating to the adult and smolt life stages will be summarized for this report. Spawning and rearing take place in the tributaries which are outside of the spatial boundaries governed by the Order (Table 4-1).

Steelhead timing

Based on video monitoring at the Water Agency's Mirabel inflatable dam and returns to the Warm Springs Hatchery, adult steelhead return to the Russian River later than Chinook. Deflation of the inflatable dam and removal of the underwater video camera system preclude a precise measure of adult return timing or numbers; however, continuous video monitoring at the Mirabel dam during late fall through spring in 2006-2007, timing of returns to the hatchery, and data gathered from steelhead angler report cards (SCWA unpublished data, Jackson 2007) suggests that although a very few adult steelhead may return as early September in some years, the vast majority of returns occur between January and April. Additionally, during coho spawner surveys conducted by the University of California Cooperative Extension (UCCE) steelhead have been observed spawning in tributaries of the Russian River in January, but more often in February and March (Obedzinski 2012).

Many steelhead spawn and rear in the tributaries of the Russian River while some steelhead rear in the upper mainstem Russian River (NMFS 2008, Cook 2003). The steelhead smolt migration in the Russian River begins at least as early as March and continues through June, peaking between mid-March and mid-May (Martini-Lamb and Manning 2011). For Russian River steelhead, only the adult migratory, parr, and smolt life stage are present in the mainstem during the time period covered by the Order and only these life stages will be analyzed for the potential effect of altered temperature and dissolved oxygen levels related to the Order (Table 4-1).

Chinook timing

Based on video monitoring at the Water Agency's inflatable dam in Mirabel, adult Chinook are typically observed in the Russian River before coho and steelhead. Chinook enter the Russian River as early as September, but are typically not present in high numbers until mid-October. Generally the Chinook run peaks in mid-November and is over in late December (Chase et al. 2005 and 2007). Chinook are mainstem spawners and deposit their eggs into the stream bed of the mainstem Russian River and in Dry Creek during the fall (Chase et al. 2005 and 2007, Martini-Lamb and Manning 2011). Chinook offspring rear for less than one year before out migrating to sea as smolts in the spring. Based on downstream migrant trapping data the majority of the Chinook smolt out-migration appears to be complete by mid to late June (Chase et al. 2005 and 2007, Martini-Lamb and Manning 2011). Only the adult migratory and smolt life stages are present in the mainstem of the Russian River during the time period covered by the Order. Therefore, temperature and dissolved oxygen levels during the time period related to the Order will be analyzed for these Chinook life stages in this report (Table 4-1).

Table 4-1. The species and life stage of salmonids found in the Russian River watershed that will be analyzed for this report during the period covered by the Order (May 25, 2010 to October 15, 2010) and the justification for excluding certain life stages from the analysis. The Order only applies to the Mainstem Russian River and not its tributaries.

Species	Life stage	Summarized in report	Comments
Chinook	adult	x	September to late December
	spawning		Fall/winter
	egg		Winter/early spring
	alevin		Winter/early spring
	fry		Winter/early spring
	smolt	x	Spring/early summer
steelhead	adult		Fall/winter
	spawning		Winter/early spring
	egg		Winter/early spring
	alevin		Winter/early spring
	fry		Spring/early summer
	parr	x	spring/summer/fall/possibly winter
	smolt	x	Winter/early spring
coho	adult	x	Fall/winter
	spawning		spawns in tributaries
	egg		eggs deposited tributaries
	alevin		Alvin emerge in tributaries
	fry		freshwater rearing takes place in tributaries
	parr		freshwater rearing takes place in tributaries
	smolt	x	Spring/early summer

4.2.3 Flow

The purpose of the 2010 TUCP was to request a change in minimum in-stream flow requirements under D1610 in order to improve salmonid rearing habitat in the Russian River as outlined in the Biological Opinion. The Russian River Biological Opinion concludes that reducing minimum in-stream flow requirements under D1610 minimum will enable alternative flow management scenarios which will increase available rearing habitat in Dry Creek and the upper Russian River. These flow changes are intended to provide a lower, closer-to-natural inflow to the estuary between late spring and early fall, thereby enhancing the potential for maintaining a seasonal freshwater lagoon that would likely support increased production of juvenile steelhead and salmon (NMFS 2008). The Biological Opinion found that flows lower than those required by D1610 (approximately 125 cfs) in the section of the Russian River from Ukiah to the mouth of Dry Creek (upper Russian River) would improve habitat for summer rearing steelhead, specifically upstream of Cloverdale. Upper Russian River flows were below D1610 minimum, but above the minimum flows authorized by the 2010 Order (Figures 2-1 and 2-2). While the flow of 125 cfs was not realized through the upper Russian River during the period the Order was in effect in 2010, flows lower than D1610 minimums were implemented. Flows in the lower Russian River (downstream of the confluence with Dry Creek) were higher than D1610 minimum flows during the entire Order with the exception of a few isolated days (Figure 2-3). This was likely due to late rains and relatively cool summer temperatures in 2010 which caused high tributary inflow.

Because sustained flows in the lower river did not drop below D1610 minimum stream flows in 2010 the Water Agency did not analyze the potential impact of water temperature and dissolved oxygen levels on salmonids in the lower river as there was no impact related to the Order. Despite the fact that flows in 2010 were generally close to normal D1610 flows (i.e., higher than those requested in the TUCP), water temperatures at some locations remained at levels that were not the most conducive for juvenile steelhead growth and survival. This finding suggests that factors in addition to flow (e.g., ambient air temperature) may be important drivers of water temperature in the mainstem Russian River.

The Order may have been a contributing factor to the earlier timing of adult Chinook entering the Russian River in 2010. The Coyote Valley Dam release rates outlined in the Order were lower than D1610 releases thus conserving water in Lake Mendocino. In 2010, Lake Mendocino had storage in October that was occupying a portion of the flood control pool. In order to increase storage in Lake Mendocino and prepare the reservoir for potential flood control operations during the fall, the Army Corps of Engineers increased releases from Coyote Valley Dam. Increased releases began in early October, peaked at approximately 1,000 cfs in mid-October and began ramping down after the completion of the Order. During this time a pulse of 804 adult Chinook was observed at the Mirabel fish counting station (Martini-Lamb and Manning 2011) (Figure 4-1). The upstream movement of these fish may have been the result of a variety of factors (including breaching of the estuary on October 1 and again on October 12, as well as other unknown factors) we suspect that the pulsed flow was an important influence.

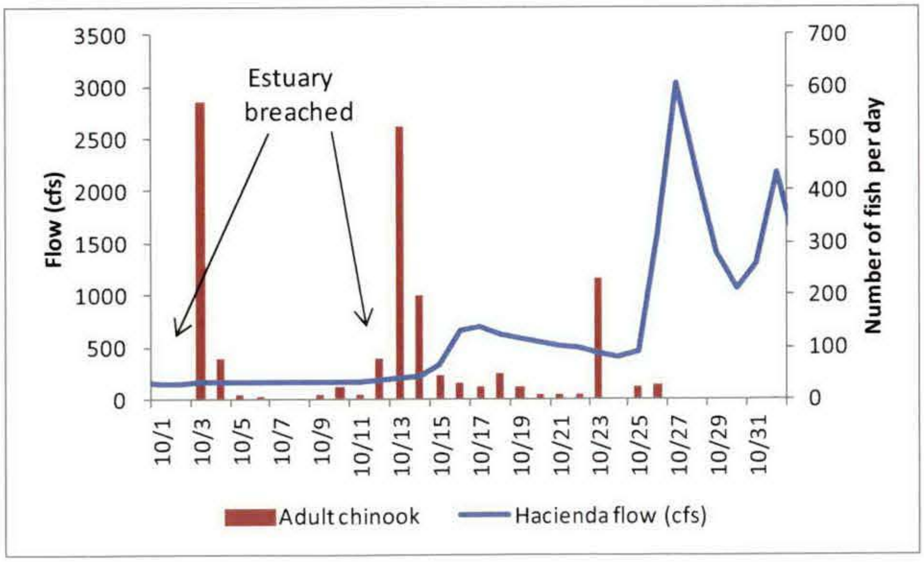

Figure 4-1. The daily count of adult Chinook at Mirabel, the discharge at Hacienda, days that the estuary was breached.

4.2.4 Temperature

Temperature requirements for salmonids differ by species and life stage as do the period and the location of residency within the upper mainstem of the Russian River. For example, steelhead parr may rear in the mainstem throughout the year, but during summer they primarily utilize the upper portion of the river upstream of Hopland. While Chinook adults may be found in any portion of the river, but are generally only present in the Russian River from September through January. Therefore it is necessary to examine each life stage of these species separately when assessing the effects of temperature on salmonids.

The water temperature ranges and thresholds reported in the literature for a particular life stage and species of salmonid vary by author. The California Regional Water Quality Control Board, North Coast Region (Regional Water Board) conducted an extensive literary search (Klampt 2000) on water quality effects on salmonids and listed recommendations for the Russian River. The Water Agency has used the information summarized in Klampt (2000) to examine the potential impacts that the Order may have had on water quality for salmonids. The Water Agency has cited other literature when appropriate.

Suggested water temperatures for Russian River salmonids are listed in Klampt (2000), but are based on Maximum Weekly Average Water Temperature (MWAT). Water temperature data collected at Hopland, Cloverdale, Jimtown, Diggers Bend, and Hacienda are only published as daily minimum and maximum values. Therefore the Water Agency used other portions of the Klampt literature review for this report. Because of this there is some variability in the ways that the criteria are set between life stages and species. The potentially lethal temperature criteria are slightly different between some of the species and life phases. Lethal temperatures are described in three ways: 1) The upper incipient lethal temperature which is the temperature that falls between the highest temperatures a fish can be acclimated to and the lowest of the extreme upper temperatures that will kill fish acclimated to warm water; 2) The water temperature where 50 % of the population will perish if exposed to this temperature for an unlimited period of time; and 3) The chronic lethal water temperature which is the water temperature where fish will perish if exposed to this temperature for a long period of time.

Coho

Coho spawn, rear, and spend most of their freshwater life phases in cold water tributaries. Coho use the mainstem of the Russian River only as migratory habitat (NMFS 2008). Because coho do not rear or spawn in the mainstem Russian River, water temperature data is only summarized in relation to the migratory requirements for this species (Table 4-1). Most tributaries that support coho in the Russian River are downstream of Dry Creek or within the Dry Creek basin.

Adult coho were observed in the Russian River during the Order, but in low numbers. The first coho in 2010 was observed on the Mirabel camera system on October 1. In total, 6 coho were observed on the Mirabel camera system before the Order expired on October 15, 2010 (SCWA unpublished data). From October 1 to October 15, 2010, water temperatures at Hopland, Cloverdale, Jimtown, Diggers Bend, and Hacienda ranged from a low at Hopland of 12.5 °C to a high of 21.9 °C at Diggers Bend.

During the period of the Order when adult coho were present in the upper Russian River, water temperatures at most sites were generally below the temperatures that would block upstream migration or cause mortality. The Klampt (2000) literature review found that the coho migration could be blocked at 21°C. Klampt (2000) also found that adult coho had an upper incipient lethal temperature limit of 21°C.

It is important to note that there is little known coho spawning that takes place upstream of Diggers Bend; rather, smolts and adults use the mainstem as a migration corridor. Water temperatures were collected at Hopland, Cloverdale, Jimtown, Diggers Bend, and Hacienda during the Order. At Hopland, water temperatures remained in the adult coho preferred water temperature range during the portion of the Order that adult coho where upstream of Mirabel (October 1 to October 15). Daily minimum and maximum water temperature were not above 21 °C which could limit migration and increase the chance of mortality except for one day at Diggers Bend when the daily maximum water temperature was above 21.0 °C (Figures 4-2 and 4-3).

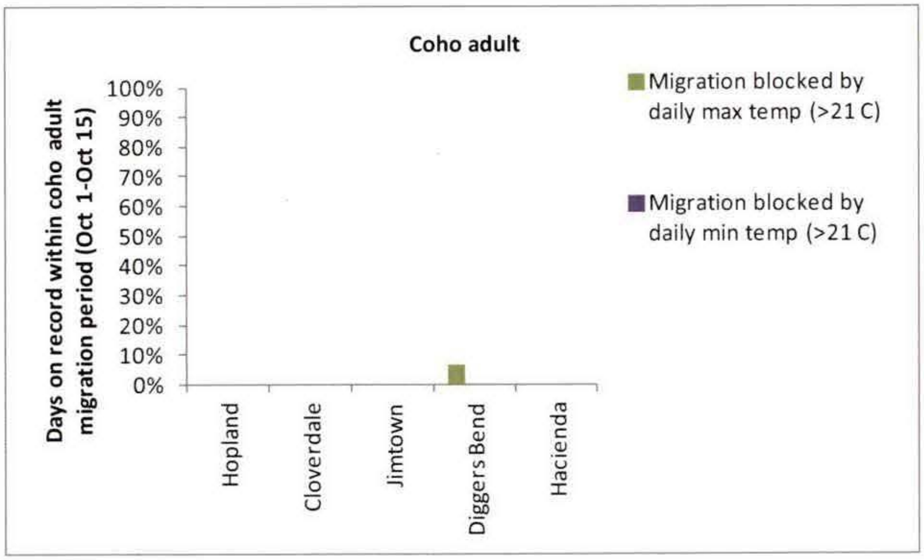

Figure 4-2. Portion of days within the adult coho migration period that overlap with the 2010 Order (October 1 to October 15, 2010) where the daily maximum or daily minimum water temperatures exceeded 21.0 °C.

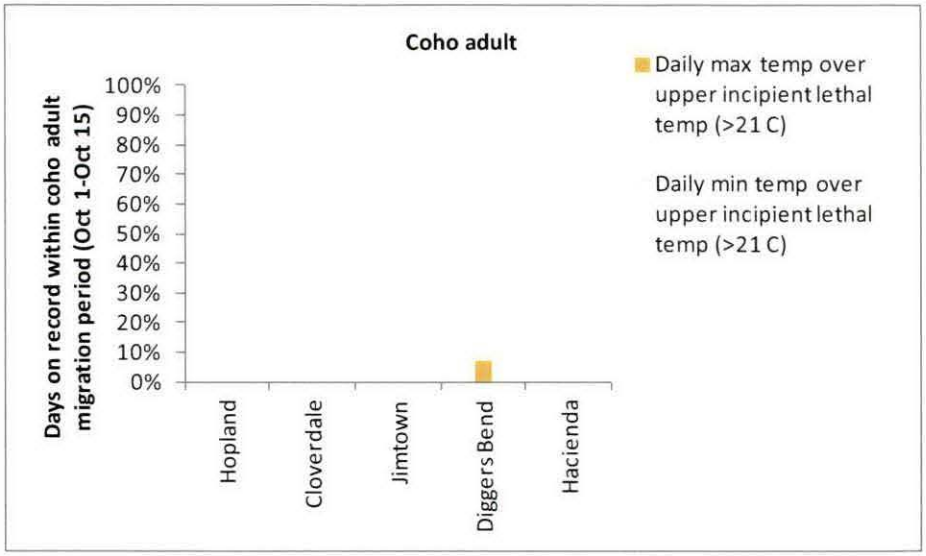

Figure 4-3. Portion of days within the adult coho migration period that overlap with the 2010 Order (October 1 to October 15, 2010) where the daily maximum or daily minimum water temperatures exceeded 21.0 °C.

Coho smolts were migrating through the mainstem Russian River during the beginning portion of the Order. Based on downstream migrant trapping data in tributaries to the Russian River, the out-migration of coho smolts peaks in early to late May and continues through mid-June depending on the year and tributary (Obedzinski 2007). Based on downstream migrant trapping at Mirabel in 2010, coho smolts were present in the mainstem Russian River until at least July 11. At Mirabel, 51 coho smolts were captured after the beginning of the Order (May 25, 2010).

During the period of the Order and when coho smolts were observed at the Mirabel dam (May 25 through July 11), water temperatures were generally below the temperatures that can cause mortality in coho. Juvenile coho in other river systems have an upper lethal temperature limit of 25 °C (Carter 2005).

Water temperatures were collected at Hopland, Cloverdale, Jimtown, Diggers Bend, and Hacienda during the coho smolt migration. From May 25to July 11, 2010, daily water temperatures ranged from a low at Hopland of 10.8 °C to a high of 26.3 °C at Diggers Bend. Daily maximum water temperatures never reached 25 °C at Hopland, Cloverdale, or Hacienda. At Jimtown and Diggers Bend, the daily maximum water temperature was above 25 °C during 5 % and 8% of the days on record, respectively (note that Jimtown has an incomplete record and is missing temperature data from May 25 through June 22, 2010) (Figure 4-4). The daily minimum water temperature was never above 25 °C at any of the five sites. Therefore, if coho smolts were emigrating through the Alexander Valley in late spring or early summer, it is unlikely they experienced lethal temperature conditions.

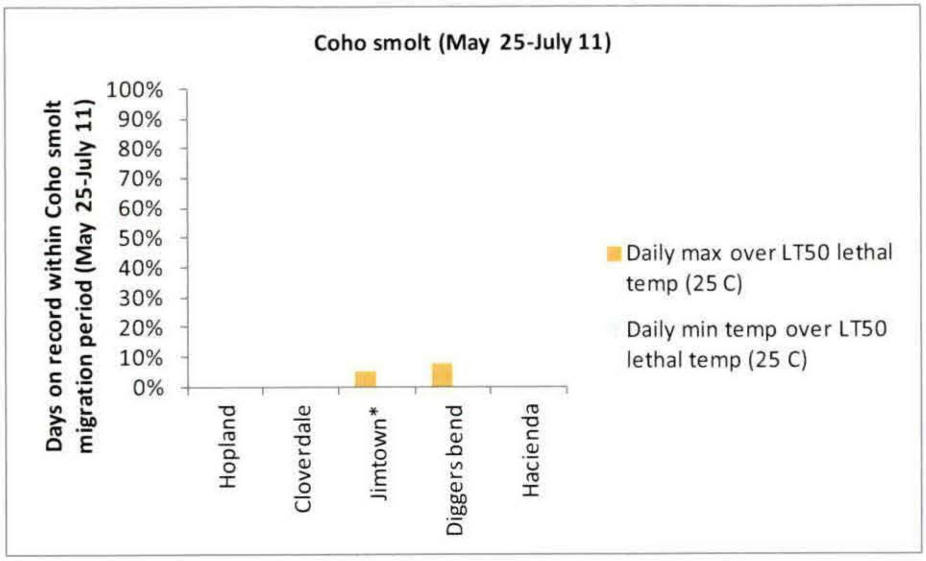

Figure 4-4. The portion of days within the coho smolt out-migration time period that overlap with the 2010 Order (May 25 to July 11, 2010) where the daily maximum or daily minimum water temperatures exceeded 25.0 °C(note that Jimtown is missing data from May 25 to June 22, 2010).

Steelhead

Few adult steelhead were found in the Russian River during the time period that the Order was in effect. The first adult steelhead of the 2010 video monitoring season was observed on October 14. A total of eight adult steelhead were estimated to have passed the Mirabel dam in the 2-day period before the end of the Order on October 15 (SCWA unpublished data). During this time water temperatures in the Russian River at the five sites where data was collected ranged from a low of 14.0 °C at Hopland to a high of 17.6 °C at Jimtown. Water temperatures at Hacienda, which is approximately 4.8 river kilometers (rKM) downstream from where steelhead were observed on the Water Agency's underwater video camera system, ranged from 16.2 °C to 17.5 °C.

The water temperatures during the portion of the Order that steelhead adults were observed in the Russian River were below the daily maximums and similar to the maximum weekly maximum temperatures, MWMT, listed in the literature (MWMT is the highest average of maximum daily water temperatures over any 7 day period). The Klampt (2000) literature review found that the migration of steelhead may be blocked at 21 °C, but concluded that a short term daily maximum of 23.9 °C is protective of all three species of Russian River salmonids during the adult migration, freshwater rearing, and seaward migration (smolt) life stages. The Carter (2005) literature review suggests that in order to fully protect adult steelhead during migration, a MWMT of 17 °C to 18 °C and a daily maximum water temperature of 21 °C to 22 °C should not be exceeded. During October 14-15, when adult steelhead were present in the Russian River, the maximum water temperature was below the short term daily maximum of 23.9 °C listed by Klampt (2000) and fell within the upper temperature limits listed by Carter (2005). It is important to note that only a few individual adult steelhead were detected during the period that the Order was in effect and that the bulk of the adult steelhead migration occurred much later in the year from December through April when water temperatures were much cooler (Chase 2005, Jackson 2007).

Steelhead in the Russian River are tributary spawners, but steelhead are also known to rear in the upper Russian River where water temperatures are adequate for over-summer survival (NMFS 2008). Cook (2003) found that summer rearing steelhead were distributed in the highest concentrations in the reach of the Russian River between Hopland and Cloverdale (Canyon Reach). Steelhead were also found in relatively high numbers (when compared to habitats downstream of Cloverdale) in the section of river between the Coyote Valley Dam and Hopland (Ukiah Reach), but at a lower density than in the Canyon Reach. The Canyon Reach is the highest gradient section of the mainstem Russian River and contains fast water habitats that include riffles and cascades (Cook 2003). Both the Canyon and Ukiah reaches have cooler water temperatures when compared to water temperatures between Cloverdale and the Russian River estuary. The cool water found in these reaches is a direct result of releases made at the Coyote Valley Dam. Therefore, for steelhead parr, water temperature data will only be summarized at Hopland and Cloverdale because they are the only sites where water temperature data was collected that are within the section of the upper Russian River known to be used by summer rearing steelhead parr.

In reaches that are considered steelhead rearing habitat (Ukiah to Cloverdale), water temperatures often remained below stressful levels. During the time period that the Order was in effect, daily water temperatures measured at the USGS gage (11462500) near Hopland ranged from 10.8°C to 18.5°C. Elevated levels of heat shock protein 72 were found in Navarro River steelhead occupying streams with daily maximum water temperatures in the range of 20-22.5 °C (Werner et al 2005). This suggests that water temperatures in this range are high enough to cause steelhead physiological stress. At Hopland, the daily maximum water temperatures never reached 20 °C during the duration of the order. At Cloverdale daily maximum water temperatures were above 20 °C 39 % of the days, but no days had a daily maximum above 22.5 °C. While water temperatures reached stressful levels for steelhead at Cloverdale for a portion of the order it is important to note that the Cloverdale gage is at the downstream limit of the reaches considered to be steelhead habitat and that water temperatures are likely gradually cooler as one moves upstream from Cloverdale towards Hopland.

Water temperatures remained below lethal levels in reaches that are considered steelhead rearing habitat (Ukiah to Cloverdale). The upper lethal limit for juvenile steelhead is reportedly 23.9°C (Carter 2005). Water temperatures at Hopland and at Cloverdale remained below the upper lethal limit of 23.9 °C for the duration of the order.

Steelhead smolts were present in the Russian River during the time period that the Order was in effect, although probably in low numbers. Based on 11 years of downstream migrant trapping at Mirabel Dam, the steelhead smolt migration in the Russian River appears to begin at least as early as March and peaks between mid-March and mid-May. During 2010, 18 steelhead smolts were captured between May 25 and June 13 at Mirabel. During this time period the water temperature at Hopland ranged from 10.8 °C to 16.6 °C and water temperatures at Cloverdale ranged from 11.7 °C to 20 °C. There were no records for water temperature at Jimtown during this time period. Water temperatures at Diggers Bend near Healdsburg ranged from 12.7 °C to 23.6 °C and water temperatures at Hacienda (approximately 4.8 river kilometers (rKM) downstream of the Water Agency's mainstem downstream migrant trapping site) ranged from 13.3 °C to 22.8 °C. Summarizing the effect of these temperatures on steelhead smolts is not practical as there is little information on the specific temperature requirements of steelhead smolts in the literature (Klampt 2000).

Chinook

Chinook are found in the Russian River at all life stages, but only the adult and smolt life stages are present during the time period when the Order was in effect. Chinook adults were present in the Russian River during the latter portion of the time span regulated by the Order. The first Chinook adult of 2010 was observed on September 25. By October 15, a total of 1,523 Chinook were estimated to have passed the dam, representing approximately 60 % of the minimum number of Chinook estimated to pass the dam in 2010. During this time period daily water temperatures at the five sites where data was collected ranged from a low at Hopland of 12.5°C to a high of 22.9 °C at Diggers Bend.

Water temperatures where generally favorable for adult Chinook in 2010, although there were periods of time where the daily maximum water temperature was above the threshold that can block upstream migration. Based on a literature review by Klampt (2000) the adult Chinook migration is reportedly blocked at 21.2 °C. The portion of days in 2010 where the daily maximum water temperature was above the temperature that has the potential to block the Chinook migration (21.2 °C) during September 25, 2010 through October 15, 2010 occurred 14 %, 33 %, and 19% of the days at Jimtown, Diggers Bend, and Hacienda respectively (Figure 4-5) . None of the days at Hopland and Cloverdale had daily maximum water temperatures above the temperature that can potentially block the upstream migration of adult Chinook. Dry Creek is an important spawning area for Chinook salmon and that many Chinook may have entered Dry Creek after passing the Mirabel dam rather than continue traveling up the Russian River past Healdsburg to Diggers Bend and Jimtown. Water temperatures in Dry Creek are much cooler than the mainstem Russian River during the summer and fall and more favorable for adult Chinook.

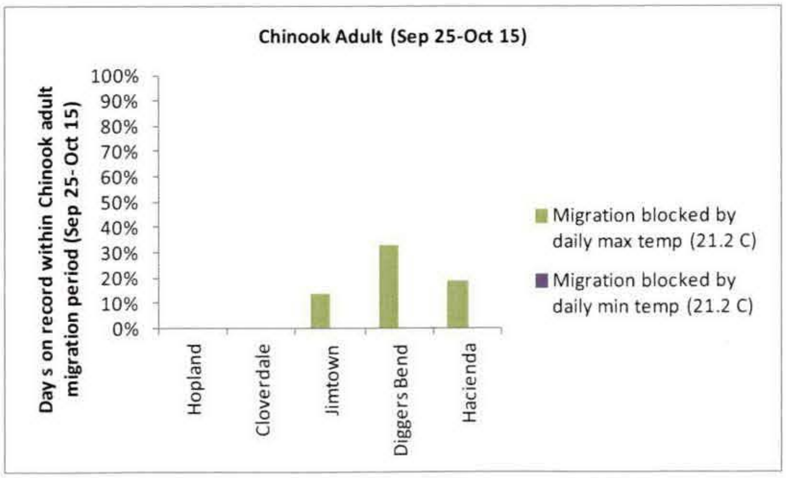

Figure 4-5. The portion of days within adult Chinook migration time period that overlap with the 2010 Order (September 25 to October 15, 2010) where the daily maximum or daily minimum water temperatures exceeded 21.2 °C.

Chinook smolts are present in the Russian River during the early part of the Order and migrate to the sea in water temperatures that occur during late spring and early summer. Between May 25, 2010 and when the traps were removed on July 15, 2010, a total of 1,415 Chinook smolts were captured at Mirabel. During this time period daily water temperatures at the five sites where data was collected ranged from a low at Hopland of 10.8 °C to a high of 26.3 °C at Diggers Bend.

Excellent growth rates for juvenile Chinook salmon have been reported to occur at temperatures ranging between 15 °C and 19 °C (Brett et al. 1982, cited by Raleigh et al. 1986).The maximum and minimum water temperatures were often within this temperature range during May 25, 2010 to July 15, 2010. The maximum daily water temperature at Hopland, Cloverdale, Jimtown, Diggers bend, and Hacienda where within this temperature range 90 %, 31 %, 0 %, 12 %, and 12% of the days on record, respectively (Figure 4-6). The minimum daily water temperature were within this range at Hopland, Cloverdale, Jimtown, Diggers bend, and Hacienda 37 %, 88 %, 54 %, 31 %, and 23 % of the days on record respectively.

The upper temperature limit that blocks Chinook smolts from migration was above by the daily maximum and minimum water temperatures during some portions of the time between May 25 and July 15, 2010. The upper lethal long term exposure limit is reportedly 25.8 °C (Klampt 2000). The portion of the days on record from May 25 to July 15, 2010, where the daily maximum water temperatures were above the upper limit that may block Chinook smolts from migrating (21.0 °C) at Hopland, Cloverdale, Jimtown, Diggers bend, and Hacienda, was 0%, 17 %, 100 %, 77 %, and 74 % respectively (Figure 4-7). Only Diggers Bend and Hacienda had daily minimum water temperatures above the upper limit that may block Chinook smolts from migrating (21.0 °C) during this same time period. This occurred on 6 % of the days at both sites.

The upper lethal long term temperature limit (25.0 °C) for Chinook salmon smolts was only rarely above the daily maximum water temperature and only at 2 sites during the May 25, 2010 to July 15, 2010 time period. The daily minimum water temperature was never above this threshold at any of the sites (Figure 4-8). Only Jimtown and Diggers Bend had daily maximum water temperatures above the upper lethal long term limit for Chinook salmon smolts during this same time period, which occurred 4 % and 11 % of the time, respectively. The daily minimum water temperature was never above 25 °C at any of the five sites. Therefore, Chinook smolts had temporal thermal refuge during a portion of each day which would help protect them from mortality related to chronic exposure to water temperatures above 25 °C.

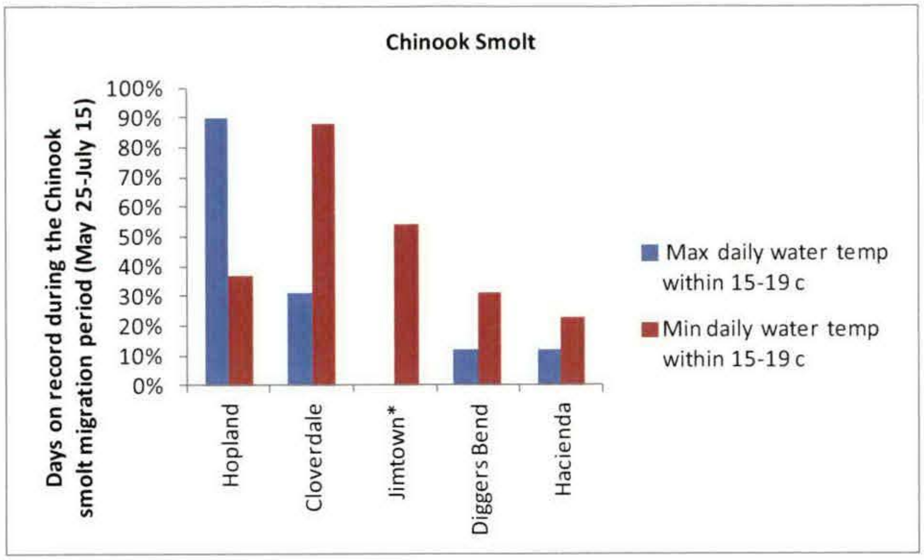

Figure 4-6. The portion of days within adult Chinook migration time period that overlap with the 2010 Order (May 25 to July, 15 2010) where the daily maximum or daily minimum water temperatures fall within the range that is reported to have excellent growth rates for Chinook smolts (15 °C to 19 °C) (Brett et al. 1982, cited by Raleigh et al. 1986).

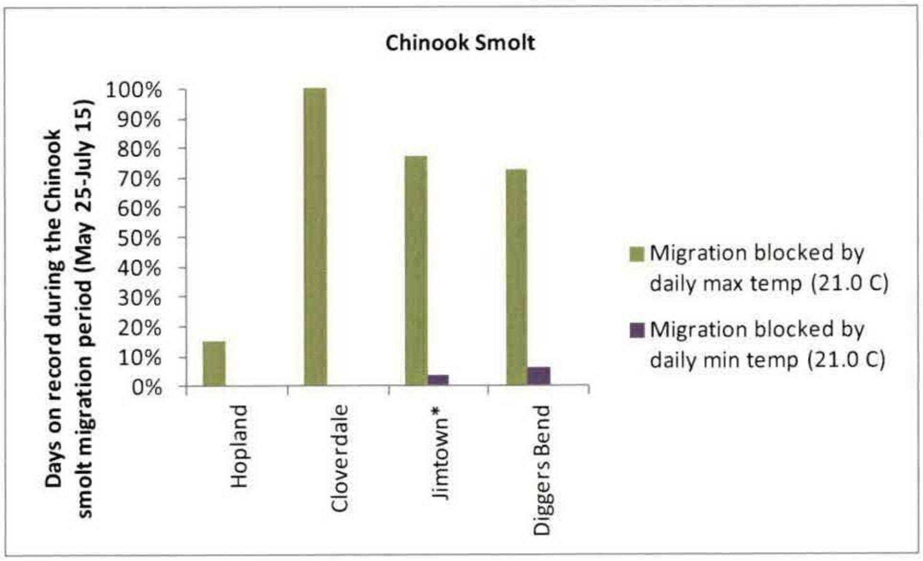

Figure 4-7. The portion of days within Chinook smolt out-migration time period that overlap with the 2010 Order (May 25, 2010 to July 15, 2010) where the daily maximum or daily minimum water temperatures exceeded 21.0 °C.

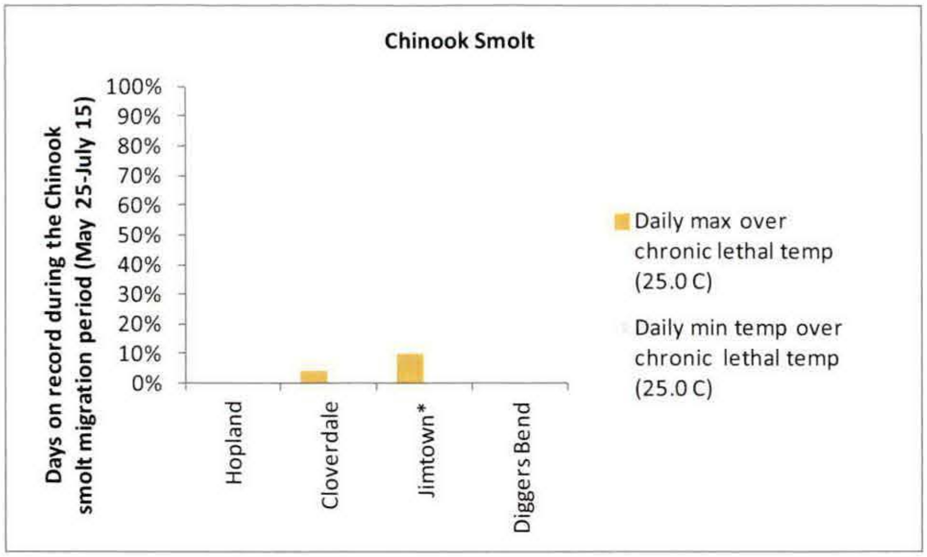

Figure 4-8. The portion of days within the coho smolt out-migration time period that overlap with the 2010 Order (May 25 to July 15, 2010) where the daily maximum or daily minimum water temperatures exceeded 25.0 °C (note that Jimtown is missing data from May 25 to June 22, 2010).

4.2.5 Dissolved Oxygen

Salmonids are fish species that are known to be particularly sensitive to low levels of dissolved oxygen. Depressed levels of dissolved oxygen can affect swimming performance, growth rates and survival. Unlike temperature requirements, dissolved oxygen requirements are similar for the 3 species and all of the life stages of salmonids found in the Russian River. Klampt (2000) conducted a literature review on water quality requirements of salmonids and suggested minimum levels of dissolved oxygen for the Russian River for each salmonid life stage that would avoid impacts to Chinook, steelhead, and coho. Klampt (2000) found dissolved oxygen levels should not drop below 7.0 mg/L or 80 % saturation whichever is greater for salmonids of all life stages. The data for the dissolved oxygen section of this report has been summarized for the time period when the Order overlaps the presence of each salmonid life stage found in the upper mainstem of the Russian River.

Adult Salmonids

All three species of adult salmonid were present in the Russian River during a portion of the Order and they encountered various dissolved oxygen levels at different locations on the river. The first adult salmonid observed in 2010 at the Mirabel dam was a Chinook observed on September 25. A total of 1,523 Chinook were estimated to have passed the Mirabel dam before the Order expired on October 15, 2010 (Martini-Lamb and Manning 2011). During this time six adult coho and eight adult steelhead were also observed on the Mirabel camera system (SCWA unpublished data). From September 25 to October 15, 2010, the lowest minimum dissolved oxygen readings at Hopland, Cloverdale, Jimtown, Diggers Bend, and Hacienda were 8.7, 8.6, 5.6, 7.4, and 7.9 mg/L, respectively.

Daily minimum dissolved oxygen levels at Jimtown were low enough to cause moderate impairment to adult salmonids during the portion of some of the days during the Order according to the standards reported by Klampt (2000). Jimtown was the only monitoring station that had daily minimum dissolved oxygen levels below 7.0 mg/L during the September 25 and October 15, 2010 time period. Daily minimum dissolved oxygen levels were below 7 mg/L for 12 days of the 21 day period between September 25 and October 15, 2010. Klampt (2000) reported that dissolved oxygen levels below 6.3 mg/L can block the upstream movement of adult salmonids and that dissolved oxygen levels below 6.0 mg/L can cause moderate production impairment for adult salmonids. There were 8 days at Jimtown when the dissolved oxygen levels were below 6.3 mg/L and 7 days when the dissolved oxygen levels were below 6 mg/L during the September 25 and October 15, 2010, time period.

While daily minimum dissolved oxygen levels at Jimtown were below the standards reported by Klampt (2000) adults may have been able to avoid these low levels by using other portions of the basin or by migration past Jimtown later in the year. During the 21 day long portion of the Order when adult salmonids were observed passing the Mirabel dam the lowest daily maximum dissolved oxygen level at Jimtown was 10 mg/L. This suggests that adult salmonids would be able to migrate past Jimtown during a portion of each day during the Order. The Russian River and Dry Creek confluence is located downstream of Jimtown. It is important to note that Dry Creek is heavily used by Chinook, steelhead, and coho (Martini-Lamb and Manning 2011) and that Dry Creek may have been the destination of many of these adult fish during the September 25 to October 15 time period. Furthermore, daily minimum dissolved oxygen levels reached 7 mg/L by October 7 at Jimtown and remained above 7 mg/L until at least when the gage went offline on October 31.

Juvenile freshwater rearing

Steelhead parr were likely present in the mainstem of the Russian River during the Order, but steelhead habitat is generally thought to be limited to the Ukiah and Canyon reaches (the section of river from the Coyote Valley Dam to Cloverdale) in the upper Russian River (NMFS 2008). During the order the lowest daily minimum dissolved oxygen readings at Hopland, Cloverdale, Jimtown, Diggers Bend, and Hacienda were 8.5, 7.4, 5.3, 7.2, and 7.4 mg/L, respectively. Jimtown was the only monitoring station to have dissolved oxygen levels below 7.0 mg/L during the Order, which is the threshold reported by Klampt (2000) that may impair salmonids. However, Jimtown is outside of the section of the upper Russian River that is typically considered steelhead summer rearing habitat.

Smolts

Salmonid smolts were observed in the mainstem Russian River during a portion of the Order. Downstream migrant traps were installed at the Mirabel Dam in 2010 before the Order went into effect and were operated until July 15, 2010. The traps were ultimately removed because the daily catch of salmonids was diminishing. In total 1,549 Chinook smolts, 51 coho smolts, and 18 steelhead smolts were captured in the downstream migrant traps from May 25 to July 15, 2010. During this time period daily minimum dissolved oxygen readings at Hopland, Cloverdale, Jimtown, Diggers Bend, and Hacienda were 8.5, 7.4, 6.1, 7.2, and 7.4 mg/L, respectively. At the five upper Russian River sites where dissolved oxygen data was collected only Jimtown had dissolved oxygen levels below 7.0 mg/L from May 25 to July 15, 2010 which is below the threshold that Klampt (2000) reports can cause impairment to salmonids. During this 116 day period, 107 days had a daily minimum dissolved oxygen level below 7 mg/L. During the 116 day long portion of the Order where salmonids smolts were captured at the Mirabel dam downstream migrant traps the lowest daily maximum dissolved oxygen level at Jimtown was 8.3 mg/L.

This suggests that salmonid smolts would be able to migrate past Jimtown during a portion of each day during the smolt migration.

4.3 Summary

The Water Agency was tasked with evaluating impacts to water quality and the availability of aquatic habitat for salmonids in the Russian River associated with flow reductions outlined in the Order. However due to a relatively small temperature and dissolved oxygen data set coupled with climate variability it is difficult to determine, in most cases, if changes in temperature or dissolved oxygen were due to flow changes related to the Order. Therefore the Water Agency summarized the environmental conditions experienced by salmonids during the Order and compared these conditions to standards outlined in the literature.

Flow

Flows were effectively reduced in summer steelhead rearing habitat in the upper portion of the Russian River during a portion of the time period covered by the Order. While flows in the upper Russian River never reached the minimum in-stream flow of 125 cfs, they were lower than D1610 flows. However flows in the lower Russian River remained above D1610 minimum in-stream flows for all but a few isolated days in 2010 due to an unusually wet year and high tributary inflow (Figures 2-1, 2-2 and 2-3).

The Order may have facilitated adult Chinook entering the Russian River earlier in 2010. Water was conserved in Lake Mendocino due to the flow regime outlined in the Order was releases by the U.S. Army Corps of Engineers in the fall, which may have stimulated adult Chinook to migrate upstream. However there were other factors that may have led to this pulsed upstream movement in October such as breaching the Estuary, naturally occurring early run timing, or other unknown environmental triggers.

Temperature

In the upper Russian River near Hopland, water temperatures remained cooler into the fall than during many other years. During late September, the warmest period in 2010, water temperatures were 5.2 °C cooler than in previous years (Figure 4-9). This is likely due to the cold water pool (the portion of the lake below the thermocline) in Lake Mendocino being depleted under D1610 releases, but being preserved under the flow regime outlined in the Order. Flow is not the only factor in determining water temperature. Ambient air temperature is likely an important factor in determining mainstem Russian River water temperatures. However, preserving the cold water pool into the fall likely provides adult Chinook, as well as summer rearing steelhead, with cooler temperatures in the upper reaches of the mainstem Russian River.

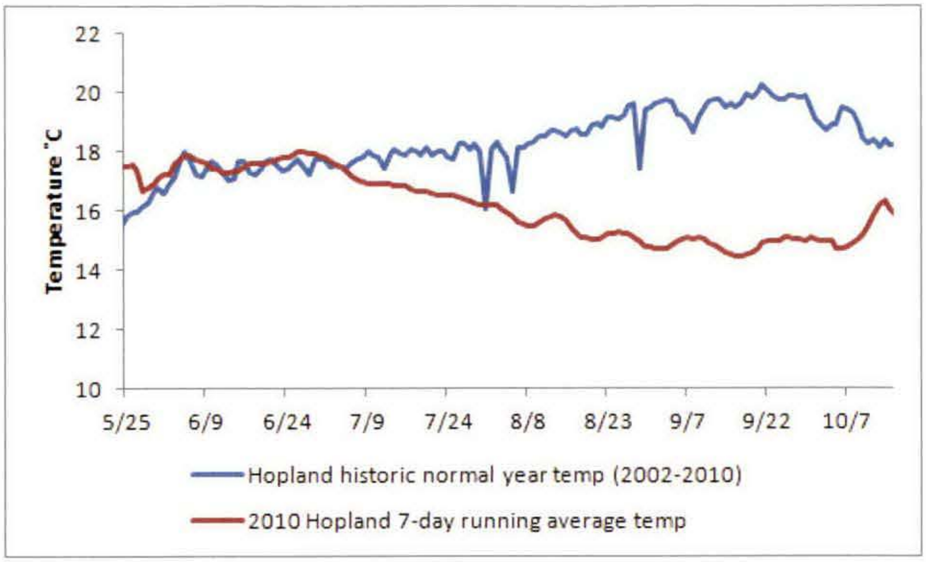

Figure 4-9. The 7 day running average of the daily maximum water temperature in 2010 and the historic daily maximum water temperature (the average of the daily maximum water temperature from D1610 normal water years (2002, 2003, 2005, 2006, 2008).

Coho

Adult coho were observed in the Russian River during the Order, but in low numbers. During the period of the Order, water temperatures observed in the Russian River were generally below the temperatures that would block upstream migration or cause mortality. While all adult coho observed at Mirabel must pass Hacienda, it is important to note that coho do not spawn in all tributaries to the Russian River and many of the coho may never have been exposed to the water temperatures at Diggers Bend, Jimtown, Cloverdale, or Hopland. In 2010 the only Russian River tributary upstream of the confluence of the Russian River and Dry Creek that coho were known to inhabit was Redwood Creek in the Maacama Creek watershed (Obedzinski 2012). It is likely that once coho passed Hacienda and Mirabel many coho entered the Dry Creek watershed, which has much cooler water temperatures than the mainstem Russian River.

Coho smolts use the mainstem Russian River as migratory habitat and were in the river during the beginning portion of the Order. Occasionally the daily maximum water temperature was warmer than the water temperature where 50 % of the population will perish if exposed to this temperature for an unlimited period of time regulated by the Order. However, the daily minimum water was always below this level. Therefore coho smolts were only exposed to these temperatures for a portion of each day. Therefore, coho smolts had temporal thermal refuge during a portion of each day which would help protect them from mortality related to chronic exposure to warm water temperatures.

Steelhead

Adult steelhead were observed in the Russian River during the time period that the Order was in effect. However, it is important to note that only a few individual adult steelhead were detected during the Order and that the bulk of the adult steelhead migration occurs later in the year from December through April when water temperatures are cooler. The water temperatures during the portion of the order that steelhead adults were observed in the Russian River were below the daily maximums and similar to the MWMTs listed in the literature as upper limits for adult steelhead.

Steelhead parr are known to rear throughout the summer in a section of the upper Russian River near Ukiah and Hopland. During this time the water temperatures in this section of river were below the upper lethal limit. Water temperatures in this section of the river are influenced by the temperature of water released from the Coyote Valley Dam. The flow regime outlined by the Order may have preserved the cold water pool in Lake Mendocino later into the year than under D1610 releases (Figure 4-9). Juvenile steelhead that reared between Ukiah and Hopland may have benefited from the releases remaining cooler later into the year.

Steelhead smolts were present in the Russian River during the time period that the Order was in effect, although probably in low numbers. Summarizing the effect of these temperatures on steelhead smolts is not practical as there is little information on the specific temperature requirements of steelhead smolts in the literature.

Chinook

Chinook are found in the Russian River at all life stages, but only the adult and smolt life stages were present during the time period in which the Order was in effect. Chinook adults were present in the Russian River during the latter portion of the time span regulated by the Order. Water temperatures where generally favorable for adult Chinook in 2010, although there were periods of time in some sections of the river where the daily maximum water temperature was above the threshold that can block upstream migration. However the daily minimum water temperatures were always below the threshold that can block upstream migration so it is likely that Chinook adults could migrate in these sections of the river during the cooler parts of the day.

Chinook smolts are present in the Russian River during the early part of the Order and migrate to the sea in water temperatures that occur during the late spring and early summer. During this time the daily maximum water temperatures at 4 of the 5 sites where water temperature data was collected was often above the temperature that is reported to block the Chinook smolt migration, but daily minimum water temperatures were rarely above this threshold. Two sites (Jimtown and Diggers Bend) had daily maximum water temperatures that were above the water temperature where Chinook smolts will perish if exposed to this temperature for a long period of time. However these warm water temperatures did not occur for long periods of time and the daily minimum water temperature was always below this threshold. Therefore Chinook smolts were not continuously exposed to these high temperatures. Chinook smolts had temporal thermal refuge during a portion of each day which would help protect them from mortality related to chronic exposure to high water temperatures.

Dissolved oxygen

Only one site where dissolved oxygen data was collected had daily minimum dissolved oxygen levels that were below the standards for salmonids outlined in the literature. While this site had daily minimum dissolved oxygen levels that were below the standards for salmonids during much of the Order not all life stages or all species occupy this section of the river. Furthermore the daily maximum dissolved oxygen levels were always above the standards for salmonids outlined in the literature.

Therefore, if there were salmonids occupying this section of the river during the period of depressed dissolved oxygen levels they likely had some temporal refugia from these conditions.

Daily minimum and maximum dissolved oxygen levels where published by the USGS, but hourly dissolved oxygen levels would allow for more in depth analysis. The Water Agency may summarize hourly dissolved oxygen measurements in future reports. This would be particularly useful at Jimtown where dissolved oxygen levels were often below 7 mg/l during a portion of the day. Hourly measurements may answer some of the questions about the duration of these depressed dissolved oxygen events.

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Appendix A

2010 USGS Water Quality Results

Table 15. Discharge measurements and water-quality data collected from 10 Russian River sites, Mark West Creek, and 3 groundwater sites in the Russian River Basin, Mendocino and Sonoma Counties, California, 2010.

[Number below the constituent or property is the U.S. Geological Survey (USGS) parameter code, which is a 5-digit number used in the USGS National Water Information System (NWIS), to uniquely identify a specific constituent or property. **Abbreviations**: no., number; AHTN, acetyl hexamethyl tetrahydronaphthalene, HHCB, hexahydrohexamethyl cyclopentabenzopyran; DEET, *N,N*-diethyl-meta-toluamide, ft^3/s, cubic feet per second; FNU, formazine nephelometric units; NTU, nephelometric turbidity units; Hg, mercury; mm, millimeter, µS/cm, microsiemens per centimeter; °C, degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter; <, actual value less than value shown; E, estimated value; –, no data]

Map site no.	USGS station no.	Station name	Date	Time	Discharge, inst. (ft^3/s) (00061)	Turbidity, IR LED (FNU) (63680)	Barometric pressure, (mm of Hg) (00025)	Dissolved oxygen, (mg/L as O_2) (00300)	Dissolved oxygen, (percent saturation) (00301)	pH, field (standard units) (00400)	Specific conductance, field (µS/cm) (00095)
2	11462500	Russian River near Hopland	06/14/2010	13:00	221 [b]	14	750	10.1	105	7.7	212
			08/23/2010	11:30	–	6.6	–	9.9	–	7.8	189
3	11463000	Russian River near Cloverdale	06/14/2010	15:30	271	6.8	754	12.3	136	8.6	234
			08/23/2010	15:00	144 [b]	4.9	–	11.0	–	8.4	204
4	11463980	Russian River at Digger Bend near Healdsburg	06/15/2010	09:30	360 [b]	2.2	760	8.1	89	8.0	297
			08/24/2010	09:00	132 [b]	0.7	–	7.8	–	8.1	272
6	383132122514901	Russian River at River Front Park	06/15/2010	13:30	502	2.1	761	9.0	101	8.0	279
			08/24/2010	13:00	218	0.9	–	9.4	–	8.1	246
7	11465400	Russian River at Wohler Bridge	06/16/2010	08:00	([a])	2.9	762	8.2	88	7.9	277
			08/25/2010	09:00	([a])	1.5	–	7.9	–	7.9	248
8	382959122535601	Russian River at Steelhead Beach	06/16/2010	13:30	410	3.6	763	9.1	101	8.0	289
			08/25/2010	13:00	124	1.3	–	9.7	–	8.3	256
9	11467000	Russian River near Guerneville	06/17/2010	10:00	385 [b]	3.2	762	7.8	86	7.9	288
			08/26/2010	09:00	103 [b]	2.9	–	7.4	–	7.8	255
11	11467002	Russian River at Johnson's Beach	06/17/2010	11:30	([a])	1.9	763	8.1	90	7.9	290
			08/26/2010	12:00	([a])	3.4	–	8.8	–	8.2	255
			10/14/2010	12:30	623	2.1	768	9.3	100	7.3	147
13	382757123003801	Russian River at Monte Rio	06/17/2010	14:00	419	1.7	763	9.2	106	8.1	291
			08/26/2010	13:30	113	3.1	–	8.7	–	8.0	259
14	382754123030501	Russian River at Casini Ranch	06/18/2010	09:30	–	1.8	761	8.2	92	8.0	292
			08/27/2010	09:30	–	1.5	–	7.3	–	7.9	259
22	11466800	Mark West Creek near Mirabel Heights	06/16/2010	10:30	27	6.1	774	6.2	65	7.7	452
			08/25/2010	10:30	3 [b]	5.8	–	6.1	–	7.8	572
26	383002122530601	8N/9W-32C1	06/16/2010	17:30	–	0.2	762	1.2	–	7.5	253
			08/25/2010	19:00	–	0.1	–	2.7	–	7.5	261
30	383045122525701	8N/9W-29F1	06/16/2010	16:30	–	0.3	761	6.5	–	7.4	270
			08/25/2010	17:30	–	0.3	–	1.3	–	7.6	262
33	383132122514501	8N/9W-21F1	06/15/2010	17:30	–	0.6	–	3.4	–	6.7	507
			08/24/2010	15:00	–	0.5	–	3.0	–	6.7	505

Table 15. Discharge measurements and water-quality data collected from 10 Russian River sites, Mark West Creek, and 3 groundwater sites in the Russian River Basin, Mendocino and Sonoma Counties, California, 2010.–Continued

[[Number below the constituent or property is the U.S. Geological Survey (USGS) parameter code, which is a 5-digit number used in the USGS National Water Information System (NWIS), to uniquely identify a specific constituent or property. **Abbreviations**: no., number; AHTN, acetyl hexamethyl tetrahydronaphthalene; HHCB, hexahydrohexamethyl cyclopentabenzopyran; DEET, *N,N*-diethyl-meta-toluamide; ft^3/s, cubic feet per second; FNU, formazine nephelometric units; NTU, nephelometric turbidity units; Hg, mercury; mm, millimeter, µS/cm, microsiemens per centimeter; °C, degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter; <, actual value less than value shown; E, estimated value, –, no data]

Map site no.	USGS station no.	Station name	Date	Time	Temperature, water (°C) (00010)	Calcium, dissolved (mg/L as Ca) (00915)	Magnesium, dissolved (mg/L as Mg) (00925)	Potassium, dissolved (mg/L as K) (00935)	Sodium, dissolved (mg/L as Na) (00930)	Acid neutralizing capacity, lab (mg/L as $CaCO_3$) (90410)	Bromide, dissolved (mg/L as Br) (71870)
2	11462500	Russian River near Hopland	06/14/2010	13:00	16.6	20.8	9.38	1.11	9.06	90	E0.01
			08/23/2010	11:30	14.6	18.5	8.35	1 05	7.00	84	E0.01
3	11463000	Russian River near Cloverdale	06/14/2010	15:30	19.7	22.4	11.6	1.14	9.39	103	E0.02
			08/23/2010	15:00	18.8	19.3	9 41	99	7.43	92	E0.01
4	11463980	Russian River at Digger Bend near Healdsburg	06/15/2010	09:30	19.9	28.5	16.1	1.17	9.55	132	E0.02
			08/24/2010	09:00	20.7	26.1	14 3	1 05	8.72	126	0.03
6	383132122514901	Russian River at River Front Park	06/15/2010	13:30	20.7	26.5	15.3	1.16	10.0	122	0.02
			08/24/2010	13:00	21.7	22.5	12.7	97	8.87	109	0.02
7	11465400	Russian River at Wohler Bridge	06/16/2010	08:00	18.5	25.4	14.7	1.03	9.28	122	0.03
			08/25/2010	09:00	21.2	22.6	12.9	1.00	9.25	110	0.02
8	382959122535601	Russian River at Steelhead Beach	06/16/2010	13:30	20.4	26.1	15.5	1.24	10.3	126	0.03
			08/25/2010	13:00	23.7	21 9	12.8	1.00	9.93	112	0.03
9	11467000	Russian River near Guerneville	06/17/2010	10:00	19.6	26.4	15.7	1.24	10.6	126	0.03
			08/26/2010	09:00	21.1	22.3	13.6	1.04	9.20	114	0.03
11	11467002	Russian River at Johnson's Beach	06/17/2010	11:30	20.8	26.9	15.9	1.31	10.8	126	0.03
			08/26/2010	12:00	22 6	23.8	14.0	1.09	9.44	115	0.03
			10/14/2010	12:30	19.1	20.6	11.1	1.05	7.95	97	–
13	382757123003801	Russian River at Monte Rio	06/17/2010	14:00	22.2	25.5	15.2	1.24	10.5	127	0.03
			08/26/2010	13:30	23.3	23.1	14.2	1.12	9.00	116	0.03
14	382754123030501	Russian River at Casini Ranch	06/18/2010	09:30	21 0	26.7	16.2	1.30	10.9	128	0.03
			08/27/2010	09:30	21.3	23.2	14.5	1.20	9.70	117	0.03
22	11466800	Mark West Creek near Mirabel Heights	06/16/2010	10:30	18.9	33.2	24.1	3.08	27.4	188	0 09
			08/25/2010	10:30	19.1	39 5	31.2	3 18	38.1	250	0.12
26	383002122530601	8N/9W-32C1	06/16/2010	17:30	15.2	23.4	13 4	0.94	8.6	113	0.03
			08/25/2010	19:00	17 2	25.2	13 7	1 00	8 9	120	0.03
30	383045122525701	8N/9W-29F1	06/16/2010	16:30	20 5	24.8	14.0	1.18	9.2	117	0.03
			08/25/2010	17:30	20.4	25.4	13 9	1 10	8.9	120	0.04
33	383132122514501	8N/9W-21F1	06/15/2010	17:30	16.0	47.3	36.2	1.35	7.44	214	0.03
			08/24/2010	15:00	16.7	46.7	35.2	1 28	7.30	217	0.03

Table 15. Discharge measurements and water-quality data collected from 10 Russian River sites, Mark West Creek, and 3 groundwater sites in the Russian River Basin, Mendocino and Sonoma Counties, California, 2010.–Continued

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Map site no.	USGS station no.	Station name	Date	Time	Chloride, dissolved (mg/L as Cl) (00940)	Fluoride, dissolved (mg/L as F) (00950)	Silica, dissolved (mg/L as SiO_2) (00955)	Sulfate, dissolved (mg/L as SO_4) (00945)	Solids, residue at 180°C dissolved (mg/L) (70300)	Nitrogen, ammonia, dissolved (mg/L as N) (00608)	Nitrogen, ammonia +organic, dissolved (mg/L as N) (00623)
2	11462500	Russian River near Hopland	06/14/2010	13:00	5.36	0.09	12.2	10.1	136	0.388	1.3
			08/23/2010	11:30	3 97	E0.08	11 3	8.47	112	<0.020	0.18
3	11463000	Russian River near Cloverdale	06/14/2010	15:30	5 59	0 11	11 8	11 3	132	<0 020	0.22
			08/23/2010	15:00	4.38	0.08	9.79	9.07	120	<0.020	0.19
4	11463980	Russian River at Digger Bend near Healdsburg	06/15/2010	09:30	5.67	0.10	12.4	15 9	176	E0.014	0.14
			08/24/2010	09:00	5.52	0.09	11.5	13.9	144	<0.020	0.12
6	383132122514901	Russian River at River Front Park	06/15/2010	13:30	6.71	0 10	13 1	14 8	161	E0.014	0.17
			08/24/2010	13:00	6.19	0.09	12.9	12.4	135	<0.020	0.12
7	11465400	Russian River at Wohler Bridge	06/16/2010	08:00	5 81	0.11	13.3	14.9	160	E0.015	0.12
			08/25/2010	09:00	6.67	0.10	13.1	12.4	141	<0.020	0.13
8	382959122535601	Russian River at Steelhead Beach	06/16/2010	13:30	6.90	0.10	14.1	15 0	164	E0.017	0.16
			08/25/2010	13:00	8.06	0.09	13.2	12.5	141	<0.020	0.23
9	11467000	Russian River near Guerneville	06/17/2010	10:00	7 02	0.10	14.4	15.2	171	0.021	0 16
			08/26/2010	09:00	6.97	0.10	13.7	12.6	147	<0.020	0.10
11	11467002	Russian River at Johnson's Beach	06/17/2010	11:30	7.12	0 10	14 0	14.9	153	0.020	0.15
			08/26/2010	12:00	6.22	0.11	14.1	12.7	154	0.028	0.10
			10/14/2010	12:30	5 01	0.11	12.7	10.9	133	<0 01	0.13
13	382757123003801	Russian River at Monte Rio	06/17/2010	14:00	7.32	0.12	13.9	14 9	166	E0.016	0 17
			08/26/2010	13:30	6.48	0.01	14.5	12 6	–	<0.020	0.11
14	382754123030501	Russian River at Casini Ranch	06/18/2010	09:30	7.28	0.11	14.2	14.7	166	0.027	0.20
			08/27/2010	09:30	6.83	0 10	15.1	12.5	161	<0.020	0 11
22	11466800	Mark West Creek near Mirabel Heights	06/16/2010	10:30	22.9	0.12	28.8	15.4	288	0.047	0.41
			08/25/2010	10:30	32.2	0.15	33.3	17.5	359	0.037	0.33
26	383002122530601	8N/9W-32C1	06/16/2010	17:30	5.78	0.09	12 80	11.80	132	<0.020	E0.05
			08/25/2010	19:00	5.74	0.10	13.90	13.60	148	<0.020	<0 10
30	383045122525701	8N/9W-29F1	06/16/2010	16:30	5 99	0.11	14 10	15 00	176	<0.020	E0.06
			08/25/2010	17:30	5 65	0.13	14.20	12.50	147	<0 020	E0 05
33	383132122514501	8N/9W-21F1	06/15/2010	17.30	5.98	E0.07	23.0	47.9	303	<0.020	E0.07
			08/24/2010	15:00	6 15	E0.07	22.7	51.3	291	<0.020	<0.10

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Map site no.	USGS station no.	Station name	Date	Time	Nitrogen, ammonia + organic, total (mg/L as N) (00625)	Nitrogen, NO_2+NO_3, dissolved (mg/L as N) (00631)	Nitrogen, nitrite, dissolved (mg/L as N) (00613)	Phosphorous, dissolved (mg/L as P) (00666)	Phosphorus, ortho-phosphate, dissolved (mg/L as P) (00671)	Phosphorous, total (mg/L as P) (00665)	Carbon, organic, dissolved (mg/L as C) (00681)
2	11462500	Russian River near Hopland	06/14/2010	13:00	0.27	0.41	0.005	0.028	E0.004	0.083	2.4
			08/23/2010	11:30	0.23	0.24	0.006	0.054	0.050	0.069	2.7
3	11463000	Russian River near Cloverdale	06/14/2010	15:30	0.19	0.28	0.005	0.038	0.038	0.053	2.2
			08/23/2010	15:00	0.25	0.11	0.002	0.032	0.028	0.049	2.5
4	11463980	Russian River at Digger Bend near Healdsburg	06/15/2010	09:30	0.15	0.12	0.003	0.009	0.011	0.018	1.8
			08/24/2010	09:00	0.17	<0.04	<0.002	E0.004	0.009	0.010	1.7
6	383132122514901	Russian River at River Front Park	06/15/2010	13:30	0.16	0.11	0.002	0.009	0.012	0.017	1.7
			08/24/2010	13:00	0.15	<0.04	<0.002	0.007	0.010	0.013	1.6
7	11465400	Russian River at Wohler Bridge	06/16/2010	08:00	0.14	0.12	E0.004	0.009	0.013	0.017	1.8
			08/25/2010	09:00	0.12	<0.04	<0.002	0.006	0.011	0.014	1.5
8	382959122535601	Russian River at Steelhead Beach	06/16/2010	13:30	0.15	0.12	0.003	0.034	0.035	0.048	1.9
			08/25/2010	13:00	0.12	<0.04	<0.002	0.013	0.016	0.023	1.5
9	11467000	Russian River near Guerneville	06/17/2010	10:00	0.17	0.13	0.003	0.035	0.036	0.050	1.7
			08/26/2010	09:00	0.13	<0.04	<0.002	0.014	0.017	0.025	1.6
11	11467002	Russian River at Johnson's Beach	06/17/2010	11:30	0.14	0.09	0.003	0.035	0.038	0.048	–
			08/26/2010	12:00	0.15	<0.04	<0.002	0.016	0.018	0.025	1.6
			10/14/2010	12:30	0.20	<0.02	<0.001	00.02	0.02	0.04	2.1
13	382757123003801	Russian River at Monte Rio	06/17/2010	14:00	0.15	0.06	0.003	0.035	0.037	0.046	1.8
			08/26/2010	13:30	0.14	<0.04	<0.002	0.020	0.021	0.029	1.6
14	382754123030501	Russian River at Casini Ranch	06/18/2010	09:30	0.27	0.06	0.003	0.037	0.037	0.048	1.8
			08/27/2010	09:30	0.19	<0.04	<0.002	0.026	0.026	0.034	1.7
22	11466800	Mark West Creek near Mirabel Heights	06/16/2010	10:30	0.53	0.07	0.006	0.410	0.413	0.513	4.9
			08/25/2010	10:30	0.37	0.08	0.004	0.332	0.310	0.379	3.9
26	383002122530601	8N/9W-32C1	06/16/2010	17:30	–	0.11	<0.002	<0.04	0.021	–	0.7
			08/25/2010	19:00	–	0.15	<0.002	<0.04	0.023	–	E0.4
30	383045122525701	8N/9W-29F1	06/16/2010	16:30	–	0.13	<0.002	E0.03	0.043	–	1.0
			08/25/2010	17:30	–	0.06	<0.002	0.05	0.043	–	E0.6
33	383132122514501	8N/9W-21F1	06/15/2010	17:30	–	1.11	E0.001	<0.04	0.023	–	0.7
			08/24/2010	15:00	–	0.99	<0.002	<0.04	0.020	–	E0.5

Table 15. Discharge measurements and water-quality data collected from 10 Russian River sites, Mark West Creek, and 3 groundwater sites in the Russian River Basin, Mendocino and Sonoma Counties, California, 2010.–Continued

[Number below the constituent or property is the U.S. Geological Survey (USGS) parameter code, which is a 5-digit number used in the USGS National Water Information System (NWIS), to uniquely identify a specific constituent or property. **Abbreviations** no., number; AHTN, acetyl hexamethyl tetrahydronaphthalene; HHCB, hexahydrohexamethyl cyclopentabenzopyran; DEET, *N,N*-diethyl-meta-toluamide; ft^3/s, cubic feet per second; FNU, formazine nephelometric units; NTU, nephelometric turbidity units; Hg, mercury; mm, millimeter; µS/cm, microsiemens per centimeter; °C, degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter; <, actual value less than value shown; E, estimated value, –, no data]

Map site no.	USGS station no.	Station name	Date	Time	Carbon, organic, total (mg/L as C) (00680)	Aluminum, dissolved (µg/L as Al) (01106)	Antimony, dissolved (µg/L as An) (01095)	Arsenic, dissolved (µg/L as As) (01000)	Barium, dissolved (µg/L as Ba) (01005)	Beryllium, dissolved (µg/L as Be) (01010)	Boron, dissolved (µg/L as B) (01020)
2	11462500	Russian River near Hopland	06/14/2010	13:00	2 8	15.7	0.21	0.75	61	<0.01	251
			08/23/2010	11:30	2.4	25 4	0.20	0 89	52	<0 01	215
3	11463000	Russian River near Cloverdale	06/14/2010	15:30	–	9.1	0.08	0.68	68	E0.01	324
			08/23/2010	15:00	3.0	11.0	0.14	0 81	63	<0 01	306
4	11463980	Russian River at Digger Bend near Healdsburg	06/15/2010	09:30	–	3.8	0.13	0.70	92	E0.01	332
			08/24/2010	09:00	2.2	<3.4	0.18	0.62	90	<0 01	340
6	383132122514901	Russian River at River Front Park	06/15/2010	13:30	1.9	4.0	0.10	0.72	80	<0.01	258
			08/24/2010	13:00	1.9	3.5	0.09	0.55	73	<0.01	238
7	11465400	Russian River at Wohler Bridge	06/16/2010	08:00	1.7	3.8	0.10	0.61	81	<0.01	258
			08/25/2010	09:00	2.0	E2.5	0.15	0.61	74	<0.01	241
8	382959122535601	Russian River at Steelhead Beach	06/16/2010	13:30	1.9	4.7	0.10	0.72	81	<0.01	284
			08/25/2010	13:00	2.1	7.0	0.13	0.61	71	<0.01	227
9	11467000	Russian River near Guerneville	06/17/2010	10:00	1.9	E3.0	0.09	0.75	80	E0.01	256
			08/26/2010	09:00	2.1	E2 1	0.13	0.63	74	<0.01	231
11	11467002	Russian River at Johnson's Beach	06/17/2010	11:30	2.1	E3.0	0.11	0.82	79	<0.01	267
			08/26/2010	12:00	2.1	E2.3	0.13	0.72	69	<0.01	241
			10/14/2010	12:30	3.2	3.9	0.18	0.86	63	<0.01	216
13	382757123003801	Russian River at Monte Rio	06/17/2010	14:00	2.0	E2.0	0 11	0.91	78	<0.01	261
			08/26/2010	13:30	1.8	E2.5	0.15	0.87	73	<0.01	228
14	382754123030501	Russian River at Casini Ranch	06/18/2010	09:30	2.0	E2.9	0.11	0.94	78	<0.01	260
			08/27/2010	09:30	1.9	10.3	0.18	0.97	74	<0.01	229
22	11466800	Mark West Creek near Mirabel Heights	06/16/2010	10:30	5.7	5.3	0.23	2 3	60	<0 01	152
			08/25/2010	10:30	4.9	E2.5	0.12	2.1	86	<0 01	195
26	383002122530601	8N/9W-32C1	06/16/2010	17:30	–	–	–	–	–	–	–
			08/25/2010	19:00	–	–	–	–	–	–	–
30	383045122525701	8N/9W-29F1	06/16/2010	16:30	–	–	–	–	–	–	–
			08/25/2010	17:30	–	–	–	–	–	–	–
33	383132122514501	8N/9W-21F1	06/15/2010	17:30	–	–	–	–	–	–	–
			08/24/2010	15:00	–	–	–	–	–	–	–

Table 15. Discharge measurements and water-quality data collected from 10 Russian River sites, Mark West Creek, and 3 groundwater sites in the Russian River Basin, Mendocino and Sonoma Counties, California, 2010.—Continued

[Number below the constituent or property is the U.S. Geological Survey (USGS) parameter code, which is a 5-digit number used in the USGS National Water Information System (NWIS), to uniquely identify a specific constituent or property. **Abbreviations**: no., number; AHTN, acetyl hexamethyl tetrahydronaphthalene; HHCB, hexahydrohexamethyl cyclopentabenzopyran; DEET, *N,N*-diethyl-meta-toluamide, ft^3/s, cubic feet per second; FNU, formazine nephelometric units; NTU, nephelometric turbidity units; Hg, mercury; mm, millimeter; µS/cm, microsiemens per centimeter; °C, degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter; <, actual value less than value shown; E, estimated value; –, no data]

Map site no.	USGS station no.	Station name	Date	Time	Cadmium, dissolved (µg/L as Cd) (01025)	Chromium, dissolved (µg/L as Cr) (01030)	Cobalt, dissolved (µg/L as Co) (01035)	Copper, dissolved (µg/L as Cu) (01040)	Iron, dissolved (µg/L as Fe) (01046)	Lead, dissolved (µg/L as Pb) (01049)	Lithium, dissolved (µg/L as Li) (01130)
2	11462500	Russian River near Hopland	06/14/2010	13:00	<0.02	0.31	2.4	1.2	28	0.04	2.4
			08/23/2010	11:30	<0.02	0.28	1.2	2.2	42	0.03	2.1
3	11463000	Russian River near Cloverdale	06/14/2010	15:30	<0.02	0.29	0.37	E0.80	18	E0.02	2.7
			08/23/2010	15:00	<0.02	0.21	0.60	2.2	22	E0.02	2.3
4	11463980	Russian River at Digger Bend near Healdsburg	06/15/2010	09:30	<0.02	0.44	0.26	E0.92	E6	E0.02	2.6
			08/24/2010	09:00	<0.02	0.24	0.73	E0.88	8	<0.03	3.0
6	383132122514901	Russian River at River Front Park	06/15/2010	13:30	<0.02	0.44	0.19	1.2	9	<0.03	2.7
			08/24/2010	13:00	<0.02	0.36	0.15	1.8	19	E0.02	2.3
7	11465400	Russian River at Wohler Bridge	06/16/2010	08:00	<0.02	0.41	0.15	E0.72	13	0.03	2.7
			08/25/2010	09:00	<0.02	0.28	0.63	E0.98	12	<0.03	2.3
8	382959122535601	Russian River at Steelhead Beach	06/16/2010	13:30	<0.02	0.42	0.13	E0.97	12	E0.02	3.2
			08/25/2010	13:00	<0.02	0.25	0.24	1.4	11	<0.03	2.3
9	11467000	Russian River near Guerneville	06/17/2010	10:00	<0.02	0.41	0.13	E0.91	10	E0.02	2.9
			08/26/2010	09:00	<0.02	0.26	0.39	E0.80	11	E0.02	2.4
11	11467002	Russian River at Johnson's Beach	06/17/2010	11:30	<0.02	0.43	0.15	E0.54	9	<0.03	2.5
			08/26/2010	12:00	<0.02	0.24	0.42	E0.78	7	<0.03	2.4
			10/14/2010	12:30	<0.02	0.19	1.0	1.2	17	<0.01	1.9
13	382757123003801	Russian River at Monte Rio	06/17/2010	14:00	<0.02	0.37	0.26	E0.81	7	<0.03	2.4
			08/26/2010	13:30	<0.02	0.21	0.58	1.5	12	E0.02	2.3
14	382754123030501	Russian River at Casini Ranch	06/18/2010	09:30	<0.02	0.33	0.18	E0.53	10	E0.02	2.4
			08/27/2010	09:30	<0.02	0.26	0.49	1.2	10	<0.03	2.4
22	11466800	Mark West Creek near Mirabel Heights	06/16/2010	10:30	<0.02	0.24	2.7	E0.95	44	0.04	6.1
			08/25/2010	10:30	<0.02	E0.10	0.31	1.2	18	<0.03	7.9
26	383002122530601	8N/9W-32C1	06/16/2010	17:30	–	–	–	–	<6	–	–
			08/25/2010	19:00	–	–	–	–	<6	–	–
30	383045122525701	8N/9W-29F1	06/16/2010	16:30	–	–	–	–	<6	–	–
			08/25/2010	17:30	–	–	–	–	<6	–	–
33	383132122514501	8N/9W-21F1	06/15/2010	17:30	–	–	–	–	<6	–	–
			08/24/2010	15:00	–	–	–	–	E4	–	–

Table 15. Discharge measurements and water-quality data collected from 10 Russian River sites, Mark West Creek, and 3 groundwater sites in the Russian River Basin, Mendocino and Sonoma Counties, California, 2010.—Continued

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Map site no.	USGS station no.	Station name	Date	Time	Manganese, dissolved (µg/L as Mn) (01056)	Mercury, dissolved (µg/L as Hg) (71890)	Molybdenum, dissolved (µg/L as Mo) (01060)	Nickel, dissolved (µg/L as Ni) (01065)	Selenium, dissolved (µg/L as Se) (01145)	Silver, dissolved (µg/L as Ag) (01075)	Strontium, dissolved (µg/L as Sr) (01080)
2	11462500	Russian River near Hopland	06/14/2010	13:00	13.8	<0.010	0.3	1.8	0.08	<0.010	196
			08/23/2010	11:30	7.8	<0.010	0 3	1 6	0 09	<0.010	184
3	11463000	Russian River near Cloverdale	06/14/2010	15:30	4.4	<0.010	0.3	1.5	0.09	<0.010	221
			08/23/2010	15:00	4.4	<0.010	0 3	1 4	0.07	<0.010	193
4	11463980	Russian River at Digger Bend near Healdsburg	06/15/2010	09:30	3.6	<0.010	0.4	2 0	0.10	<0.010	272
			08/24/2010	09:00	3.4	<0.010	0.4	1 5	0.07	<0.010	248
6	383132122514901	Russian River at River Front Park	06/15/2010	13:30	7.6	<0.010	0.4	1.7	0.09	<0.010	237
			08/24/2010	13:00	7.3	<0.010	0.4	1.4	0.06	<0.010	203
7	11465400	Russian River at Wohler Bridge	06/16/2010	08:00	6.3	<0.010	0.4	1.7	0.08	<0.010	241
			08/25/2010	09:00	5.5	<0.010	0.4	1.4	0.07	<0.010	203
8	382959122535601	Russian River at Steelhead Beach	06/16/2010	13:30	14.0	<0.010	0.4	1.7	0.06	<0.010	241
			08/25/2010	13:00	5.4	<0.010	0.4	1.3	0.06	<0.010	198
9	11467000	Russian River near Guerneville	06/17/2010	10:00	8.8	<0.010	0.4	1.8	0.06	<0.010	235
			08/26/2010	09:00	9.8	<0.010	0.4	1.4	0.06	<0.010	206
11	11467002	Russian River at Johnson's Beach	06/17/2010	11:30	2.1	<0.010	0.4	2.0	0.08	<0.010	239
			08/26/2010	12:00	3.8	<0.010	0.4	1.4	0.06	<0.010	205
			10/14/2010	12:30	5.5	–	0.3	1.5	0.06	<0.005	198
13	382757123003801	Russian River at Monte Rio	06/17/2010	14:00	5.7	<0.010	0.4	2.0	0.06	<0.010	238
			08/26/2010	13:30	13.2	<0.010	0.4	1.6	0.07	<0.010	207
14	382754123030501	Russian River at Casini Ranch	06/18/2010	09:30	7.6	<0.010	0.4	2.0	0.08	<0.010	236
			08/27/2010	09:30	21.5	<0.010	0.4	1.6	0.07	<0.010	208
22	11466800	Mark West Creek near Mirabel Heights	06/16/2010	10:30	208	<0 010	0.6	3.5	0.12	<0.010	192
			08/25/2010	10.30	241	<0.010	0 8	3.2	0.08	<0.010	232
26	383002122530601	8N/9W-32C1	06/16/2010	17:30	E0.2	–	–	–	–	–	–
			08/25/2010	19:00	0.2	–	–	–	–	–	–
30	383045122525701	8N/9W-29F1	06/16/2010	16:30	0.2	–	–	–	–	–	–
			08/25/2010	17:30	0.2	–	–	–	–	–	–
33	383132122514501	8N/9W-21F1	06/15/2010	17:30	0.2	–	–	–	–	–	–
			08/24/2010	15:00	0.3	–	–	–	–	–	–

Table 15. Discharge measurements and water-quality data collected from 10 Russian River sites, Mark West Creek, and 3 groundwater sites in the Russian River Basin, Mendocino and Sonoma Counties, California, 2010.—Continued

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Map site no.	USGS station no.	Station name	Date	Time	Thallium, dissolved (µg/L as Tl) (01057)	Vanadium, dissolved (µg/L as V) (01085)	Zinc, dissolved (µg/L as Zn) (01090)	1,4-Dichlorobenzene, dissolved (µg/L) (34572)	1-Methylnaphthalene, dissolved (µg/L) (62054)	2, 6-Dimethylnaphthalene, dissolved (µg/L) (62055)	2-Methylnaphthalene, dissolved (µg/L) (62056)
2	11462500	Russian River near Hopland	06/14/2010	13:00	<0.02	0.86	<2.8	<0.040	<0.022	<0.1	<0.036
			08/23/2010	11:30	<0.02	0.77	<2.8	<0.040	<0.022	<0.1	<0.036
3	11463000	Russian River near Cloverdale	06/14/2010	15:30	<0.02	0.78	<2.8	<0.040	<0.022	<0.1	<0.036
			08/23/2010	15:00	<0.02	0.75	<2.8	<0.040	<0.022	<0.1	<0.036
4	11463980	Russian River at Digger Bend near Healdsburg	06/15/2010	09:30	<0.02	0.94	4.6	<0.040	<0.022	<0.1	<0.036
			08/24/2010	09:00	<0.02	0.88	<2.8	<0.040	<0.022	<0.1	<0.036
6	383132122514901	Russian River at River Front Park	06/15/2010	13:30	<0.02	0.98	<2.8	<0.040	<0.022	<0.1	<0.036
			08/24/2010	13:00	<0.02	0.88	<2.8	<0.040	<0.022	<0.1	<0.036
7	11465400	Russian River at Wohler Bridge	06/16/2010	08:00	<0.02	0.95	<2.8	<0.040	<0.022	<0.1	<0.036
			08/25/2010	09:00	<0.02	0.94	<2.8	<0.040	<0.022	<0.1	<0.036
8	382959122535601	Russian River at Steelhead Beach	06/16/2010	13:30	<0.02	1.1	<2.8	<0.040	<0.022	<0.1	<0.036
			08/25/2010	13:00	<0.02	0.99	<2.8	<0.040	<0.022	<0.1	<0.036
9	11467000	Russian River near Guerneville	06/17/2010	10:00	<0.02	1.0	<2.8	<0.040	<0.022	<0.1	<0.036
			08/26/2010	09:00	<0.02	1.0	<2.8	<0.040	<0.022	<0.1	<0.036
11	11467002	Russian River at Johnson's Beach	06/17/2010	11:30	E0.02	1.2	<2.8	<0.040	<0.022	<0.1	<0.036
			08/26/2010	12:00	<0.02	1.3	<2.8	<0.040	<0.022	<0.1	<0.036
			10/14/2010	12:30	<0.01	0.98	<1.4	<0.040	<0.022	<0.1	<0.036
13	382757123003801	Russian River at Monte Rio	06/17/2010	14:00	<0.02	1.1	<2.8	<0.040	<0.022	<0.1	<0.036
			08/26/2010	13:30	<0.02	1.4	<2.8	<0.040	<0.022	<0.1	<0.036
14	382754123030501	Russian River at Casini Ranch	06/18/2010	09:30	<0.02	1.2	<2.8	<0.040	<0.022	<0.1	<0.036
			08/27/2010	09:30	<0.02	1.4	<2.8	<0.040	<0.022	<0.1	<0.036
22	11466800	Mark West Creek near Mirabel Heights	06/16/2010	10:30	<0.02	2.6	E1.4	<0.040	<0.022	<0.1	<0.036
			08/25/2010	10:30	<0.02	2.7	<2.8	<0.040	<0.022	<0.1	<0.036
26	383002122530601	8N/9W-32C1	06/16/2010	17:30	–	–	–	<0.040	<0.022	<0.1	<0.036
			08/25/2010	19:00	–	–	–	<0.040	<0.022	<0.1	<0.036
30	383045122525701	8N/9W-29F1	06/16/2010	16:30	–	–	–	<0.040	<0.022	<0.1	<0.036
			08/25/2010	17:30	–	–	–	–	–	–	–
33	383132122514501	8N/9W-21F1	06/15/2010	17:30	–	–	–	<0.040	<0.022	<0.1	<0.036
			08/24/2010	15:00	–	–	–	<0.040	<0.022	<0.1	<0.036

Table 15. Discharge measurements and water-quality data collected from 10 Russian River sites, Mark West Creek, and three groundwater sites in the Russian River Basin, Mendocino and Sonoma Counties, California, 2010.—Continued

[Number below the constituent or property is the U.S. Geological Survey (USGS) parameter code, which is a 5-digit number used in the USGS National Water Information System (NWIS), to uniquely identify a specific constituent or property. **Abbreviations** no., number; AHTN, acetyl hexamethyl tetrahydronaphthalene; HHCB, hexahydrohexamethyl cyclopentabenzopyran; DEET, *N,N*-diethyl-meta-toluamide; ft^3/s, cubic feet per second; FNU, formazine nephelometric units; NTU, nephelometric turbidity units; Hg, mercury; mm, millimeter, µS/cm, microsiemens per centimeter; °C, degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter; <, actual value less than value shown; E, estimated value; –, no data]

Map site no.	USGS station no.	Station name	Date	Time	3-β-Coprostanol, dissolved (µg/L) (62057)	3-Methyl-1H-indole, dissolved (µg/L) (62058)	3-*tert*-Butyl-4-hydroxyanisole, dissolved (µg/L) (62059)	4-Cumylphenol, dissolved (µg/L) (62060)	4-n-Octylphenol, dissolved (µg/L) (62061)	4-Nonylphenol, dissolved (µg/L) (62085)	4-Nonylphenol diethoxylates dissolved (µg/L) (62083)
2	11462500	Russian River near Hopland	06/14/2010	13:00	<2	<0.036	<8	<0.06	<0.16	<2	<5
			08/23/2010	11:30	<2	<0.036	–	<0.06	<0.16	<2	<5
3	11463000	Russian River near Cloverdale	06/14/2010	15:30	<2	<0.036	<8	<0.06	<0.16	<2	<5
			08/23/2010	15:00	<2	<0.036	–	<0.06	<0.16	<2	<5
4	11463980	Russian River at Digger Bend near Healdsburg	06/15/2010	09:30	<2	<0.036	<8	<0.06	<0.16	<2	<5
			08/24/2010	09:00	<2	<0.036	–	<0.06	<0.16	<2	<5
6	383132122514901	Russian River at River Front Park	06/15/2010	13:30	<2	<0.036	<8	<0.06	<0.16	<2	<5
			08/24/2010	13:00	<2	<0.036	–	<0.06	<0.16	<2	<5
7	11465400	Russian River at Wohler Bridge	06/16/2010	08:00	<2	<0.036	<8	<0.06	<0.16	<2	<5
			08/25/2010	09:00	<2	<0.036	–	<0.06	<0.16	<2	<5
8	382959122535601	Russian River at Steelhead Beach	06/16/2010	13:30	<2	<0.036	<8	<0.06	<0.16	<2	<5
			08/25/2010	13:00	<2	<0.036	–	<0.06	<0.16	<2	<5
9	11467000	Russian River near Guerneville	06/17/2010	10:00	<2	<0.036	<8	<0.06	<0.16	<2	<5
			08/26/2010	09:00	<2	<0.036	–	<0.06	<0.16	<2	<5
11	11467002	Russian River at Johnson's Beach	06/17/2010	11:30	<2	<0.036	<8	<0.06	<0.16	<2	<5
			08/26/2010	12:00	<2	<0.036	–	<0.06	<0.16	<2	<5
			10/14/2010	12:30	<2	<0.036	–	<0.06	<0.16	<2	<5
13	382757123003801	Russian River at Monte Rio	06/17/2010	14:00	<2	<0.036	<8	<0.06	<0.16	<2	<5
			08/26/2010	13:30	<2	<0.036	–	<0.06	<0.16	<2	<5
14	382754123030501	Russian River at Casini Ranch	06/18/2010	09:30	<2	<0.036	<8	<0.06	<0.16	<2	<5
			08/27/2010	09:30	<2	<0.036	<8	<0.06	<0.16	<2	<5
22	11466800	Mark West Creek near Mirabel Heights	06/16/2010	10:30	<2	<0.036	<8	<0.06	<0.16	<2	<5
			08/25/2010	10:30	<2	<0.036	–	<0.06	<0.16	<2	<5
26	383002122530601	8N/9W-32C1	06/16/2010	17:30	<2	<0.036	<8	<0.06	<0.16	<2	<5
			08/25/2010	19:00	<2	<0.036	<8	<0.06	<0.16	<2	<5
30	383045122525701	8N/9W-29F1	06/16/2010	16:30	<2	<0.036	<8	<0.06	<0.16	<2	<5
			08/25/2010	17:30	–	–	–	–	–	–	–
33	383132122514501	8N/9W-21F1	06/15/2010	17:30	<2	<0.036	<8	<0.06	<0.16	<2	<5
			08/24/2010	15:00	<2	<0.036	–	<0.06	<0.16	<2	<5

Table 15. Discharge measurements and water-quality data collected from 10 Russian River sites, Mark West Creek, and 3 groundwater sites in the Russian River Basin, Mendocino and Sonoma Counties, California, 2010.—Continued

[[Number below the constituent or property is the U.S. Geological Survey (USGS) parameter code, which is a 5-digit number used in the USGS National Water Information System (NWIS), to uniquely identify a specific constituent or property. **Abbreviations** no., number; AHTN, acetyl hexamethyl tetrahydronaphthalene; HHCB, hexahydrohexamethyl cyclopentabenzopyran; DEET, *N,N*-diethyl-meta-toluamide; ft^3/s, cubic feet per second; FNU, formazine nephelometric units; NTU, nephelometric turbidity units; Hg, mercury, mm, millimeter; µS/cm, microsiemens per centimeter; °C, degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter; <, actual value less than value shown; E, estimated value; –, no data]

Map site no.	USGS station no.	Station name	Date	Time	4-Octyl-phenol di-ethoxylates dissolved (µg/L) (61705)	4-Octyl-phenol mono-ethoxylates dissolved (µg/L) (61706)	4-*tert*-Octyl-phenol, dissolved (µg/L) (62062)	5-Methyl-1H-benzo-triazole, dissolved (µg/L) (62063)	9,10-Anthra-quinone, dissolved (µg/L) (62066)	Aceto-phenone, dissolved (µg/L) (62064)	AHTN, dissolved (µg/L) (62065)
2	11462500	Russian River near Hopland	06/14/2010	13:00	<1	<1	<0 14	<1	<0.2	<0.4	<0.028
			08/23/2010	11:30	<1	<1	<0.14	<1	<0.2	<0 4	<0.028
3	11463000	Russian River near Cloverdale	06/14/2010	15:30	<1	<1	<0.14	<1	<0.2	<0.4	<0 028
			08/23/2010	15:00	<1	<1	<0.14	<1	<0.2	<0 4	<0 028
4	11463980	Russian River at Digger Bend near Healdsburg	06/15/2010	09:30	<1	<1	<0.14	<1	<0 2	<0.4	<0.028
			08/24/2010	09:00	<1	<1	<0.14	<1	<0 2	<0 4	<0.028
6	383132122514901	Russian River at River Front Park	06/15/2010	13:30	<1	<1	<0.14	<1	<0.2	<0.4	<0.028
			08/24/2010	13:00	<1	<1	<0.14	<1	<0 2	<0.4	<0.028
7	11465400	Russian River at Wohler Bridge	06/16/2010	08:00	<1	<1	<0.14	<1	<0.2	<0.4	<0.028
			08/25/2010	09:00	<1	<1	<0.14	<1	<0.2	<0.4	<0.028
8	382959122535601	Russian River at Steelhead Beach	06/16/2010	13:30	<1	<1	<0.14	<1	<0.2	<0.4	<0.028
			08/25/2010	13:00	<1	<1	<0.14	<1	<0.2	<0.4	<0.028
9	11467000	Russian River near Guerneville	06/17/2010	10:00	<1	<1	<0.14	<1	<0.2	<0.4	<0.028
			08/26/2010	09:00	<1	<1	<0.14	<1	<0.2	<0.4	<0.028
11	11467002	Russian River at Johnson's Beach	06/17/2010	11:30	<1	<1	<0.14	<1	<0.2	<0.4	<0.028
			08/26/2010	12:00	<1	<1	<0.14	<1	<0.2	<0.4	<0.028
			10/14/2010	12:30	<1	<1	<0.14	<1	<0.2	<0.4	<0.028
13	382757123003801	Russian River at Monte Rio	06/17/2010	14:00	<1	<1	<0.14	<1	<0.2	<0.4	<0.028
			08/26/2010	13:30	<1	<1	<0.14	<1	<0.2	<0.4	<0.028
14	382754123030501	Russian River at Casini Ranch	06/18/2010	09:30	<1	<1	<0.14	<1	<0.2	<0.4	<0.028
			08/27/2010	09:30	<1	<1	<0.14	<1	<0.2	<0.4	<0.028
22	11466800	Mark West Creek near Mirabel Heights	06/16/2010	10:30	<1	<1	<0.14	<1	<0.2	<0.4	<0.028
			08/25/2010	10:30	<1	<1	<0.14	<1	<0.2	<0.4	<0 028
26	383002122530601	8N/9W-32C1	06/16/2010	17:30	<1	<1	<0.14	<1	<0.2	<0.4	<0.028
			08/25/2010	19:00	<1	<1	<0.14	<1	<0.2	<0.4	<0.028
30	383045122525701	8N/9W-29F1	06/16/2010	16:30	<1	<1	<0.14	<1	<0.2	<0.4	<0.028
			08/25/2010	17:30	–	–	–	–	–	–	–
33	383132122514501	8N/9W-21F1	06/15/2010	17 30	<1	<1	<0 14	<1	<0.2	<0.4	<0.028
			08/24/2010	15:00	<1	<1	<0.14	<1	<0 2	<0.4	<0.028

Table 15. Discharge measurements and water-quality data collected from 10 Russian River sites, Mark West Creek, and 3 groundwater sites in the Russian River Basin, Mendocino and Sonoma Counties, California, 2010.—Continued

[Number below the constituent or property is the U.S. Geological Survey (USGS) parameter code, which is a 5-digit number used in the USGS National Water Information System (NWIS), to uniquely identify a specific constituent or property. **Abbreviations**: no., number; AHTN, acetyl hexamethyl tetrahydronaphthalene; HHCB, hexahydrohexamethyl cyclopentabenzopyran; DEET, *N,N*-diethyl-meta-toluamide; ft³/s, cubic feet per second; FNU, formazine nephelometric units; NTU, nephelometric turbidity units; Hg, mercury, mm, millimeter; µS/cm, microsiemens per centimeter; °C, degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter; <, actual value less than value shown, E, estimated value; –, no data]

Map site no.	USGS station no.	Station name	Date	Time	Anthracene, dissolved (µg/L) (34221)	Benzo-[a]-pyrene, dissolved (µg/L) (34248)	Benzophenone, dissolved (µg/L) (62067)	β-Sitosterol, dissolved (µg/L) (62068)	β-Stigmastanol, dissolved (µg/L) (62086)	Bromacil, dissolved (µg/L) (04029)	Caffeine, dissolved (µg/L) (50305)
2	11462500	Russian River near Hopland	06/14/2010	13:00	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
			08/23/2010	11:30	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
3	11463000	Russian River near Cloverdale	06/14/2010	15:30	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
			08/23/2010	15:00	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
4	11463980	Russian River at Digger Bend near Healdsburg	06/15/2010	09:30	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
			08/24/2010	09:00	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
6	383132122514901	Russian River at River Front Park	06/15/2010	13:30	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
			08/24/2010	13:00	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
7	11465400	Russian River at Wohler Bridge	06/16/2010	08:00	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
			08/25/2010	09:00	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
8	382959122535601	Russian River at Steelhead Beach	06/16/2010	13:30	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
			08/25/2010	13:00	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
9	11467000	Russian River near Guerneville	06/17/2010	10:00	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
			08/26/2010	09:00	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
11	11467002	Russian River at Johnson's Beach	06/17/2010	11:30	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
			08/26/2010	12:00	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
			10/14/2010	12:30	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
13	382757123003801	Russian River at Monte Rio	06/17/2010	14:00	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
			08/26/2010	13:30	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
14	382754123030501	Russian River at Casini Ranch	06/18/2010	09:30	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
			08/27/2010	09:30	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
22	11466800	Mark West Creek near Mirabel Heights	06/16/2010	10:30	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
			08/25/2010	10:30	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
26	383002122530601	8N/9W-32C1	06/16/2010	17:30	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
			08/25/2010	19:00	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
30	383045122525701	8N/9W-29F1	06/16/2010	16:30	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
			08/25/2010	17:30	–	–	–	–	–	–	–
33	383132122514501	8N/9W-21F1	06/15/2010	17:30	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1
			08/24/2010	15:00	<0.028	<0.1	<0.1	<4	<3	<0.4	<0.1

Table 15. Discharge measurements and water-quality data collected from 10 Russian River sites, Mark West Creek, and 3 groundwater sites in the Russian River Basin, Mendocino and Sonoma Counties, California, 2010.—Continued

[Number below the constituent or property is the U.S. Geological Survey (USGS) parameter code, which is a 5-digit number used in the USGS National Water Information System (NWIS), to uniquely identify a specific constituent or property. **Abbreviations**: no., number; AHTN, acetyl hexamethyl tetrahydronaphthalene; HHCB, hexahydrohexamethyl cyclopentabenzopyran; DEET, *N,N*-diethyl-meta-toluamide; ft³/s, cubic feet per second; FNU, formazine nephelometric units; NTU, nephelometric turbidity units; Hg, mercury, mm, millimeter; µS/cm, microsiemens per centimeter; °C, degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter; <, actual value less than value shown; E, estimated value, –, no data]

Map site no.	USGS station no.	Station name	Date	Time	Camphor, dissolved (µg/L) (62070)	Carbaryl, dissolved (µg/L) (82680)	Carbazole, dissolved (µg/L) (62071)	Chlorpyrifos, dissvolved (µg/L) (38933)	Cholesterol, dissolved (µg/L) (62072)	Cotinine, dissolved (µg/L) (62005)	DEET, dissolved (µg/L) (62082)
2	11462500	Russian River near Hopland	06/14/2010	13:00	<0.044	<0.38	<0.030	<0.2	<2	<0.600	<0.1
			08/23/2010	11:30	<0.044	<0.38	<0.030	<0.2	<2	<0.038	<0.1
3	11463000	Russian River near Cloverdale	06/14/2010	15:30	<0.044	<0.38	<0.030	<0.2	<2	<0.600	<0.1
			08/23/2010	15:00	<0.044	<0.38	<0.030	<0.2	<2	<0.600	<0.1
4	11463980	Russian River at Digger Bend near Healdsburg	06/15/2010	09:30	<0.044	<0.38	<0.030	<0.2	<2	<0.038	<0.1
			08/24/2010	09:00	<0.044	<0.38	<0.030	<0.2	<2	<0.038	<0.1
6	383132122514901	Russian River at River Front Park	06/15/2010	13:30	<0.044	<0.38	<0.030	<0.2	<2	<0.600	<0.1
			08/24/2010	13:00	<0.044	<0.38	<0.030	<0.2	<2	<0.600	<0.1
7	11465400	Russian River at Wohler Bridge	06/16/2010	08:00	<0.044	<0.38	<0.030	<0.2	<2	<0.600	<0.1
			08/25/2010	09:00	<0.044	<0.38	<0.030	<0.2	<2	<0.600	<0.1
8	382959122535601	Russian River at Steelhead Beach	06/16/2010	13:30	<0.044	<0.38	<0.030	<0.2	<2	<0.600	<0.1
			08/25/2010	13:00	<0.044	<0.38	<0.030	<0.2	<2	<0.600	<0.1
9	11467000	Russian River near Guerneville	06/17/2010	10:00	<0.044	<0.38	<0.030	<0.2	<2	<0.038	<0.1
			08/26/2010	09:00	<0.044	<0.38	<0.030	<0.2	<2	<0.038	<0.1
11	11467002	Russian River at Johnson's Beach	06/17/2010	11:30	<0.044	<0.38	<0.030	<0.2	<2	<0.600	<0.1
			08/26/2010	12:00	<0.044	<0.38	<0.030	<0.2	<2	<0.600	<0.1
			10/14/2010	12:30	<0.044	<0.38	<0.030	<0.2	<2	<0.600	<0.1
13	382757123003801	Russian River at Monte Rio	06/17/2010	14:00	<0.044	<0.38	<0.030	<0.2	<2	<0.600	<0.1
			08/26/2010	13:30	<0.044	<0.38	<0.030	<0.2	<2	<0.600	<0.1
14	382754123030501	Russian River at Casini Ranch	06/18/2010	09:30	<0.044	<0.38	<0.030	<0.2	<2	<0.038	<0.1
			08/27/2010	09:30	<0.044	<0.38	<0.030	<0.2	<2	<0.038	<0.1
22	11466800	Mark West Creek near Mirabel Heights	06/16/2010	10:30	<0.044	<0.38	<0.030	<0.2	<2	<0.600	<0.1
			08/25/2010	10:30	<0.044	<0.38	<0.030	<0.2	<2	<0.600	<0.1
26	383002122530601	8N/9W-32C1	06/16/2010	17:30	<0.044	<0.38	<0.030	<0.2	<2	<0.600	<0.1
			08/25/2010	19:00	<0.044	<0.38	<0.030	<0.2	<2	<0.600	<0.1
30	383045122525701	8N/9W-29F1	06/16/2010	16:30	<0.044	<0.38	<0.030	<0.2	<2	<0.600	<0.1
			08/25/2010	17:30	–	–	–	–	–	–	–
33	383132122514501	8N/9W-21F1	06/15/2010	17:30	<0.044	<0.38	<0.030	<0.2	<2	<0.600	<0.1
			08/24/2010	15:00	<0.044	<0.38	<0.030	<0.2	<2	<0.600	<0.1

Table 15. Discharge measurements and water-quality data collected from 10 Russian River sites, Mark West Creek, and 3 groundwater sites in the Russian River Basin, Mendocino and Sonoma Counties, California, 2010.—Continued

[Number below the constituent or property is the U.S. Geological Survey (USGS) parameter code, which is a 5-digit number used in the USGS National Water Information System (NWIS), to uniquely identify a specific constituent or property **Abbreviations**: no., number; AHTN, acetyl hexamethyl tetrahydronaphthalene; HHCB, hexahydrohexamethyl cyclopentabenzopyran; DEET, *N,N*-diethyl-meta-toluamide; ft³/s, cubic feet per second, FNU, formazine nephelometric units, NTU, nephelometric turbidity units; Hg, mercury; mm, millimeter; µS/cm, microsiemens per centimeter; °C, degrees Celsius, mg/L, milligrams per liter; µg/L, micrograms per liter, <, actual value less than value shown; E, estimated value; –, no data]

Map site no.	USGS station no.	Station name	Date	Time	Diazinon, dissolved (µg/L) (39572)	*d*-Limonene, dissolved (µg/L) (62073)	Fluoranthene, dissolved (µg/L) (34377)	HHCB, dissolved (µg/L) (62075)	Indole, dissolved (mg/L) (62076)	Isoborneol, dissolved (µg/L) (62077)	Isophorone, dissolved (µg/L) (34409)
2	11462500	Russian River near Hopland	06/14/2010	13:00	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
			08/23/2010	11:30	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
3	11463000	Russian River near Cloverdale	06/14/2010	15:30	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
			08/23/2010	15:00	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
4	11463980	Russian River at Digger Bend near Healdsburg	06/15/2010	09:30	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
			08/24/2010	09:00	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
6	383132122514901	Russian River at River Front Park	06/15/2010	13:30	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
			08/24/2010	13:00	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
7	11465400	Russian River at Wohler Bridge	06/16/2010	08:00	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
			08/25/2010	09:00	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
8	382959122535601	Russian River at Steelhead Beach	06/16/2010	13:30	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
			08/25/2010	13:00	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
9	11467000	Russian River near Guerneville	06/17/2010	10:00	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
			08/26/2010	09:00	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
11	11467002	Russian River at Johnson's Beach	06/17/2010	11:30	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
			08/26/2010	12:00	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
			10/14/2010	12:30	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
13	382757123003801	Russian River at Monte Rio	06/17/2010	14:00	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
			08/26/2010	13:30	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
14	382754123030501	Russian River at Casini Ranch	06/18/2010	09:30	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
			08/27/2010	09:30	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
22	11466800	Mark West Creek near Mirabel Heights	06/16/2010	10:30	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
			08/25/2010	10:30	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
26	383002122530601	8N/9W-32C1	06/16/2010	17:30	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
			08/25/2010	19:00	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
30	383045122525701	8N/9W-29F1	06/16/2010	16:30	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
			08/25/2010	17:30	–	–	–	–	–	–	–
33	383132122514501	8N/9W-21F1	06/15/2010	17:30	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1
			08/24/2010	15:00	<0.2	<0.1	<0.024	<0.1	<0.1	<0.2	<0.1

Table 15. Discharge measurements and water-quality data collected from 10 Russian River sites, Mark West Creek, and 3 groundwater sites in the Russian River Basin, Mendocino and Sonoma Counties, California, 2010.—Continued

[Number below the constituent or property is the U.S. Geological Survey (USGS) parameter code, which is a 5-digit number used in the USGS National Water Information System (NWIS), to uniquely identify a specific constituent or property. **Abbreviations**: no., number; AHTN, acetyl hexamethyl tetrahydronaphthalene; HHCB, hexahydrohexamethyl cyclopentabenzopyran; DEET, *N,N*-diethyl-meta-toluamide; ft³/s, cubic feet per second; FNU, formazine nephelometric units; NTU, nephelometric turbidity units; Hg, mercury; mm, millimeter; SC, specific conductance; µS/cm, microsiemens per centimeter; °C, degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter; <, actual value less than value shown; E, estimated value; –, no data]

Map site no.	USGS station no.	Station name	Date	Time	Isopropyl-benzene, dissolved (µg/L) (62078)	Isoquinoline, dissolved (µg/L) (62079)	Menthol, dissolved (µg/L) (62080)	Metalaxyl, dissolved (µg/L) (50359)	Methyl salicylate, dissolved (µg/L) (62081)	Metolachlor, dissolved (µg/L) (39415)	Naphth-alene, dissolved (µg/L) (34443)
2	11462500	Russian River near Hopland	06/14/2010	13:00	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
			08/23/2010	11:30	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
3	11463000	Russian River near Cloverdale	06/14/2010	15:30	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
			08/23/2010	15:00	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
4	11463980	Russian River at Digger Bend near Healdsburg	06/15/2010	09:30	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
			08/24/2010	09:00	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
6	383132122514901	Russian River at River Front Park	06/15/2010	13:30	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
			08/24/2010	13:00	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
7	11465400	Russian River at Wohler Bridge	06/16/2010	08:00	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
			08/25/2010	09:00	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
8	382959122535601	Russian River at Steelhead Beach	06/16/2010	13:30	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
			08/25/2010	13:00	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
9	11467000	Russian River near Guerneville	06/17/2010	10:00	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
			08/26/2010	09:00	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
11	11467002	Russian River at Johnson's Beach	06/17/2010	11:30	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
			08/26/2010	12:00	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
			10/14/2010	12:30	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
13	382757123003801	Russian River at Monte Rio	06/17/2010	14:00	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
			08/26/2010	13:30	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
14	382754123030501	Russian River at Casini Ranch	06/18/2010	09:30	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
			08/27/2010	09:30	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
22	11466800	Mark West Creek near Mirabel Heights	06/16/2010	10:30	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
			08/25/2010	10:30	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
26	383002122530601	8N/9W-32C1	06/16/2010	17:30	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
			08/25/2010	19:00	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
30	383045122525701	8N/9W-29F1	06/16/2010	16:30	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
			08/25/2010	17:30	–	–	–	–	–	–	–
33	383132122514501	8N/9W-21F1	06/15/2010	17:30	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040
			08/24/2010	15:00	<0.3	<0.046	<0.03	<0.1	<0.044	<0.1	<0.040

Table 15. Discharge measurements and water-quality data collected from 10 Russian River sites, Mark West Creek, and 3 groundwater sites in the Russian River Basin, Mendocino and Sonoma Counties, California, 2010.—Continued

[Number below the constituent or property is the U.S. Geological Survey (USGS) parameter code, which is a 5-digit number used in the USGS National Water Information System (NWIS), to uniquely identify a specific constituent or property. **Abbreviations**: no., number; AHTN, acetyl hexamethyl tetrahydronaphthalene; HHCB, hexahydrohexamethyl cyclopentabenzopyran; DEET, *N,N*-diethyl-meta-toluamide; ft³/s, cubic feet per second; FNU, formazine nephelometric units; NTU, nephelometric turbidity units; Hg, mercury; mm, millimeter, µS/cm, microsiemens per centimeter; °C, degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter; <, actual value less than value shown; E, estimated value; –, no data]

Map site no.	USGS station no.	Station name	Date	Time	*p*-Cresol, dissolved (µg/L) (62084)	Phenanthrene, dissolved (µg/L) (34462)	Prometon, dissolved (µg/L) (04037)	Pyrene, dissolved (µg/L) (34470)	Tetrachloroethene, dissolved (µg/L) (34476)	Tribromomethane, dissolved (µg/L) (34288)	Tributyl phosphate, dissolved (µg/L) (62089)
2	11462500	Russian River near Hopland	06/14/2010	13:00	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
			08/23/2010	11:30	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
3	11463000	Russian River near Cloverdale	06/14/2010	15:30	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
			08/23/2010	15:00	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
4	11463980	Russian River at Digger Bend near Healdsburg	06/15/2010	09:30	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
			08/24/2010	09:00	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
6	383132122514901	Russian River at River Front Park	06/15/2010	13:30	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
			08/24/2010	13:00	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
7	11465400	Russian River at Wohler Bridge	06/16/2010	08:00	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
			08/25/2010	09:00	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
8	382959122535601	Russian River at Steelhead Beach	06/16/2010	13:30	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
			08/25/2010	13:00	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
9	11467000	Russian River near Guerneville	06/17/2010	10:00	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
			08/26/2010	09:00	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
11	11467002	Russian River at Johnson's Beach	06/17/2010	11:30	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
			08/26/2010	12:00	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
			10/14/2010	12:30	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
13	382757123003801	Russian River at Monte Rio	06/17/2010	14:00	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
			08/26/2010	13:30	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
14	382754123030501	Russian River at Casini Ranch	06/18/2010	09:30	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
			08/27/2010	09:30	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
22	11466800	Mark West Creek near Mirabel Heights	06/16/2010	10:30	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
			08/25/2010	10:30	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
26	383002122530601	8N/9W-32C1	06/16/2010	17:30	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
			08/25/2010	19:00	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
30	383045122525701	8N/9W-29F1	06/16/2010	16:30	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
			08/25/2010	17:30	–	–	–	–	–	–	–
33	383132122514501	8N/9W-21F1	06/15/2010	17:30	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2
			08/24/2010	15:00	<0.08	<0.032	<0.1	<0.042	<0.1	<0.1	<0.2

Table 15. Discharge measurements and water-quality data collected from 10 Russian River sites, Mark West Creek, and 3 groundwater sites in the Russian River Basin, Mendocino and Sonoma Counties, California, 2010.—Continued

[Number below the constituent or property is the U.S. Geological Survey (USGS) parameter code, which is a 5-digit number used in the USGS National Water Information System (NWIS), to uniquely identify a specific constituent or property. **Abbreviations**: no., number; AHTN, acetyl hexamethyl tetrahydronaphthalene; HHCB, hexahydrohexamethyl cyclopentabenzopyran; DEET, *N,N*-diethyl-meta-toluamide, ft^3/s, cubic feet per second; FNU, formazine nephelometric units; NTU, nephelometric turbidity units; Hg, mercury; mm, millimeter, µS/cm, microsiemens per centimeter, °C, degrees Celsius; mg/L, milligrams per liter, µg/L, micrograms per liter; <, actual value less than value shown; E, estimated value, –, no data]

Map site no.	USGS station no.	Station name	Date	Time	Triclosan, dissolved (µg/L) (62090)	Tri-ethyl citrate, dissolved (µg/L) (62091)	Tri-phenyl phosphate, dissolved (µg/L) (62092)	Tris(2-butoxyethyl) phosphate, dissolved (µg/L) (62093)	Tris(2-chloroethyl) phosphate, dissolved (µg/L) (62087)
2	11462500	Russian River near Hopland	06/14/2010	13:00	<0.20	<0.4	<0.1	<0.8	<0.1
			08/23/2010	11:30	<0.20	<0.4	<0.1	<0.8	<0.1
3	11463000	Russian River near Cloverdale	06/14/2010	15:30	<0.20	<0.4	<0.1	<0.8	<0.1
			08/23/2010	15:00	<0.20	<0.4	<0.1	<0.8	<0.1
4	11463980	Russian River at Digger Bend near Healdsburg	06/15/2010	09:30	<0.20	<0.4	<0.1	<0.8	<0.1
			08/24/2010	09:00	<0.20	<0.4	<0.1	<0.8	<0.1
6	383132122514901	Russian River at River Front Park	06/15/2010	13:30	<0.20	<0.4	<0.1	<0.8	<0.1
			08/24/2010	13:00	<0.20	<0.4	<0.1	<0.8	<0.1
7	11465400	Russian River at Wohler Bridge	06/16/2010	08:00	<0.20	<0.4	<0.1	<0.8	<0.1
			08/25/2010	09:00	<0.20	<0.4	<0.1	<0.8	<0.1
8	382959122535601	Russian River at Steelhead Beach	06/16/2010	13:30	<0.20	<0.4	<0.1	<0.8	<0.1
			08/25/2010	13:00	<0.20	<0.4	<0.1	<0.8	<0.1
9	11467000	Russian River near Guerneville	06/17/2010	10:00	<0.20	<0.4	<0.1	<0.8	<0.1
			08/26/2010	09:00	<0.20	<0.4	<0.1	<0.8	<0.1
11	11467002	Russian River at Johnson's Beach	06/17/2010	11:30	<0.20	<0.4	<0.1	<0.8	<0.1
			08/26/2010	12:00	<0.20	<0.4	<0.1	<0.8	<0.1
			10/14/2010	12:30	<0.20	<0.4	<0.1	<0.8	<0.1
13	382757123003801	Russian River at Monte Rio	06/17/2010	14:00	<0.20	<0.4	<0.1	<0.8	<0.1
			08/26/2010	13:30	<0.20	<0.4	<0.1	<0.8	<0.1
14	382754123030501	Russian River at Casini Ranch	06/18/2010	09:30	<0.20	<0.4	<0.1	<0.8	<0.1
			08/27/2010	09:30	<0.20	<0.4	<0.1	<0.8	<0.1
22	11466800	Mark West Creek near Mirabel Heights	06/16/2010	10:30	<0.20	<0.4	<0.1	<0.8	<0.1
			08/25/2010	10:30	<0.20	<0.4	<0.1	<0.8	<0.1
26	383002122530601	8N/9W-32C1	06/16/2010	17:30	<0.20	<0.4	<0.1	<0.8	<0.1
			08/25/2010	19:00	<0.20	<0.4	0.11	<0.8	<0.1
30	383045122525701	8N/9W-29F1	06/16/2010	16:30	<0.20	<0.4	E0.1	<0.8	<0.1
			08/25/2010	17:30	–	–	–	–	–
33	383132122514501	8N/9W-21F1	06/15/2010	17:30	<0.20	<0.4	<0.1	<0.8	<0.1
			08/24/2010	15:00	<0.20	<0.4	0.11	<0.8	<0.1

Table 15. Discharge measurements and water-quality data collected from 10 Russian River sites, Mark West Creek, and 3 groundwater sites in the Russian River Basin, Mendocino and Sonoma Counties, California, 2010.—Continued

[Number below the constituent or property is the U.S. Geological Survey (USGS) parameter code, which is a 5-digit number used in the USGS National Water Information System (NWIS), to uniquely identify a specific constituent or property **Abbreviations**: no., number; AHTN, acetyl hexamethyl tetrahydronaphthalene; HHCB, hexahydrohexamethyl cyclopentabenzopyran; DEET, *N,N*-diethyl-meta-toluamide, ft^3/s, cubic feet per second; FNU, formazine nephelometric units; NTU, nephelometric turbidity units; Hg, mercury; mm, millimeter; µS/cm, microsiemens per centimeter; °C, degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter; <, actual value less than value shown; E, estimated value; –, no data]

Map site no.	USGS station no.	Station name	Date	Time	Tris(dichloroisopropy) phosphate, dissolved (µg/L) (62088)	Hydrogen-2/1, (per mil) (82082)	Oxygen-18/16, (per mil) (82085)
2	11462500	Russian River near Hopland	06/14/2010	13:00	<0 2	–53.50	–8.12
			08/23/2010	11:30	<0.2	–57 60	–8.26
3	11463000	Russian River near Cloverdale	06/14/2010	15:30	<0 2	–53.00	–7 91
			08/23/2010	15:00	<0.2	–54 40	–8.20
4	11463980	Russian River at Digger Bend near Healdsburg	06/15/2010	09:30	<0 2	–48.70	–7.53
			08/24/2010	09.00	<0.2	–52 70	–7.70
6	383132122514901	Russian River at River Front Park	06/15/2010	13:30	<0 2	–47.00	–7.06
			08/24/2010	13.00	<0.2	–46.80	–6.97
7	11465400	Russian River at Wohler Bridge	06/16/2010	08:00	<0.2	–45.60	–7.06
			08/25/2010	09:00	<0.2	–47 40	–6.94
8	382959122535601	Russian River at Steelhead Beach	06/16/2010	13.30	<0.2	–45 90	–6.95
			08/25/2010	13:00	<0.2	–46.00	–6.88
9	11467000	Russian River near Guerneville	06/17/2010	10:00	<0.2	–45 10	–6.89
			08/26/2010	09:00	<0.2	–46.20	–6.90
11	11467002	Russian River at Johnson's Beach	06/17/2010	11:30	<0.2	–45.40	–6.90
			08/26/2010	12:00	<0.2	–45.90	–6.76
			10/14/2010	12:30	<0.2	–51.50	–7.69
13	382757123003801	Russian River at Monte Rio	06/17/2010	14:00	<0.2	–43.90	–6.94
			08/26/2010	13:30	<0.2	–43.20	–6.69
14	382754123030501	Russian River at Casini Ranch	06/18/2010	09:30	<0.2	–42.30	–6.75
			08/27/2010	09:30	<0.2	–43.90	–6.51
22	11466800	Mark West Creek near Mirabel Heights	06/16/2010	10:30	<0.2	–36 30	–5.49
			08/25/2010	10:30	<0.2	–35.10	–4.82
26	383002122530601	8N/9W-32C1	06/16/2010	17:30	<0.2	–42.60	–6.47
			08/25/2010	19:00	<0 2	–46.40	–6.85
30	383045122525701	8N/9W-29F1	06/16/2010	16:30	<0.2	–46 10	–7.10
			08/25/2010	17:30	–	–46.70	–6.90
33	383132122514501	8N/9W-21F1	06/15/2010	17:30	<0.2	–36.60	–5.78
			08/24/2010	15:00	<0.2	–37.60	–5.69

[a] Grab sample.

[b] Daily stsreamflow measurement obtained from NWISweb.

Table 16. Bacteria concentrations for water samples collected from 10 Russian River sites and Mark West Creek in the Russian River Basin, and quality-control data detected in field blanks from the Russian River Basin, Mendocino and Sonoma Counties, California, 2010.

[**Abbreviations**: no., number; MPN, most probable number; ND, analyte not detected at or above the reporting limit; mL, milliliter; >, actual value greater than value shown]

USGS station no.	Station name	Date	Time	Total coliform, (MPN/100 mL)	Fecal coliform (MPN/100 mL)	Enterococci, (MPN/100 mL)
11462500	Russian River near Hopland	06/14/2010	13:00	>1,600	30	11
		08/23/2010	11:30	170	130	24
11463000	Russian River near Cloverdale	06/14/2010	15:30	>1,600	50	14
		08/23/2010	15:00	350	50	8.0
11463980	Russian River at Digger Bend near Healdsburg	06/15/2010	09:30	>1,600	70	4.0
		08/24/2010	09:00	240	22	22
11465400	Russian River at Wohler Bridge	06/16/2010	08:00	>1,600	50	27
		08/25/2010	09:00	170	50	240
11467000	Russian River near Guerneville	06/17/2010	10:00	500	26	90
		08/26/2010	09:00	280	70	90
11467002	Russian River at Johnson's Beach	06/17/2010	11:30	1,600	17	17
		08/26/2010	12:00	500	9.0	8.0
		10/14/2010	12:30	>1,600	500	900
382754123030501	Russian River at Casini Ranch	06/18/2010	09:30	900	17	4.0
		08/27/2010	09:30	140	2.0	8.0
382757123003801	Russian River at Monte Rio	06/17/2010	14:00	300	4.0	2.0
		08/26/2010	13:30	80	8.0	7.0
382959122535601	Russian River at Steelhead Beach	06/16/2010	13:30	300	22	33
		08/25/2010	13:00	34	17	50
383132122514901	Russian River at River Front Park	06/15/2010	13:30	250	13	4.0
		08/24/2010	13:00	500	30	49
11466800	Mark West Creek near Mirabel Heights	06/16/2010	10:30	>1,600	80	17
		08/25/2010	10:30	>1,600	900	>1,600
		Blank sample				
11465400	Russian River at Wohler Bridge	06/16/2010	13:40	ND	ND	ND
		08/25/2010	08:10	ND	ND	ND

Appendix B

2010 Estuary Water Quality Monitoring

4.1 Water Quality Monitoring

Water quality monitoring was conducted in the lower, middle, and upper reaches of the Russian River Estuary between the mouth of the river at Jenner and Monte Rio, including two tributaries. Water Agency staff continued to collect data to establish baseline information on water quality in the Estuary, gain a better understanding of the longitudinal and vertical water quality profile during the ebb and flow of the tide, and track changes to the water quality profile that may occur during periods of barrier beach closure and reopening.

Saline water is denser than freshwater and a salinity "wedge" forms as freshwater outflow passes over the denser tidal inflow. During the lagoon management period (May 15 to October 15), the lower and middle reaches of the Estuary up to Sheephouse Creek are predominantly saline environments with a thin freshwater layer that flows over the denser saltwater. The upper reach of the Estuary transitions to a predominantly freshwater environment, which is periodically underlain by a denser, saltwater layer that migrates upstream to Duncans Mills during summer low flow conditions and barrier beach closure. Additionally, river flows, tides, topography, and wind action affect the amount of mixing of the water column at various longitudinal and vertical positions within the Estuary.

In 2010, the Estuary experienced three closures during the lagoon management period. The barrier beach formed and the Estuary closed for a period of 7 days from 4 July to 11 July, 10 days from 21 September to 1 October, and 9 days from 3 October to 12 October. During these closures, the Water Agency was able to monitor the partial development of a freshwater lagoon system as freshwater inflows increased the depth of the surface layer and the volume of denser saltwater in the lower layer of the water column began to decline, presumably as it seeped through the barrier beach.

Methods

Continuous Multi-Parameter Monitoring

Water quality was monitored using YSI Series 6600 multi-parameter datasondes. Hourly salinity (parts per thousand, ppt), water temperature (degrees Celsius), dissolved oxygen (milligrams per liter, mg/L), and pH (hydrogen ion) data were collected. Datasondes were cleaned and recalibrated periodically following the YSI User Manual procedures, and data was downloaded during each calibration event.

Nine stations were established for continuous water quality monitoring, including seven stations in the mainstem and two tributary stations (Figure 4.1.1). One mainstem station was located in the lower reach at the mouth of the Russian River at Goat Rock State Beach (Mouth Station). Three mainstem stations were placed in the middle reach: Patty's Rock upstream of Penny Island (Patty's Rock Station); Bridgehaven just downstream from the Highway 1 Bridge (Bridgehaven Station); and in the pool downstream of Sheephouse Creek (Sheephouse Creek Station). One tributary station was located in the mouth of Willow Creek, which flows into the middle reach of the estuary (Willow Creek Station). Two mainstem stations were located in the upper reach; a pool next to an area known as Heron Rookery located halfway between Sheephouse Creek and Duncans Mills (Heron Rookery Station), and downstream of Freezeout Creek in Duncans Mills (Freezeout Creek Station). The other tributary station was located downstream of the first steel bridge in lower Austin Creek, which flows into the mainstem above Duncans Mills (Austin Creek Station). The furthest upstream mainstem station was located in Monte Rio, outside of the influence of saline water, but within the upper extent of inundation and backwatering during lagoon formation (Monte Rio Station).

The rationale for choosing Estuary sites was to locate the deepest holes at various points throughout the Estuary to obtain the fullest vertical profiles possible, and to monitor hypoxic and/or anoxic events and temperature or salinity stratification. Sondes were located in the mouths of Willow and Austin Creeks to collect baseline water quality conditions and monitor potential changes to water quality, including salinity intrusion, during estuary closure and inundation. The Monte Rio station was established to monitor potential changes to water quality conditions in the upstream extent of the river that can become inundated during barrier beach closure, also referred to as the maximum backwater area (Figure 4.1.1).

Mainstem estuary monitoring stations were comprised of a concrete anchor attached to a steel cable suspended from the surface by a large buoy (Figure 4.1.2). All mainstem estuary stations had a vertical array of two datasondes to collect water quality profiles. Stations in the lower and middle reaches of the Estuary that are predominantly saline had sondes placed at the surface (~1m) and mid-depth (~3m) portions of the water column.

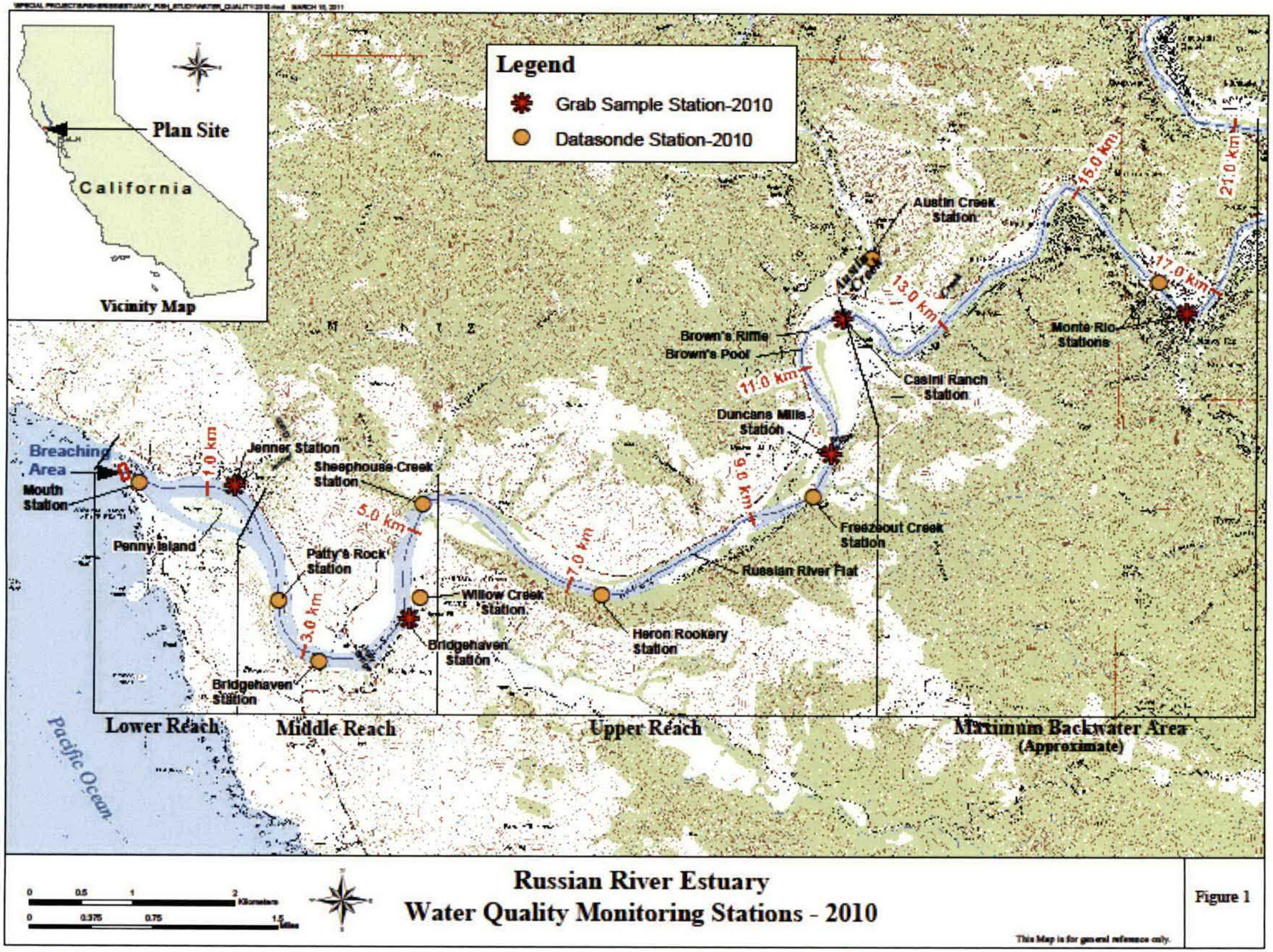

Figure 4.1.1. 2010 Russian River Estuary Water Quality Monitoring Stations

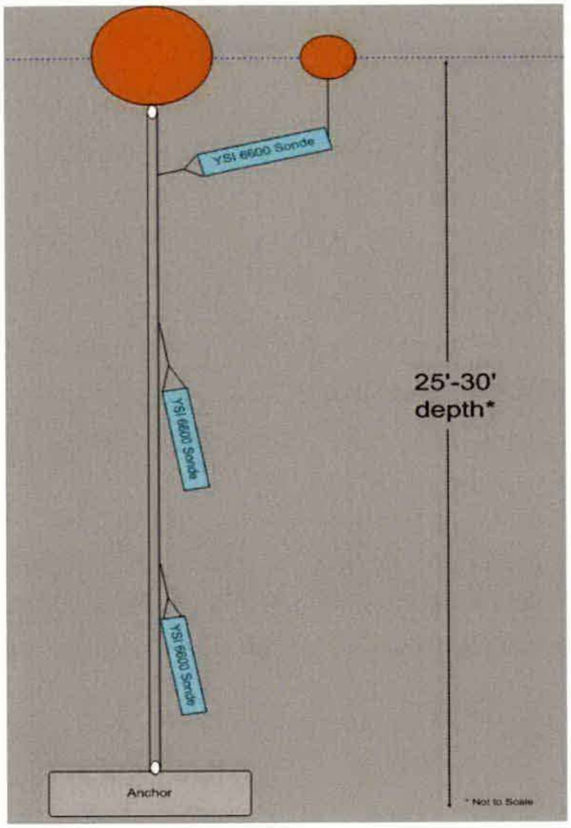

Figure 4.1.2. Typical Russian River Estuary monitoring station datasonde array.

The two stations in the upper reach of the Estuary, where water is predominantly fresh to brackish, were located in the lower half of the water column at mid-depth (~3-4m) and the bottom (~6-8m). Sondes were located in this manner to track vertical and longitudinal changes in water quality characteristics, including periods of barrier beach closure and reopening.

Monitoring stations in the tributaries and at Monte Rio consisted of one datasonde suspended at approximately mid-depth (during open conditions) in the thalweg at each respective site.

Monitoring stations at the Mouth, Patty's Rock, Bridgehaven, Sheephouse Creek, Heron Rookery, and Freezeout Creek stations were deployed from the end of April to the end of October. The Willow Creek and Austin Creek stations were deployed from the first week of May to the end of October, and the Monte Rio Station was deployed from the first week of June to the end of October. All stations were retrieved earlier than typical years due to strong storm events and resultant high flows that occurred in late October.

Grab Sample Collection

Five stations were established in 2010 for nutrient and indicator bacteria grab sampling: the Jenner Boat Ramp (Jenner Station); Bridgehaven at the mouth of Willow Creek (Bridgehaven Station); Moscow Road Bridge in Duncans Mills (Duncans Mills Station); Casini Ranch across from the mouth of Austin Creek (Casini Ranch Station); and just downstream of the Monte Rio Bridge (Monte Rio Station). This sampling was included in the *Russian River Water Quality Monitoring Plan for the Sonoma County Water Agency2010 Temporary Urgency Change (TUC)* (Appendix A-5). Refer to Figure 4.1.1 for grab sampling locations.

Water Agency staff collected grab samples once every two weeks from 22 June to 14 October. Additional focused sampling (collecting three samples over a ten-day period), was conducted following or during specific river management and operational events including: removal of Vacation Beach dam, sandbar breaching, and lagoon outlet channel implementation. All grab samples were analyzed at Alpha Analytical Labs in Ukiah.

Nutrient sampling was conducted for total organic nitrogen, ammonia, unionized ammonia, nitrate, nitrite, total Kjeldahl nitrogen, total nitrogen (calculated), and total phosphorus, as well as for *chlorophyll a*, which is a measurable parameter of algal growth that can be tied to excessive nutrient concentrations. Grab samples were collected for presence of indicator bacteria including total coliforms, fecal coliforms, and *Enterococcus*. These bacteria are considered indicators of water quality conditions that may be a concern for water contact recreation and public health. The results of sampling conducted for total orthophosphate, dissolved organic carbon, total organic carbon, total dissolved solids, and turbidity are included as an appendix; however, an analysis and discussion of these constituents is not included in this report. Temperature and pH were recorded during grab sampling events and are included in the appendix.

Results

Water quality conditions in 2010 were similar to trends observed in sampling from 2004 to 2009. The lower and middle reaches are predominantly saline environments with a thin freshwater layer that flows over the denser saltwater layer. The upper reach transitions to a predominantly freshwater environment, which is periodically underlain by a denser, saltwater layer that migrates up and downstream and appears to be affected in part by freshwater inflow rates, tidal inundation, barrier beach closure, and subsequent tidal cycles following reopening of the barrier beach. The lower and middle reaches of the Estuary are subject to tidally-influenced fluctuations in water depth and inundation during barrier beach closure, as is the upper reach to a lesser degree. The river upstream of Duncans Mills is considered freshwater habitat that is subject to inundation and backwatering during barrier beach closure.

Table 4.1.1 presents a summary of minimum, mean, and maximum values for temperature, depth, dissolved oxygen (DO), pH, and salinity recorded at the various datasonde monitoring stations. Data associated with malfunctioning datasonde equipment has been removed from

Table 4.1.1. Russian River Estuary 2010 water quality monitoring results. Minimum, mean, and maximum temperature (degrees C), depth (m), dissolved oxygen (mg/L), hydrogen ion (pH), and salinity (ppt).

Monitoring Station *Sonde*	Temperature (°C)	Depth (m)	Dissolved Oxygen (%) saturation	Dissolved Oxygen (mg/L)	Hydrogen Ion (pH)	Salinity (ppt)
Mouth						
Surface						
April 23 - October 22						
Min	9.7	0.5	58.7	5.4	7.5	0.1
Mean	16.8	0.9	104.7	9.4	8.2	10.5
Max	**23.0**	**1.0**	**192.4**	**16.8**	**9.0**	**33.9**
Mid-Depth						
April 23 - October 22						
Min	9.3	2.8	51.3	4.5	7.3	0.2
Mean	13.7	3.0	102.1	9.1	7.9	24.9
Max	**20.8**	**3.1**	**294.6**	**25.3**	**8.9**	**34.2**
Patty's Rock						
Surface						
April 28 - October 24						
Min	11.5	0.6	62.6	5.7	7.3	0.1
Mean	17.1	0.8	103.3	9.8	8.2	4.1
Max	**23.0**	**0.9**	**248.5**	**24.2**	**9.1**	**31.1**
Mid-Depth						
April 28 - October 20						
Min	10.0	2.3	51.0	4.3	7.4	0.1
Mean	14.1	2.7	96.3	8.4	8.0	25.9
Max	**20.9**	**2.8**	**229.7**	**18.8**	**8.7**	**33.5**
Bridgehaven						
Surface						
April 28 - October 26						
Min	12.4	0.6	40.3	3.7	7.2	0.1
Mean	18.0	0.8	101.3	9.2	8.1	6.7
Max	**23.2**	**1.1**	**345.4**	**34.7**	**9.0**	**31.0**
Mid-Depth						
April 28 - October 26						
Min	10.5	2.4	1.3	0.1	7.1	0.1
Mean	14.4	3.4	99.6	8.7	7.9	25.2
Max	**20.6**	**5.9**	**164.5**	**14.0**	**8.7**	**32.8**
Willow Creek						
Mid-Depth						
May 3 - October 27						
Min	8.7	0.4	0.0	0.0	6.5	0.1
Mean	16.5	1.1	75.8	7.4	7.6	3.5
Max	**24.3**	**2.9**	**198.3**	**16.1**	**9.3**	**24.6**
Sheephouse Creek						
Surface						
April 23 - October 26						
Min	12.6	0.8	39.9	3.4	6.8	0.1
Mean	19.2	0.9	97.9	9.1	8.0	2.3
Max	**23.9**	**1.0**	**233.3**	**22.9**	**9.4**	**30.2**
Mid-Depth						
April 23 - October 26						
Min						
Mean						
Max						

Table 4.1.1. (cont.)

Monitoring Station *Sonde*	Temperature (°C)	Depth (m)	Dissolved Oxygen (%) saturation	Dissolved Oxygen (mg/L)	Hydrogen Ion (pH)	Salinity (ppt)
Heron Rookery						
Mid-Depth						
April 29 - October 24						
Min	12.0	2.7	42.3	3.6	7.3	0.1
Mean	18.5	3.4	88.0	8.1	8.1	3.3
Max	**23.6**	**4.8**	**167.6**	**15.9**	**8.9**	**28.3**
Bottom						
April 29 - October 24						
Min	12.6	7.6	0.5	0.1	5.5	0.1
Mean	17.3	8.6	56.6	5.2	7.1	15.2
Max	**23.1**	**9.4**	**163.3**	**15.3**	**8.7**	**26.5**
Freezeout Creek						
Mid-Depth						
April 29 - October 26						
Min	12.7	3.5	57.0	5.2	7.3	0.2
Mean	19.8	3.8	95.0	8.7	8.1	0.7
Max	**24.2**	**7.8**	**151.3**	**14.1**	**8.8**	**9.0**
Bottom						
April 29 - October 26						
Min	12.6	4.6	0.0	0.0	5.5	0.1
Mean	19.6	6.3	74.6	6.8	7.7	2.5
Max	**23.7**	**8.4**	**169.4**	**14.8**	**8.7**	**11.0**
Austin Creek						
Mid-Depth						
May 5 - October 27						
Min	11.0	0.3	29.4	3.0	7.3	0.0
Mean	16.4	0.7	84.4	8.3	7.8	0.1
Max	**21.3**	**2.7**	**120.9**	**11.6**	**8.3**	**0.2**
Monte Rio						
Mid-Depth						
June 7 - October 28						
Min	10.6	0.8	66.3	6.2	7.2	0.1
Mean	17.8	1.1	100.3	9.5	7.9	0.1
Max	**22.1**	**2.7**	**231.3**	**21.2**	**9.1**	**0.2**

the data sets, resulting in the data gaps observed in the graphs presented as Figures 4.1.3 through 4.1.38. These data gaps may affect minimum, mean, and maximum values of the various monitored constituents, including at the Patty's Rock Surface Sonde in July and September, the Bridgehaven Mid-Depth Sonde in October, the Willow Creek Sonde in May, the Sheephouse Creek Surface Sonde for the entire monitoring season, the Heron Rookery Bottom Sonde from late July to early August and late August to late September, the Freezeout Creek Bottom Sonde from mid- to late May, and the Austin Creek Sonde in May and early to mid-August.

Although gaps exist in the 2010 data that affect sample statistics, long time-series data has been collected on an hourly frequency for several years at most of these stations, and it is unlikely that the missing data appreciably affected the broader understanding of water quality conditions within the estuary. The following sections provide a brief discussion of the results observed for each parameter monitored.

Salinity

Full strength seawater has a salinity of approximately 35 ppt, with salinity decreasing from the ocean to the upstream limit of the Estuary, which is considered freshwater at approximately 0.5 ppt (Horne 1994). All of the mid-depth sondes in the lower and middle reaches were located in a predominantly saline environment, whereas the surface sondes were located at the saltwater-freshwater interface (halocline or salt wedge) and recorded both freshwater and saltwater conditions. In the middle reach of the Estuary, salinities can range as high as 30 ppt in the saltwater layer, with brackish conditions prevailing at the upper end of the salt wedge, to less than 1 ppt in the freshwater layer on the surface. The Willow Creek sonde was located just upstream of the confluence with the Russian River, where predominantly freshwater conditions observed during higher springtime flows transitioned to a brackish environment during lower dry season flows.

In the upper reach, the Estuary begins to transition to a predominantly brackish and freshwater environment in the Heron Rookery area. The Freezeout Creek station is located in a predominantly freshwater environment; however, saltwater does occur in the lower half of the water column during open estuary conditions with lower instream flows, as well as during barrier beach closure.

The Austin Creek and Monte Rio stations are located in freshwater habitat above the upper reach of the Estuary (in the maximum backwater area) that becomes partially inundated during barrier beach closure. Salinity was not observed at these stations during either open or closed conditions.

Lower and Middle Reach Salinity

The surface sondes at the Mouth, Patty's Rock, Bridgehaven, and Sheephouse Creek stations were suspended at a depth of approximately 1 meter, and experienced frequent hourly fluctuations in salinity during open conditions after springtime flows receded in early July. These fluctuations are caused by tidal movement and expansion and contraction of the salt wedge. The freshwater layer was persistent at the surface sondes before spring flows receded. The surface sondes at the Mouth, Patty's Rock, Bridgehaven, and Sheephouse Creek had mean salinity values of 10.5, 4.1, 6.7, and 2.3 ppt, respectively (Table 4.1.1).

Salinity concentrations were observed to decrease at the surface sondes in response to barrier beach closure (Figures 4.1.3 through 4.1.6). This is due to a combination of freshwater inflows

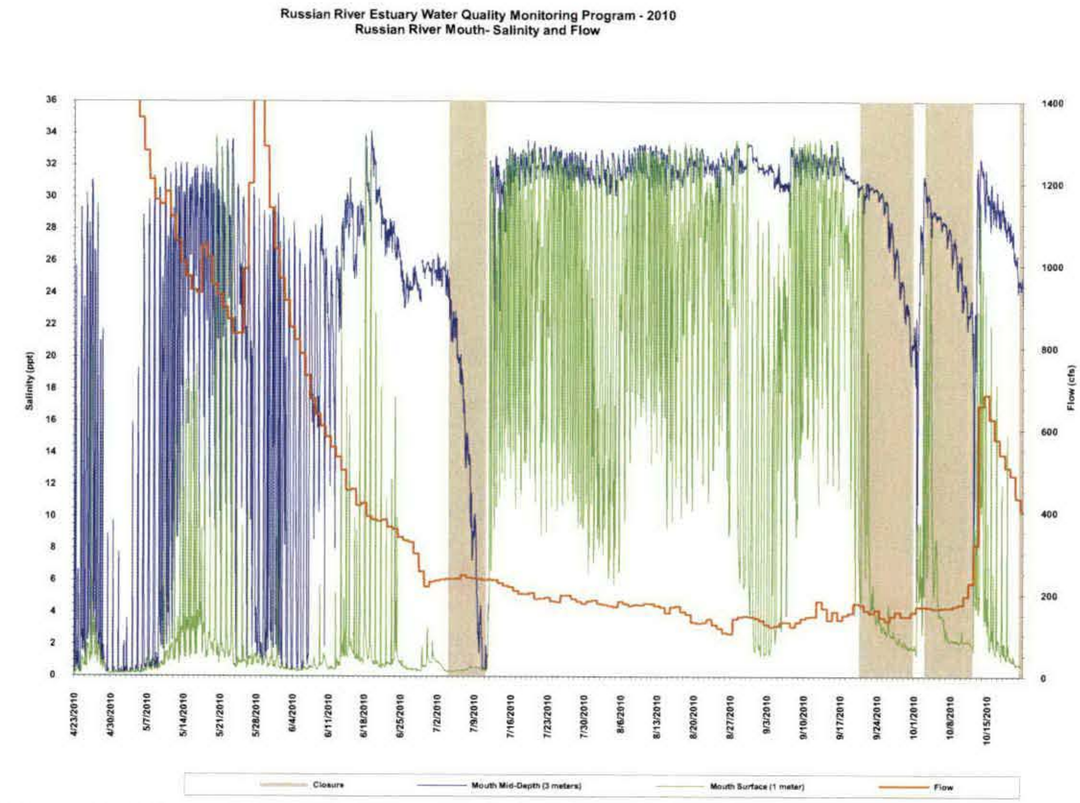

Figure 4.1.3. 2010 Russian River Mouth Salinity and Flow Graph

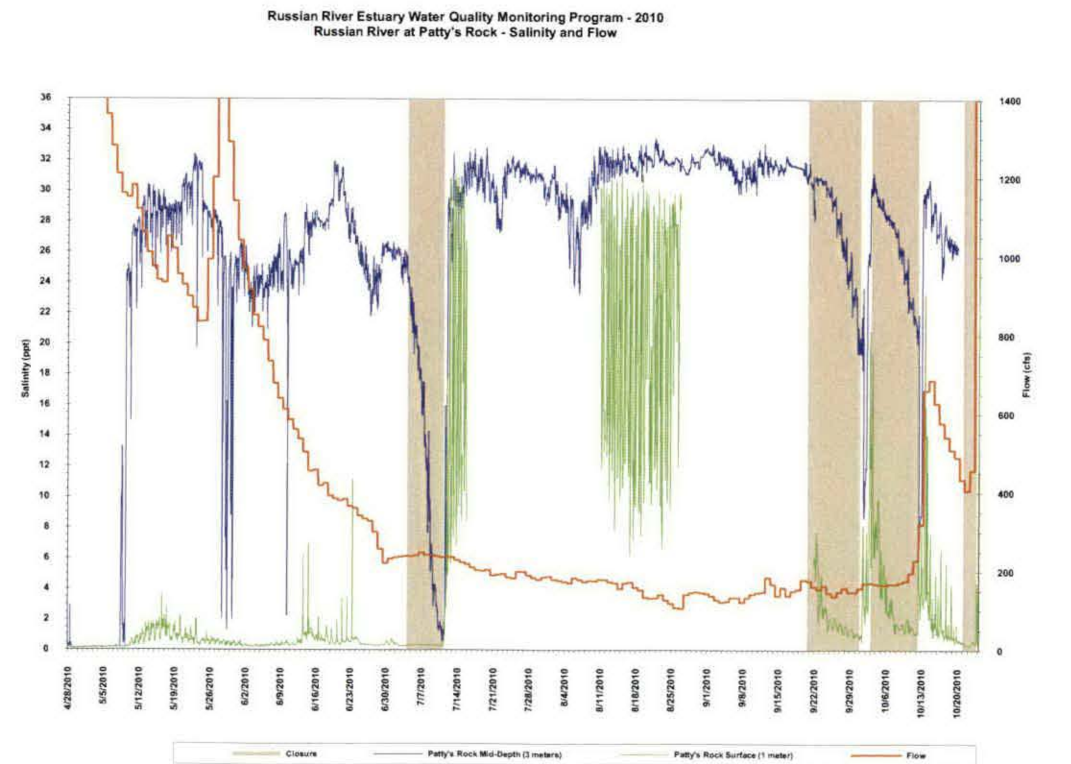

Figure 4.1.4. 2010 Russian River at Patty's Rock Salinity and Flow Graph

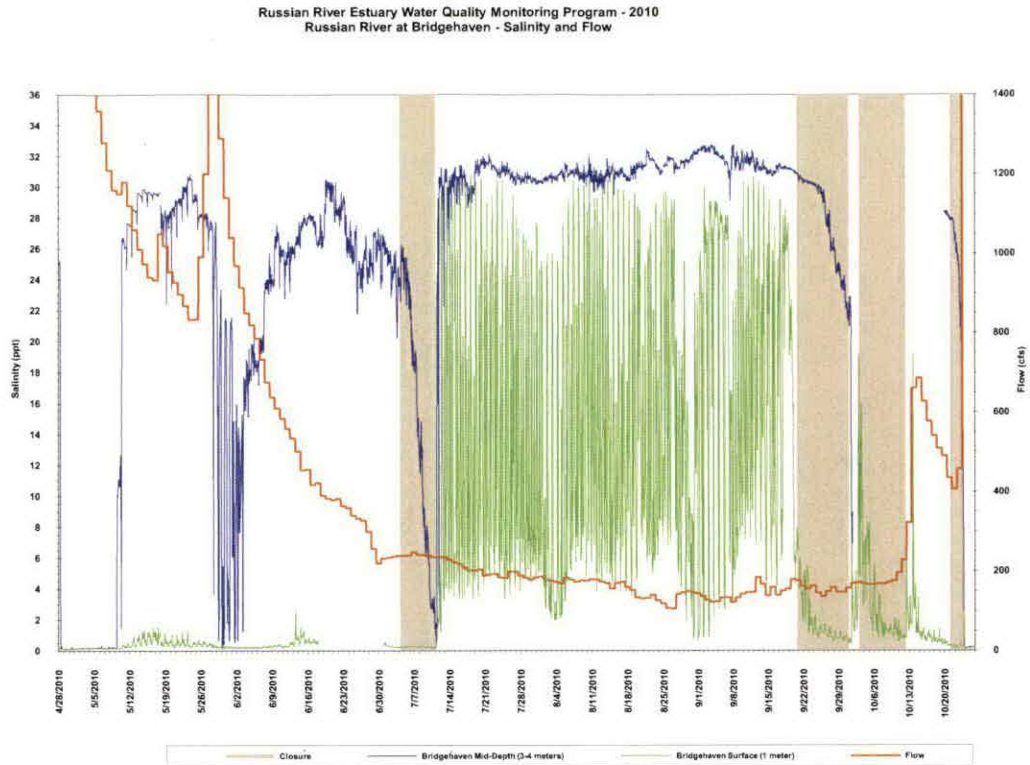

Figure 4.1.5. 2010 Russian River at Bridgehaven Salinity and Flow Graph

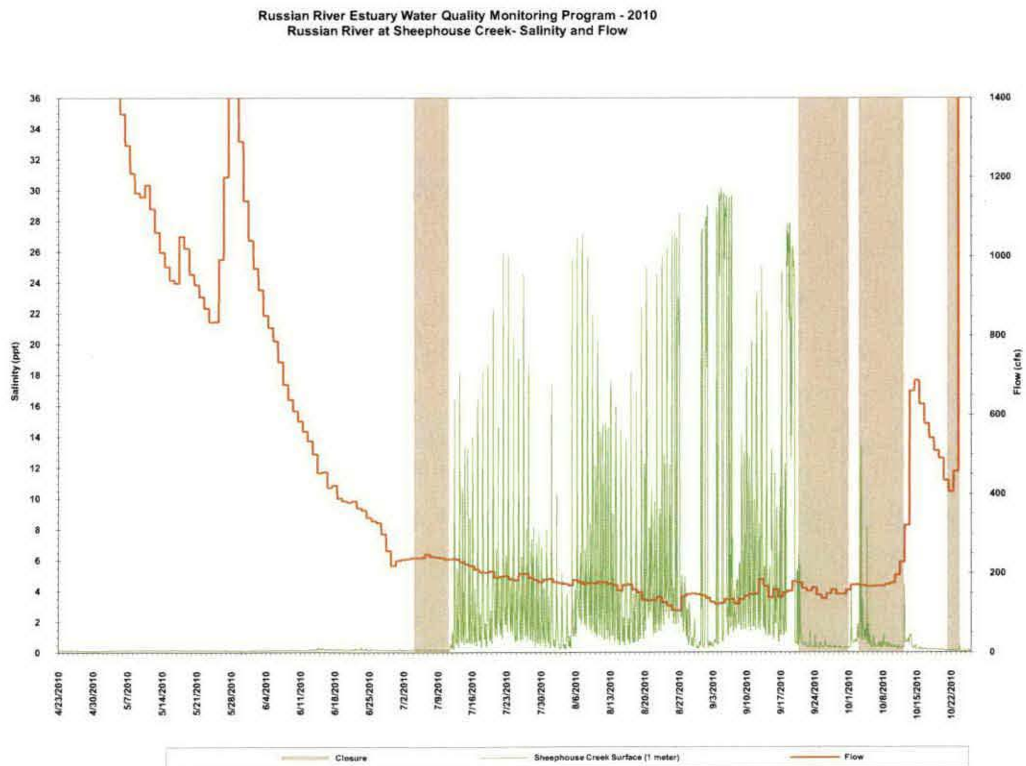

Figure 4.1.6. 2010 Russian River at Sheephouse Creek Salinity and Flow Graph

increasing the depth of the freshwater layer over the salt layer, the resulting compression and leveling out of the salt layer during stratification, and seepage of saline water through the barrier beach. Salinity returned to pre-closure levels after the mouth was breached, although the time required to return to pre-breach conditions varied at each site and differed between closure events. This variability was related to the strength of subsequent tidal cycles, freshwater inflow rates, topography, relative location within the Estuary, and to a lesser degree, wind mixing.

The Sheephouse Creek mid-depth sonde experienced an equipment malfunction during the entire monitoring period and no data were collected for this station in 2010. The mid-depth sondes at the Mouth, Patty's Rock, and Bridgehaven had mean salinity values near 25 ppt (Table 4.1.1). Minimum values at the Mouth mid-depth sonde were observed to occur with hourly fluctuations during high springtime flows, similar to what is observed at the surface sondes during open conditions later the monitoring period (Figure 4.1.3). Minimum salinity values were also observed at all mid-depth stations in the lower and middle reaches when freshwater flows temporarily displaced the saltwater at these stations during: spring storm events in late-April and May, barrier beach closure, and flushing events after the barrier beach was breached (Figures 4.1.3 through 4.1.6).

The Willow Creek sonde was located in a predominantly freshwater habitat during higher mainstem flows that persisted through June. Freshwater conditions remained at the station during and immediately following the 4 July to 11 July closure, however saline water migrated to this location on a high tide on 13 July and remained for the rest of the season (Figure 4.1.7). Once present, salinity at this site varied over the season, but remained primarily brackish in concentration (Table 4.1.1).

Upper Reach Salinity

Two stations were monitored in the upper reach in 2010: Heron Rookery and Freezeout Creek. Both stations included a bottom sonde and a mid-depth sonde. Sondes were located in this manner to track changes in concentration of salinity in the water column.

The Heron Rookery station is located approximately 7.5 km upstream from the mouth of the river in a deep pool. This station is situated where the Estuary begins to transition from predominantly saline conditions to brackish and freshwater conditions. The bottom and mid-depth sondes at Heron Rookery had mean salinity concentrations of 15.2 ppt and 3.3 ppt, respectively (Table 4.1.1). The high value at the mid-depth sonde was associated with a spike in concentration that occurred during barrier beach closure on 23 September (Figure 4.1.8).

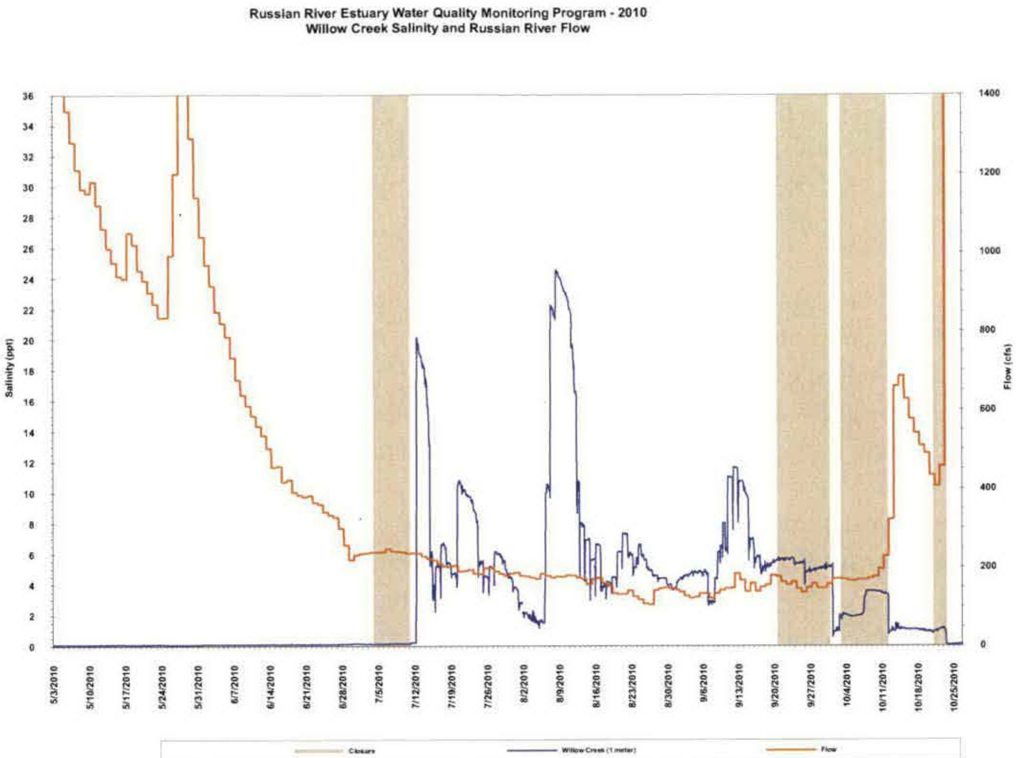

Figure 4.1.7. 2010 Willow Creek Salinity and Russian River Flow Graph

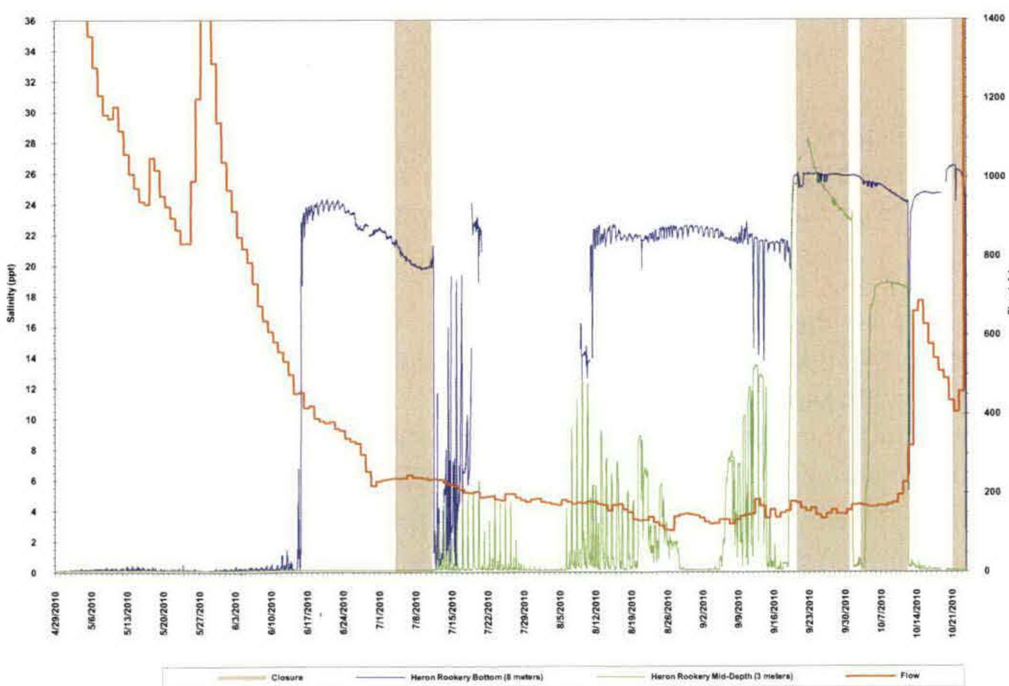

Figure 4.1.8. 2010 Russian River at Heron Rookery Salinity and Flow Graph

The Freezeout Creek station is located in a predominantly freshwater habitat that was occasionally subject to elevated salinity levels as the salt wedge migrated up the Estuary during both open and closed conditions (Figure 4.1.9). The bottom and mid-depth sondes at Freezeout Creek had mean salinity concentrations of 2.5 and 0.7 ppt (Table 4.1.1).

The salt wedge migrated to the Heron Rookery station during open conditions in mid-June when freshwater inflows decreased below 500 cfs (Figures 4.1.8). The salt wedge was not observed at the Freezeout Creek station until mid-July when freshwater inflows decreased to approximately 200 cfs (Figures 4.1.9). However, concentrations varied during open conditions due to tidal cycles and changes in freshwater inflow. Additionally, saline conditions increased and persisted at the mid-depth and bottom sondes at Heron Rookery and Freezeout Creek during barrier beach closures in September and early October as the salt layer stratified and flattened out underneath the deepening freshwater layer. Salinity was generally observed to decrease after the mouth was breached, although the time required to return to pre-breach conditions varied at each site and differed between closure events. This variability was related to the strength of subsequent tidal cycles, freshwater inflow rates, topography, relative location within the Estuary, and to a lesser degree, wind mixing.

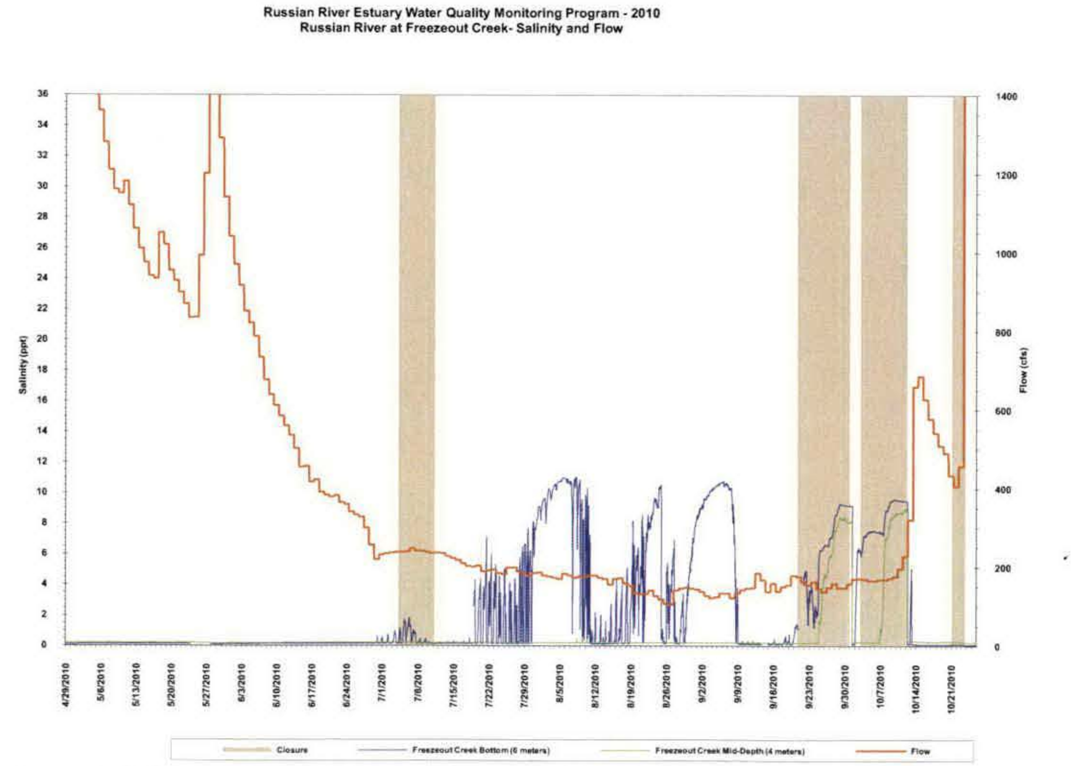

Figure 4.1.9. 2010 Russian River at Freezeout Creek Salinity and Flow Graph

The Freezeout Creek station and mid-depth sonde at Heron Rookery transitioned to a predominantly freshwater habitat following early season storms that produced flows over 600 cfs on 14 October; however salinity persisted at the Heron Rookery bottom sonde until another storm produced inflows over 3,000 cfs on 24 October (Figures 4.1.8 and 4.1.9). Consequently, both storm events coincided with the breaching of the barrier beach, first by the Water Agency on 12 October and then naturally on 24 October. The natural breach on 24 October appeared to be a result of the high storm flows.

Maximum Backwater Area Salinity

Two stations were located in the maximum backwater area including one tributary station located in lower Austin Creek, and one mainstem Russian River station located in Monte Rio Figure 4.1.1). The Austin Creek station was located approximately 0.6 km upstream from the confluence with the Russian River. The Monte Rio station was located approximately 0.5 km downstream of the Monte Rio Bridge.

Neither station was observed to have salinity levels above normal background conditions expected in freshwater habitat, during both open and closed barrier beach conditions (Figures 4.1.10 and 4.1.11). Both stations had mean salinity concentrations of 0.1 ppt, with concentrations ranging from 0.1 to 0.2 ppt at Monte Rio, and 0.0 to 0.2 ppt at Austin Creek (Table 4.1.1).

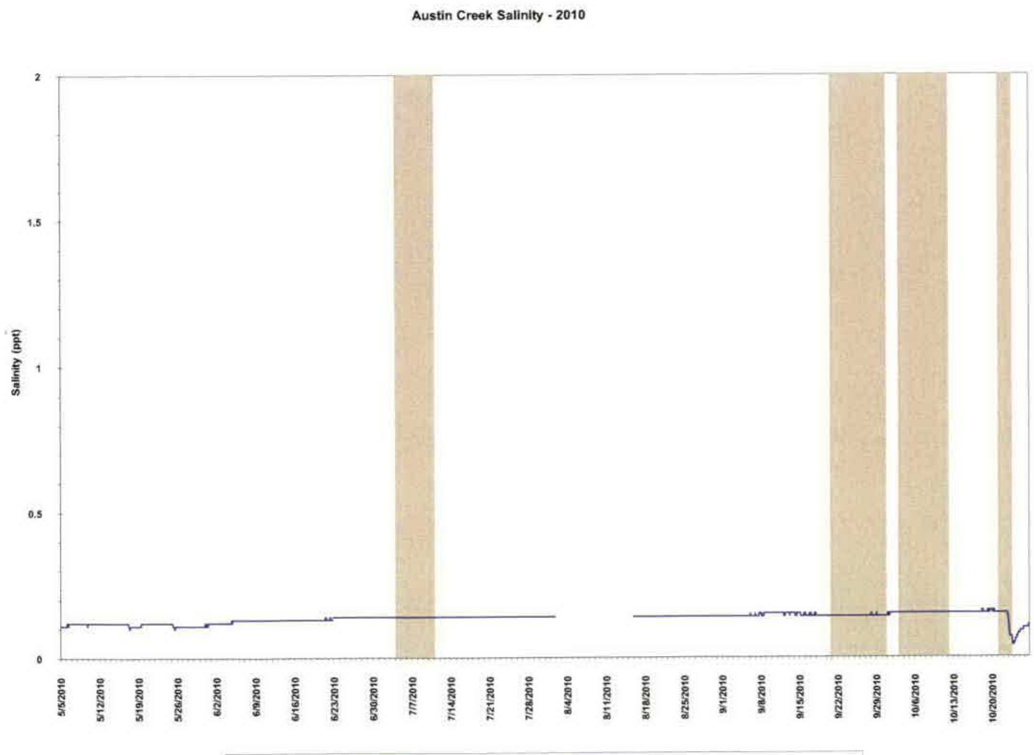

Figure 4.1.10. 2010 Austin Creek Salinity Graph

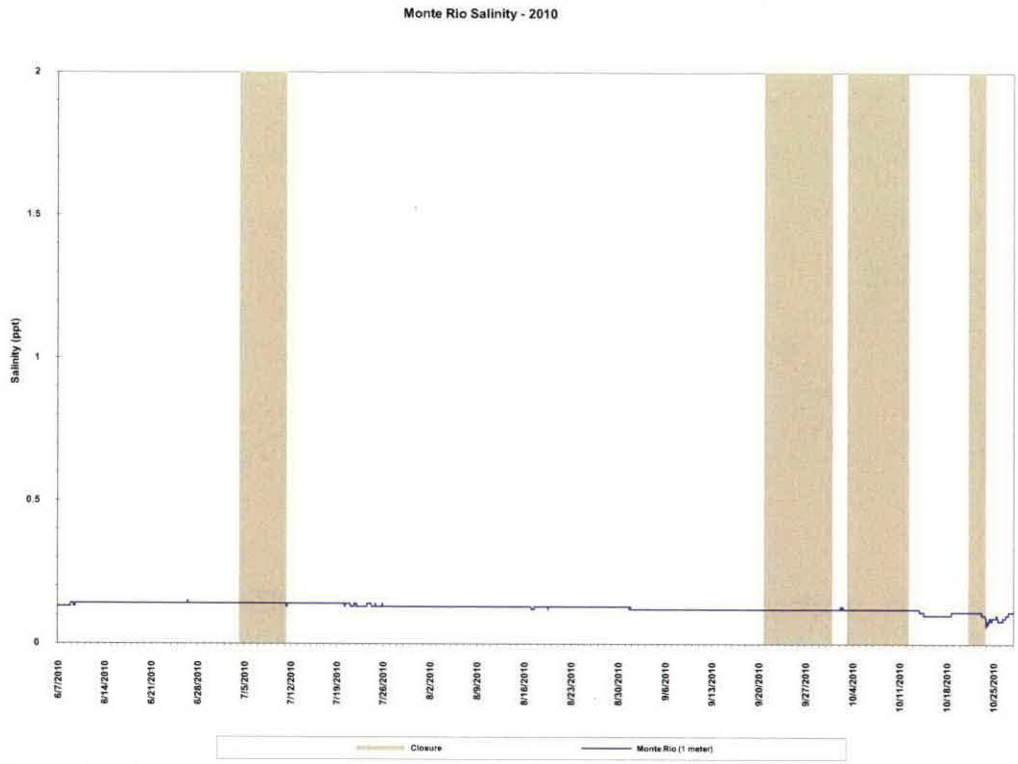

Figure 4.1.11. 2010 Russian River at Monte Rio Salinity Graph

Temperature

During open estuary conditions, water temperatures were reflective of the halocline[5], with lower mean and maximum temperatures typically being observed in the saline layer at the bottom and mid-depth sondes compared to temperatures recorded in the freshwater layer at the mid-depth and surface sondes (Figures 4.1.12 through 4.1.17). The differences in maximum temperatures between the underlying saline layer and the overlying freshwater layer can be attributed in part to the source of saline and fresh water. During open estuary conditions, the saline water from the Pacific Ocean, with temperatures typically around 10 degrees C, enters the Estuary. Whereas, the mainstem Russian River, with temperatures reaching as high as 25 degrees C in the interior valleys, is the primary source of freshwater into the Estuary.

However, during barrier beach closure, fresh/salt water stratification occurred. Density and temperature gradients between freshwater and saltwater play a role in stratification and serve to prevent/minimize mixing of the freshwater and saline layers. Over time, solar radiation heats the mid-depth saline layer, and the overlying surface freshwater layer restricts the release of heat. This often resulted in higher water temperatures in the mid-depth saline layer than in the overlying surface freshwater layer and underlying bottom saline layer located below the effects of solar heating (Figures 4.1.12 through 4.1.18). This stratification-based heating also

[5] A vertical salinity gradient in a body of water.

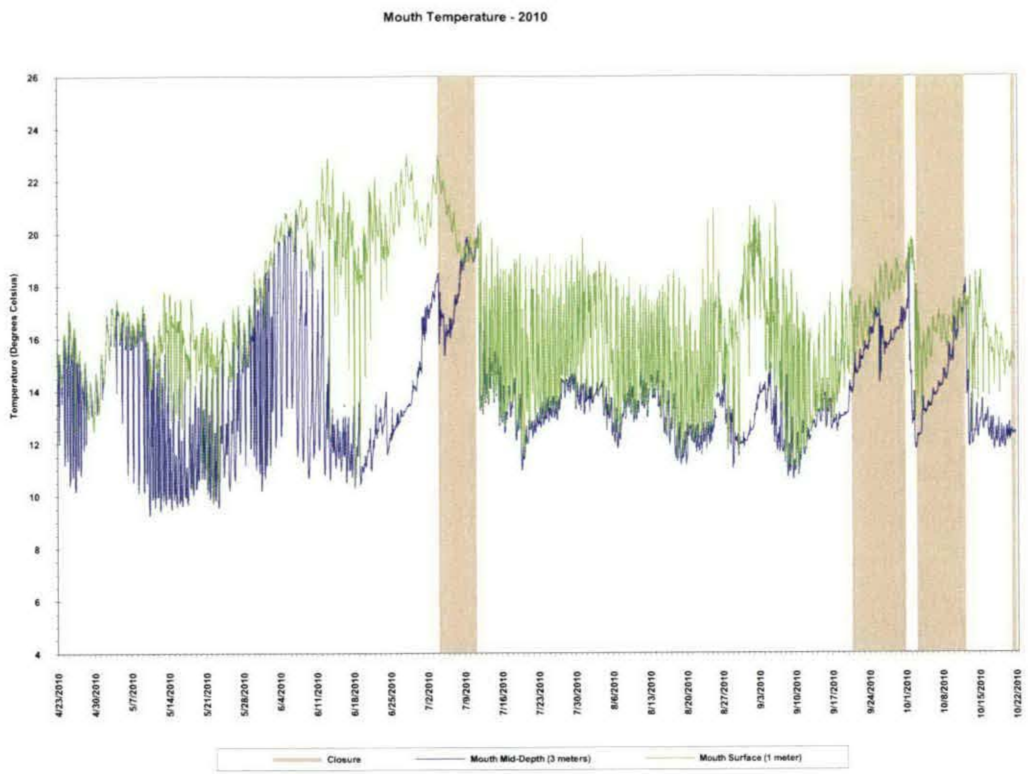

Figure 4.1.12. 2010 Russian River Mouth Temperature Graph

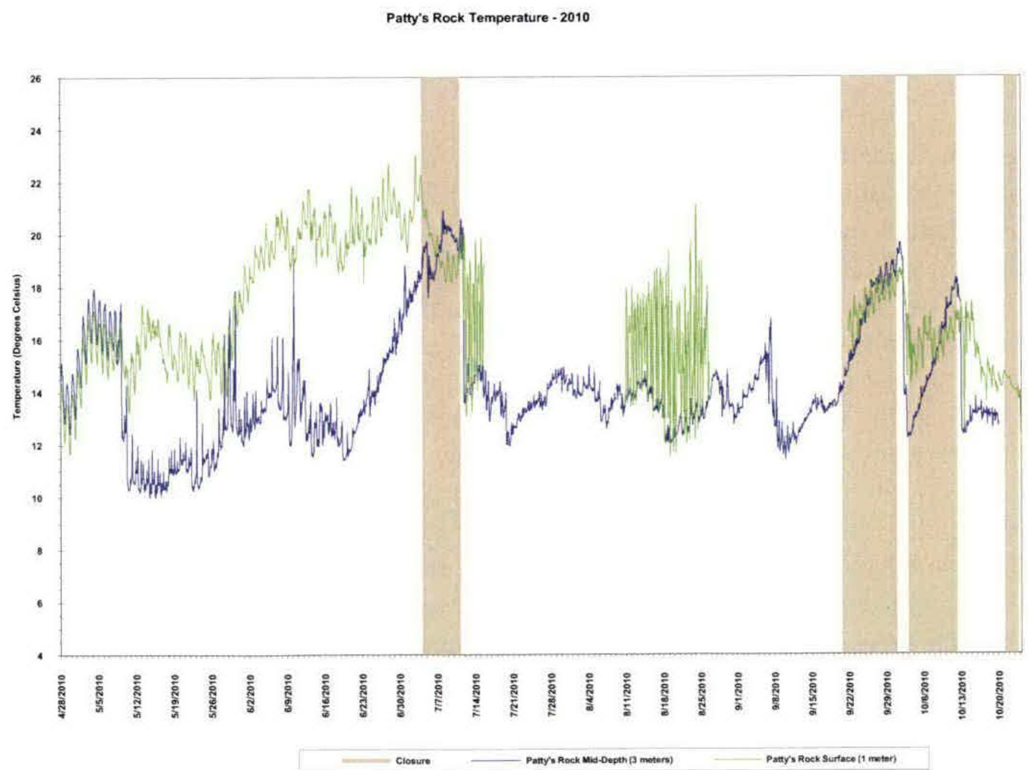

Figure 4.1.13. 2010 Russian River at Patty's Rock Temperature Graph

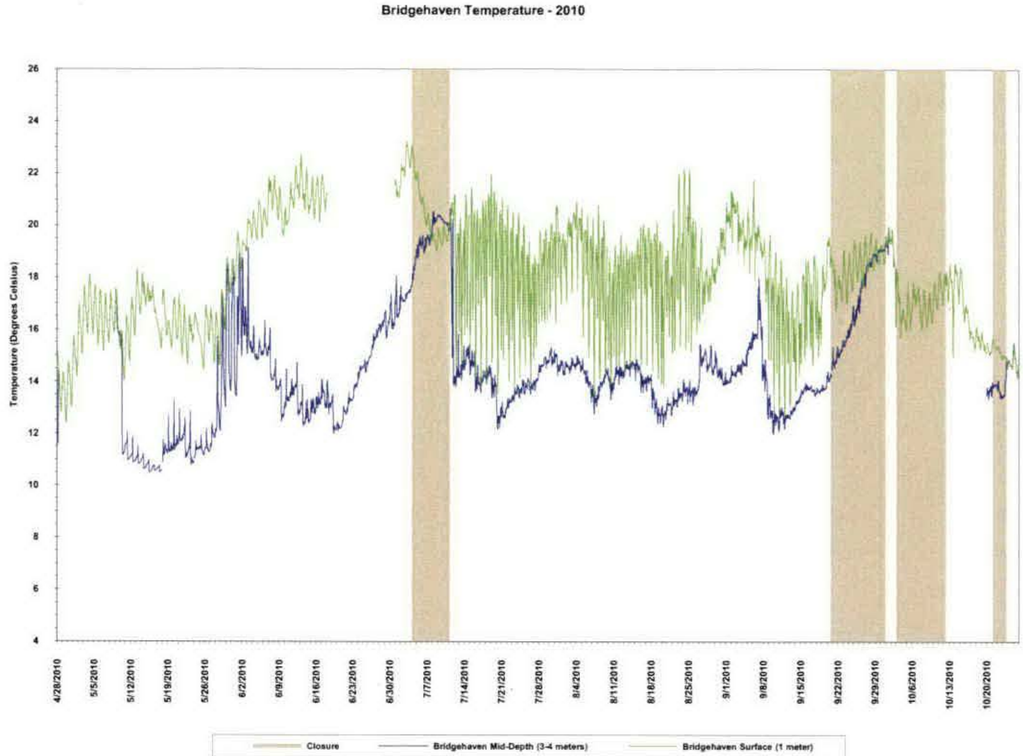

Figure 4.1.14. 2010 Russian River at Bridgehaven Temperature Graph

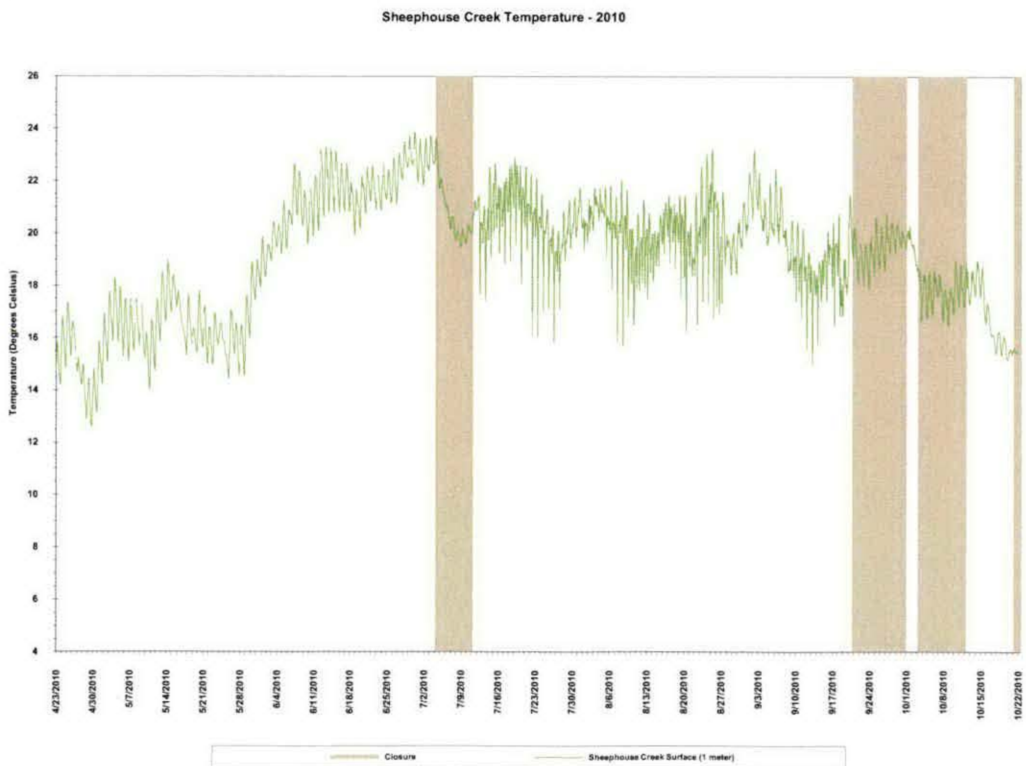

Figure 4.1.15. 2010 Russian River at Sheephouse Creek Temperature Graph

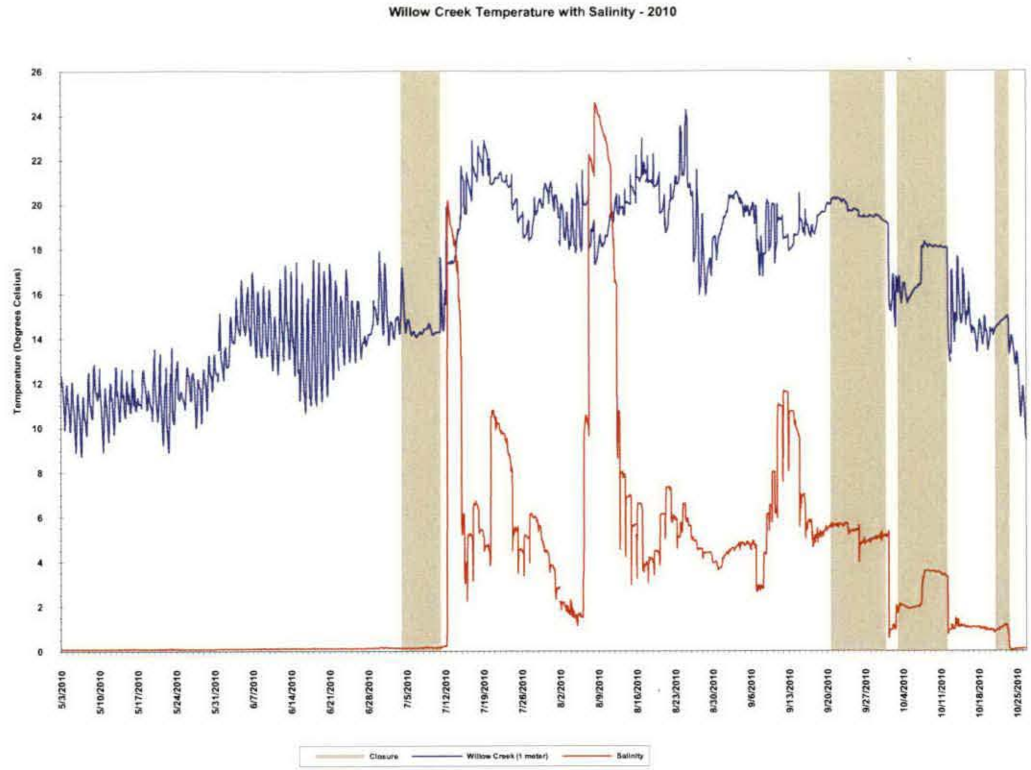

Figure 4.1.16. 2010 Willow Creek Temperature with Salinity Graph

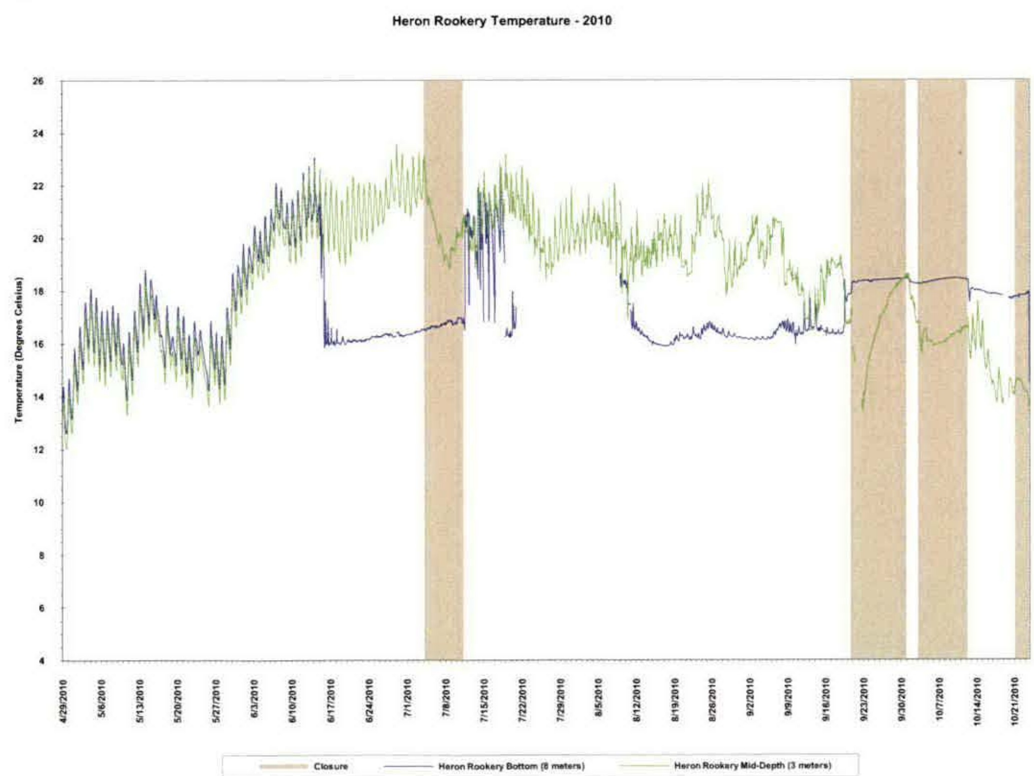

Figure 4.1.17. 2010 Russian River at Heron Rookery Temperature Graph

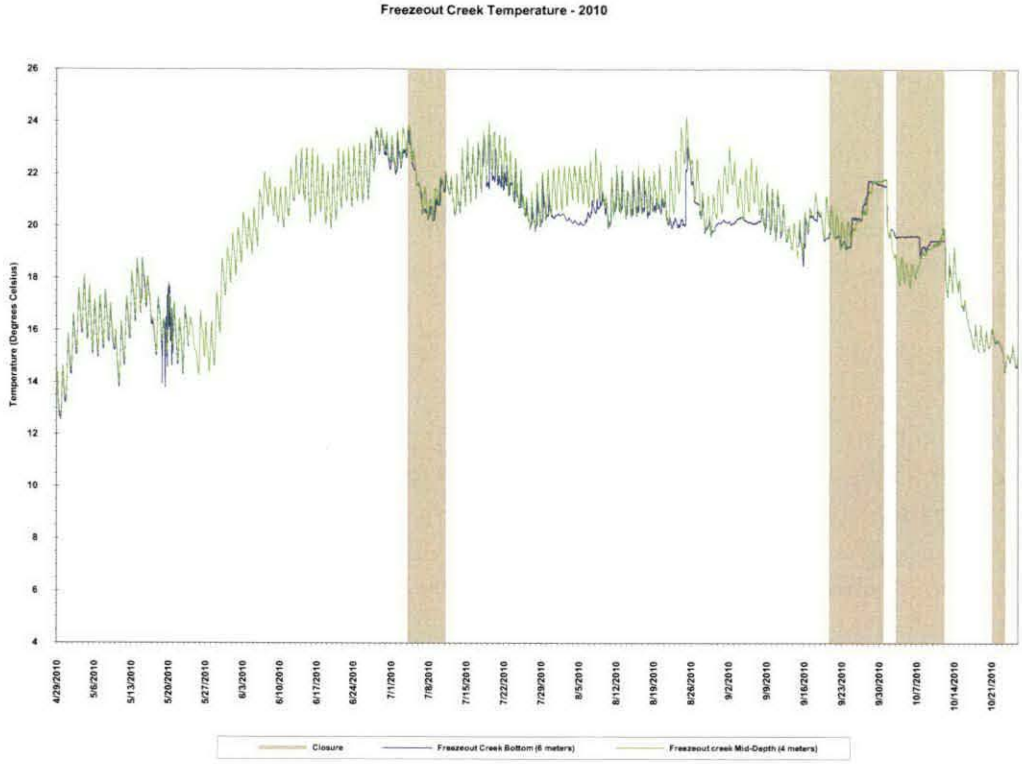

Figure 4.1.18. 2010 Russian River at Freezeout Creek Temperature Graph

contributed to higher seasonal mean and maximum temperatures in the mid-depth saline layer than would be expected to occur under open conditions.

Lower and Middle Reach Temperature

The surface sondes were located at the freshwater/saltwater interface. The Sheephouse Creek surface sonde tends to have the highest temperatures (Table 4.1.1), given that it is the furthest upstream of the lower and middle reach stations, where the freshwater layer has the least amount of cooling time as the river leaves the warmer canyons around Guerneville and Monte Rio and enters the cooler climate near the coastline. The Sheephouse Creek station is approximately 5.1 km (3.2 mi) upstream from the Mouth Station, 2.7 km (1.7 mi) inland from the coastline, and behind two ridgelines to the west and south that provide additional protection from the influences of marine fog and wind.

The mid-depth sondes were located primarily in saltwater and had maximum temperatures of approximately 20 degrees C at the Mouth, Patty's Rock, and Bridgehaven, respectively (Table 4.1.1).

The Sheephouse Creek mid-depth sonde experienced an equipment malfunction during the entire monitoring period and no valid data were collected at this station in 2010 (Figure 4.1.15).

The Willow Creek sonde was located in primarily freshwater habitat until after the first barrier beach closure and reopening in July. At this point, the station transitioned to a brackish system and temperatures were observed to increase, on average, until storm-related flows at the end of October flushed out the brackish water (Figure 4.1.16). Minimum temperatures were observed at the beginning and the end of the monitoring period during periods of cooler weather and storm related flow events that contributed cooler freshwater into the system. Maximum temperatures were observed mid-season in brackish water. Temperature response to barrier beach closure was variable, cooling slightly during the July closure, heating and then cooling during the September closure, and heating considerably during the October closure. It should be noted that the July closure occurred under freshwater conditions and the September and October closure occurred during brackish conditions, with an increase in salinity corresponding with the temperature increase during the October closure.

Upper Reach Temperature

Overall temperatures in both the saline layer and freshwater layer were typically hottest at the furthest upstream stations, as recorded at Heron Rookery and Freezeout Creek, and became progressively cooler as the water flows downstream, closer to the cooling effects of the coast and ocean. For example, during open conditions on 24 June, a maximum freshwater temperature of 23.1 degrees C was observed at the Freezeout Creek station (Figure 4.1.18); whereas a maximum freshwater temperature of 20.8 degrees C was observed at the Mouth station (Figure 4.1.12).

The bottom sondes at Heron Rookery and Freezeout Creek had mean temperatures of 17.3 and 19.6 degrees C, respectively (Table 4.1.1). The lower mean temperature can be partially attributed to the presence of cooler tidally-mixed saline water for a longer time period at Heron Rookery than at Freezeout Creek (Figures 4.1.8 and 4.1.9).

The mid-depth sondes at Heron Rookery and Freezeout Creek had mean temperatures of 18.5 and 19.8 degrees C, respectively (Table 4.1.1). The lower mean and minimum temperatures at Heron Rookery were also due to the presence of cooler saline water that was not present at the Freezeout Creek station with as much frequency.

During open estuary conditions in the lagoon management period, water temperatures in the upper reach of the Estuary were cooler in the saline layer than the overlying freshwater layer (Figures 4.1.17 and 4.1.18). Upon closure of the barrier beach, stratification-related heating of the saline layer was observed in the upper reach similar to that observed in the lower and middle reaches (Figures 4.1.12 through 4.1.14). While temperatures initially decreased during several closures at both stations, this was usually associated with freshwater conditions, whereas temperature increases corresponded with the presence of salinity (Figures 4.1.8 and 4.1.9).

Temperatures generally decreased after the barrier beach was breached, although the time required to return to pre-breach conditions varied at each site and differed between closure events. This variability was related to the presence of salinity, strength of subsequent tidal cycles, freshwater inflow rates, topography, relative location within the Estuary, and to a lesser degree, wind mixing.

Maximum Backwater Area Temperature

Austin Creek had a maximum temperature of 21.3 degrees C, a mean temperature of 16.4 degrees C, and a minimum temperature of 11.0 degrees C. Temperatures at this station did not appear to be affected by barrier beach closure during the July closure. The diurnal cycle of heating and cooling appeared to increase during the September and October closures, when freshwater inflows from Austin Creek were at their lowest point (<5cfs) for the season; however the diurnal cycle was not as large as was observed earlier in the season during open conditions (Figure 4.1.19).

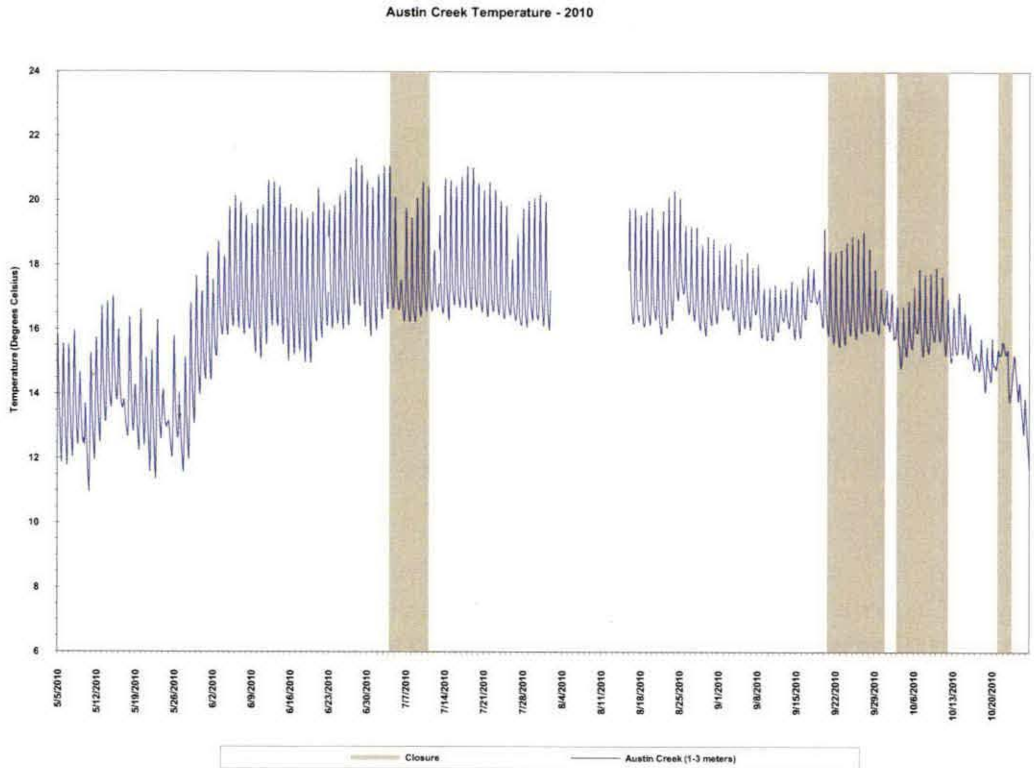

Figure 4.1.19. 2010 Austin Creek Temperature Graph

The Monte Rio station had a maximum temperature of 22.1 degrees C, a mean temperature of 17.8 degrees C, and a minimum temperature of 10.6 degrees C (Table 4.1.1). The highest temperatures were observed to occur during open conditions. The affect of barrier beach closure on temperature was insignificant and variable, with minor increases and decreases observed to occur during barrier beach closure and reopening (Figure 4.1.20). This variability was likely related to differences in air temperatures and freshwater inflow rates, and to a lesser degree, wind mixing.

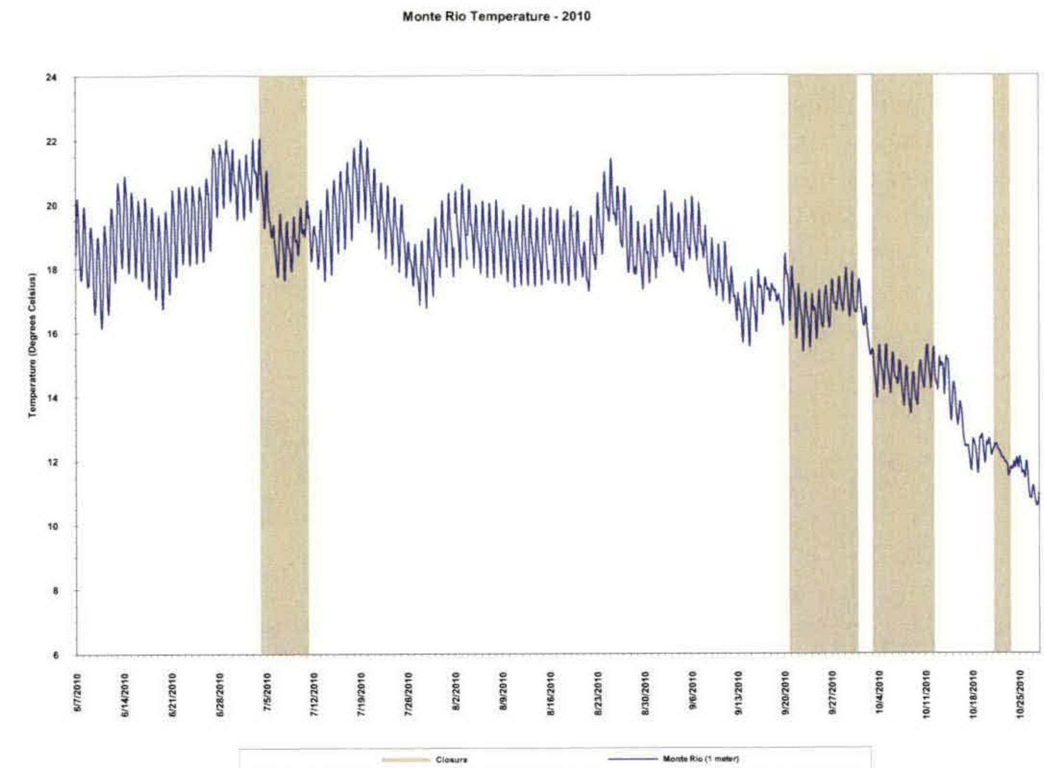

Figure 4.1.20. 2010 Russian River at Monte Rio Temperature Graph

Dissolved Oxygen

Dissolved oxygen (DO) levels in the Estuary, including the maximum backwater area, depend upon factors such as the extent of diffusion from surrounding air and water movement, including freshwater inflow. DO is affected by salinity and temperature stratification, tidal and wind mixing, abundance of aquatic plants, and presence of decomposing organic matter. DO affects fish growth rates, embryonic development, metabolic activity, and under severe conditions, stress and mortality. Cold water has a higher saturation point than warmer water; therefore cold water is capable of carrying higher levels of oxygen.

DO levels are also a function of nutrients, which can accumulate in water and promote plant and algal growth that both consume and produce DO during respiration and photosynthesis. Estuaries tend to be naturally eutrophic because land-derived nutrients are concentrated where runoff enters the marine environment in a confined channel.[6] Upwelling in coastal systems also promotes increased productivity by conveying deep, nutrient-rich waters to the surface, where the nutrients can be assimilated by algae. Excessive nutrient concentrations and plant and algal growth can overwhelm eutrophic systems and lead to a reduction in DO levels that can affect the overall ecological health of the Estuary.

[6] *National Estuarine Eutrophication Assessment* by NOAA National Centers for Coastal Ocean Science (NCCOS) and the Integration and Application Network (IAN), 1999.

Dissolved oxygen concentrations in the lower and middle reaches were generally higher at the surface sondes compared to the mid-depth sondes at a given sampling station (Figures 4.1.21 through 4.1.24). The surface sondes typically had the highest mean DO concentrations, as well as the highest maximum and minimum concentrations, when compared with the mid-depth sondes (Table 4.1.1). Supersaturation conditions observed at the surface sondes contributed to the higher maximum and mean DO concentrations, with the most significant events occurring at Patty's Rock and Bridgehaven during open estuary conditions (Figures 4.1.22 and 4.1.23).

However, supersaturation events were also observed at the mid-depth sondes, with the most significant events occurring at the Mouth (Figure 4.1.21). Supersaturation events at the mid-depth sondes were typically less significant and occurred less frequently than events at the corresponding surface sondes, except during the September and October closures, when they were observed to exceed DO concentrations at the corresponding surface sondes (Figures 4.1.21 through 4.1.23). However, these values did not exceed the season high values observed at the corresponding surface sondes, except at the Mouth station, where a data gap at the surface station during a supersaturation event in late-June may have contributed to this exception (Figure 4.1.21).

Dissolved oxygen concentrations in Willow Creek were reflective of the presence of salinity, with higher values being observed in freshwater habitat and lower values being observed in brackish conditions. However, the lowest DO concentrations were observed during estuary closure, in both freshwater and brackish conditions, with hypoxic to anoxic conditions being observed in brackish water during the September closure (Figure 4.1.25).

The upper reach DO concentrations at the mid-depth sondes were fairly consistent with conditions at the mid-depth sondes in the lower and middle reaches. However, it should be noted that the mid-depth sondes in the upper reach were located in predominantly freshwater habitat, whereas the mid-depth sondes in the lower and middle reaches were located in predominantly brackish to saline habitat. Upper reach DO concentrations were typically lower in the saline layer, as observed at the bottom sondes during both open and closed Estuary conditions, than DO concentrations observed in the saline layer in the lower and middle reaches. This can partially be attributed to the location of these sondes at the bottom of deep holes where the saline layer becomes trapped. There is less mixing of the saline layer in these deep holes, especially further up in the estuary where the influence of the tidal cycle is reduced, resulting in recurring hypoxic and anoxic conditions.

Lower and Middle Reach DO

The Surface Sondes had fairly consistent mean DO concentrations in the lower and middle reaches (Table 4.1.1). Mean DO concentrations at the mid-depth sondes were also fairly consistent from station to station, with mean DO concentrations of 9.1, 8.4, and 8.7 mg/L at the Mouth, Patty's Rock, and Bridgehaven, respectively (Table 4.1.1). The Sheephouse Creek mid-depth sonde experienced an equipment malfunction during the entire monitoring period and no valid data were collected at this station in 2010 (Figure 4.1.24).

Significant fluctuations in DO concentrations were observed at all stations in the lower and middle reaches during open Estuary conditions, with more pronounced events occurring during

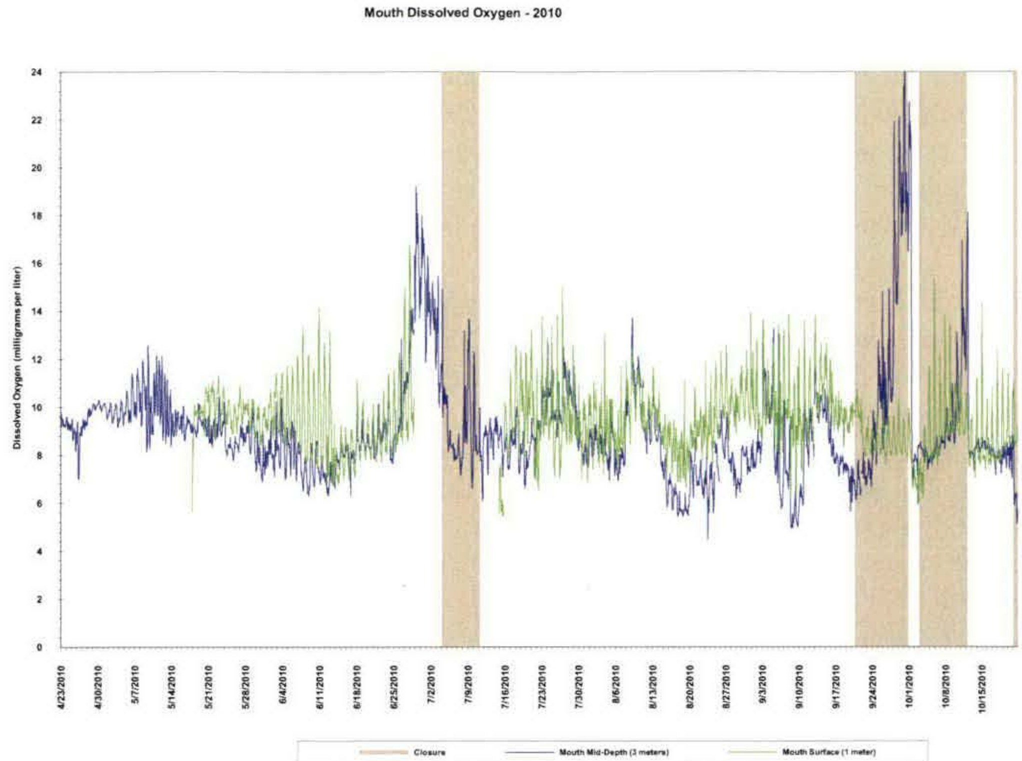

Figure 4.1.21. 2010 Russian River Mouth Dissolved Oxygen Graph

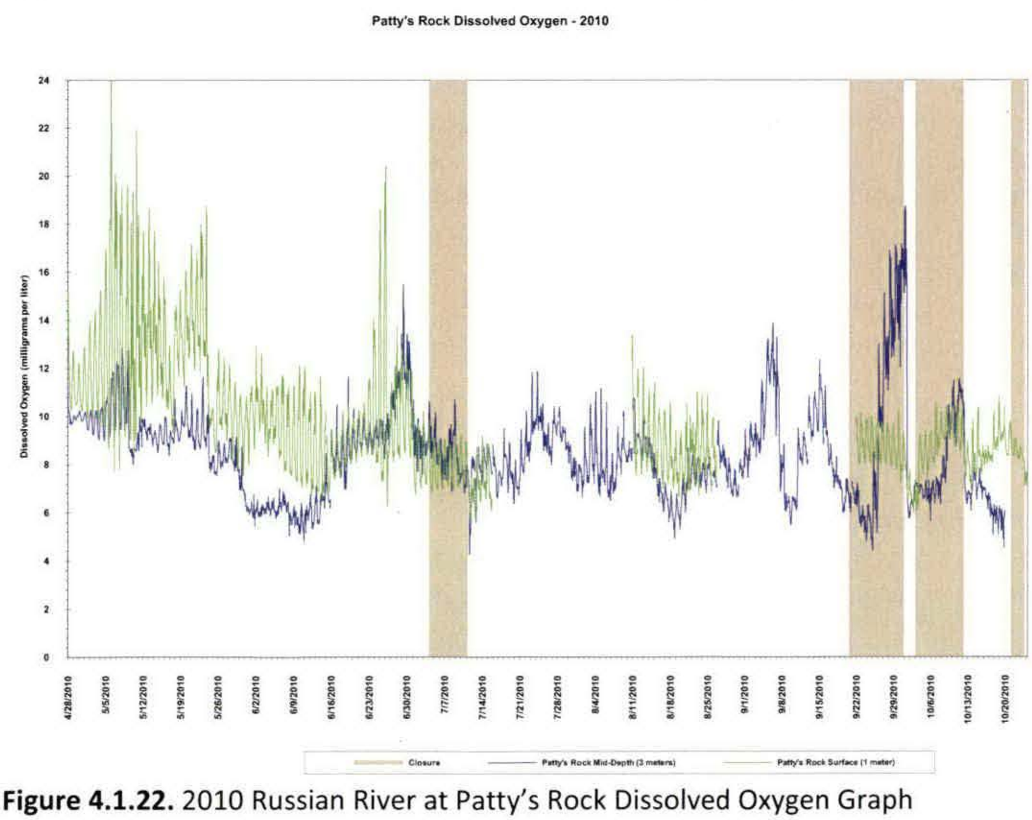

Figure 4.1.22. 2010 Russian River at Patty's Rock Dissolved Oxygen Graph

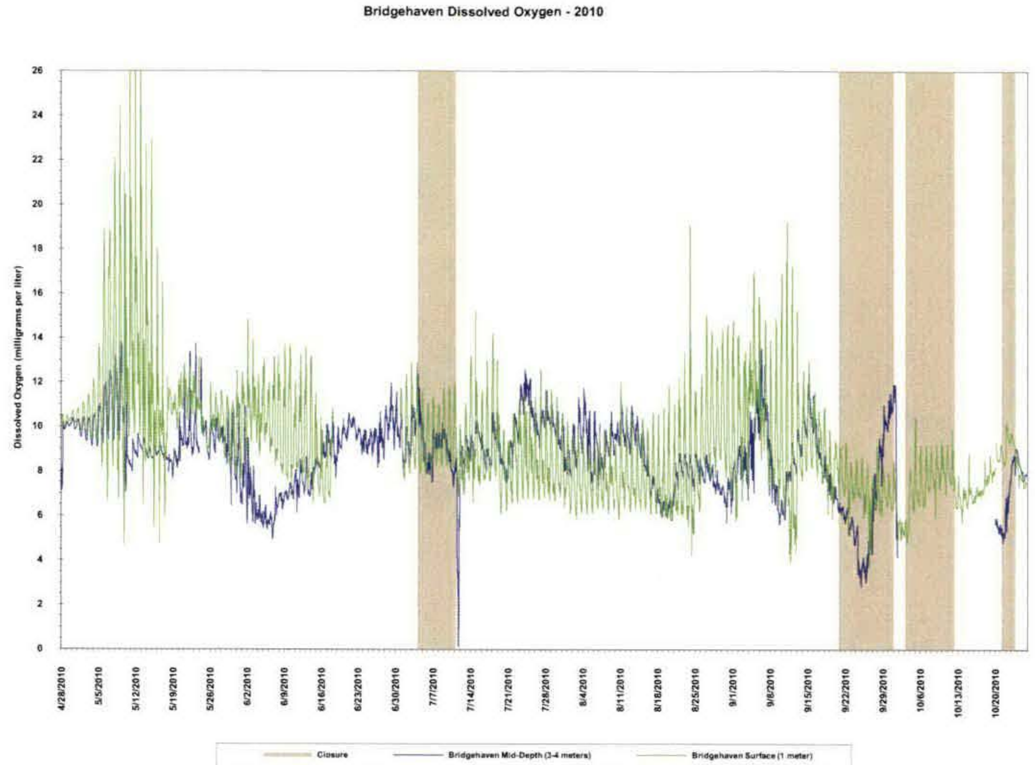

Figure 4.1.23. 2010 Russian River at Bridgehaven Dissolved Oxygen Graph

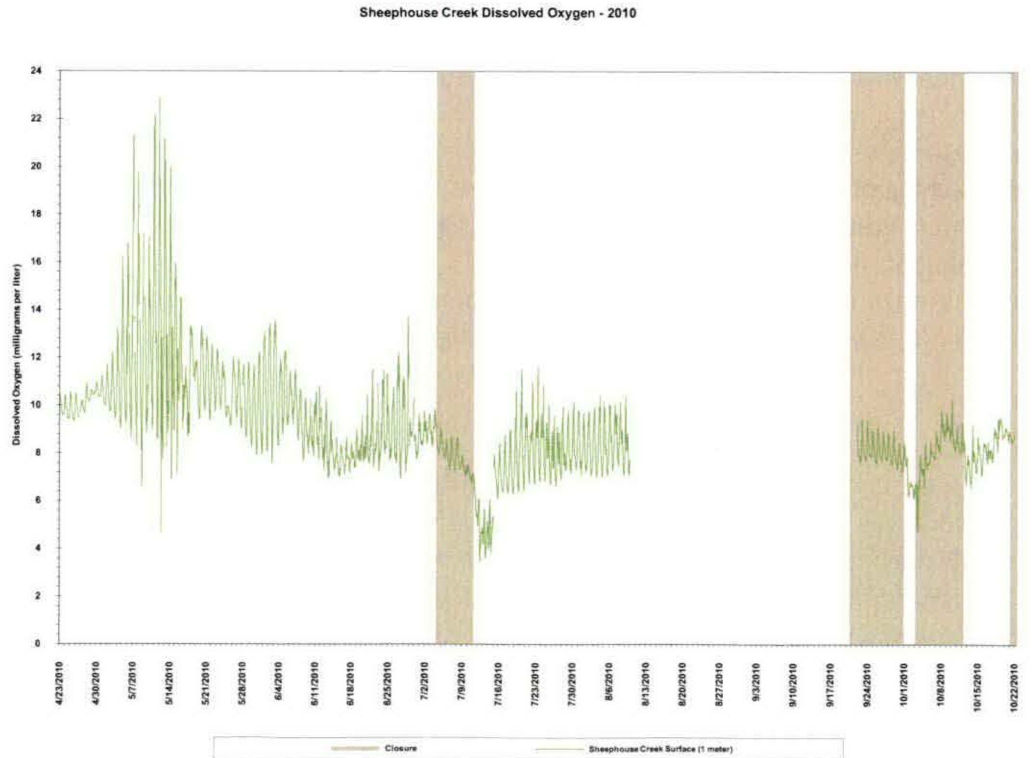

Figure 4.1.24. 2010 Russian River at Sheephouse Creek Dissolved Oxygen Graph

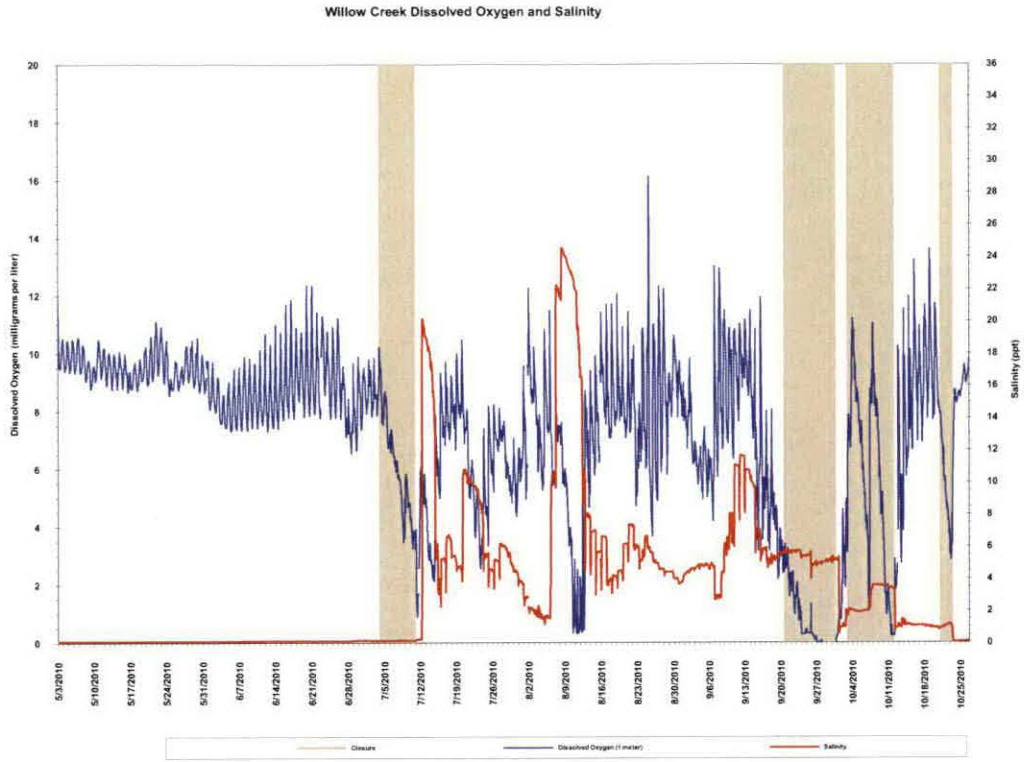

Figure 4.1.25. 2010 Willow Creek Dissolved Oxygen and Salinity Graph

periods of barrier beach closure. Short-term hypoxic and/or anoxic events observed at some of the mid-depth sondes in 2009 were not observed during 2010. DO concentrations at the mid-depth sondes declined during estuary closure, but not to hypoxic or anoxic levels. However, DO concentrations became temporarily anoxic at the Bridgehaven mid-depth sonde immediately following the breaching of the barrier beach in July (Figure 4.1. 23) and may have been affected by the downstream migration of hypoxic to anoxic water from Willow Creek, which is located about 1km upstream of the Bridgehaven station (Figure 4.1.25). Minimum DO concentrations occurred either during or immediately following barrier beach closure and were observed to be 4.5, 4.3, and 0.1 mg/L at the Mouth, Patty's Rock, and Bridgehaven mid-depth sondes, respectively.

Consequently, all sondes at all depths experienced some degree of fluctuating DO concentrations, especially during periods of barrier beach closure. However, the effect of barrier beach closure was variable as DO concentrations at the surface sondes remained unaffected, slightly decline, or increase in some instances. Although the surface sondes at the Mouth, Patty's Rock, Bridgehaven, and Sheephouse Creek had minimum seasonal DO concentrations of 5.4, 5.7, 3.7 and 3.4 mg/L, most of these values did not coincide with any of the barrier beach closures (Table 4.1.1). However, temporary decreases in DO concentrations were observed at the stations immediately following reopening of the barrier beach. These decreases in DO concentration may have also been affected by the downstream migration of hypoxic and/or anoxic water from Willow Creek and/or the upper reach of the estuary (Figures 4.1.25 through 4.1 27).

Recovery of DO concentrations following reopening of the barrier beach was variable in timing and relative concentration among stations and sondes, but typically occurred within several days of the barrier beach being opened.

Again, differences between stations can be partially attributed to data gaps associated with equipment malfunctions, as well as different monitoring periods. Additional data collection and analysis would be needed to further explore whether any of these conditions represent trends.

The surface sondes, and mid-depth sondes to a lesser degree, also experienced hourly fluctuating supersaturation events. At times when oxygen production exceeds the diffusion of oxygen out of the system, supersaturation may occur (Horne, 1994). DO concentrations exceeding 100% saturation in the water column are considered supersaturated conditions. Because the ability of water to hold oxygen changes with temperature, there are a range of concentration values that correspond to 100% saturation. For instance, at sea level, 100% saturation is equivalent to approximately 11 mg/L at 10 degrees C, but only 8.2 mg/L at 24 degrees C. Consequently, these two temperature values roughly represent the range of temperatures observed in the Estuary during the 2009 monitoring season.

The most significant supersaturation event was observed at the Bridgehaven surface sonde (Figure 4.1.23). The maximum DO concentration at the Bridgehaven surface sonde was approximately 34.7 mg/L (345%), compared to 16.8 mg/L (192%), 24.2 mg/L (249%) , and 22.9 mg/L (233%) at the Mouth, Patty's Rock, and Sheephouse Creek surface sondes, respectively (Table 4.1.1). Maximum DO concentrations at the Mid-Depth sondes were approximately 25.3 mg/L (295%) at the Mouth, 18.8 mg/L (230%) at Patty's Rock, and 14.0 mg/L (164.5%) at Bridgehaven.

The Willow Creek sonde had a mean DO concentration of 7.4 mg/L, a maximum DO concentration of 16.1 mg/L, and a minimum DO concentration of 0.0 mg/L (Table 4.1.1). Minimum values were observed to occur during and/or following barrier beach closure, with more pronounced hypoxic to anoxic conditions being observed during closure in the presence of saline water. However, low DO values were also observed during open conditions in the presence of saline water (Figure 4.1.25).

Upper Reach DO

Dissolved oxygen concentrations at the mid-depth sondes in the upper reach were slightly lower overall compared to concentrations in the lower and middle reaches (Table 4.1.1), with less significant supersaturation events contributing to this difference. The mid-depth sondes at Heron Rookery and Freezeout Creek had mean DO concentrations of 8.1 and 8.7 mg/L (Table 4.1.1).

The bottom sondes at Heron Rookery and Freezeout Creek had mean DO concentrations of 5.2 and 6.8 mg/L, maximum concentrations of 15.3 and 14.8 mg/L, and minimum concentrations of 0.1 and 0.0 mg/L, respectively (Table 4.1.1). However, the Heron Rookery bottom sonde experienced equipment malfunctions that produced data gaps in July and September, which may have affected minimum, mean, and maximum DO values (Figure 4.1.26).

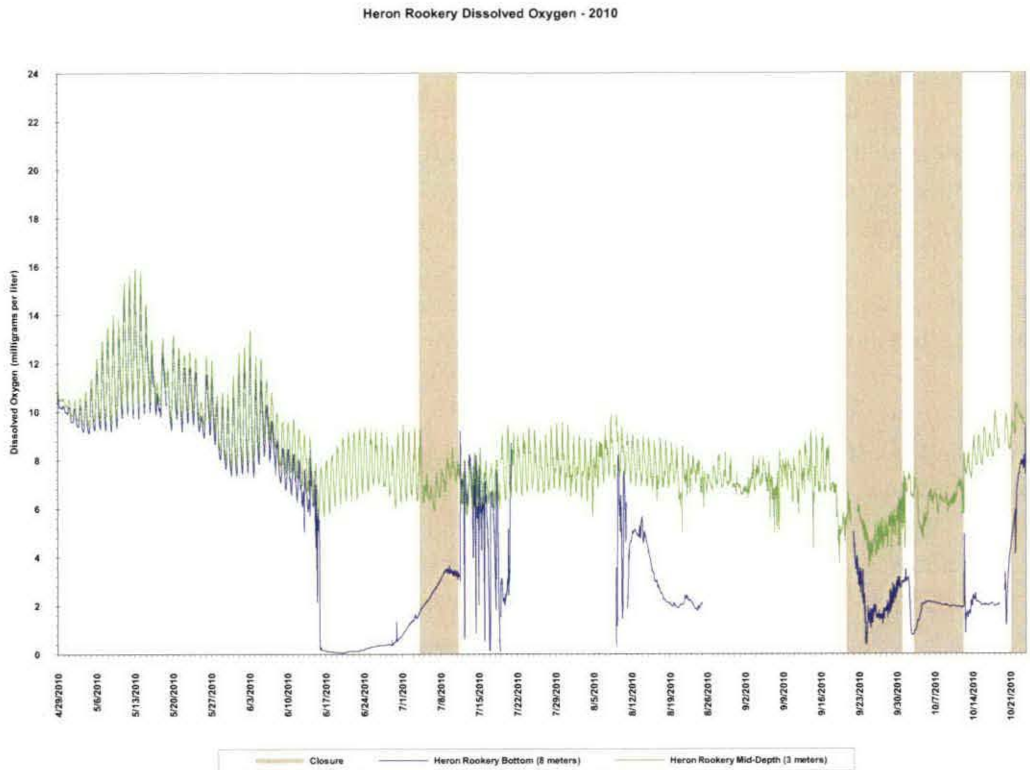

Figure 4.1.26. 2010 Russian River at Heron Rookery Dissolved Oxygen Graph

The salt wedge migrated upstream in mid-June and displaced the freshwater in the lower portion of the water column at the Heron Rookery station when late-spring storm flows dropped below approximately 500 cfs (Figures 4.1.26). This was not observed until late July at the Freezeout Creek station when flows dropped to approximately 200 cfs (Figure 4.1.27). The salt wedge then became persistent in the deep pools during open conditions from early July to early October; however, salinity concentrations continued to fluctuate at the two stations with changes to freshwater inflow rates, tidal inundation and mixing.

During open conditions, DO levels periodically became hypoxic in the saline layer at the bottom sondes. Whereas, DO levels at the mid-depth sondes remained at acceptable levels for salmonids during open conditions (Figures 4.1.26 and 4.1.27).

DO response to barrier beach closure and reopening was also variable throughout the season and dependent on the presence of salinity, the length of time of the closure, the timing of subsequent closure events, freshwater inflow rates and subsequent tidal inundation and mixing. During the July closure, DO levels at the bottom sondes became hypoxic to anoxic, while DO levels at the mid-depth sondes remained at acceptable levels (Figures 4.1.26 and 4.1.27). During this closure, the bottom sondes were located in the saline layer and the mid-depth sondes were located in the freshwater layer.

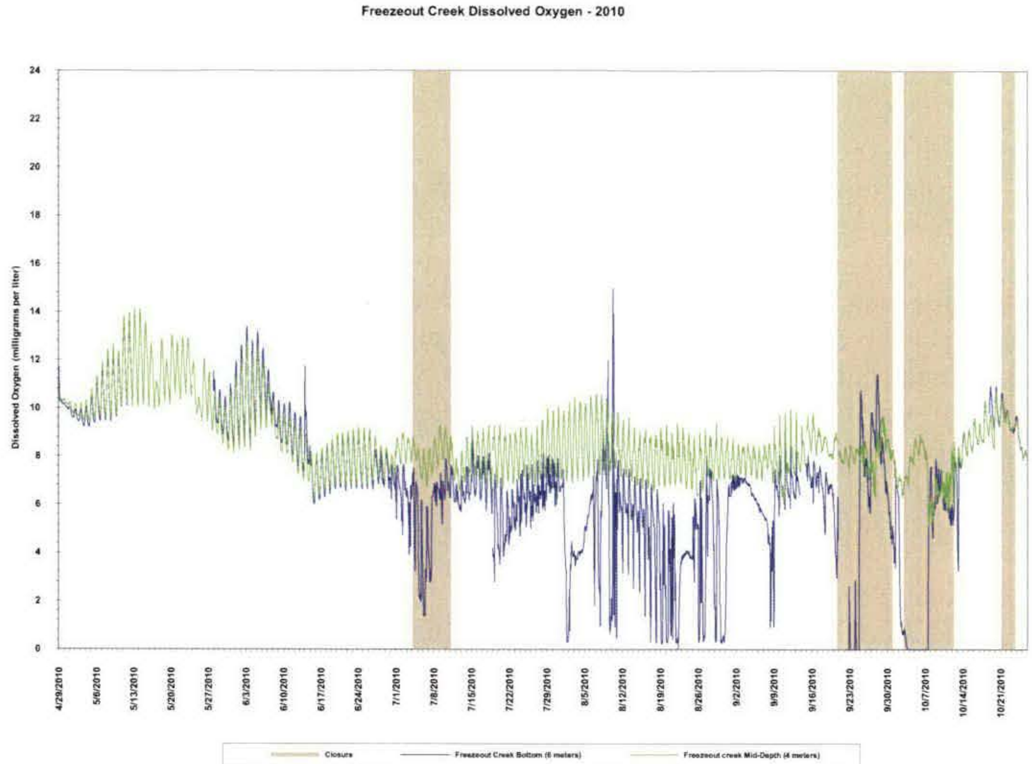

Figure 4.1.27. 2010 Russian River at Freezeout Creek Dissolved Oxygen Graph

Whereas, during the closures in September and October, the salt wedge had migrated further upstream placing the mid-depth sondes within the salt layer and DO levels decreased slightly, with concentrations becoming temporarily hypoxic at Heron Rookery during the September closure and at Freezeout Creek during the first October closure. Low DO concentrations persisted at the bottom of the Freezeout Creek and Heron Rookery stations until mid-October, when increased freshwater storm flows began to push the saline layer out of these stations.

The presence of salinity would typically coincide with the presence of depressed DO levels, but not always, suggesting that variability is dependent on changes in the length of time of closures, the timing of subsequent closure events, freshwater inflow rates and subsequent tidal inundation and mixing.

It is important to note that highly anoxic conditions observed at the Freezeout Creek bottom sonde, and to a lesser degree at the Heron Rookery bottom sonde, included the release of hydrogen sulfide (H_2S) into the water column, whereby equipment was observed with staining and odors consistent with releases of H_2S. According to the manufacturer, H_2S releases can be read by the YSI dissolved oxygen sensor as a false positive for dissolved oxygen. These H_2S releases were directly observed by staff during maintenance and calibration efforts and also recorded in the data set, where DO levels were observed to spike from hypoxic and/or anoxic conditions to fully saturated and supersaturated conditions during the same time that these observations were made (Figures 4.1.26 and 4.1.27).

Maximum Backwater Area DO

The Austin Creek station had a mean DO concentration of 8.3 mg/L, a maximum concentration of 11.6 mg/L, and a minimum concentration of 3.0 mg/L (Table 4.1.1). Minimum values were observed in mid-October during open estuary conditions when flow became intermittent (measured at less than 2 cfs at the upstream USGS gauging station) and several pools in lower Austin Creek (including the station pool) became isolated from one another, with only subsurface flow occurring between pools (Figure 4.1.28).

Dissolved oxygen concentrations were observed to increase at the Austin Creek station during a subsequent short closure event that began on 21 October, and continued to increase to approximately 10 mg/L during storm flows that began on 23 October and peaked at approximately 1,700 cfs on 24 October (Figure 4.1.28). Consequently, the river mouth reopened on 24 October during these high flows.

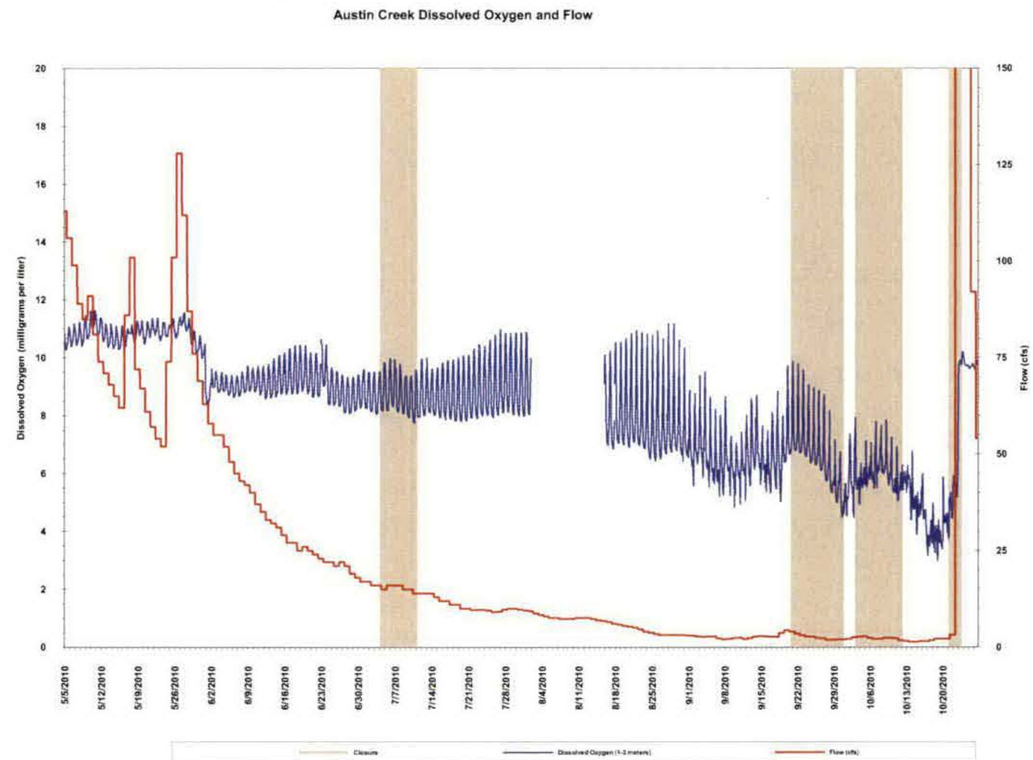

Figure 4.1.28. 2010 Austin Creek Dissolved Oxygen and Flow Graph

The Monte Rio Station had a mean DO concentration of 9.5 mg/L, a maximum concentration of 21.2 mg/L, and a minimum concentration of 6.2 mg/L (Table 4.1.1). Dissolved oxygen concentrations were observed to initially increase and then decrease slightly during estuary closure or reopening events. However, concentrations remained above 8 mg/L, on average, during both closed and open estuary summer flow conditions (Figure 4.1.29).

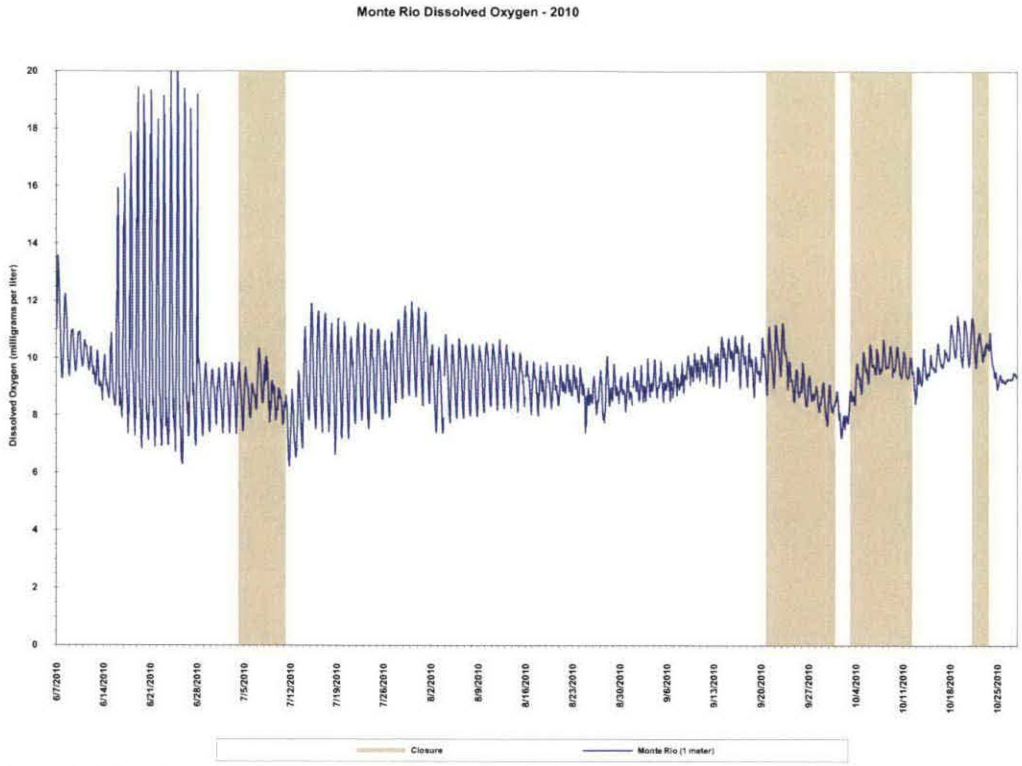

Figure 4.1.29. 2010 Russian River at Monte Rio Dissolved Oxygen Graph

Hydrogen Ion (pH)

The acidity or alkalinity of water is measured in units called pH, an exponential scale of 1 to 14 (Horne, 1994).[7] A pH value of 7 is considered neutral, freshwater streams generally remain at a pH between 6 and 9, and ocean-derived salt water is usually at a pH between 8 and 9. When the pH falls below 6 over the long term, there is a noticeable reduction in the abundance of many species, including snails, amphibians, crustacean zooplankton, and fish such as salmon and some trout species (Horne, 1994).

Lower and Middle Reach pH

Hydrogen ion (pH) values were fairly consistent among all stations at all depths in the lower and middle reaches, with mean values ranging from 7.9 pH at the Mouth and Bridgehaven mid-depth sondes to 8.2 pH at the Mouth and Patty's Rock surface sondes (Table 4.1.1). Values generally increased slightly at the surface sondes during closed estuary conditions, with the exception of the Sheephouse Creek station (Figures 4.1.30 through 4.1.33). The Sheephouse Creek surface sonde became more variable in response to barrier beach closures, with decreases and increases appearing to reflect similar decreases and increases of DO concentrations (see Figures 4.1.24 and 4.1.33). Similarly, pH values varied at the mid-depth sondes during closures, with decreases and increases appearing to reflect similar decreases and increases of DO concentrations at these stations (see Figures 4.1.20 and 4.1.29 for example).

[7] Acidity is controlled by the hydrogen ion H^+, and pH is defined as the negative log of the hydrogen ion concentration.

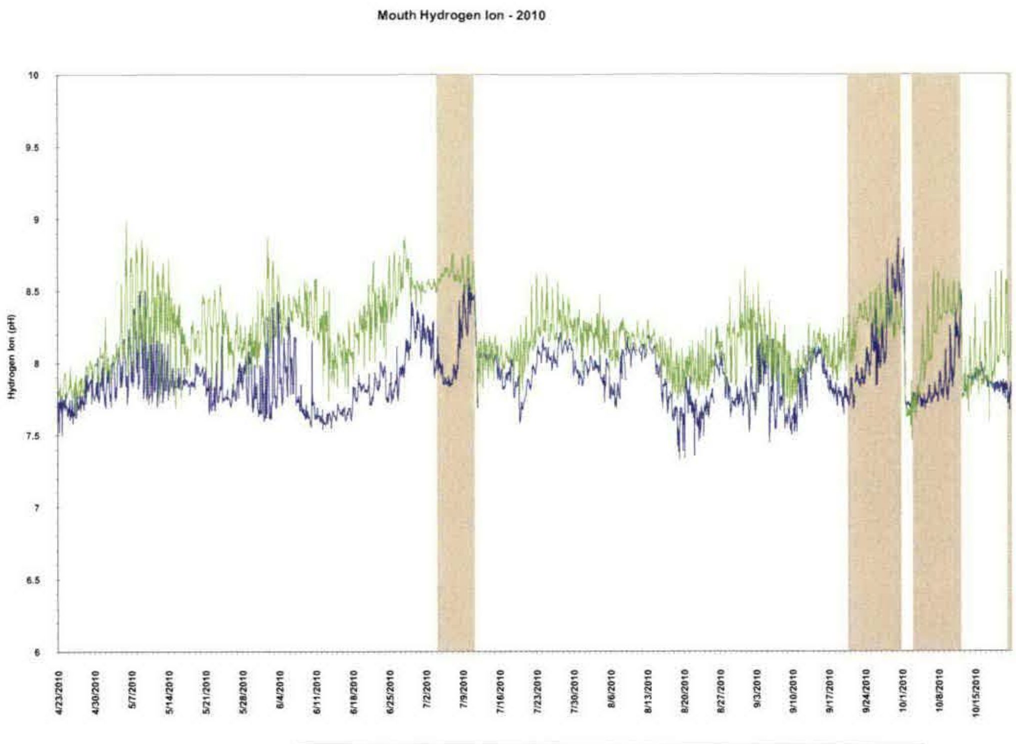

Figure 4.1.30. 2010 Russian River Mouth Hydrogen Ion Graph

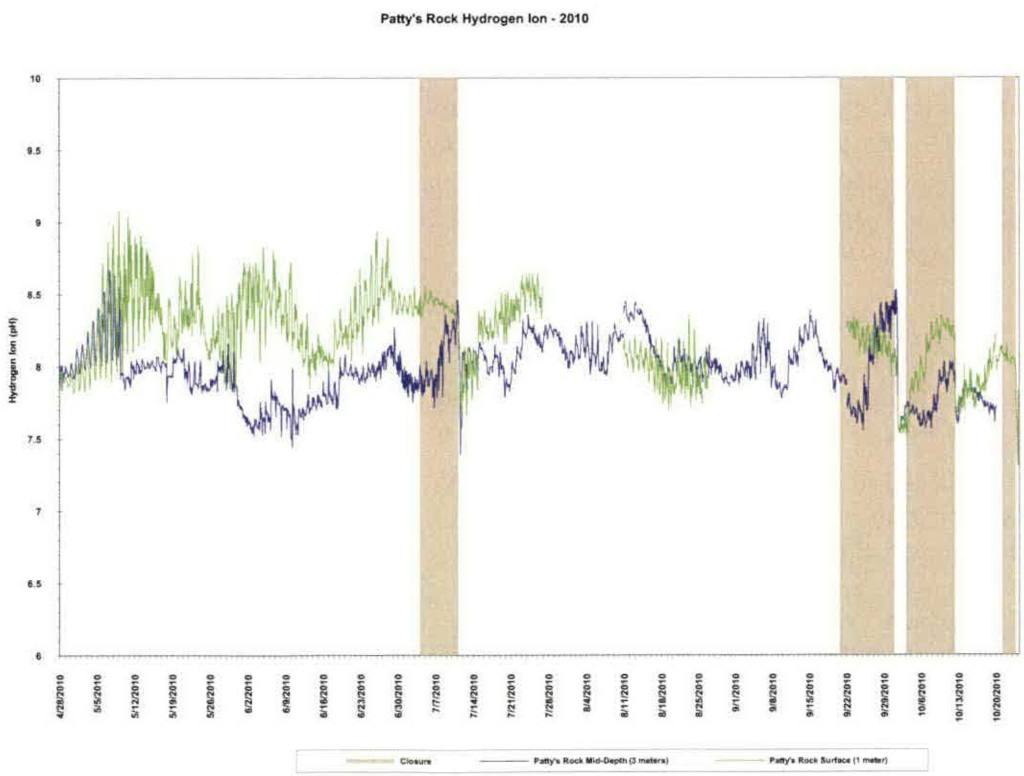

Figure 4.1.31. 2010 Russian River at Patty's Rock Hydrogen Ion Graph

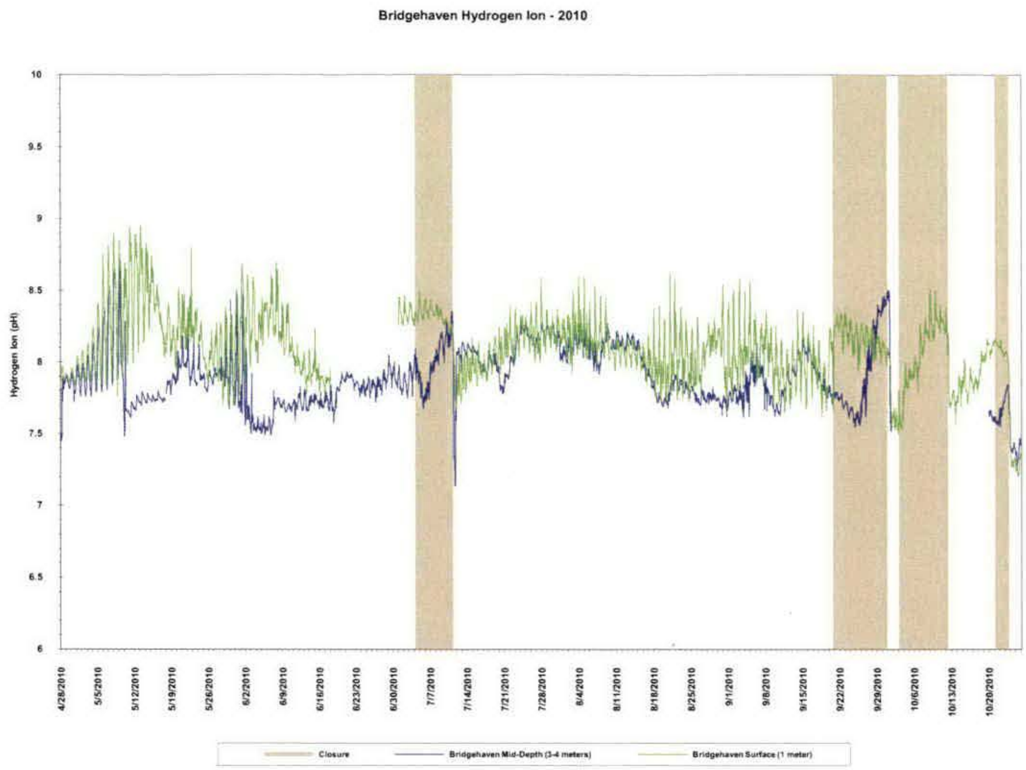

Figure 4.1.32. 2010 Russian River at Bridgehaven Hydrogen Ion Graph

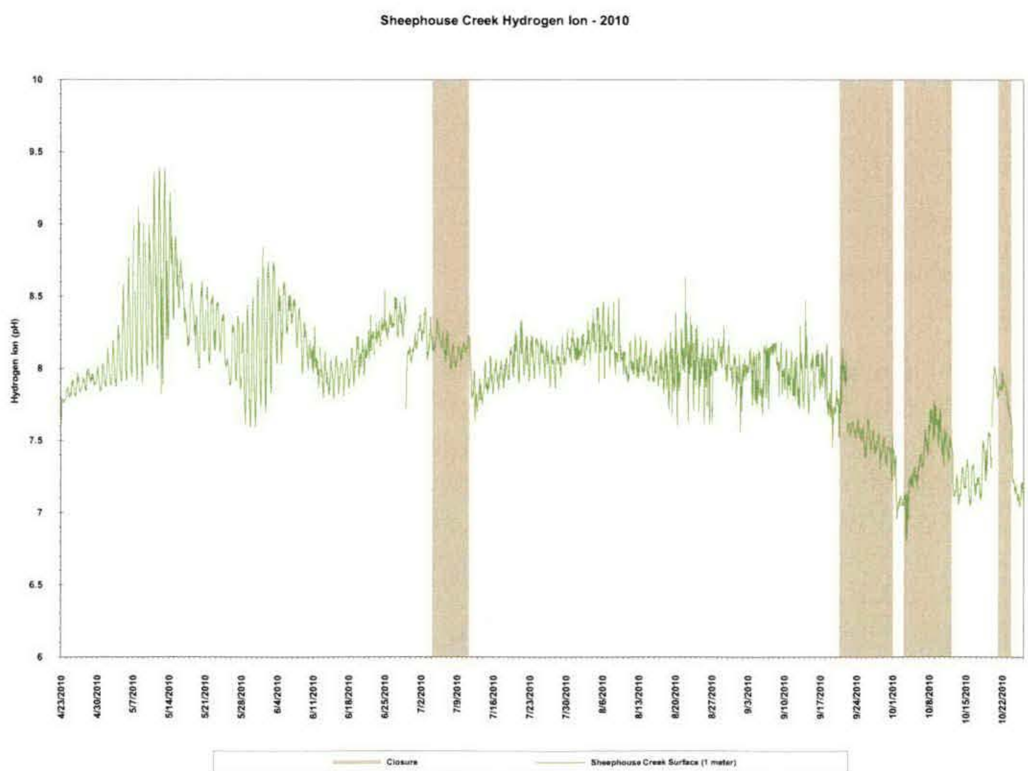

Figure 4.1.33. 2010 Russian River at Sheephouse Creek Hydrogen Ion Graph

The Willow Creek station had a mean pH value of 7.6, a maximum pH value of 9.3, and a minimum pH value of 6.5 (Table 4.1.1). Values were generally higher in saline water than in freshwater. However, the lowest values occurred after the barrier beach was breached on 1 October, as hypoxic brackish water of approximately 6 ppt was flushed out of the system and replaced with water containing less than 1 ppt of salt. The river mouth closed again on 4 October, and pH values increased as oxygenated brackish water moved back into the system (Figure 4.1.34).

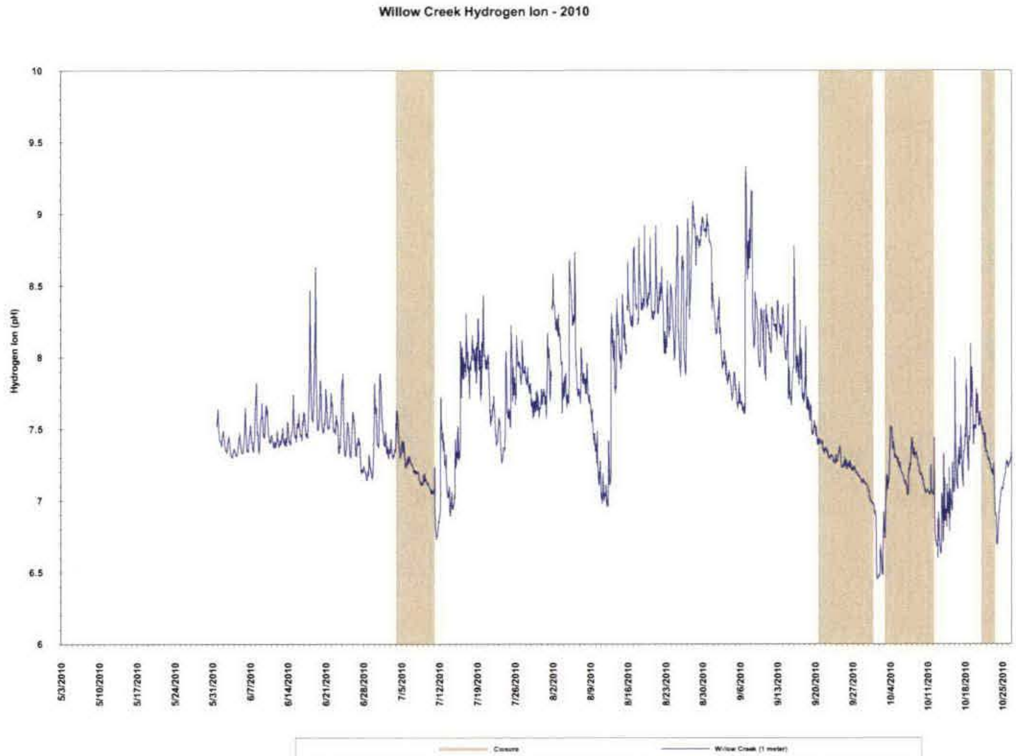

Figure 4.1.34. 2010 Willow Creek Hydrogen Ion Graph

Upper Reach pH

Minimum, mean, and maximum pH values at the Heron Rookery and Freezeout Creek mid-depth sondes were consistent with each other and with pH values observed in the lower and middle reaches of the estuary (Table 4.1.1). Whereas, pH values at the bottom sondes at Heron Rookery and Freezeout Creek were generally lower than those observed at the mid-depth sondes, including significantly lower minimum pH values (Figures 4.1.35 and 4.1.36).

Mean pH values were 8.1 at both mid-depth sondes, and 7.1 and 7.7 at the Heron Rookery and Freezeout Creek bottom sondes, respectively (Table 4.1.1). Maximum pH values were 8.9 at the Heron Rookery mid-depth sonde, 8.8 at the Freezeout Creek Mid-depth sonde, and 8.7 at both bottom sondes. Minimum pH values were observed to be 7.3 at both mid-depth sondes, and 5.5 at both bottom sondes.

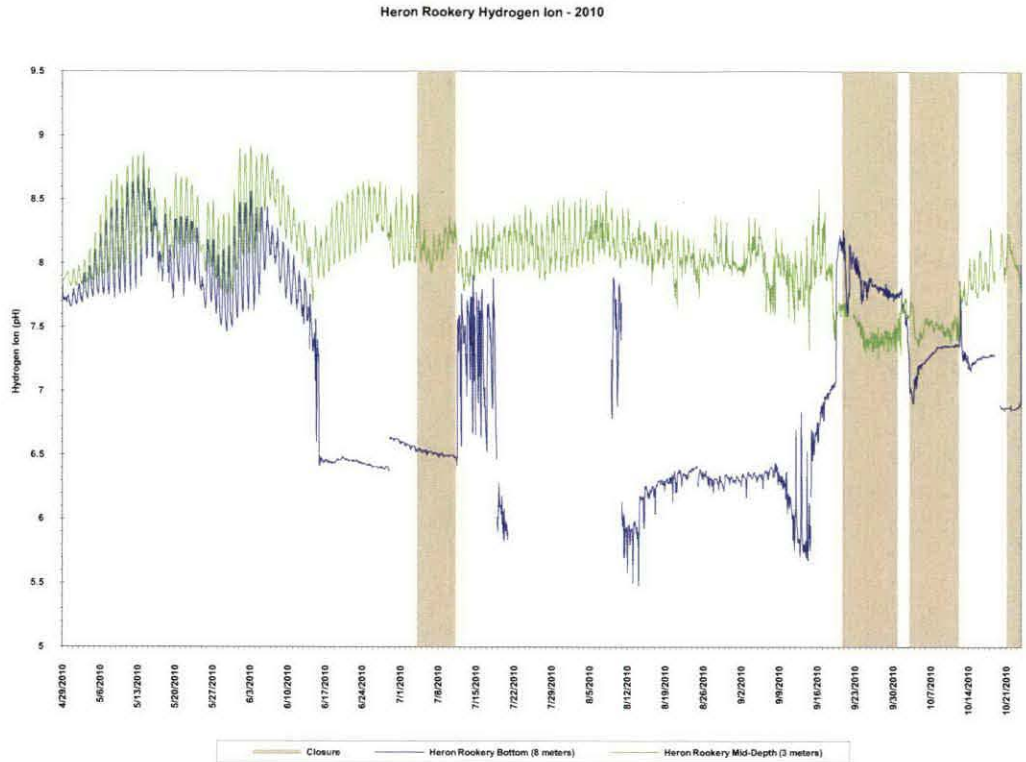

Figure 4.1.35. 2010 Russian River at Heron Rookery Hydrogen Ion Graph

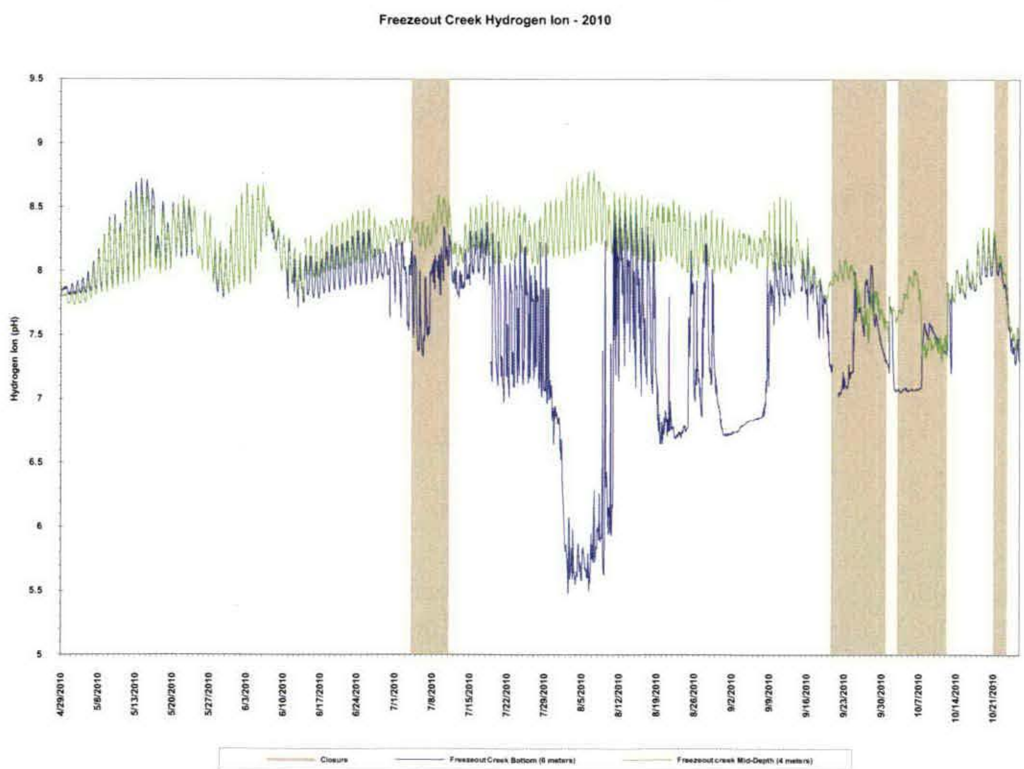

Figure 4.1.36. 2010 Russian River at Freezeout Creek Hydrogen Ion Graph

Both bottom sondes had minimum pH values of 5.5 that were observed to occur during periods of salinity intrusion and hypoxic to anoxic DO concentrations. During these anoxic events, H_2S was often released into the water column (as evidenced by large swings in DO concentrations and/or false DO supersaturation values shown in Figures 4.1.26 and 4.1.27) and likely contributed to the resulting low pH values (Figures 4.1.35 and 4.1.36).

Maximum Backwater Area pH

The Austin Creek station had a mean pH value of 7.8, a maximum pH value of 8.3, and a minimum pH value of 7.3 (Table 4.1.1). Values increased slightly during estuary closures in September and October; however response was variable during the first estuary closure in July. Although response observed during estuary closure was variable over the season, pH values continued to remain within the range of values observed during open conditions (Figure 4.1.37).

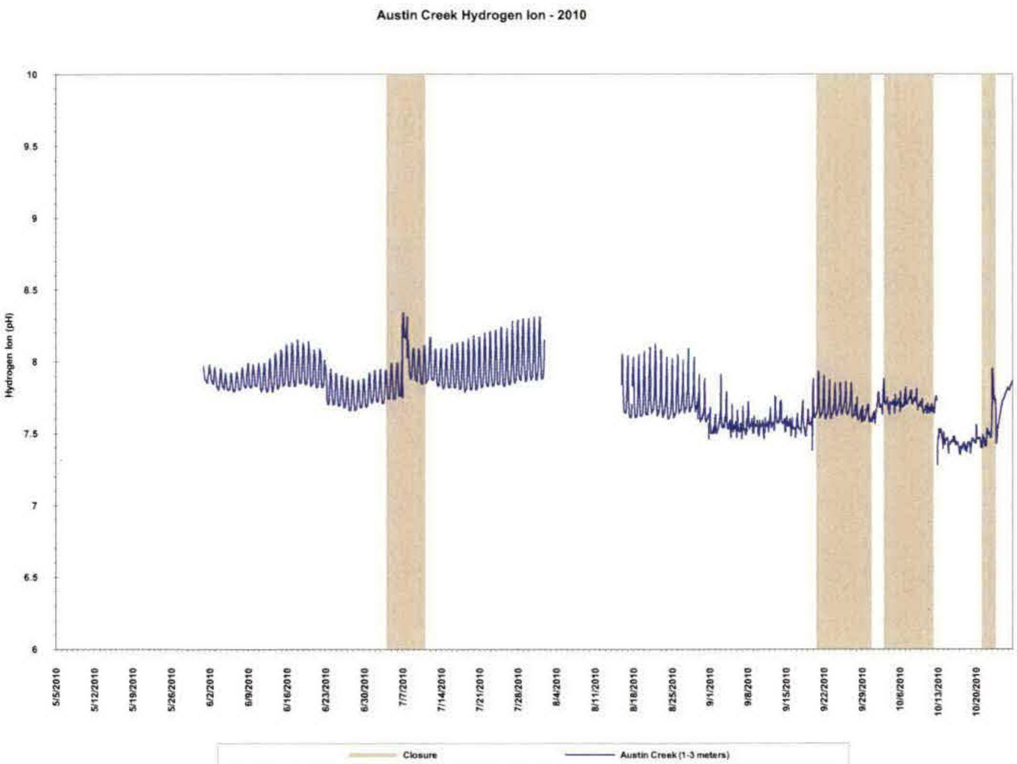

Figure 4.1.37. 2010 Austin Creek Hydrogen Ion Graph

The Monte Rio station had a mean pH value of 7.9, a maximum pH value of 9.1, and a minimum pH value of 7.2 (Table 4.1.1). Response to estuary closure was variable and fairly insignificant, with values observed to increase and decrease during closure but remain within the range of pH values observed throughout the rest of the monitoring season (Figure 4.1.38). High values coincided with high DO concentrations that occurred in June (Figure 4.1.29). Low values coincided with a storm event and increasing stream flows at the end of October.

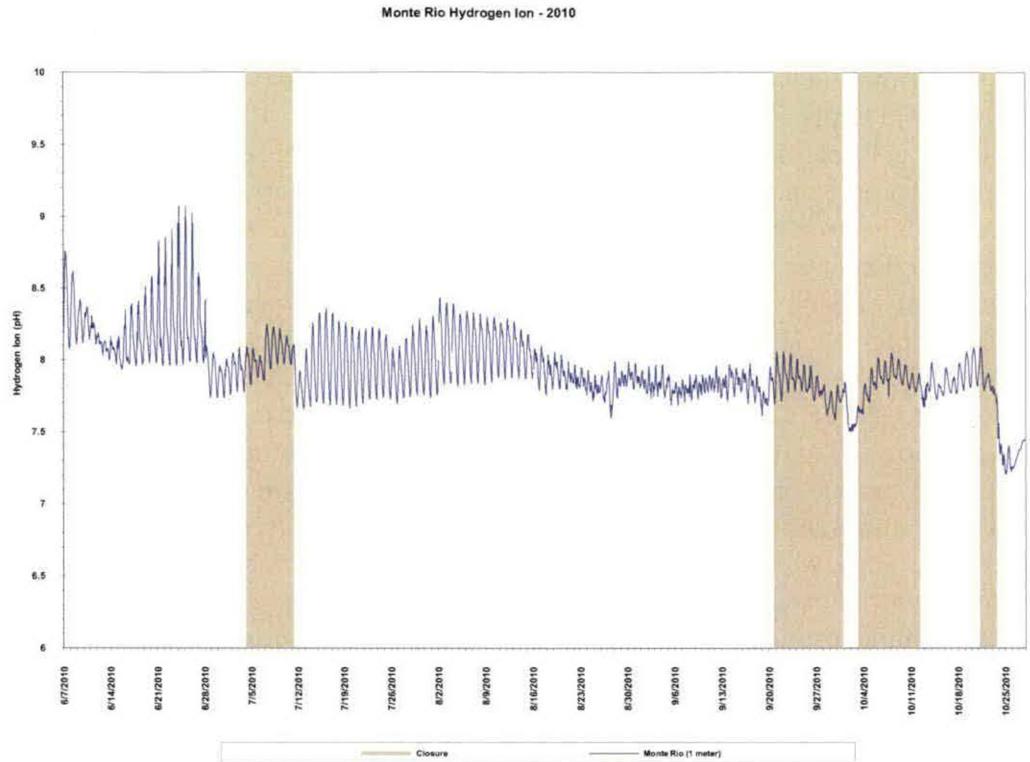

Figure 4.1.38. 2010 Russian River at Monte Rio Hydrogen Ion Graph

Grab Sampling

Grab sampling was conducted at five mainstem stations from Jenner to Monte Rio (Figure 4.1.1). Sampling was generally conducted every two weeks from 22 June to 14 October, when flows were above 125 cfs and the estuary was open. Sampling would have increased to every week if flows dropped below 125 cfs, but they remained above that level throughout the lagoon management period. Additional sampling was conducted twice weekly during estuary closure events and summer dam removal in late-September and October (Figures 4.1.2 through 4.1.6). Samples collected and analyzed for nutrients, chlorophyll *a*, and indicator bacteria are discussed below. Other sample results including organic carbon, dissolved solids, and turbidity are not analyzed, but are included as an appendix to the report.

Nutrients

The United States Environmental Protection Agency (USEPA) established section 304(a) nutrient criteria across 14 major ecoregions of the United States. The Russian River was designated in Aggregate Ecoregion III (USEPA, 2011). USEPA's section 304(a) criteria are intended to provide for the protection of aquatic life and human health (USEPA, 2011). The following discussion of nutrients compares sampling results to these USEPA criteria. However, it is important to note that these criteria are established for freshwater systems, and as such, are only applicable to the freshwater portions of the Estuary. Currently, there are no numeric nutrient criteria established specifically for estuaries.

Total nitrogen concentrations were generally below levels recommended for the protection of aquatic habitats; however total phosphorus concentrations were predominantly above recommended levels. The USEPA desired goal for total nitrogen in Aggregate Ecoregion III is 0.38 mg/L for rivers and streams not discharging into lakes or reservoirs (USEPA, 2000). Calculating total nitrogen values requires the summation of the different components of total nitrogen; organic and ammoniacal nitrogen (together referred to as Total Kjeldahl Nitrogen or TKN), and nitrate/nitrite nitrogen. Often times, nitrogen constituent results were reported as less than the Method Detection Limit (MDL). In these instances, the MDL is used for the purposes of calculating total nitrogen estimates, and the total nitrogen value is considered less than the estimate (Tables 4.1.2 – 4.1.6). Estimated total nitrogen concentrations were observed to remain below the USEPA criteria of 0.38 mg/L a majority of the time at all stations, however there were exceedances observed at each station. Most of these exceedances occurred during sampling events in June and early July, however there were a few exceedances at various stations in September and October (Tables 4.1.2 – 4.1.6). Interestingly, there were no exceedances at any stations during sampling events in August. Exceedances occurred during open and closed conditions, with the most exceedances at the Jenner Boat Ramp station. Total nitrogen concentrations that exceeded the criteria were generally observed to be 0.5 mg/L or less, but there were some instances where higher concentrations were observed, including two total nitrogen concentrations of <0.83 mg/L, recorded at the Duncans Mills station on 5 October, and at the Monte Rio station on 12 October. Both of these values were observed during closed estuary conditions; however the next highest value of 0.75 mg/L was observed during open estuary conditions at the Jenner Boat Ramp station on 14 September.

The USEPA's goal for total phosphates as phosphorus in Aggregate Ecoregion III is 21.88 micrograms per liter (µg/L), or approximately 0.022 mg/L, for rivers and streams not discharging into lakes or reservoirs (USEPA, 2000). Total phosphorus concentrations exceeded the USEPA criteria a majority of the time during both open and closed conditions at all five stations in the Estuary. Measureable levels of total phosphorus ranged from a high of 0.077 mg/L at the Bridgehaven Station on 14 October during open conditions and elevated storm flows, to a low of >0.21 mg/L at the Monte Rio Station on 12 October during closed conditions as storm flows were just starting to increase, and was the only sample collected at Monte Rio that did not exceed the USEPA criteria. The other stations also had season low values below the 0.02 mg/L MDL (<0.02) and recorded as non-detect (ND) on 12 October, and the Duncans Mills station had an ND sample result on 14 October as well. Total phosphorus concentrations were generally higher in June and July at all stations during both open and closed Estuary conditions, when late springs flows were still elevated, and tended to decrease through the rest of the season. However, total phosphorus concentrations increased during the last sampling event on 14 October compared to 12 October, except at the Duncans Mills station, which had ND sample results on both events. Samples were collected on 12 October during closed conditions and stream flows of approximately 228 cfs as measured at the Hacienda gaging station, whereas samples were collected on 14 October during open conditions and stream flows of approximately 660 cfs.

Table 4.1.2. 2010 Jenner Station Grab Sample Results

Jenner Boat Ramp*	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N (NO_3^-)	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen (calculated)	Phosphorus, Total	Chlorophyll-a	Total Coliforms	Fecal Coliforms	Enterococcus	
MDL**	0 200	0.10	0.00010	0 030	0.020	0 10		0 020	0 000050	2.0	2 0	2.0	Estuary
Unit of Measure	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	MPN/100mL	MPN/100mL	MPN/100mL	Condition
6/22/2010	0.35	ND	--	0 15	ND	0.35	0.50	0.05	0.001	110	23	8.0	open
7/6/2010	0 273	ND	0 0086	0.13	ND	0 28	0 41	0 035	0 0033	500	240	50	closed
7/20/2010	ND	ND	ND	0.13	ND	0 40	0.53	0 041	0 00023	170	30	4.0	open
8/3/2010	0 210	ND	ND	ND	ND	0 21	0 21	0.043	0 0017	220	50	4 0	open
8/17/2010	ND	ND	ND	ND	ND	0.18	0 18	0.032	0 00071				open
8/19/2010										70	22	ND	open
8/31/2010	0 203	ND	0 0036	0.097	ND	0 24	0 34	0.039	0 0014	27	11	ND	open
9/14/2010	0.224	ND	ND	0.53	ND	0 22	0 75	0.029	0.0013	140	13	6 0	open
9/28/2010	0 231	ND	0 0032	0.081	ND	0 27	0.35	0.031	0 0015	>1600	80	500	closed
9/30/2010	ND	ND	0 0037	ND	ND	0.20	0 20	0.027	0 00097	>1600	240	1600	closed
10/5/2010	ND	ND	0 0015	ND	ND	0.18	0 18	0.033	0 00028	>1600	500	1600	closed
10/7/2010	0 217	ND	0 0010	0 084	ND	0 25	0 33	0 036	0.0017	>1600	300	1600	closed
10/12/2010	ND	ND	0 0034	0.13	ND	0 18	0 31	ND	0.0015	>1600	70	130	closed
10/14/2010	ND	ND	0 00062	0.22	ND	0 18	0 40	0 024	0 00046	300	23	8 0	open

* results are preliminary and subject to final revision.
** Method Detection Limit

Recommended EPA Criteria based on Aggregate Ecoregion III:
Total Phosporus 0 02188 mg/L (21 88 ug/L)
Total Nitrogen. 0.38 mg/L
Chlorophyll *a* 0 00178 mg/L (1.78 ug/L)
Turbidity 2 34 FTU/NTU

Single Sample Values
Beach posting is recommended when indicator organisms exceed any of the following levels
Total coliforms 10,000 per 100 ml
Fecal coliforms· 400 per 100 ml
Enterococcus 61 per 100 ml

Table 4.1.3. 2010 Bridgehaven Station Grab Sample Results

Bridgehaven*	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N (NO_3^-)	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen (calculated)	Phosphorus, Total	Chlorophyll-a	Total Coliforms	Fecal Coliforms	Enterococcus	
MDL**	0.200	0 10	0.00010	0 030	0.020	0 10		0.020	0.000050	2 0	2 0	2 0	Estuary
Unit of Measure	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	MPN/100mL	MPN/100mL	MPN/100mL	Condition
6/22/2010	0 238	ND	--	0 14	ND	0 24	0 38	0 044	0.0002	900	22	110	open
7/6/2010	ND	ND	0 0032	0.12	ND	0 21	0 33	0 042	0.0036	500	23	80	closed
7/20/2010	ND	0.10	0 0062	0 13	ND	0 28	0 41	0 054	0 0083	>1600	170	30	open
8/3/2010	ND	ND	0.00057	0 088	ND	0 14	0 23	0 042	0 0017	23	8 0	22	open
8/17/2010	ND	ND	0 0023	ND	ND	0 21	0 21	0 040	0 0057				open
8/19/2010										110	13	4 0	open
8/31/2010	ND	ND	0.0027	0 094	ND	0.24	0 33	0.036	0 0032	50	8 0	4 0	open
9/14/2010	ND	ND	0.00019	0 40	ND	0 18	0 58	0 039	0 0043	140	17	13	open
9/28/2010	0 301	ND	ND	0.093	ND	0 30	0.39	0 027	0 00097	>1600	50	50	closed
9/30/2010	ND	ND	0.0058	0 077	ND	0 15	0.23	0 031	0 00087	900	90	300	closed
10/5/2010	ND	ND	0 0014	ND	ND	0.21	0 21	0 038	0 00047	>1600	900	>1600	closed
10/7/2010	ND	0.10	0 0036	0 098	ND	0.21	0 31	0.057	0.00055	>1600	70	240	closed
10/12/2010	ND	ND	0 00065	ND	ND	0 18	0 18	ND	0 0015	>1600	70	130	closed
10/14/2010	ND	ND	0.00044	0 11	ND	0 10	0 21	0 077	0.0023	900	240	14	open

* results are preliminary and subject to final revision
** Method Detection Limit

Recommended EPA Criteria based on Aggregate Ecoregion III:
Total Phosporus. 0.02188 mg/L (21 88 ug/L)
Total Nitrogen 0.38 mg/L
Chlorophyll *a* : 0 00178 mg/L (1 78 ug/L)
Turbidity. 2 34 FTU/NTU

Single Sample Values
Beach posting is recommended when indicator organisms exceed any of the following levels.
Total coliforms, 10,000 per 100 ml
Fecal coliforms 400 per 100 ml
Enterococcus. 61 per 100 ml

Table 4.1.4. 2010 Duncans Mills Station Grab Sample Results

Duncans Mills*	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N (NO_3^-)	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen (calculated)	Phosphorus, Total	Chlorophyll-a	Total Coliforms	Fecal Coliforms	Enterococcus	
MDL**	0 200	0 10	0.00010	0 030	0 020	0.10		0 020	0 000050	2 0	2 0	2.0	Estuary
Unit of Measure	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	MPN/100mL	MPN/100mL	MPN/100mL	Condition
6/22/2010	ND	ND	--	0 18	ND	0 21	0 39	0 047	0.0005	300	8.0	4 0	open
7/6/2010	ND	ND	0 0018	0 14	ND	0 20	0 34	0.038	0 0027	50	50	30	closed
7/20/2010	ND	0.14	0.020	0 14	ND	0 14	0 28	0 041	0.00092	300	8 0	6 0	open
8/3/2010	ND	ND	0 0034	0 096	ND	0 14	0 24	0.032	0 00059	50	13	2 0	open
8/17/2010	ND	ND	0.0082	0 078	ND	0.14	0 22	0.023	0.00059				open
8/19/2010										140	13	4.0	open
8/31/2010	ND	ND	ND	0 077	ND	0 17	0 25	0 030	0.00028	47	32	4.0	open
9/14/2010	0 245	ND	ND	0.082	ND	0.24	0 32	0 034	0.0013	170	23	14	open
9/28/2010	ND	ND	0.0046	0 10	ND	0 16	0.26	0 034	0.00087	430	140	80	closed
9/30/2010	ND	ND	0.0056	0 075	ND	0.16	0 24	ND	0.0011	>1600	500	240	closed
10/5/2010	0 683	ND	0 0031	0.075	ND	0 75	0.83	0 025	0 00056	500	30	22	closed
10/7/2010	ND	ND	0.0023	0.076	ND	0.25	0 33	0.032	0.00027	130	23	17	closed
10/12/2010	ND	ND	0 0024	0.15	ND	0 21	0.36	ND	0 00055	1600	23	17	closed
10/14/2010	ND	ND	0 00089	0 12	ND	0 11	0.23	ND	0.0037	170	23	23	open

* results are preliminary and subject to final revision
** Method Detection Limit

Recommended EPA Criteria based on Aggregate Ecoregion III:
Total Phosporus 0 02188 mg/L (21.88 ug/L)
Total Nitrogen. 0 38 mg/L
Chlorophyll *a* . 0 00178 mg/L (1 78 ug/L)
Turbidity· 2 34 FTU/NTU

Single Sample Values
Beach posting is recommended when indicator organisms exceed any of the following levels
Total coliforms· 10,000 per 100 ml
Fecal coliforms. 400 per 100 ml
Enterococcus 61 per 100 ml

Table 4.1.5. 2010 Casini Ranch Station Grab Sample Results

Casini Ranch*	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N (NO_3^-)	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen (calculated)	Phosphorus, Total	Chlorophyll-a	Total Coliforms	Fecal Coliforms	Enterococcus	
MDL**	0 200	0.10	0 00010	0 030	0 020	0 10		0.020	0 000050	2.0	2 0	2.0	Estuary
Unit of Measure	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	MPN/100mL	MPN/100mL	MPN/100mL	Condition
6/22/2010	0.35	ND	--	0 15	ND	0.35	0 50	0 05	0 001	110	23	8 0	open
7/6/2010	0 273	ND	0 0086	0 13	ND	0.28	0 41	0 035	0.0033	500	240	50	closed
7/20/2010	ND	ND	ND	0 13	ND	0.40	0 53	0.041	0 00023	170	30	4 0	open
8/3/2010	0 210	ND	ND	ND	ND	0.21	0.21	0.043	0 0017	220	50	4 0	open
8/17/2010	ND	ND	ND	ND	ND	0 18	0.18	0.032	0 00071				open
8/19/2010										70	22	ND	open
8/31/2010	0 203	ND	0 0036	0 097	ND	0 24	0 34	0.039	0 0014	27	11	ND	open
9/14/2010	0 224	ND	ND	0.53	ND	0 22	0 75	0.029	0 0013	140	13	6 0	open
9/28/2010	0.231	ND	0 0032	0 081	ND	0 27	0 35	0 031	0 0015	>1600	80	500	closed
9/30/2010	ND	ND	0.0037	ND	ND	0 20	0.20	0 027	0 00097	>1600	240	1600	closed
10/5/2010	ND	ND	0.0015	ND	ND	0.18	0 18	0 033	0.00028	>1600	500	1600	closed
10/7/2010	0 217	ND	0.0010	0.084	ND	0 25	0 33	0 036	0.0017	>1600	300	1600	closed
10/12/2010	ND	ND	0 0034	0 13	ND	0 18	0 31	ND	0.0015	>1600	70	130	closed
10/14/2010	ND	ND	0 00062	0 22	ND	0 18	0 40	0 024	0 00046	300	23	8.0	open

* results are preliminary and subject to final revision.
** Method Detection Limit

Recommended EPA Criteria based on Aggregate Ecoregion III:
Total Phosporus· 0.02188 mg/L (21.88 ug/L)
Total Nitrogen· 0 38 mg/L
Chlorophyll *a* 0 00178 mg/L (1.78 ug/L)
Turbidity: 2.34 FTU/NTU

Single Sample Values
Beach posting is recommended when indicator organisms exceed any of the following levels
Total coliforms: 10,000 per 100 ml
Fecal coliforms· 400 per 100 ml
Enterococcus 61 per 100 ml

Table 4.1.6. 2010 Monte Rio Station Grab Sample Results

Monte Rio*	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N (NO_3^-)	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen (calculated)	Phosphorus, Total	Chlorophyll-a	Total Coliforms	Fecal Coliforms	Enterococcus	
MDL**	0.200	0.10	0.00010	0.030	0.020	0.10		0.020	0.000050	2.0	2.0	2.0	Estuary
Unit of Measure	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	MPN/100mL	MPN/100mL	MPN/100mL	Condition
6/22/2010	0.203	ND	--	0.20	ND	0.21	0.41	0.047	0.0012	130	8.0	30	open
7/6/2010	ND	ND	0.0029	0.13	ND	0.16	0.29	0.035	0.0025	900	170	130	closed
7/20/2010	ND	ND	0.0024	0.13	ND	ND	0.13	0.042	0.0018	30	23	7.0	open
8/3/2010	ND	ND	0.0019	0.073	ND	0.14	0.21	0.026	0.00099	170	50	9.0	open
8/17/2010	ND	ND	ND	0.074	ND	0.18	0.25	0.024	0.00071				open
8/19/2010										170	13	13	open
8/31/2010	ND	ND	ND	0.076	ND	0.17	0.25	0.030	0.00019	140	17	8.0	open
9/14/2010	ND	ND	0.00096	0.073	ND	0.18	0.25	0.028	0.00025	280	90	33	open
9/28/2010	ND	ND	0.0015	0.081	ND	0.16	0.24	0.027	0.00019	300	130	130	closed
9/30/2010	ND	ND	0.0018	0.075	ND	0.20	0.28	0.027	0.000097	>1600	350	210	closed
10/5/2010	ND	ND	0.0016	0.076	ND	0.18	0.26	0.025	ND	80	17	30	closed
10/7/2010	ND	0.14	0.0046	0.076	ND	0.25	0.33	0.029	0.00037	240	50	240	closed
10/12/2010	0.520	0.18	0.0048	0.13	ND	0.70	0.83	0.021	0.00027	300	80	300	closed
10/14/2010	ND	ND	0.0011	0.12	ND	0.20	0.32	0.027	0.0015	500	240	240	open

* results are preliminary and subject to final revision.
** Method Detection Limit

Recommended EPA Criteria based on Aggregate Ecoregion III:
Total Phosporus: 0.02188 mg/L (21.88 ug/L)
Total Nitrogen: 0.38 mg/L
Chlorophyll *a*: 0.00178 mg/L (1.78 ug/L)
Turbidity: 2.34 FTU/NTU

Single Sample Values
Beach posting is recommended when indicator organisms exceed any of the following levels:
Total coliforms: 10,000 per 100 ml
Fecal coliforms: 400 per 100 ml
Enterococcus: 61 per 100 ml

It is highly likely that phosphorus in the river substrate was re-suspended into the water column from the increasing storm flows and the flushing effects of breaching the barrier beach, leading to the increased concentrations observed at most stations on 14 October.

Chlorophyll *a*

In the process of photosynthesis, chlorophyll *a* - a green pigment in plants, absorbs sunlight and combines carbon dioxide and water to produce sugar and oxygen. Chlorophyll *a* can therefore serve as a measureable parameter of algal growth. Qualitative assessment of primary production on water quality can be based on chlorophyll *a* concentrations. A U.C. Davis report on the Klamath River (1999) assessing potential water quality and quantity regulations for restoration and protection of anadromous fish includes a discussion of chlorophyll *a* and how it can affect water quality. The report characterizes the effects of chlorophyll *a* in terms of different levels of discoloration (e.g., no discoloration to some, deep, or very deep discoloration). The report indicated that less than 10 µg/L (or 0.01 mg/L) of chlorophyll *a* exhibits no discoloration (Deas and Orlob, 1999). Additionally, the USEPA criterion for chlorophyll *a* in Aggregate Ecoregion III is 1.78 µg/L, or approximately 0.0018 mg/L for rivers and streams not discharging into lakes or reservoirs (USEPA, 2000). However, it is important to note that the EPA criterion is established for freshwater systems, and as such, is only applicable to the freshwater portions of the Estuary. Currently, there are no numeric chlorophyll *a* criteria established specifically for estuaries.

Chlorophyll *a* concentrations were less than 0.01 mg/L at all stations during all sampling events; the level recommended to prevent discoloration of surface waters (Tables 4.1.2 – 4.1.4). Estimated chlorophyll *a* concentrations were also observed to remain below the USEPA criteria of 0.0018 mg/L a majority of the time at all stations, however there were exceedances observed at each station (Tables 4.1.2 – 4.1.6). The grab sampling stations typically experienced only one or two exceedances during the entire season; however the Bridgehaven Station exceeded the criteria six times. These exceedances generally occurred during sampling events in June and early July, with all stations exceeding the criteria on the 6 July sampling event. Exceedances occurred during open and closed estuary conditions early in the season; however there were no exceedances at any station during closed estuary conditions in September and October. The Bridgehaven Station had the highest chlorophyll *a* concentration of the season, with a value of 0.0083 mg/L recorded during open conditions on 20 July, whereas the Monte Rio Station had a season low value below the 0.000050 mg/L MDL (<0.000050) and recorded as non-detect (ND) on 5 October during closed estuary conditions (Figures 4.1.3 and 4.1.6). There were also exceedances at the Casini Ranch, Duncans Mills, and Bridgehaven stations during the last sampling event on 14 October, two days after the estuary had been re-opened (Tables 4.1.3 – 4.1.5).

Indicator Bacteria

The California Department of Public Health (CDPH) developed the "Draft Guidance for Fresh Water Beaches," which describes bacteria levels that, if exceeded, may require posted warning signs in order to protect public health (CDPH, 2011). The CDPH draft guideline for total coliform is 10,000 most probable numbers (MPN) per 100 milliliters (ml), and 400 MPN per 100 ml for fecal coliforms. The MPN for *Enterococcus* is 61 per 100 ml. However, it must be emphasized that these are draft guidelines, not adopted standards, and are therefore both subject to change (if it is determined that the guidelines are not accurate indicators) and are not currently enforceable. In addition, these draft guidelines were established for and are only applicable to fresh water beaches. Currently, there are no numeric guidelines that have been developed for estuarine areas.

Sampling results in 2010 indicate there is a large variation in indicator bacteria levels observed through the different sections of the Estuary (Tables 4.1.2 – 4.1.6). These variations occurred under both open and closed mouth conditions and may be seasonal as well.

Sample results in 2010 did not include an absolute value for high counts of total coliforms and were reported by the lab as being greater than 1,600 MPN (>1,600). This precludes the comparison of total coliform sample results to the draft CDPH guidelines for public recreation.

In 2010, total coliform counts were generally higher during closed conditions in September and October than during open conditions earlier in the season, although there were a few counts during open conditions as high as counts observed during closed conditions. All five stations sampled in 2010 had at least one total coliform value of >1,600 MPN, with the Bridgehaven and Jenner Boat Ramp stations having five each (Tables 4.1.2 – 4.1.6). These high counts occurred during closed estuary conditions in late September and early October following increased freshwater inflows related to upstream dam removals at the end of September and during repeated barrier beach closures in early October. Total coliform values were occasionally elevated during open conditions, with high counts of >1,600 MPN being recorded at the Bridgehaven Station on 20 July, and at the Casini Ranch Station on 14 October, two days after the mouth had been re-opened.

Fecal coliform counts were generally low during the monitoring season during open and closed estuary conditions. The Monte Rio and Casini Ranch stations had no counts above the draft CDPH guideline of 400 MPN/100 ml. The Jenner Boat Ramp and Bridgehaven stations had one high count each, of 500 MPN and 900 MPN, respectively that exceeded the draft CDPH guidelines during closed conditions on 5 October (Tables 4.1.2 and 4.1.3). The Duncans Mills station had a high count of 500 MPN that also exceeded draft CDPH guidelines during closed conditions on 30 September. These high counts occurred during closed estuary conditions in late September and early October following increased freshwater inflows related to upstream dam removals at the end of September and during repeated barrier beach closures in early October.

Enterococcus counts were higher during closed estuary conditions in September and October, and all stations exceeded draft freshwater levels during closed barrier beach conditions. The draft guidance for freshwater beach posting identifies the potential for public health concerns when *Enterococcus* levels exceed 61 MPN/100ml. The Jenner Boat Ramp Station had three counts of 1,600 MPN during closed conditions between 30 September and 7 October (Table 4.1.2). The Casini Ranch Station also had a high count of 1,600 MPN during closed conditions on 30 September and the Bridgehaven Station had a high count of >1,600 MPN during closed conditions on 5 October (Tables 4.1.5 and 4.1.3). These high counts occurred during closed estuary conditions in late September and early October following increased freshwater inflows related to upstream dam removals at the end of September and during repeated barrier beach closures in early October. Draft guideline criteria were not exceeded during open and closed conditions earlier in the season at the Jenner, Duncans Mills and Casini Ranch stations. However, draft criteria were exceeded at the Bridgehaven Station during open and closed conditions on 22 June and 6 July, respectively, and at the Monte Rio Station during the 6 July closure.

Conclusions and Recommendations

Overall, water quality conditions observed during the 2010 monitoring season were similar to conditions associated with a dynamic estuarine system observed in previous years. There were a few notable observations associated with salinity and indicator bacteria that will be discussed further below. Monitoring efforts for the 2011 season will also be discussed.

The lower and middle reaches of the Estuary up to Sheephouse Creek are predominantly saline environments with a thin freshwater layer that flows over the denser saltwater. Salinities near the mouth (1st mile of the Estuary) are mostly similar to ocean salinities. Whereas, the middle portion of the Estuary (one to five miles from the mouth) is most subject to fluctuation in salinities throughout the water column due to ocean tides and freshwater inflow rates. In the middle reach of the Estuary, salinities can range as high as 30 ppt in the saltwater layer, with brackish conditions prevailing at the upper end of the salt wedge, to less than 1 ppt in the freshwater layer on the surface. The upper reach of the Estuary transitions to a predominantly freshwater environment, which is periodically underlain by a denser, saline to brackish layer that migrates upstream as far as the Moscow Road Bridge in Duncans Mills during summer low flow conditions. The most upstream portion of the Estuary from Duncans Mills to Austin Creek (upper one mile of the Estuary) is the only portion where a predominance of freshwater habitat is maintained throughout the summer. River flows, tides, and wind action affect the amount of mixing at various longitudinal and vertical positions within the Estuary.

When the barrier beach forms, saltwater is trapped in the lagoon and water quality conditions can undergo abrupt alteration. After closure, salinity, DO and temperature changes occur within 24 hours. After the estuary becomes stratified, the mid-depth saltwater lens traps heats (Smith, 1990; Entrix, 2004). Through natural processes, DO becomes depleted in the bottom saline layer and anoxic conditions can develop. Salinity stratification leads to reductions in DO and increases in temperature in the lower water column following closure.

During barrier beach closures, the freshwater lens deepened at the surface. Highly saline conditions were typical in the mid-depths of the lower and middle reaches of the Estuary within a few days of barrier beach closures. However, salinity levels were observed to decrease at mid-depth over time, which may be evidence that the denser saltwater was percolating out of the Estuary through the barrier beach. Conversely, brackish water extended into the lower half of the water column during barrier beach closure as far upstream as Freezeout Creek in the upper reach, providing further evidence that the salt layer was stratifying and flattening out. As the closed Estuary continued to backwater, a reduction in the hydraulic forces of freshwater inflow also appeared to contribute to the upstream migration of the salt layer. Once the barrier beach had been reopened, salinity concentrations were generally observed to increase at the surface sondes as the freshwater layer diminished and the Estuary became tidally influenced again.

Temperature stratification coincided with the presence of the halocline, as the saltwater was typically observed to be significantly colder than the freshwater during open Estuary conditions. surface sonde temperatures were observed to have the greatest degree of fluctuation due to their location at the saltwater-freshwater interface. However, temperatures were also observed to exhibit diel fluctuations based on the heating and cooling effects of night and day, as well as longer-term seasonal heating and cooling events, including barrier beach closure and reopening.

When the barrier beach closed, temperatures were observed to increase in the saline layer and often exceed temperatures in the overlying surface freshwater layer. Over time, a three-layer system would form with a cooler saline to brackish bottom layer that is below the effects of solar heating, a hot mid-depth layer of saline to brackish water subject to the effects of solar heating, and a cooler (but still relatively warm) freshwater layer on the surface.

Mean DO levels were typically higher in the freshwater layer than in the saline layer. However, DO concentrations fluctuated significantly during the monitoring season at all stations, and fluctuations were not necessarily associated with tidal cycles or a diurnal cycle. DO levels in the Estuary depend upon factors such as the extent of diffusion from surrounding air and water movement, including freshwater inflow. DO levels are also a function of nutrients, which can accumulate in standing water during an extended period of time and promote excessive plant and algal growth that utilize DO. This can reduce DO levels leading to eutrophication and affecting overall ecological health of the Estuary. Estuaries tend to be naturally eutrophic because land-derived nutrients are concentrated where runoff enters the marine environment in a confined channel.[8] Upwelling in coastal systems, which typically occurs from March to July, also promotes increased productivity by conveying deep, nutrient-rich waters to the surface and into the estuary through tidal action, where the nutrients can be assimilated by algae.

When the barrier beach closes, salinity stratification results in pronounced DO stratification in the closed lagoon. Supersaturation, hypoxic, and anoxic events were observed, with prolonged hypoxic and/or anoxic events occurring in the deeper portions of the Estuary through the duration of barrier beach closure. DO concentrations were variable in the mid-depth saline layer of the water column during barrier beach closures with decreases and increases observed. DO levels in the freshwater at the surface of the Estuary did not appear to be negatively impacted by barrier beach closure and remained similar to open conditions (7 to 10 mg/L), or increased in some instances. Similar stratified conditions were also observed when the barrier beach was open during neap tides or low river flows, indicating that the deeper portions of the Estuary may not be subject to mixing even during open tidal conditions.

In 2010, the salt wedge migrated to the Heron Rookery and Freezeout Creek stations under higher flows than were observed in 2009 (SCWA 2011). The salt wedge migrated to the Heron Rookery and Freezeout Creek stations when flows decreased to approximately 150 cfs in 2009. Whereas, in 2010, the salt wedge migrated to the Heron Rookery station when flows were above 400 cfs, and migrated to the Freezeout Creek Station when flows were approximately 200 cfs. However, it should be noted that in 2009, the Heron Rookery Bottom Sonde was not at the absolute bottom of the pool, and the salt wedge may have been at the station, but located deeper in the water column than the sonde. For the 2011 monitoring effort, the bottom sonde at Heron Rookery will continue to be placed in the deepest portion of the pool to record the timing of the upstream migration of the salt wedge.

Indicator bacteria exhibited high variability in counts between stations and seasons. During the 2009 season, indicator bacteria were observed to have high counts that exceeded draft CDPH guidelines primarily during open estuary conditions (SCWA 2011). Whereas, in 2010, indicator bacterial counts were high and exceeded draft guidelines primarily during closed estuary conditions.

Potential causes for higher counts observed during open conditions in 2009 than in 2010 include lower flows in 2009 than in 2010. However, these differences could also be caused by other variables including higher water temperatures, more nutrient availability, more days of sun, and increased recreational usage at a given station. Higher values during closed conditions in 2010 than in 2009 may be attributable to increased freshwater inflows related to upstream dam removals at the end of September, at a time when the estuary was repeatedly closing and impounding water, and when exceedances of the draft CDPH guidelines occurred.

[8] *National Estuarine Eutrophication Assessment* by NOAA National Centers for Coastal Ocean Science (NCCOS) and the Integration and Application Network (IAN), 1999.

Monitoring in 2011 will continue to focus on the movement of the salt wedge within the estuary and will be expanded to include a station above the Moscow Road Bridge in Duncans Mills to track potential salinity migration above Freezeout Creek, where it has been observed to occur. Monitoring will also be expanded in 2011 to include a station in the mainstem above Austin Creek, but below Monte Rio in an effort to locate potential cold water refugia in the maximum backwater area. Finally, grab sampling will continue in 2011 at the five stations sampled in 2010 and focused sampling will occur when the estuary closes and when the summer dams are removed to gain additional information on the potential for either of these two actions to increase bacterial concentrations in the estuary.

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SONOMA COUNTY WATER AGENCY

FILE:CF/42-0.19-9 SWRCB ORDER APPROVING TEMPORARY URGENCY CHANGE IN PERMITS 12947A, 12949, 12950 & 16596 FOR 2010 TW# 10/11-149

June 29, 2011

Deputy Chief Barbara Evoy
State Water Resources Control Board
Division of Water Rights
1001 I Street
P.O. Box 2000
Sacramento, CA 95812

RE: TRANSMITTAL OF DOCUMENTS

Dear Deputy Chief Evoy:

Enclosed are eight copies of the report required by WR-2010-0018-DWR Provision 15 (Assessment of Transmission System Conditions and Non-Revenue Water).

Sincerely,

Joan Hultberg

Joan Hultberg
Technical Writing Specialist

Enc

c Don Seymour
Pam Jeane

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State Water Resources Control Board
Order WR 2010-0018-DWR

Provision 15 – Assessment of Transmission System Conditions and Non-Revenue Water

SONOMA
COUNTY
WATER
AGENCY

June 30, 2011

Prepared by

Sonoma County Water Agency
404 Aviation Boulevard
Santa Rosa, CA 95403

Table of Contents

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1 Purpose of Report

This report has been prepared by the Sonoma County Water Agency (Water Agency) to fulfill the requirements of Provision 15 of the State Water Resources Control Board (State Board) Order WR 2010-0018 DWR (Order).

Provision 15 of the Order directs the Water Agency to take the following actions:

> SCWA shall evaluate (1) physical conditions and integrity of its transmission system pipelines, and (2) opportunities for increased automated operational data sharing between the SCWA and its water contractors' respective systems, with the goal of reducing water loss and promoting increases in water use efficiency. SCWA shall require that each of its water contractors provide an assessment of unaccounted[1] water associated with their distribution systems. This assessment shall include, as appropriate, any programs or projects identified by each water contractor to reduce unaccounted water and system losses. SCWA shall update the Deputy Director on the progress of these efforts by June 30, 2011.

2 Water Transmission System Condition Assessment Program

Early in 2010, the Water Agency initiated a comprehensive program to assess the condition of the overall transmission system. In October of that year, Water Agency staff performed the first pipeline inspection of the Santa Rosa Aqueduct since its installation in 1959. The inspection was conducted during a scheduled air valve replacement project on the Santa Rosa Aqueduct. The project required partial dewatering of several miles of pipeline and presented a rare opportunity to perform a video inspection using a tethered, camera-mounted rover. Figure 1 shows the rover ready in place for pipe inspection. A total of 3,500 linear feet of pipeline from several different locations were inspected in one day. In general, the pipeline appeared to be in good condition with only isolated areas where cracks and spalling of the mortar lining were observed. Figure 2 shows an example of a mortar crack that was found. Prior to this limited study, there had been no interior inspections of the pipelines.

[1] Provision 15 uses the term 'unaccounted;' however, in this report the term 'non-revenue water' is preferred. Non-revenue water is defined by the American Water Works Association (AWWA) as water that is produced but lost before it reaches the customer, through real losses (e.g. system leaks) or apparent losses (e.g. theft, metering inaccuracies).

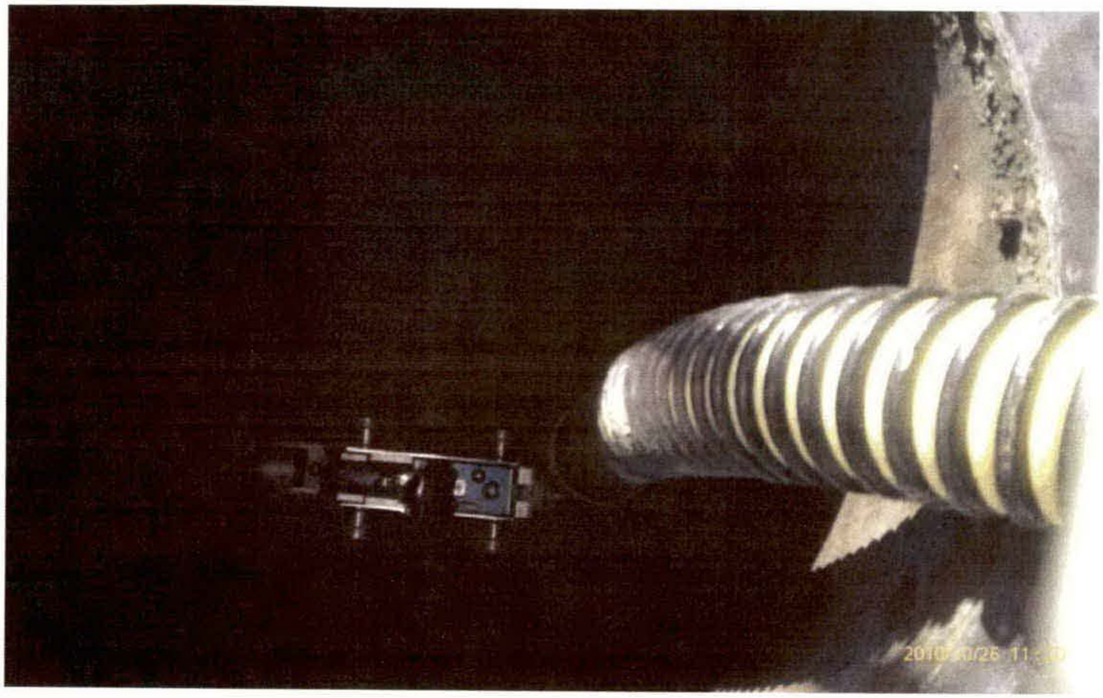


Figure 1. Video Inspection Rover In Pipe

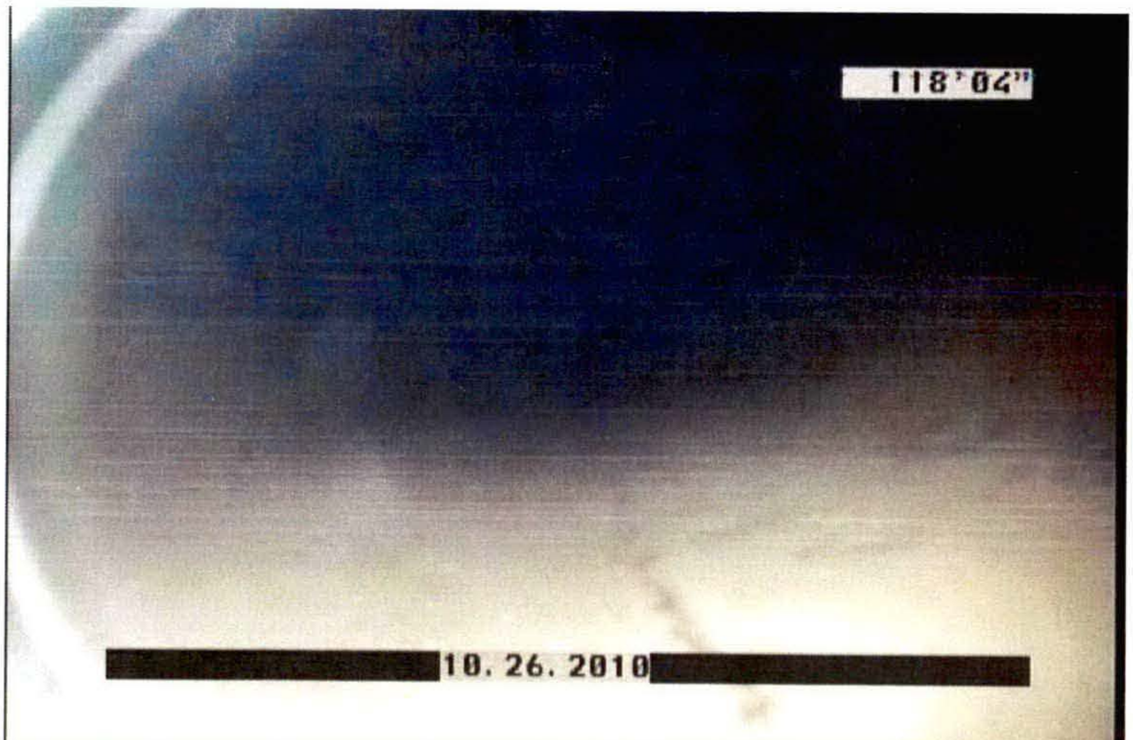


Figure 2. Image Captured by Video Inspection Rover

Another pipeline condition assessment activity conducted to date has been the visual inspection of pipe coupons[2] retrieved from various installations of appurtenances. Based on the review of several coupons, there may be sections of the transmission system where wearing and degradation of the mortar lining have occurred. Additionally, pieces of mortar have been retrieved from screens located at turnouts along the pipelines, as well as in the system's storage tanks. This summer, the Water Agency plans to confirm the mechanism of mortar loss that has been observed on the pipe coupons with petrographic analysis, which analyzes the surface of the mortar and its aggregate minerals.

Due to the age and some signs of compromised integrity of the mortar lining, the Water Agency has prioritized the inspection of its pipelines. The Water Agency is particularly interested in conducting visual inspections of the piping interior, measurements of mortar lining, and assessments of the integrity of the mortar lining. In addition, leak detection, while not believed to be a major issue in the transmission system, will be considered.

In April 2011, the Water Agency issued a Request for Qualifications to contractors interested in providing closed circuit television (CCTV), sonar, and laser profiling services in support of the condition assessment program. From the Statements of Qualifications received, the Water Agency intends to develop a short list of contractors who can be utilized for both a pilot study and a comprehensive study of the entire transmission system.

The Water Agency is developing a strategy and schedule to perform condition assessments for the entire water transmission system. The program will begin with a pilot-study project on the Petaluma Aqueduct. The Petaluma Aqueduct project will cover approximately 6,500 linear feet of 33-inch diameter concrete cylinder pipe. This region was selected for its relative accessibility and because it has experienced some of the highest velocities in the transmission system (~10 feet per second). After completion of the pilot study and subsequent analysis of the results, the Water Agency will move forward to complete the condition assessment of the rest of the system.

3 Water Transmission System Assessment of Non-Revenue Water

On a monthly basis, the Water Agency analyzes records of daily water production (supplies) and monthly water sales (deliveries) to determine the amount of non-revenue water (NRW). Overall system production is calculated from flow measurements at the following five locations:

- Santa Rosa Aqueduct (42-inch ultrasonic meter)
- Cotati Intertie (48-inch ultrasonic meter)

[2] Coupon – A small piece of pipe cut out from a pipeline that may serve as a test specimen.

- Occidental Road Well (12-inch electromagnetic meter)
- Sebastopol Road Well (12-inch electromagnetic meter)
- Todd Road Well (10-inch electromagnetic meter)

Deliveries are calculated by totaling the measurements from 175 turnout meters. The table below presents the results of the non-revenue water analyses on an annual basis for the last five years.

Year	Water Supplied (ac-ft)	Water Delivered (ac-ft)	Non-Revenue Water (ac-ft)	NRW %
2006	62,457	64,866	-2,409	-3.9%
2007	60,046	60,995	-948	-1.6%
2008	58,754	58,746	8	0.0%
2009	51,406	49,764	1,642	3.2%
2010	49,302	48,055	1,247	2.5%

In 2006 and 2007, there were no losses observed based on the meter records for the transmission system. This may be attributed to problems with the system meters used for calculating production volumes. In 2008, the system meters were replaced and the subsequent years' non-revenue water analysis shows reasonable transmission system losses reflecting significant improvements in the production meter data quality.

In addition to its internal non-revenue water analysis, the Water Agency conducts annual water audits as specified in California Urban Water Conservation Council (CUWCC) Best Management Practice (BMP) 1.2. The analysis for BMP 1.2 is prepared according to the American Water Works Association (AWWA) Third Edition M36 Manual, *Water Audits and Loss Control Programs,* and uses the AWWA Water Loss Control Committee Water Audit software, which quantifies the Agency's current volume of apparent and real water losses.

4 Advanced Metering Infrastructure Project

The Water Agency has embarked on a two-phase project to improve metering of transmission system deliveries, which is expected to be complete by the end of 2012. The Advanced Metering Infrastructure (AMI) Project will install the communications infrastructure to report customer turnout delivery meter readings to the Supervisory Control and Data Acquisition (SCADA) system. The completed project will provide the Water Agency with near real-time delivery flow rates at all of the system's turnout meters. Phase 1 will include the construction of three gateway towers and the installation of new transmitters for approximately half of the turnout meters. Phase 2 will complete the conversion of the remainder of the turnout meters and install two to three more gateway towers and repeater stations. The project will significantly improve the Water Agency's response time to meter malfunctions and potential system failures. Under the current protocol, these meters are only read on a monthly basis and any problems are discovered after this data is processed. With this data integrated into the Water Agency's SCADA system, direct meter readings and water balance calculations will be used to set alert and alarm conditions to notify staff immediately of anomalous measurements or operational conditions.

5 IBM Collaboration with Water Agency and Valley of the Moon Water District

The Water Agency, VOMWD, and the IBM Corporation are currently collaborating on a pilot study to identify system leakage and demonstrate the ability to reduce non-revenue water. Non-revenue water is defined as water that is produced, but lost before it reaches the customer through real losses (e.g., system leaks) or apparent losses (e.g., theft, metering inaccuracies).

The pilot study will evaluate the application of advanced analytics and optimization techniques to reduce non-revenue water, as well as provide improved pressure management of both the Water Agency's and VOMWD's distribution networks using operational data that the Water Agency and VOMWD are currently collecting.

The pilot study is part of the First-of-a Kind program offered through IBM. This program is an attempt to bring IBM researchers and clients together in the marketplace to test new technologies on real business problems and growth opportunities.

The Water Agency-VOMWD pilot study was selected through a competitive process between more than 25 projects submitted to IBM. The study has received a funding commitment from IBM of approximately $3,000,000 for product development.

Because the pilot study is a research project, there is a risk of not developing a working solution. However, if proven successful, the leak detection system will be of interest to other retail water contractors that purchase wholesale water from the Water Agency and could contribute to collaborative efforts to improve the efficiency and sustainability of Water Agency activities. Furthermore, the Water Agency anticipates that if the system becomes generally available, it will likely attract strong interest from water utilities in general.

6 Water Contractor Distribution System Assessments of Non-Revenue Water

The Water Agency's transmission system provides wholesale water to utilities and water districts in Sonoma and Marin County. The Water Agency's eight water contractors have each evaluated their distribution systems for non-revenue water for the last five years. This section includes the results of the non-revenue water analysis for:

- City of Cotati
- North Marin Water District
- City of Santa Rosa
- City of Sonoma

- City of Petaluma
- City of Rohnert Park
- Valley of the Moon Water District
- Town of Windsor

The following information was reported to the Water Agency by its water contractors.

6.1 City of Cotati

6.1.1 Five-Year Average Non-Revenue Water

The City of Cotati's (Cotati) five-year average for non-revenue water is 9.94%. The annual figures are given below:

Year	Water Produced/Imported (gallons)	Water Usage (gallons)	Non-Revenue Water (gallons)	Non-Revenue Water (ac-ft)
2006	364,214,061	338,511,578	25,702,483	79
2007	372,915,955	328,539,720	44,376,235	136
2008	342,299,426	335,940,117	6,359,309	20
2009	329,762,168	280,835,998	48,926,170	150
2010	306,705,919	261,521,641	45,184,278	139
			Five-Year Average of Non-Revenue Water =	105 acre-feet

6.1.2 Methods for Controlling System Water Loss

Production and consumption data is tabulated on a bi-monthly basis and reviewed for potential issues. Cotati responds to and repairs any reported leaks within 1 day.

Cotati continually checks for leaks in its system by responding immediately to customer calls on potential leaks, and visually checking for abnormal wet areas or green spots during routine work activities. Cotati checks for leaks during bi-monthly meter reads by visually checking and listening for leaks, and by checking for abnormally high reads. Cotati also periodically hires professional leak detection survey companies to investigate the water distribution system. To date, very few leaks have been found.

Cotati is in the process of performing pilot programs on automated meter reading systems. Automated meter reading (AMR), while primarily installed for billing purposes, allows for real-time monitoring of customer-side leaks, vandalism, and top of the hour reads to get a clear picture of actual water losses. In addition, the AMR infrastructure allows for deployment of city-wide system leak detectors, which is currently being explored.

For the future, Cotati is investigating district metering in order to isolate problem areas and give highest priority to those areas with the highest apparent losses.

6.2 North Marin Water District

6.2.1 Five-Year Average Non-Revenue Water

North Marin Water District's (NMWD) five-year-average for non-revenue water is -3.30%.The annual percentages are given below:

Year	NRW %
2006	(1.6%)
2007	4.5%
2008	0.8%
2009	(7.2%)
2010	0.2%

This average that shows negative water loss is primarily due to the anomaly of the 2009 data. While the 2006 data shows a negative water loss, this figure can be attributed to minor meter inaccuracies. The non-revenue water value for 2009 identifies significant production metering issues.

6.2.2 Methods for Controlling System Water Loss

NMWD employs the following methods to control its system water loss.

1. NMWD annually completes the Standard Water Audit and Water Balance Worksheet using AWWA software and has submitted the worksheets to CUWCC as part of the BMP reporting for FY2009/2010.
2. NMWD has no unmetered water use.
3. NMWD water repair crews respond and typically repair all leaks in one day.
4. NMWD monitors all water coming into its distribution system, both imported and locally produced, on a continuous basis with a SCADA system and produces daily and monthly water production and storage reports.
5. NMWD has a service line replacement program prioritized to target high failure rate installations, typically polybutelyne services.
6. NMWD has staff on call at all times to respond to leaks and emergency conditions. The on call staff are notified via the Novato Police Department dispatch or telephone alarms triggered by SCADA system monitors.

6.3 City of Petaluma

6.3.1 Five-Year Average Non-Revenue Water

The City of Petaluma's (Petaluma) five-year average for non-revenue water is 6.59%. The annual percentages are given below:

Year	NRW %
2006	8.58%
2007	5.97%
2008	6.47%
2009	7.65%
2010	4.28%

6.3.2 Methods for Controlling System Water Loss

Petaluma employs the following methods to control its system water loss.

1. Petaluma has areas of its water distribution that are over 100 years old. Its capital replacement program targets replacement of these sections.
2. Petaluma has a very active meter repair and replacement program. All meters over 2" are individually analyzed as they are read and tested at least every 3 years.
3. Petaluma uses AMR meters which include a memory chip. This allows for detailed water use analysis and many conservation opportunities.
4. Petaluma Water Repair Crews respond to all leaks in one day and average 2 days for repairs to be completed.
5. Petaluma has no unmetered water use.
6. Petaluma monitors all water coming into its system on a continuous basis with daily water production and storage reports produced.
7. Petaluma produces a monthly production and water sales report.
8. Petaluma has a service line replacement program prioritized to target high failure rate installations.

6.4 City of Rohnert Park

6.4.1 Five-Year Average Non-Revenue Water

The City of Rohnert Park's (Rohnert Park) five-year average for non-revenue water is 6.52%. The annual percentages are given below:

Year	Water Produced (MG)	Water Sold (MG)	Non-Revenue Water (MG)	NRW %
2006	1795.8	1680.5	115	6.4%
2007	1690.6	1662.0	29	1.7%
2008	1683.6	1582.5	101	6%
2009	1497.5	1398.9	98.6	7%
2010	1465.9	1251.4	162	11.5%

6.4.2 Methods for Controlling System Water Loss

Rohnert Park immediately repairs all leaks reported or discovered by system operators. Rohnert Park periodically uses audio leak detection specialist to "listen" to the entire water system to locate leaks that do not result in water coming to the surface. All detected leaks are repaired immediately.

Rohnert Park is embarking on the last of its metering projects to meter the few remaining unmetered services. These are on Rohnert Park services to landscape islands and a small number of other Rohnert Park facilities.

6.5 City of Santa Rosa

6.5.1 Five-Year Average Non-Revenue Water

The City of Santa Rosa's (Santa Rosa) five-year average for non-revenue water is 7.71%. The annual percentages are given below:

Year	Total Produced (gallons)	Non-Revenue Water (gallons)	NRW %
2006	7,756,164,553	578,164,553	7.45%
2007	7,667,773,939	592,385,799	7.73%
2008	7,626,452,875	564,171,931	7.40%
2009	6,596,712,539	415,657,492	6.30%
2010	6,325,370,345	623,407,886	9.86%
Total	35,972,474,251	2,773,787,661	7.71%

6.5.2 Methods for Controlling System Water Loss

Santa Rosa uses the American Water Works Association (AWWA) Standard Water Audit and Water Balance in the Third Edition M36 Manual, *Water Audits and Loss Control Programs,* to determine and analyze the annual water loss for the system. Santa Rosa implements a number of programs to control system water loss, including meter testing and calibration on a routine schedule based on meter size, hydrant maintenance to insure valves are exercised appropriately, metering of all City field crew trucks that use water as part of their routine maintenance activities and metering all construction use. Santa Rosa's field crews also implement a leak detection program where field staff uses traditional sounding equipment to complete a survey of the City's distribution system annually. Any leaks that are detected are repaired immediately. Santa Rosa maintains a database that records the date, time and location of the leak, as well as the repair information and estimated amount of water lost due to the leak. In addition, as a preventative measure, Santa Rosa implements a service replacement program for plastic services and certain copper services where Santa Rosa has identified areas of high leaks from services.

Santa Rosa's billing department notifies customers of potential property leaks by analyzing water use records for dramatic increases in water use and contacting customers individually and offering assistance. In addition, the Santa Rosa Water Conservation Program analyzes dedicated irrigation customers water use records to determine which accounts have high water use and contacts those customers offering assistance. Santa Rosa's robust program has led to non-revenue water being less than 10% over the past ten years.

6.6 City of Sonoma

6.6.1 Five-Year Average Non-Revenue Water

The City of Sonoma's (Sonoma) five-year average for non-revenue water is 7.38%. The annual percentages are given below:

Year	NRW %
2006	7.5%
2007	7.5%
2008	3.5%
2009	10.5%
2010	7.9%

6.6.2 Methods for Controlling System Water Loss

Sonoma is committed to doing the maximum extent practical to account for all water. Currently Sonoma employs a leak detection company to survey the water system twice a year. Sonoma has also purchased leak detection equipment for its own use. Based on its AMR data, Sonoma send out monthly "leak letters" to residents who appear to have a continuous flow of water, which could indicate a water leak and offers indoor and outdoor water audits. For the past two years Sonoma has put an emphasis on tracking its own use when hydrant flushing and exercising valves, as well as partnering with the fire department to track water used for fires and training. As part of its education and outreach, Sonoma hosts an annual Water Wisdom Fair, which this year will focus on sustainability. At outreach events, Sonoma gives away water conserving hardware and educational material and actively promotes its rebate programs, the most popular program being cash for grass.

Sonoma has an aggressive water service replacement program that replaces leaky polybutylene (PB) service laterals throughout the city. As of 2010, this program has replaced 768 service lines at an average cost of approximately $4,000 per service. Sonoma's Capital Improvement Program includes replacing an additional 856 service lines, which would bring the total replacement to approximately two-thirds of all PB installations. Leaks in customer service lines and at the meter box were repaired. Another program undertaken by Sonoma, which is believed to have reduced leakage and improved meter accuracy, is its meter replacement program. Virtually all of the meters in the system have been replaced with automatic reading equipment, with the task being completed in 2008.

6.7 Valley of the Moon Water District

6.7.1 Five-Year Average Non-Revenue Water

The Valley of the Moon Water District (VOMWD) five-year average for non-revenue water is 8.94%. The annual percentages are given below:

Year	NRW %
2006	14.3%
2007	9.3%
2008	11.2%
2009	6.8%
2010	3.1%

6.7.2 Methods for Controlling System Water Loss

VOMWD implements a number of programs to control system water loss, some of which are described below:

1. VOMWD uses the American Water Works Association (AWWA) Standard Water Audit and Water Balance in the Third Edition M36 Manual, *Water Audits and Loss Control Programs* to determine and analyze the annual water loss for the system.
2. VOMWD monitors all water coming into its distribution system, both imported and locally produced, on a continuous basis with a SCADA system, and using daily and monthly water production and storage reports.
3. VOMWD field crews respond and typically attempts to repair all leaks the same day. VOMWD has staff on-call at non-regular hours to respond to leaks and emergency conditions. The on-call staff responds to both customer calls and telephone alarms triggered by SCADA.
4. As a preventative measure, VOMWD implements a service replacement program for polybutylyne service lines, where the District has identified areas of high leaks.
5. VOMWD field crews use traditional sounding equipment to routinely survey parts of the District's distribution system. The District also hires outside help to conduct leak detection surveys periodically. Any leaks that are detected are repaired immediately.

6. In May 2011, VOMWD entered into an agreement with the Water Agency and IBM to collaborate on a pilot study using advanced analytics and optimization techniques to reduce Non-Revenue Water as well as provide improved pressure management of both the Water Agency's transmission system and the VOMWD's distribution network using data that is currently being collecting.
7. VOMWD has no un-metered water use and implements these additional measures: a) meter testing and calibration on a routine schedule based on meter size; b) hydrant maintenance to insure valves are exercised appropriately; c) metering of all field crew trucks that use water as part of their routine maintenance activities; and d) metering all construction use.

6.8 Town of Windsor

6.8.1 Five-Year Average Non-Revenue Water

The Town of Windsor (Windsor) five-year average for non-revenue water is approximately 4.20%. The annual percentages are given below:

Year	NRW %
2006	5%
2007	6%
2008	3%
2009	2%
2010	5%

6.8.2 Methods for Controlling System Water Loss

Prior to 2009, Windsor completed informal annual audits in the process of tabulating sales and production data. Most of Windsor's transmission and distribution system is less than 15 years old and is in excellent condition. Consequently, Windsor experiences relatively few pipe leaks or failures. Windsor has leak detection equipment and all leaks are traced and repaired as quickly as possible when noticed. In addition, Windsor has an aggressive corrosion control program that is intended, in part, to prolong the useful life of the distribution system pipes.

In July 2009, Windsor began implementing new water loss management procedures as detailed in the American Water Works Association (AWWA) Third Edition M36 Manual, *Water Audits and Loss Control Programs.* In March 2011, staff received CUWCC training on the use of AWWA's Water Loss Audit software. This software is now being utilized by Windsor to complete a standard water audit and balance annually.

Instructions for Monthly Sanitation and Water Reports

Sanitation Self-Monitoring Reports

\\fileserver\Data\CL\clsave\Sanitation Self-Monitoring Reports\
EACH FACILITY HAS ITS OWN FOLDER
and
\\fileserver\Data\CL\pinks\(current.week's.folder)

Randy Cullen:
Airport
ALW Windsor
Geyserville
Occidental
Russian River

Hody Wilson:
Sonoma Valley

Water Quality Monitoring Reports

\\fileserver\Data\CL\clsave\Water Quality Monitoring Reports\
and
\\fileserver\Data\CL\pinks\(current.week's.folder)

Jim Zambenini

Instructions for Monthly Sanitation and Water Reports

1) Work requests with attachments are e-mailed to the Clerical Inbox.

2) Complete Clerical Word Processing Request as usual.

3) Open the letter and save it to the **Sanitation Self-Monitoring Reports folder**, to the proper facility subfolder.

4) Process in its appropriate subfolder, including adding your initials and inserting the file name at the end as done with all correspondence. **DO NOT PRINT YET**, instead save document to the Pinks folder and **only** update the file name so that the printed copy of the letter shows the file directory for the Pinks folder.

5) Print one copy of letter from the Pinks folder.

6) Call the Coordinator to determine if he wants the letters sent via Courier to College or if he will pick them up from you.

7) You **DO NOT** make yellow copies. No scanning is done at this time.

8) After the Coordinator has signed the letter, he will make a yellow copy and return it with copies of all the reports.

9) When the letters are returned with the enclosures, scan them with their attached report copies and save to the appropriate Outgoing Correspondence folder in DocuShare.

10) Staple each letter with its reports and drop in the SANI slot in Records room.

NOTE:
Use the heavy-duty stapler in copy room 215 to staple the thick copies of the reports with their letter. If you have a bundle too thick for one staple, divided it in half and staple the letter to the first half. Create labels to attach to the upper right corner of each section (including section with the letter attached) in case they become separated at any time.

Label example:

70-12-43 Wastewater Monitoring Reports – Sonoma Valley CSD March 2011 Part 1 of 2 (or Part 2 of 3, etc.)

Clerical Temp2

From: Justin Smith
Sent: Friday, April 01, 2011 3:24 PM
To: bevoy@waterboards.ca.gov; pcrader@waterboards.ca.gov; kwashburn@waterboards.ca.gov
Cc: David Manning; Pam Jeane; Records
Subject: 2010 TUCP Fisheries Monitoring Report for WR 2010-0018-DWR
Attachments: 2010_TUCP_Fisheries_Report.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

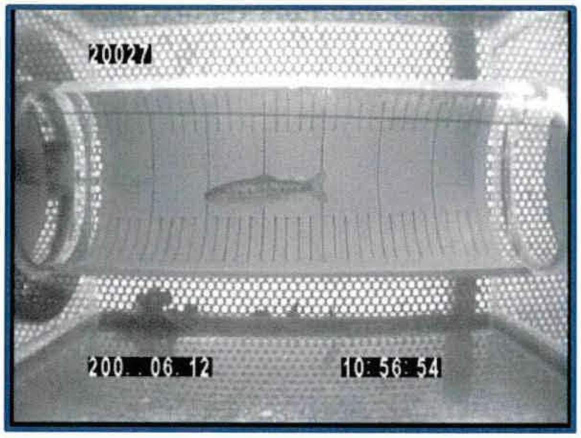
Greetings Colleagues,

This message transmits the Sonoma County Water Agency's 2010 Annual Report of Fisheries Monitoring Activities in compliance with State Water Resources Control Board Order WR 2010-0018-DWR. This report includes results from monitoring adult Chinook returns at the Mirabel inflatable dam, dive surveys to monitor Chinook in the lower and upper Russian River, dive surveys to measure the relative abundance of juvenile steelhead and native freshwater fish in the upper Russian River, salmonid downstream migrant trapping operations in Dry Creek, the mainstem of the Russian River at Mirabel Dam, in Austin Creek, Dutchbill Creek, Green Valley Creek and at the Russian River Estuary near Duncans Mills. In May 2011, the results of all Water Agency Biological Opinion monitoring will be presented in a comprehensive report to NMFS and DFG. If you have any questions about the attached 2010 TUCP Fisheries Monitoring Report feel free to contact me.

Justin Smith
Environmental Specialist
Sonoma County Water Agency
(707)-292-7673

CF/42-0.19-9 SWRCB Order Approving Temporary Urgency Change in Permits 12947A, 12949, 12950 & 16596 for 2010 (ID 2474)

RESULTS OF THE FISHERIES MONITORING PLAN TO MEET STATE WATER RESOURCES CONTROL
BOARD ORDER WR 2010 – 0018-DWR



April 1, 2011

Sonoma County Water Agency
404 Aviation Blvd.
Santa Rosa, CA 95403

SONOMA COUNTY WATER AGENCY

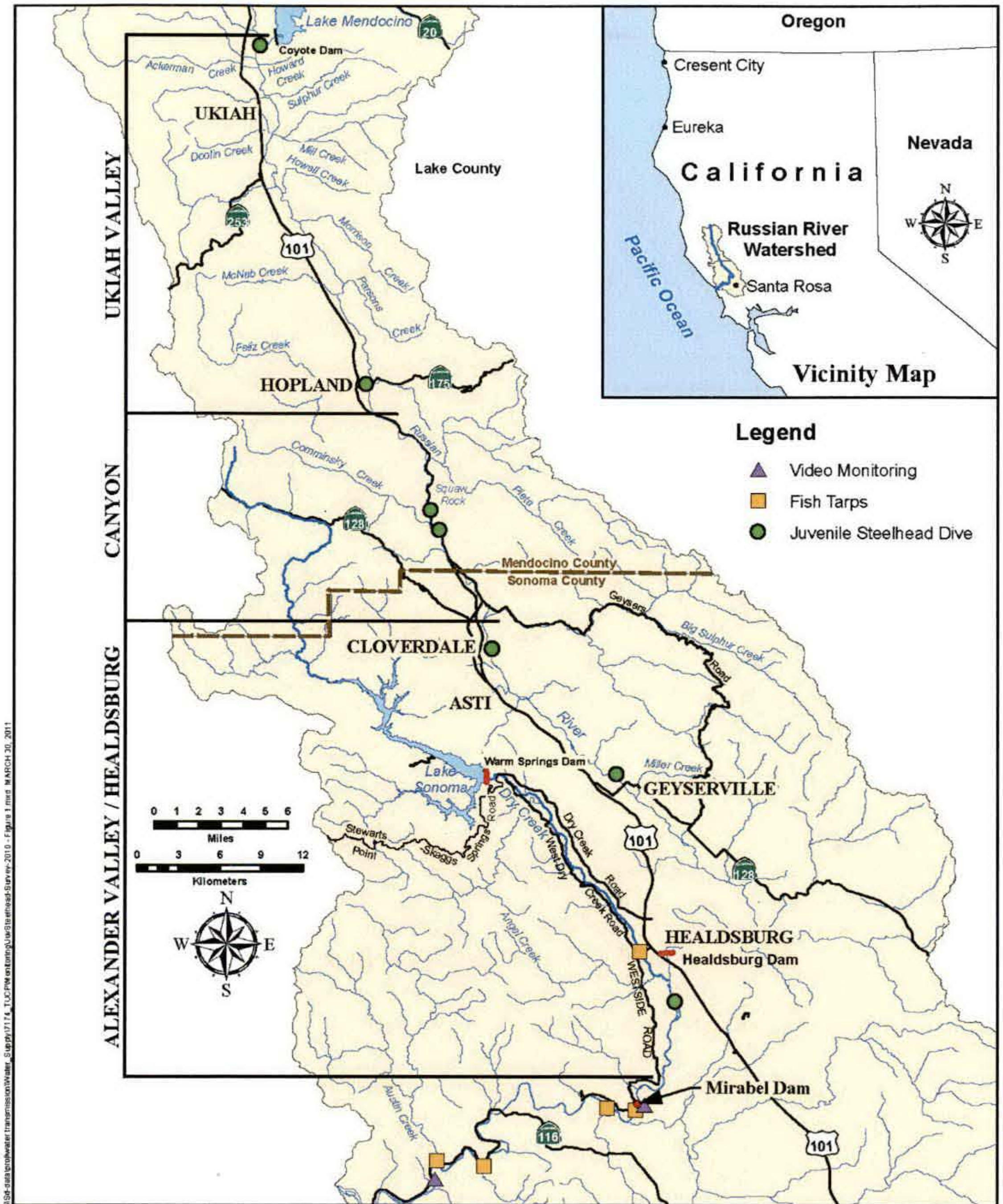
Introduction

On September 24, 2008 the National Marine Fisheries Service (NMFS) issued the Biological Opinion for Water Supply, Flood Control, and Channel Maintenance (Biological Opinion) to the U.S. Army Corps of Engineers, the Sonoma County Water Agency (Water Agency), and the Mendocino County Russian River Flood Control and Water Conservation Improvement District in the Russian River watershed (NMFS 2008). The Biological Opinion found that high summer time flow in the Russian River under the current State Water Resources Control Board (State Water Board) Decision 1610 (D1610) degraded steelhead and coho salmon habitat.

On April 6, 2010 the Water Agency submitted a petition to the State Water Board requesting a temporary urgency change to D1610 to meet lower in-stream flows required by the Biological Opinion. On May 25, 2010, the State Water Board issued Order WR 2010-0018-DWR (State Water Board Order) for the following temporary changes to D1610:

(1) From May 1 through October 15, 2010 in-stream flow requirements for the upper Russian River (from the confluence with the East Fork of the Russian River to its Confluence with Dry Creek) be reduced from 185 cubic feet per second (cfs) to 125 cfs
(2) From May 1 through October 15, 2010 in-stream flow requirements for the lower Russian River (downstream of its confluence with Dry Creek) be reduced from 125 cfs to 70 cfs with the understanding the Water Agency will typically maintain approximately 85 cfs at the Hacienda Gauge as practicably feasible.

Provisions 2 through 7 of the State Water Board Order required the Water Agency to conduct and report on a number of fisheries monitoring projects. The Water Agency and State Water Board consulted with NMFS and the California Department of Fish and Game (DFG) regarding the fisheries monitoring objectives and methods. Projects included monitoring adult Chinook returns at the Mirabel inflatable dam, dive surveys to monitor Chinook in the lower and upper Russian River, dive surveys to measure the relative abundance of juvenile steelhead and native freshwater fish in the upper Russian River, salmonid downstream migrant trapping operations in Dry Creek, the mainstem of the Russian River at Mirabel Dam and the Russian River estuary near Duncans Mills (Figure 1). Updates of fisheries monitoring data were sent to NMFS and DFG staff on a weekly basis per provision 7 of the State Water Board Order. While not a provision of the State Water Board Order, the Biological Opinion requires fish trap data collection in Austin Creek, Dutchbill Creek, and Green Valley Creek (Figure 1). We present data collected at these sites in this report to supplement information required by the State Water Board Order. In May 2011, the results of all Water Agency Biological Opinion monitoring will be presented in a comprehensive report to NMFS and DFG.



SONOMA COUNTY WATER AGENCY

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This map document and associated data are distributed for informational purposes only "AS-IS" at the published scale and provided without warranty of any kind expressed or implied. The positional accuracy of the data is approximate and not intended to represent survey map accuracy. The Sonoma County Water Agency assumes no responsibility arising from use of this information.

Figure 1

Fisheries Monitoring Sites

Methods

Video Monitoring of Adult Salmon Migration

The Water Agency has operated an underwater video camera system in fish ladders at the Mirabel inflatable dam to monitor the upstream migration of adult Chinook salmon for the past 11 years. As anadromous fish move upstream through the fish ladders on both sides of Mirabel Dam they are recorded by cameras (Figure 2). The cameras operate 24 hours a day 7 days a week starting in early September and ending when the dam is deflated due to high winter flows (typically in December). Video is reviewed by Water Agency biologists on a daily basis. Fish detected on the video are identified to species and enumerated. For detailed methods see Chase (2005).

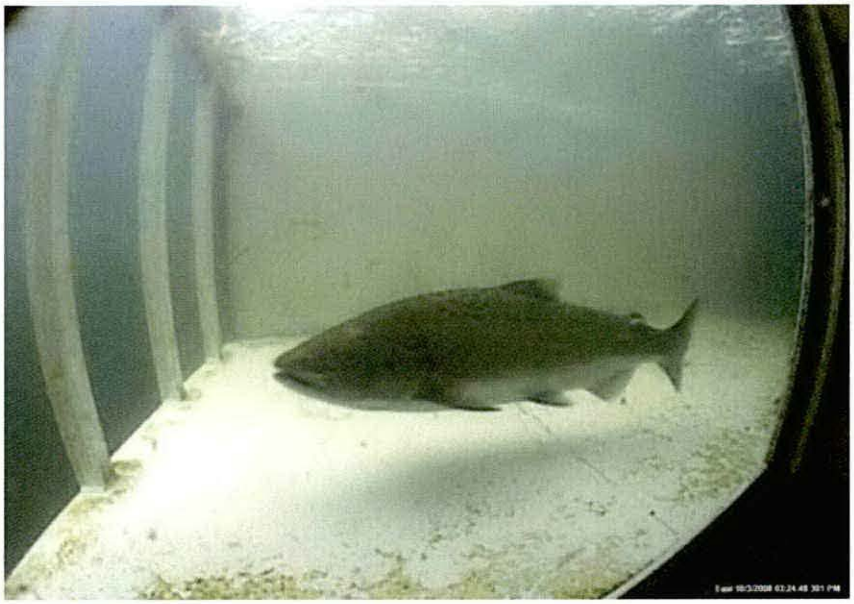

Figure 2. An image of an adult Chinook taken from the Mirabel Dam underwater video monitoring system located on the Russian River near Forestville, CA.

Adult Chinook Salmon Dive Surveys:

Weekly Chinook salmon dive surveys in the mainstem Russian River were performed from September 15 to November 15, 2010. Per the State Water Board Order, if Chinook were able to enter the Russian River (i.e. the river mouth was open), flows at U.S. Geological Survey Hacienda Bridge Gaging Station were below 125 cfs, and less than 200 Chinook had been observed on the Mirabel camera system, the Water Agency was to conduct surveys in the lower Russian River below the Mirabel Dam. Once 200 Chinook had been observed on the camera system, the Water Agency was to conduct dive surveys in the mainstem River upstream of the Mirabel Dam.

Dive sites were selected to provide the best water velocity, river depth, and water clarity conditions to observe fish. Where feasible, sites sampled during previous years of monitoring were selected for surveys in 2010. In previous years, dive surveys were conducted at 8 sites in 2 reaches along the Russian River. The Downstream reach extends from Brown's pool near Cassini's Ranch to the Mirabel Dam near the town of Forestville, CA. The Upstream reach extends from the Mirabel Dam to Diggers Bend near the Rio Linda Academy. In previous years surveys were conducted at Brown's pool near Cassini's Ranch, immediately downstream of the Vacation Beach Dam near Guerneville, immediately downstream of the Johnson Beach Dam near Guerneville, and at the pool immediately downstream of the Mirabel Dam. Upstream reach surveys were conducted at Redwood Hole approximately 3 km upstream of the Mirabel Dam, immediately downstream of the Healdsburg Memorial Dam, at the PG&E hole approximately 300 m upstream of the Healdsburg Memorial Dam, and at Diggers Bend near the Rio Linda Academy in Healdsburg. At each site, two divers entered the river and visually searched the dive site in an attempt to detect adult Chinook. General appearance and density of Chinook in the pool was noted.

Juvenile Steelhead Dive Surveys:

From August 18, 2010 to August 25, 2010 the Agency conducted a dive survey for juvenile steelhead and native freshwater fish. A total of seven sites were sampled between Mirabel Dam and Lake Mendocino (Figure 1). Site photos are included in the Appendix. Each site was 500 m long and corresponded to sites sampled in 2009 (Manning *et al.* 2009).

At each site, three divers entered the water at the downstream end of the sample site. The stream was divided into 3 lanes (left bank, mid channel, and right bank). Divers were assigned to a lane and moved upstream visually searching for fish occupying their lane. Divers would employ a serpentine swimming pattern if they could not see their entire section when swimming in a straight line. All fish were identified to species when possible. Fish that could not be identified to species were identified to family. Fish were grouped into 3 size classes (<100 mm total length (TL), 101-300 mm TL, and >300 mm TL). In general, steelhead <100 mm TL are young-of-the-year (YOY), steelhead 101-300 mm in length are age 1-2, and steelhead greater than 300 mm are age 3+ (Moyle 2002). At the end of a survey, fish data from all divers was recorded on a data form for each site. In addition, water temperature and water visibility was recorded.

Downstream Migrant Fish Trapping:

The Water Agency operates three types of downstream migrant traps in the Russian River basin; rotary screw traps, funnel traps, and pipe traps (Figure 3 and Figure 4). Water Agency rotary screw trap methods are detailed in Chase (2005) and Manning and Martini-Lamb (2011). Methods for funnel net and pipe traps can be found in Manning and Martin-Lamb (2011).

Fish traps located near the mouth of Green Valley Creek, Dutchbill Creek, Austin Creek, near West Side Road on Dry Creek, and near Mirabel Dam on the mainstem Russian River were checked daily by Water Agency staff during the trapping season (typically from April through July). Captured fish were identified to species and enumerated. Fork length (to the nearest mm) and weight (to 0.1 g) were measured for a subset of individuals. Passive integrated transponder

(PIT) tags were implanted into a subset of steelhead parr captured at the Mirabel, Dutchbill Creek, Green Valley Creek, and Austin Creek fish traps. The recapture of PIT tagged steelhead on PIT tag antennas operated by the Water Agency, at other fish traps, or during Russian River Estuary seining surveys conducted by the Water Agency provided information on steelhead movement and growth. These data are not presented here but are available in Biological Opinion annual monitoring reports.

Figure 3. A rotary screw trap on Austin Creek.

Figure 4. A pipe trap on Dutchbill Creek.

Estuary Fyke Net Juvenile Salmonid Video Monitoring System:

In addition to the aforementioned fish traps, the Water Agency also operates a video monitoring station that consists of a modified fyke net in the upper Estuary (Figure 5). The estuary video system allows fish to freely move through a viewing chamber where they are detected by the underwater video camera and PIT tag reader as they exit the downstream end of the weir. The video system alleviates the need to handle fish and minimizes fish stress in the relatively warm water conditions of the lower Russian River.

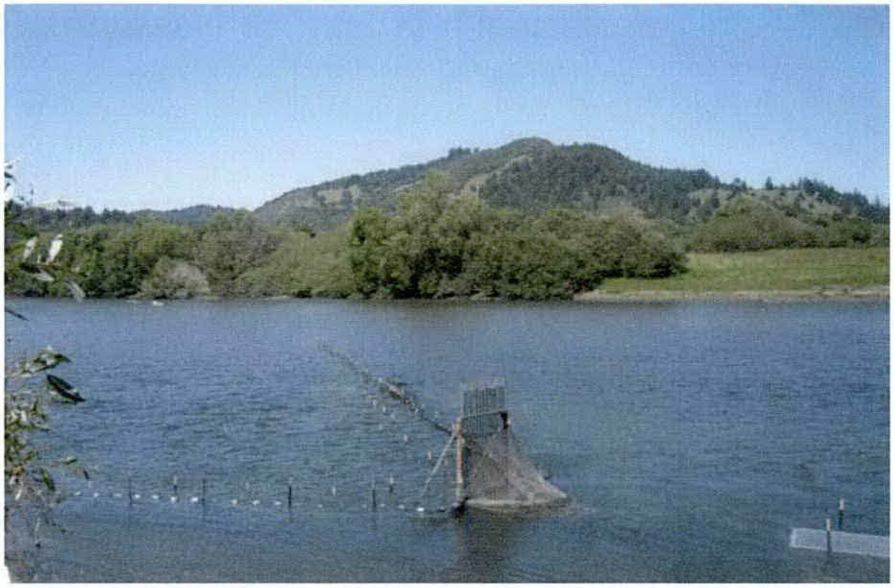

Figure 5. The Estuary fyke net juvenile salmonid video monitoring system located near the town of Duncans Mills.

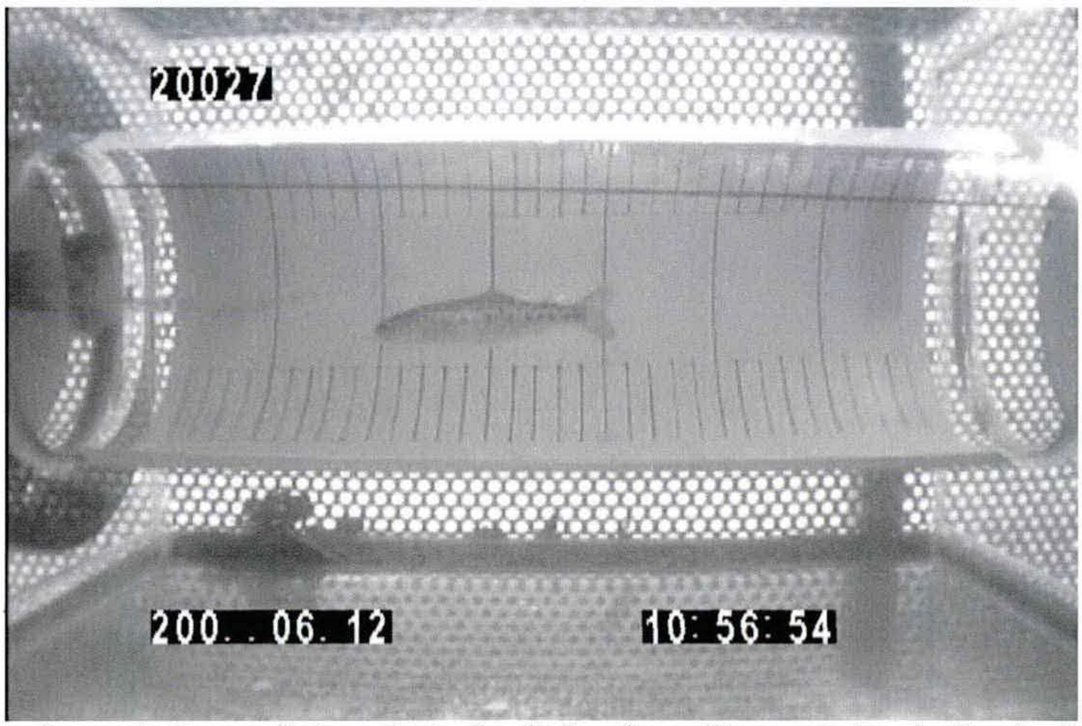

Figure 6. An image of a juvenile steelhead taken from video recoded on the Russian River Estuary fyke net juvenile salmonid video monitoring system.

Results:

Due to abundant rainfall, flows in the Russian River were higher than average in 2010. When compared to the average daily flow at the Hacienda Bridge Gaging Station from 2000 to 2009 flow in 2010 was higher in the late spring, early summer, and fall (Figure 7). Higher tributary inflow associated with a relatively wet spring necessitated that installation of traps later in 2010 than in previous years.

In October 2010, Lake Mendocino had the highest reservoir levels recorded in the last 51 years. High reservoir storage levels were due to a combination of the relatively wet spring and decreased releases to comply with the reduced in-stream flows required by the Biological Opinion. In October 2010, the US Army Corps of Engineers conducted a planned release from Coyote Valley Dam (Lake Mendocino) to evacuate water in the reservoir's flood control pool and stimulate the upstream movement of adult Chinook salmon.

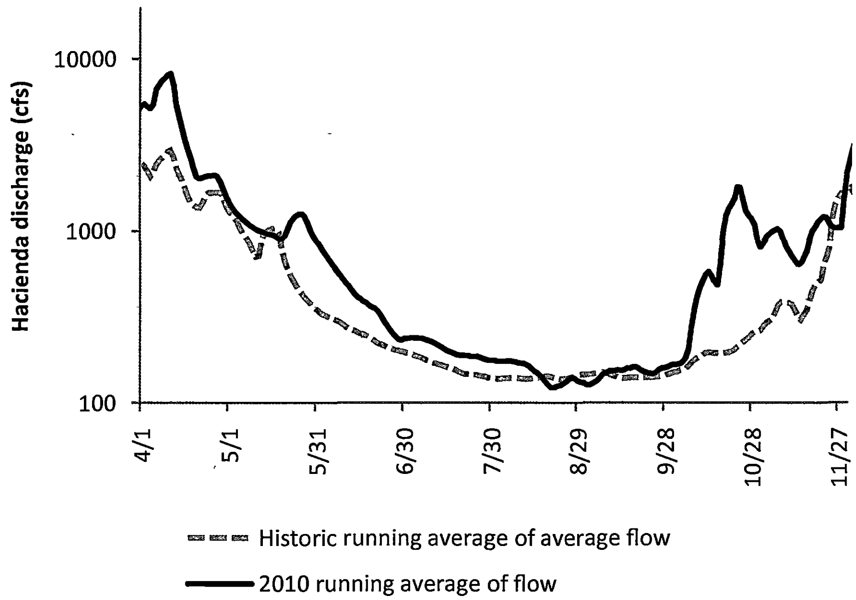

Figure 7. The weekly average of flow at Hacienda Bridge based on 10 years of data (2000-2009) shown with weekly average flow in 2010.

Early fall water conditions affected the monitoring of adult Chinook. A storm during the week of October 27, 2010 necessitated the deflation of Mirabel Dam as peak flow was forecast to rise above 5,000 cfs. When elevated storm flows subsided, the Water Agency re-inflated the dam in order to continue monitoring adult Chinook. The underwater camera system relies on counting fish as they move through fish ladders at the Mirabel inflatable dam. Unfortunately the Water Agency was not able to monitor the Chinook run while the dam was deflated and this led to a 5 day gap in the 2010 adult Chinook migration data. This storm also created river conditions that did not allow the Agency to conduct dive surveys to monitor adult Chinook salmon or to conduct Chinook redd surveys in the mainstem of the Russian River.

Video Monitoring of Adult Salmon Migration:

Video monitoring of the adult Chinook migration past the Mirabel inflatable dam began on September 1, 2010. The first Chinook for the season was observed on September 23, 2010. In total 2,515 adult Chinook salmon were observed at the Mirabel camera system (Table 1). Thirty eight Coho and 163 steelhead were also observed at the underwater camera system (Table 1). Fish could not be positively identified to the species level on October 25, 2010 due to high turbidity. The Dam was deflated for 5 days during the week of October 27, 2010, but operated continuously until it was deflated for the season on December 6, 2010. Because the video system only functions when the dam is inflated, counts at Mirabel dam represent minimum returns.

Table 1. The number of adult Chinook salmon, coho salmon, and steelhead observed on the Mirabel underwater camera system each week during the 2010. Please note that fish could not be positively identified to the species level on October 25, 2010 and October 26, 2010 due to high turbidity.

Date (Week)	Days fished	Chinook	Steelhead	Coho
1-Sep	7	0	0	0
8-Sep	7	0	0	0
15-Sep	7	0	0	0
22-Sep	7	3	0	0
29-Sep	7	654	0	1
6-Oct	7	62	0	2
13-Oct	7	954	11	8
20-Oct	7	307	5	9
27-Oct	2	33	2	1
3-Nov	7	199	2	5
10-Nov	7	93	8	4
17-Nov	7	47	41	3
24-Nov	7	124	36	1
1-Dec	5	40	58	4
Total	91	2516	163	38

Adult Chinook Salmon Dive Surveys:

Dive surveys to assess the general health and density of adult Chinook salmon were conducted by Water Agency staff in relatively deep holes along the middle and upper Russian River in 2010. Because sustained flows at Hacienda Bridge stayed above 125 cfs, the Water Agency did not conduct lower river dive surveys in 2010.

Over 200 Chinook were observed at the Mirabel fish counting station by October 4, 2010 and upper river dive surveys were initiated the week of October 7. Survey sites included the pool immediately downstream from the Healdsburg Memorial Dam and the PG&E hole (approximately 200 m upstream of the Memorial Dam). Four apparently healthy adult Chinook were observed. The Water Agency planned on conducting upper river dive surveys to monitor adult Chinook on a weekly basis starting on October 7, 2010. However these surveys were not implemented because flows were too high to safely conduct dive surveys and turbidity was too high to detect fish.

Juvenile Steelhead Dive Surveys:

A total of 9,655 fish were detected during summer dive surveys consisting of 11 fish species (Table 3). However, only 11 juvenile steelhead were detected at the 7 survey sites (Table 2). Most fish consisted of native warm water species (99.5%). Two steelhead were found near a cold water seep near Geyserville and 9 steelhead downstream of the confluence with Dry Creek. In comparison to the 4 sites (Ukiah below forks of the Russian River, Cloverdale above Comminski station, Cloverdale below Crocker road, and Geyserville, above hwy 128 bridge) sampled during 2002, 2009 and 2010 there were 604 steelhead detected in 2002, 2 steelhead detected during 2009 and 2 steelhead during 2010 (Manning *et al.* 2009 and Table 2).

Water conditions during the 2010 survey were different than conditions present during the 2002 and 2009 surveys. Water visibility was relatively poor in 2010 when compared to the other 2 years sampled. The visibility in 2010 ranged from 0.5 m to over 2 m. Visibility was the poorest near the confluence of the East and West Fork of the Russian River and gradually improved at downstream sample sites. During 2010 water visibility was best (greater than 2 m) downstream of the confluence with Dry Creek. Water temperatures were colder in 2010 at most sites than during previous study years. Temperatures ranged from 12.5 ˚C in upper Ukiah Valley and gradually increased to 21 ˚C in the Alexander Valley / Healdsburg reach. Water temperatures at the Healdsburg dive site (downstream of the confluence of Dry Creek and the Russian River) was influenced by Dry Creek stream temperatures (17 ˚C at the mouth of Dry Creek). The water temperature at this site was 21 ˚C 500 meters downstream of the confluence of Dry Creek (Table 2).

Table 2. Steelhead observations, water visibility, and temperature during summer dive surveys from 2002, 2009, and 2010 in the upper Russian River. Each site consisted of a 0.5 km river section. Note that dashes indicate locations that were not surveyed.

Reach	Location	2002						2009						2010					
		Visibly (m)	Temp (C)	Steelhead (mm)				Visibly (m)	Temp (C)	Steelhead (mm)				Visibly (m)	Temp (C)	Steelhead (mm)			
				1-100	101-300	>300	Total			1-100	101-300	>300	Total			1-100	101-300	>300	Total
Ukiah Valley	Ukiah, below Forks	1-2	20	21	33	1	55	0-1	16					0-1	12.5				
Ukiah Valley	Ukiah, above Perkins Bridge	1-2	20.5	6	1		7	0-1	18					-	-	-	-	-	-
Ukiah Valley	Ukiah, Norgard Dam	1-2	20	51	109	1	161	0-1	16.7	3	2		5	-	-	-	-	-	-
Ukiah Valley	Hopland, Feliz Creek confluence	-	-	-	-	-	-	1-2	17.2					0-1	15.5				
Canyon	Hopland, above Squaw Rock	1-2	20	57	56		113	-	-	-	-	-	-	-	-	-	-	-	-
Canyon	Hopland, below Squaw Rock	-	-	-	-	-	-	1-2	17.7					0-1	18				
Canyon	Cloverdale, above Comminski	1-2	18.9	411	24		435	1-2	17.7	1	1		2	0-1	19				
Alexander Valley/ Healdsburg	Cloverdale, below Crocker Bridge	1-2	22					1-2	21.1					0-1	21				
Alexander Valley/ Healdsburg	Geyserville, above Hwy 128	1-2	23	1			1	>2	22.2					1-2	21	1	1		2
Alexander Valley/ Healdsburg	Healdsburg, Healdsburg Dam	>2	24	4	12		16	>2	23.3		1		1	-	-	-	-	-	-
Alexander Valley/ Healdsburg	Healdsburg, Diggers Bend	-	-	-	-	-	-	>2	21.7					-	-	-	-	-	-
Alexander Valley/ Healdsburg	Healdsburg, Dry Creek confluence	-	-	-	-	-	-	>2	15.5		10		10	>2	21	1	8		9
Alexander Valley/ Healdsburg	Healdsburg, above Riverfront Park	-	-	-	-	-	-	>2	16.7					-	-	-	-	-	-
		Total:		551	235	2	788	Total:		4	14	0	18	Total:		2	9	0	9

Table 3. Observations of non-salmonids during summer dive surveys from 2002, 2009, and 2010. Each site consisted of a 0.5 km section of the river.

Location	Small Mouth Bass	Large Mouth Bass	Sac Sucker	Tule Perch	Hard-head	CA Roach	Sac Pike-minnow	Cyprinids	TS Stickle-back	Carp	Green Sunfish	Bluegill	Sculpin
2002													
Ukiah Valley, below Forks	0		83	0	0	0	0	66	10	0	0		0
Ukiah Valley, above Perkins Bridge	2		85	0	4	0	13	600	0	0	0		1
Ukiah Valley, Norgard Dam	1		511	61	1	0	0	578	300	0	0		2
Canyon, above Squaw Rock	0		298	119	10	1114	9	646	0	0	0		0
Canyon, above Comminski Station	2		1819	608	23	440	1	1297	0	0	0		0
Alexander Valley, below Crocker Bridge	37		1764	1212	40	4850	6	1454	0	0	0		0
Alexander Valley, above Geyserville Bridge (Hwy 128)	5		239	353	18	0	14	1200	0	0	0		1
Healdsburg, Healdsburg Dam	370		196	79	91	0	6	605	0	1	27		1
TOTAL	**417**	**0**	**4995**	**2432**	**187**	**6404**	**49**	**6446**	**310**	**1**	**27**	**0**	**5**
2009													
Ukiah Valley, below Forks													
Ukiah Valley, above Perkins Bridge													
Ukiah Valley, Norgard Dam	0	0	0	0	0	0	0	0	0	0	0	0	0
Canyon, below Squaw Rock	4	0	115	19	36	0	23	2060	10	1	0	0	1
Canyon, above Comminski Station	5	0	449	281	201	0	29	2589	0	0	0	0	0
Alexander Valley, below Crocker Bridge	3	1	196	116	90	0	53	1775	0	0	0	0	0
Alexander Valley, above Geyserville Bridge (Hwy 128)	14	0	222	40	102	0	33	1575	0	0	0	0	0
Healdsburg, Healdsburg Dam	309	0	160	53	1438	0	43	83	0	0	1	9	0
Ukiah Valley, Feliz Creek confluence	5	0	47	85	17	7	1	0	5	0	0	0	0
Healdsburg, Diggers Bend	470	2	450	2	219	0	45	86	0	0	4	1	0
Lower Healdsburg, Dry Creek confluence	1	0	377	13	245	0	4	415	101	0	0	0	0
Lower Healdsburg, above Riverfront Park	4	0	241	124	26	0	27	1185	0	0	0	0	0
TOTAL	**480**	**2**	**1115**	**224**	**507**	**7**	**77**	**1686**	**106**	**0**	**4**	**1**	**0**

Table 3. Continued from previous page. Observations of non-salmonids during summer dive surveys from 2002, 2009, and 2010. Each site consisted of a 0.5 km section of the river.

Location	Small Mouth Bass	Large Mouth Bass	Sac Sucker	Tule Perch	Hard-head	CA Roach	Sac Pike-minnow	Cyprinids	TS Stickle-back	Carp	Green Sunfish	Bluegill	Sculpin
2010													
Ukiah Valley, below Forks	0	0	3	0	0	0	0	0	0	0	0	0	0
Ukiah Valley, Feliz Creek confluence	0	0	2	0	0	0	0	20	0	0	0	0	0
Canyon, below Squaw Rock	0	0	17	1		0	0	800	0	0	0	0	1
Canyon, above Comminski Station	0	0	146	254	3	47	0	1561	4	0	0	0	1
Crocker Bridge	2	0	1095	45	0	82	22	685	0	0	0	0	0
Alexander Valley, above Geyserville Bridge (Hwy 128)	26	0	564	342		15	64	1985	1	0	0	0	0
Lower Healdsburg, Dry Creek confluence	6	0	48	82	220	718	53	705	0	0	3	0	0
Total	34	**0**	**1875**	**724**	**223**	**862**	**139**	**5756**	**5**	**0**	**3**	**0**	**2**

Downstream Migrant Fish Trapping:

Downstream migrant trapping commenced on Austin Creek on April 15, 2010 and traps at 4 other Russian River Basin locations were installed between April 21 and May 5. Traps were operated until out-migrant fish were no longer detected, or lower flow prevented efficient trap operation (Table 4). The UC Cooperative Extension (UCCE) Coho Salmon Monitoring Program operated a fish trap on lower Green Valley Creek to estimate the outmigration of coho smolts. The Water Agency worked in conjunction with UCCE to PIT tag steelhead parr at the Green Valley Creek trap (Table 4).

Table 4. The Installation and removal date and total number of days fished for the downstream migrant traps operated by the Water Agency and UCCE.

Trap	Installed	Removed	Total days sampled
Austin	4/16/2010	7/19/2010	94
Dutchbill	4/21/2010	7/13/2010	82
Dry Creek	4/22/2010	8/31/2010	132
Mirabel	5/5/2010	7/16/2010	73
Green Valley	3/11/2010	6/3/2010	57

<u>Steelhead</u>:
In 2010, steelhead parr were most frequently encountered in Austin Creek. Over the course of the 2010 trapping season, 4,682 steelhead parr were captured at the Austin Creek trap (Figure 8). The Water Agency applied 997 PIT tags to steelhead (of which 963 were YOY steelhead) in Austin Creek. Dry Creek had the second highest catch of steelhead during the 2010 trapping season. In total 2,083 wild steelhead parr and 41 wild steelhead smolts were caught at the Dry Creek trap (Figure 8 and Figure 9).

In 2010, relatively few steelhead were caught at Mirabel, Dutchbill Creek, and Green Valley Creek fish traps when compared to catches at Austin Creek and Dry Creek. In total, 384 and 58 steelhead parr steelhead were caught at Mirabel and Dutchbill Creek respectively (Figure 8). While 44 and 5 steelhead smolts were caught at Mirabel and Dutchbill Creek respectively (Figure 9). The Green Valley Creek trap operated by the UCCE detected 5 steelhead parr and no steelhead smolts. Please note that the above numbers reported for steelhead have not been adjusted for trap efficiencies and are not population estimates.

<u>Chinook</u>:
Chinook were most frequently encountered at the Dry Creek fish trap. In total 5,264 Chinook smolts were captured at the Dry Creek trap (Figure 10). A population estimate of 86,595 (95% CI: ± 8,890) at the Dry Creek fish trap was calculated using the Dry Creek catch data and trap efficiencies.

In 2010, Mirabel had the second highest catch of Chinook (2,501 smolts, Figure 10). Based on trap efficacies a population estimate of 101,976 ((95% CI: ± 41,916) was constructed for Mirabel in 2010. However trap efficacies were lower at Mirabel and the confidence interval is wider when compared to Dry Creek. In 2010 relatively few Chinook smolts were captured in Austin Creek and Dutchbill Creek (24 and 4 respectively) (Figure 10). Green Valley Creek had similarly low catches of Chinook smolts as well. Fourteen Chinook were captured in the Green Valley Creek trap.

Coho:
The Green Valley Creek trap operated by the UCCE detected the most coho salmon smolts of the traps operated in conjunction with, or by the Water Agency in order to meet the requirements of the State Water Board's Order. In total 2,515 hatchery coho smolts and no wild coho salmon smolts (coho with adipose fins are presumed to be wild) were captured at the Green Valley Creek fish trap. At Dutchbill Creek 221 hatchery coho smolts and 1 wild coho smolt were detected at the trap as well (Figure 11). In Austin Creek 109 hatchery coho smolts were detected at the fish trap (Figure 11). An additional 2,419 hatchery coho parr were captured between June 25, 2010 and July 16, 2010 at the Austin fish trap. At Mirabel 189 hatchery coho smolts and 1 wild coho smolt were captured (Figure 11). The Dry Creek fish trap captured 21 hatchery coho smolts and 3 wild coho smolts (Figure 11). Please note that the above numbers reported for Coho smolts have not been adjusted for trap efficiencies and are not population estimates. For detailed analysis of downstream migrant trapping catches for coho smolts in the Russian River see Conrad (2005), Obedzinski *et al.* (2006), Obedzinski *et al.* (2007), Obedzinski *et al.* (2008) and the UCCE Coho Salmon Monitoring Program results for 2010.

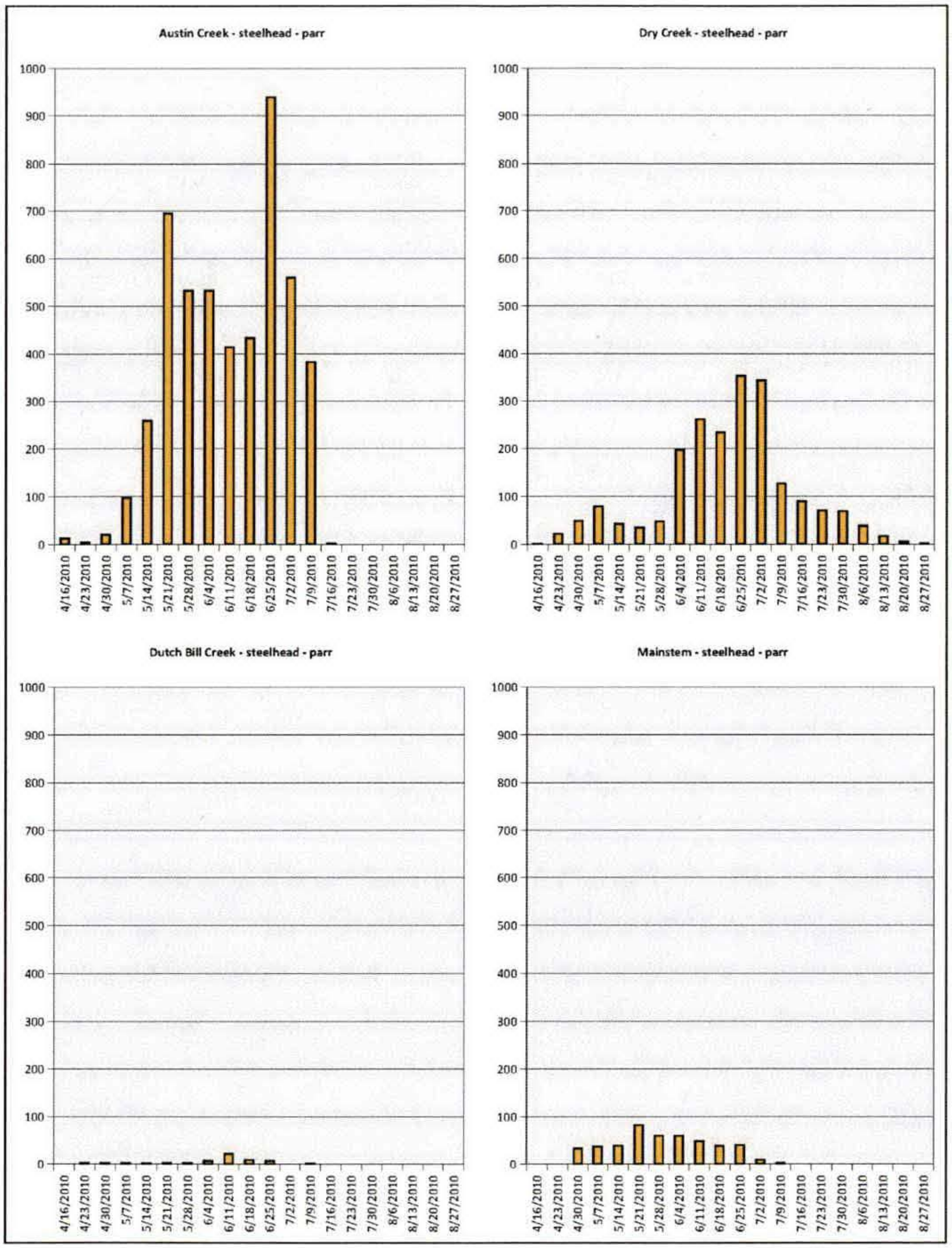

Figure 8. The weekly number of wild steelhead parr captured in Russian River fish traps operated by the Water agency at the Austin Creek, Dry Creek, Dutchbill Creek, and Mainstem (Mirabel) trapping sites during the 2010. Note that these numbers represent total catch and have not been adjusted for trap efficiencies. These are not population estimates.

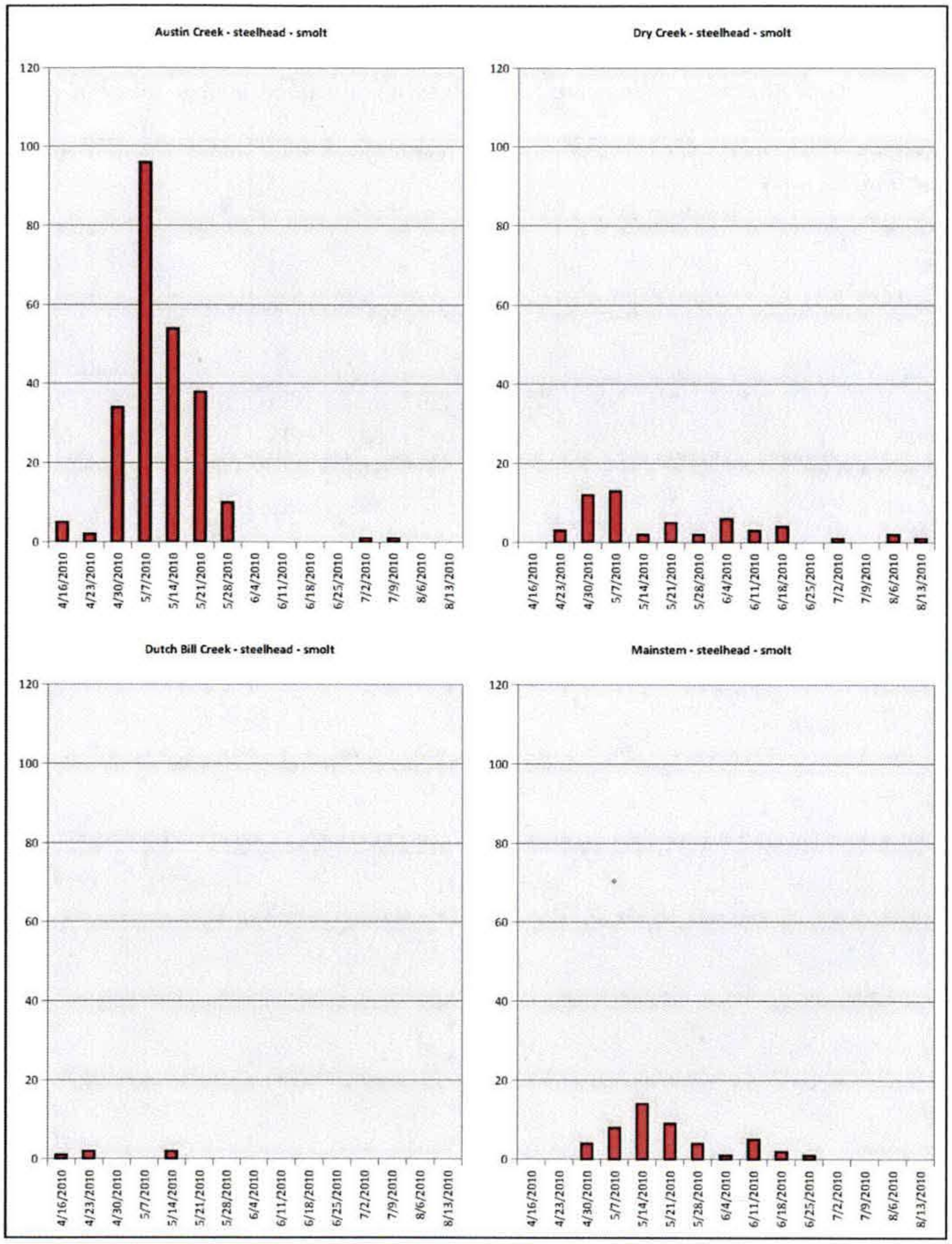

Figure 9. The weekly number of wild steelhead smolts captured in Russian River fish traps operated by the Water Agency at the Austin Creek, Dry Creek, Dutchbill Creek, and Mainstem (Mirabel) trapping sites during 2010. Note that these numbers represent total catch and have not been adjusted for trap efficiencies. These are not population estimates.

Table 5. The annual catch of non-smolt steelhead caught during the 2000 to 2010 trapping seasons at downstream migrant traps operated by the Water Agency and UCCE. Note that dashes indicate a trap was not operated at that location during that particular year.

Downstream migrant Trap	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Austin Creek	-	-	-	-	-	-	-	7,436	-	-	4774
Dry Creek	-	-	-	-	-	-	-	-	-	5290	2049
Dutch Bill Creek	-	-	-	-	-	-	-	-	-	-	58
Estuary	-	-	-	-	-	-	-	-	-	51	-
Green Valley Creek	-	-	-	-	-	417	-	27	304	1	67
Mainstem	773	156	5727	1115	1428	1594	230	1852	831	75	375
Mill Creek	-	-	-	-	-	627	393	931	725	438	352
Sheephouse Creek	-	-	-	-	-	113	59	49	17	-	-
Ward Creek	-	-	-	-	-	495	353	707	-	-	-

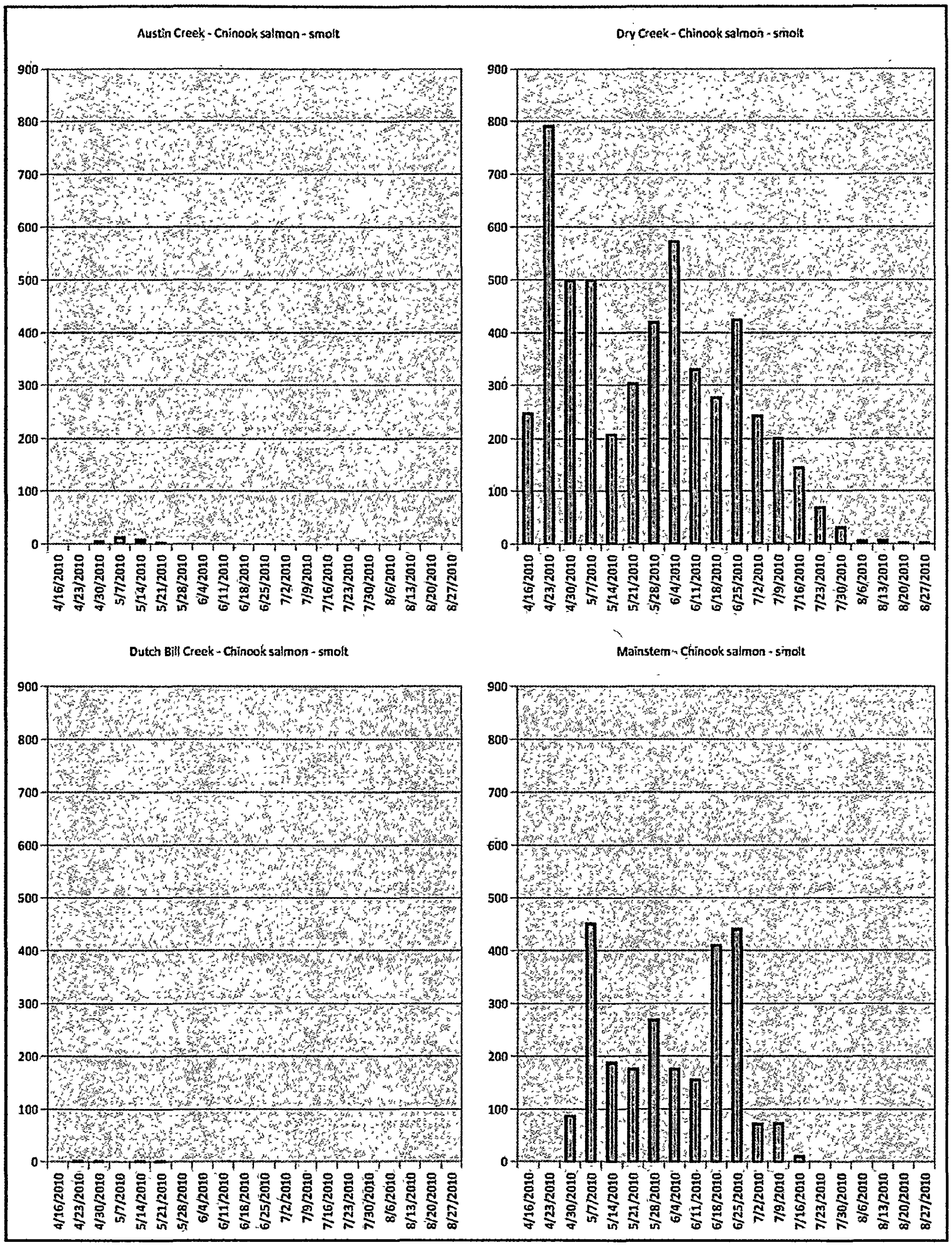

Figure 10. The weekly number of wild Chinook smolts captured in Russian River fish traps operated by the Water Agency at the Austin Creek, Dry Creek, Dutchbill Creek, and Mainstem (Mirabel) trapping sites during 2010. Note that these numbers represent total catch and have not been adjusted for trap efficiencies. These are not population estimates.

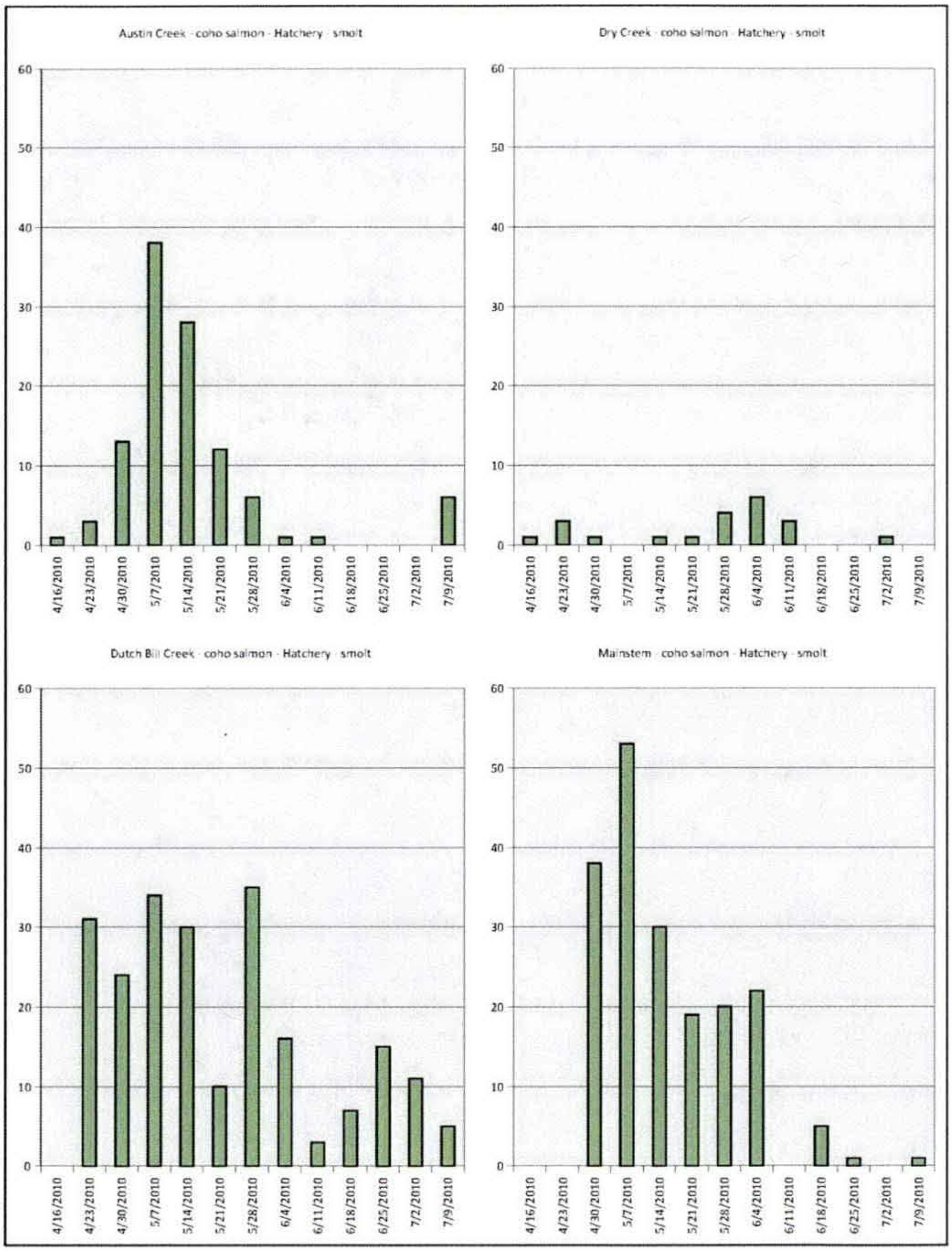

Figure 11. The weekly number of RRCCBP coho smolts captured in Russian River fish traps operated by the Water agency at the Austin Creek, Dry Creek, Dutchbill Creek, and Mainstem (Mirabel) trapping sites during the 2010. Note that these numbers represent total catch and have not been adjusted for trap efficiencies. These are not population estimates. An additional 2,419 hatchery coho parr were captured between June 25, 2010 and July 16, 2010 at the Austin fish trap and are not shown in this figure.

Estuary Fyke Net Juvenile Salmonid Video Monitoring System:

On May 27, 2010 the Water Agency began operating an underwater video camera near the upstream end of the Russian River Estuary between Austin Creek and Moscow Road Bridge (10.5 km upstream of the mouth of the River) to monitor YOY steelhead as they made their way downstream into the Estuary. The video camera recorded footage 24 hours per day through July 31 with the following exceptions; from May 29, 2010 through May 30, 2010 when turbidity was too high to detect fish and from June 2, 2010 through June 5, 2010 when the camera was damaged and out for repair.

The modifications to the fyke net in 2010 appear to have improved our ability to monitor juvenile salmonids. In 2009 the estuary fyke net was operated as a trap and 51 steelhead parr, 45 steelhead smolts, 162 Chinook, and 21 coho were captured. In comparison to 2010, when the fyke net was operated as a underwater video monitoring station 956 juvenile steelhead, 212 juvenile coho, and 404 Chinook smolts were observed (Figure 12-Figure 14). Technicians were highly confidant in the species identification of 79 % of juvenile steelhead, 65 % of juvenile coho, and to 57 % of the Chinook smolts observed on the video.

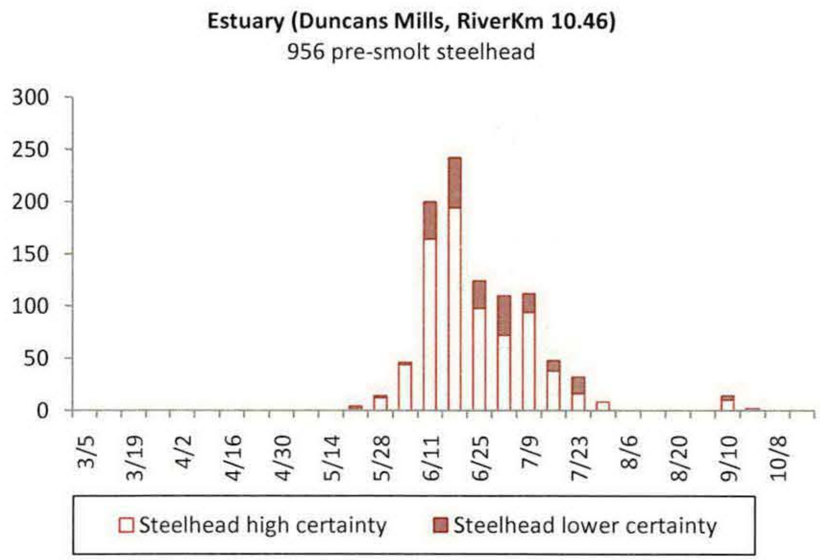

Figure 12. The number of steelhead observed on the Russian River Estuary fyke net video camera system in 2010. High/lower certainty indicates the confidence in the identification of individual fish to species level, based on image quality. The proportion of the week that the camera was operating is shown in light green. Note that these numbers represent total detections and have not been adjusted for camera efficiencies. These are not population estimates.

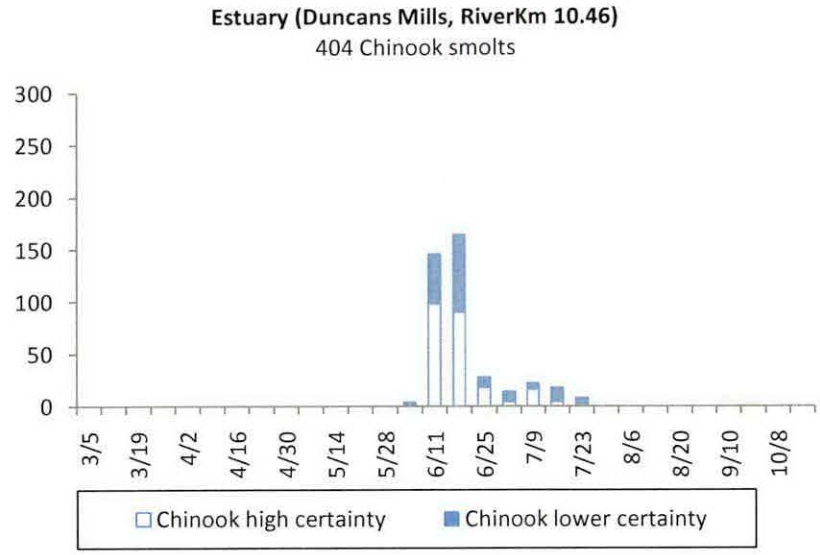

Figure 13. The number of Chinook observed on the Russian River Estuary fyke net video camera system in 2010. High/lower certainty indicates the confidence in the identification of individual fish to species level, based on image quality. The proportion of the week that the camera was operating is shown in light green. Note that these numbers represent total detections and have not been adjusted for camera efficiencies. These are not population estimates.

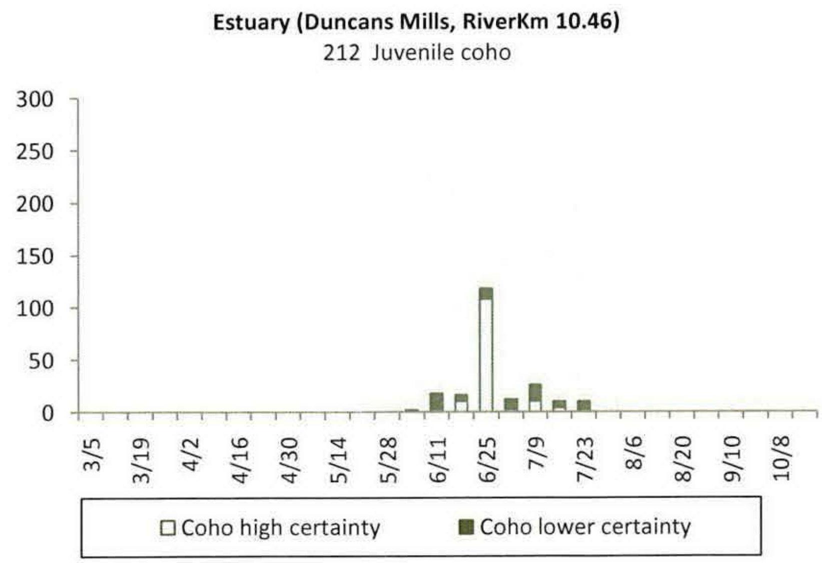

Figure 14. The number of Coho observed on the Russian River Estuary fyke net video camera system in 2010. High/lower certainty indicates the confidence in the identification of individual fish to species level, based on image quality. The proportion of the week that the camera was operating is shown in light green. Note that these numbers represent total detections and have not been adjusted for camera efficiencies. These are not population estimates.

Conclusions:

Video Monitoring of Adult Salmon Migration:

Direct comparisons between years of Chinook counts at Mirabel cannot be made due to the difference in sampling periods. However relative differences in run size can be observed. The size of the 2010 run ranked approximately 6th in the last 11 years even with the 5 day period in late October where no data was collected due to the dam being lowered. The count of hatchery coho was higher in 2010 than any other year. This is likely due to increased releases of coho smolts by the hatchery program and possibly to improved ocean conditions.

Adult Chinook Salmon Dive Surveys:

Little data was collected during the adult Chinook dives due to high water velocity and high turbidity associated with relatively early storms. Because of the lack of data no conclusions can be drawn.

Juvenile Steelhead Dive Surveys:

Overall, steelhead abundance appeared to be lower during summer 2010 than 2002 but counts were similar to 2009. Water visibility likely played a role in the low detection rate of juvenile steelhead during the 2010 survey. Of the 3 years surveyed, water visibility was the lowest during 2010. Water visibility was less than 1 meter at the forks of the Russian River, Hopland, Squaw Rock, Comminski Station Road, and Alexander Valley near Crocker Road. However, if large numbers of steelhead were present at these sites it is likely that more individuals would have been detected.

The discrepancy between juvenile steelhead counts from 2002 and steelhead counts from 2009 and 2010 dive surveys could also be explained by differences in adult steelhead returns and spawning from previous years. In the 4 sample sites that were repeatedly surveyed in 2002, 2009, and 2010 the Water Agency detected 604, 2, and 2 steelhead, respectively. Some of the lowest steelhead adult hatchery returns at Warm Springs and Coyote Valley hatcheries in the last 10 years occurred in 2008-2009 and 2009-2010. However the 2001-2002 adult returns were relatively strong (Figure 15). While steelhead observed during the dive surveys are wild, it is likely that both hatchery and wild steelhead smolts experienced similar ocean conditions and that trends in the number of returning adults would be similar between the hatchery and wild populations. It is also likely that there would be a larger population of juvenile steelhead following one or two years of strong adult returns and vice versa. This may help explain why the survey conducted during 2002 detected more steelhead than the surveys conducted in 2009 and 2010.

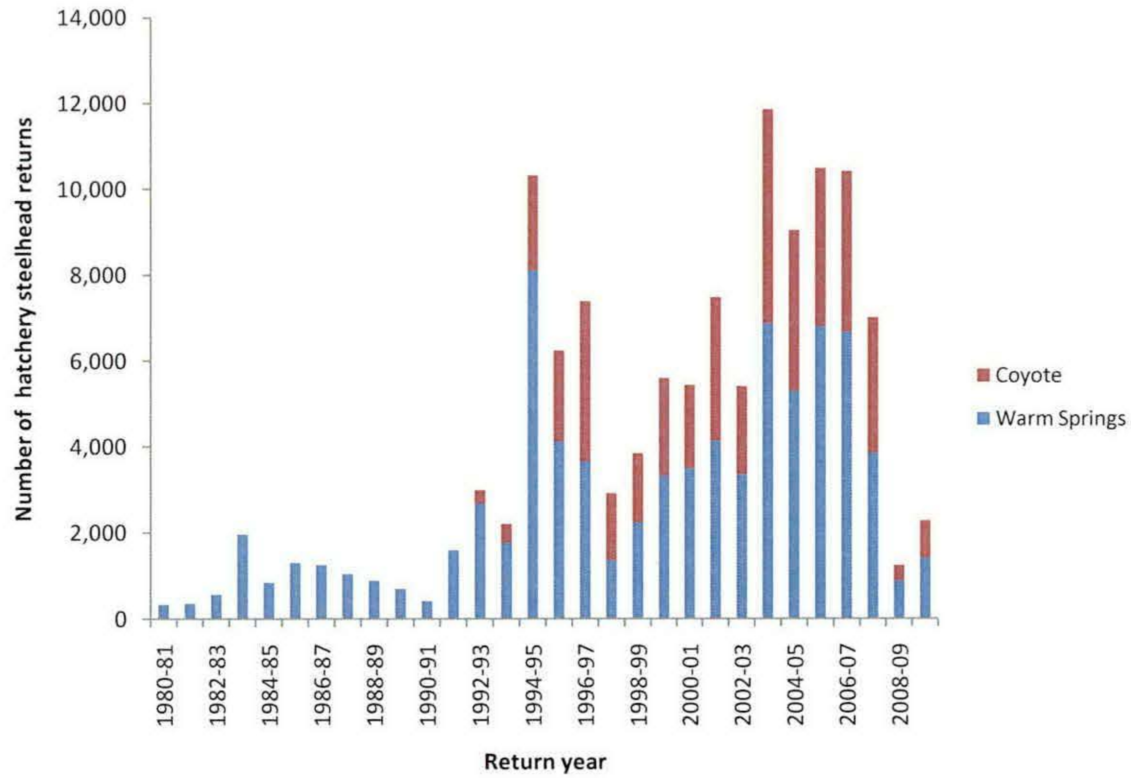

Figure 15. Hatchery returns of adult steelhead at the Coyote Valley Dam and Warm Springs Dam fish hatcheries for 1980-81 to 2010-2011 return years.

Downstream Migrant Fish Trapping:

Steelhead:
Much of the 2010 Steelhead smolt migration likely took place before the fish traps were installed. However the traps were likely operating during the majority of time that juvenile steelhead could have moved out of Austin Creek and Dutch Bill Creek because low streamflow in these tributaries prevents fish from emigrating to the mainstem during summer.

Chinook:
Based on the population estimates of Chinook salmon passing the Dry Creek trap site in 2009 and 2010 and spawner survey data (Manning and Martini-Lamb 2011), Dry Creek is an important resource for Chinook salmon in the Russian River basin. Chinook redd surveys conducted in the Russian River basin that found 22% to 44 % of Chinook redds, detected annually, in Dry Creek (Manning and Martini-Lamb 2011). The relatively low number of Chinook detected at Mirabel during 2010 when compared to other years may be partially due to lower trap efficiency in 2010. We found that trap efficacies for catching hatchery steelhead parr at Mirabel Dam decreased when the rubber dam was deflated (Water Agency unpublished data). The Dam was deflated for much of the 2010 trapping season.

As concluded by Chase et al. (2007) and confirmed by our recent trapping data, Austin Creek, Dutchbill Creek, and Green Valley Creek are less important resources for Chinook salmon.

Coho:
Since all of the Water Agency's fish traps are downstream of streams stocked with hatchery coho it is not unusual to encounter hatchery coho smolts at these traps. However it is unusual to encounter hatchery coho parr especially in large numbers since coho typically outmigrate as age 1+ smolts. The 2,419 hatchery coho parr encountered at the Austin Creek fish trap was likely an anomaly. These coho parr had been stocked in tributaries at least 10.9 km upstream of the Austin Creek trap a few days before they were captured. These fish were expected to rear throughout the summer in tributaries and their rapid downstream movement was not anticipated. For a more detailed analysis of coho trapping data in the Russian River basin see the UCCE Coho Salmon Monitoring Program results for the 2010 season.

Russian River Estuary fyke net video camera system:

When compared to the 2009 estuary fyke net trapping operations the 2010 Estuary fyke net video monitoring system improved our ability to monitor juvenile steelhead. Modifications to the fyke net increased the period of time we could monitor fish. Approximately 20 times more juvenile steelhead were detected in the 2010 sampling season than in the 2009 sampling season. The increase in the number of steelhead detected at the Estuary fyke net is likely due to the increase in the length of the 2010 trapping season and an increase in trap efficiency. However without the ability to measure trap efficiencies it is not possible to determine if the difference between the number of steelhead detected during the 2009 and 2010 monitoring seasons are related to the increased sampling season, a change in the number of steelhead entering the estuary, or to an increased detection rate due to modifications made to the trap.

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Appendix

Figure A Looking downstream at the confluence of the East and West fork of the Russian River. Note the high turbidity.

Figure B An underwater photo taken at the confluence of the East and West Forks of the Russian River of a divers hand from 0.5 m away illustrating the high turbidity.

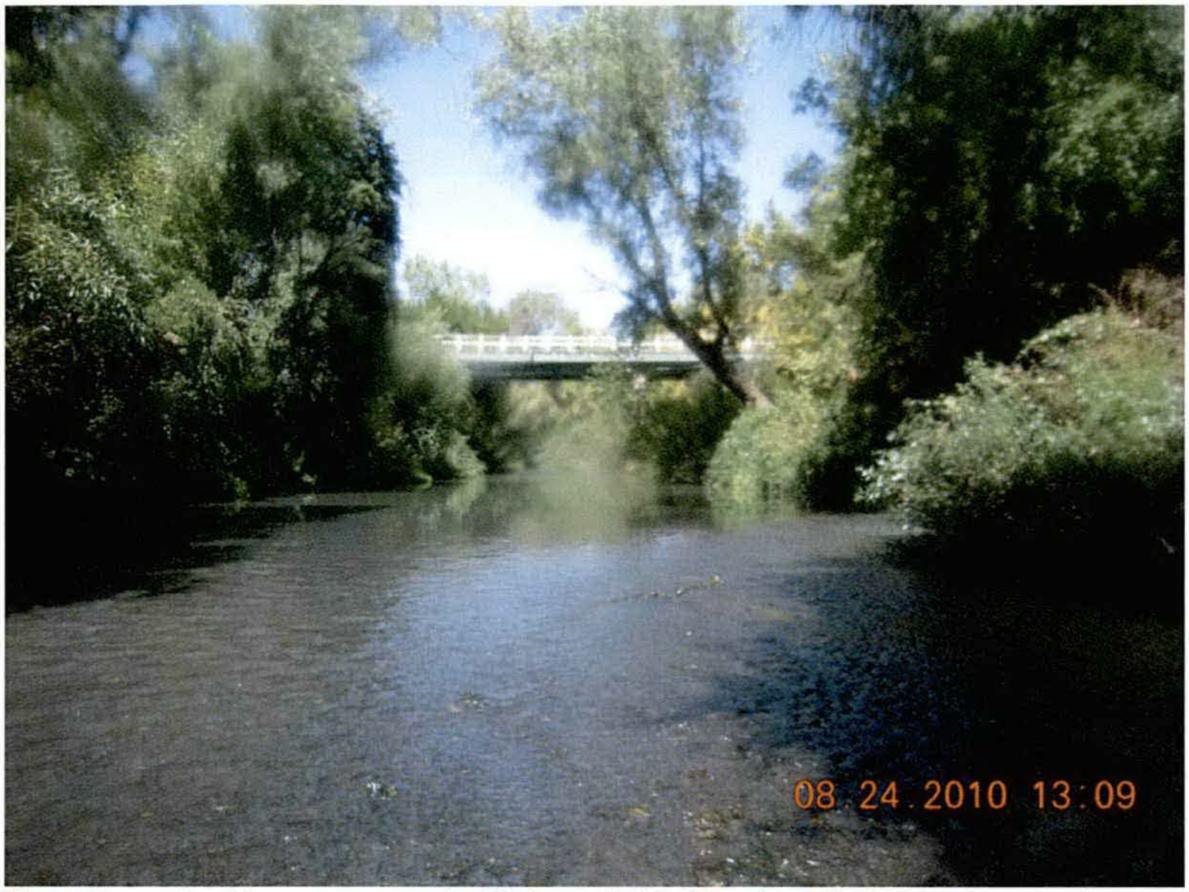


Figure C Looking upstream at the Highway 175 Bridge above the Hopland survey site.

Figure D Looking upstream near the top of the Squaw Rock survey site.

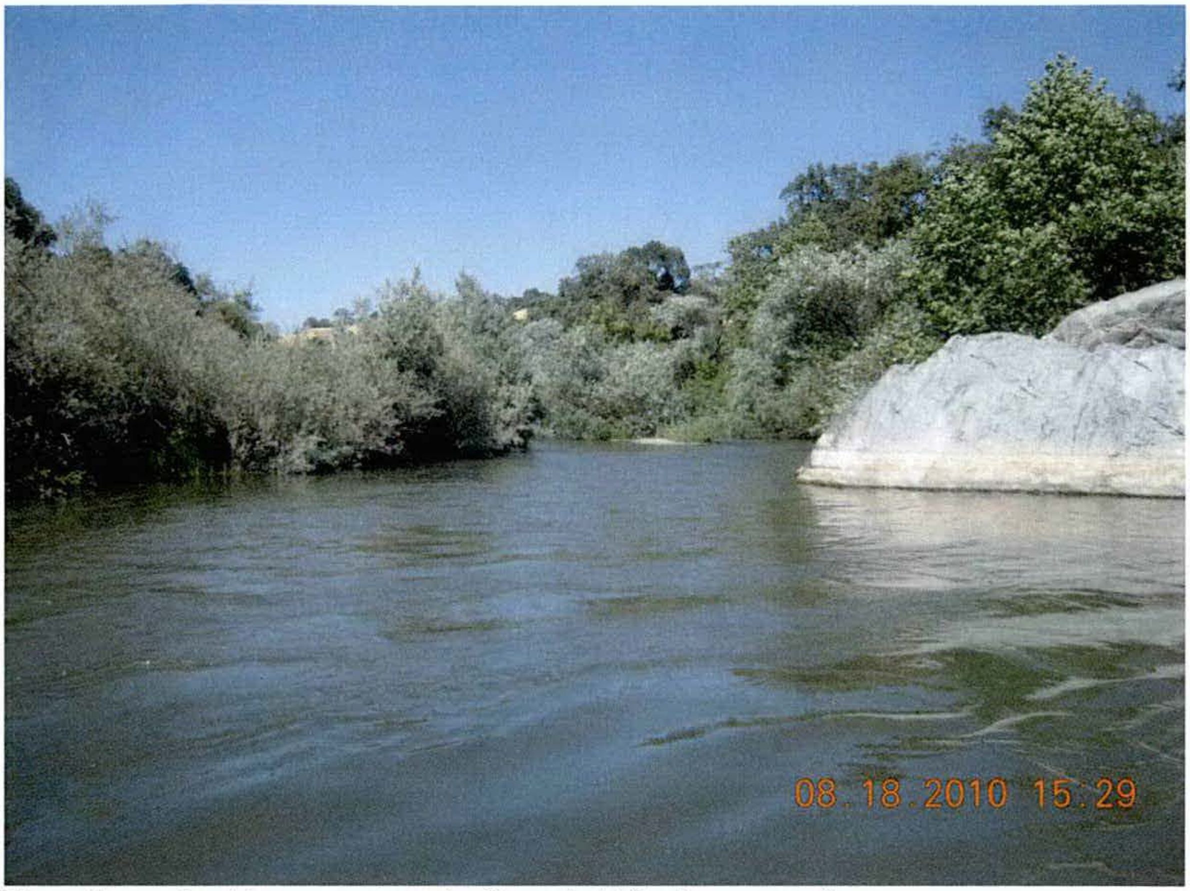


Figure E. Looking upstream at the Comminski Station survey site.

Figure F Looking upstream at the Geyserville survey site.

Figure G A photo of Russian River Tule perch taken in the Geyserville survey site.

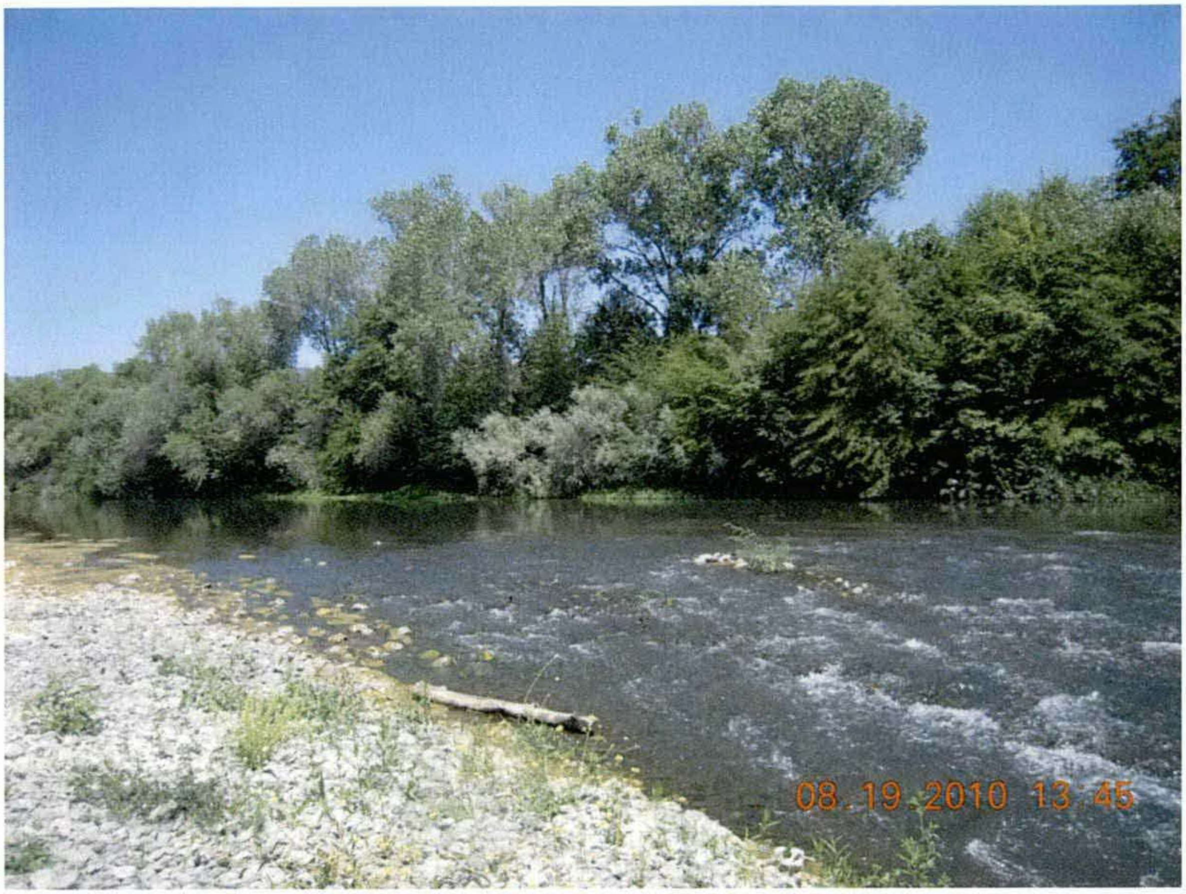


Figure H Looking upstream at the Alexander Valley survey site.

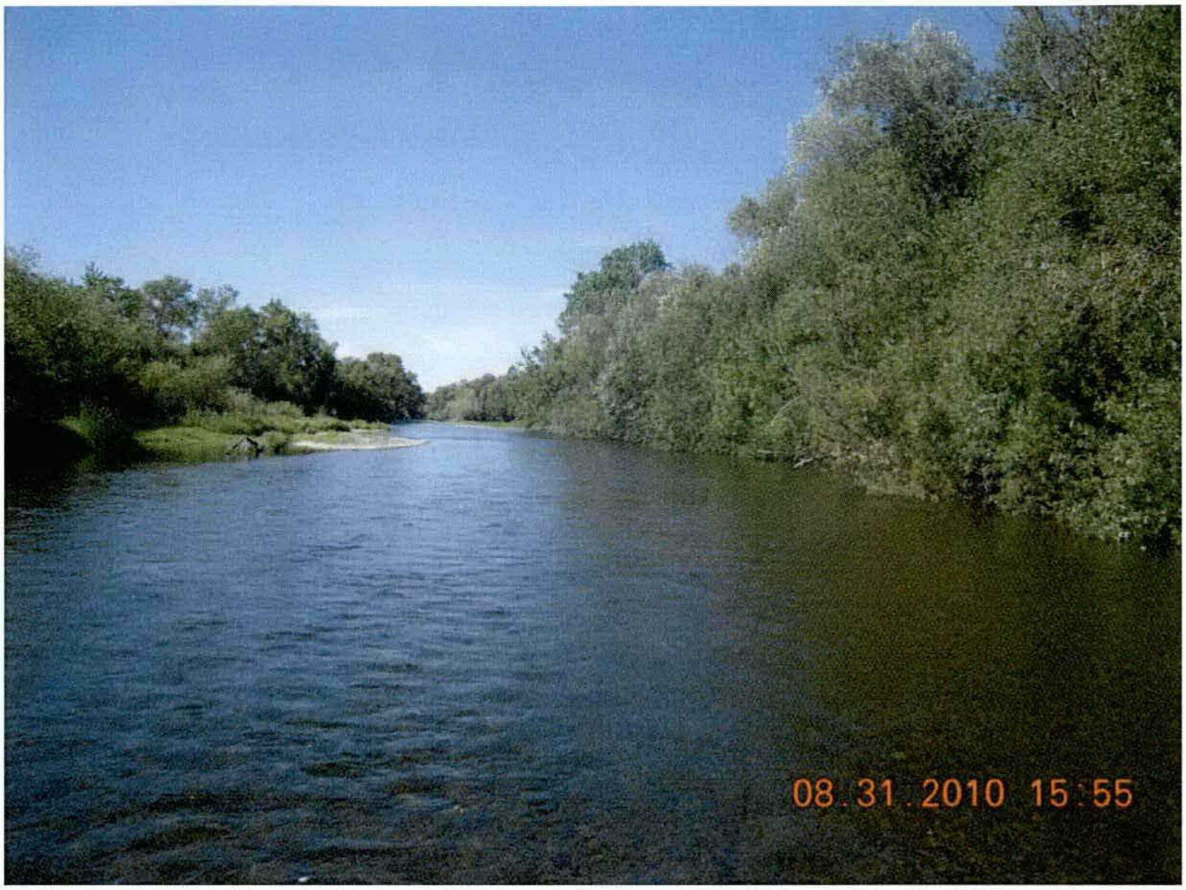


Figure I. Looking upstream at the survey site immediately downstream of the confluence of Dry Creek and the Russian River.

SONOMA COUNTY WATER AGENCY

FILE:CF/42-0.19-9 SWRCB ORDER APPROVING TEMPORARY URGENCY CHANGE IN PERMITS 12947A, 12949, 12950 & 16596 FOR 2010

December 9, 2010

Ms. Barbara Evoy
Deputy Director for Water Rights
State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

RE: Request for Extension for Water Quality Monitoring Summary Report Relative to Water Rights Order 2010-0018-DWR

Dear Ms. Evoy:

By letter dated August 30, 2010 (Letter), attached for reference, Ms. Victoria Whitney requested the Sonoma County Water Agency (Water Agency) revise its water quality monitoring program submitted pursuant to Term 8 of Water Rights Order 2010-0018-DWR (Order). The Water Agency submitted a Water Quality Monitoring Plan on June 21, 2010, that incorporated water quality monitoring for both the mainstem and estuary of the Russian River. The Water Agency reviewed the suggested changes in the Letter and implemented additional nutrient and bacteriological sampling beginning September 21, 2010.

Additionally, the Letter requested the Water Agency summarize all data collected during the 2010 water quality monitoring program in a summary report, which should include an evaluation of whether, and to what extent, the reduced flows authorized by the Order caused any impacts to water quality or availability of aquatic habitat for salmonids and that the report should be submitted to the Division of Water Rights by December 31, 2010. The Water Agency is fully committed to preparing a summary report that meets the Letter's intent. However, while data for the estuary and additional sampling noted above is being compiled, the final data from the United States Geological Survey (USGS) will not likely to be available until late spring. Consequently, the Water Agency respectfully requests that the summary report submittal date be extended to April 1, 2011. In the interim, the estuary and additional nutrient and bacteriological data will be made available on the Water Agency's website.

I look forward to your reply, should you have any questions related to this request please contact Don Seymour at (707) 547-1925 or dseymour@scwa.ca.gov.

Sincerely,

Grant Davis
General Manager

c Katy Washburn, State Water Resources Control Board, Division of Water Rights
Catherine Kuhlman, North Coast Regional Water Quality Control Board
Walt Kruse, Sonoma County Department of Health Services
Robert Anders, U.S. Geological Survey California Water Science Center, San Diego Projects Office
Alan Lilly, Bartkiewicz, Kronick & Shanahan
Pamela Jeane, Jessica Martini-Lamb, Jeff Church, David Manning, Don Seymour, George Lincoln

RW\\fileserver\Data\CL\pinks\week 12-06-10\WQ summary extension request final draft docx

Corlin Gabriel

From:	Justin Smith
Sent:	Thursday, October 28, 2010 2:25 PM
To:	' (dick.butler@noaa.gov)'; (amckannay; 'bcowan@waterboards.ca.gov'; 'carmor@dfg.ca.gov'; CGray@dfg.ca.gov; 'Efren Carrillo'; 'Eric Larson'; Jkassel@waterboards.ca.gov; Justin Smith; 'rfadness@waterboards.ca.gov'; rfitzgerald; Rick Rogers; 'Susan Upchurch'; William Hearn
Cc:	Alan Lilly; Ann DuBay; Brad Sherwood; Chris Delaney; Cory O'Donnell; David Cook; David Manning; Donald Seymour; George Lincoln; Grant Davis; Gregg Horton; Heather Bauman; Hody Wilson; Jay Jasperse; Jeff Church; Jessica Martini Lamb; Jill Golis; Jim Zambenini; Joan Hultberg; Kevin Booker; Michael Thompson; Michael Wheeler; Miguel Huerta; Nathan Baskett; Pam Jeane; Records; Renee Webber; Shawn Chase; Spencer Bader; Steve Shupe; stuart kirkham; Tim Anderson
Subject:	State Board TUCP Order Russian River Fisheries and Flow Update for 10-28-2010
Attachments:	TUCP Weekly Update 10-28-10.docx; Copy of RivReport_10-20 Through10-28-2010.xls
Categories:	Records Request

Greetings Colleagues,

This message transmits the Sonoma County Water Agency's 17th weekly update of Fisheries Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. This weekly update includes adult Chinook counts at the Wohler dam, fish trapping information gathered for the season, as well as recent flow data.

Justin Smith
Environmental Specialist
Sonoma County Water Agency
(707)-292-7673

Full record with attachments in DocuShare.

CG

CF/42-0.19-9 SWRCB Order Approving Temporary Urgency Change in Permits 12947A, 12949, 12950 & 16596 for 2010

CNV

Sonoma County Water Agency
State Water Resources Control Board Order WR 2010-0018-DWR
Russian River Fisheries and Water Quality Monitoring Plan
Agency Update October 28, 2010

This memorandum represents the 17th weekly update of Fisheries and Water Quality Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. Flows related to the US Army Corps' increased releases from Coyote Valley Dam receded earlier this week however flows in the Russian River have increased following the recent rain (Figure 1). Flow at Ukiah (USGS 11462000) is approximately 320 cubic feet per second (cfs). Flow at Hacienda (USGS 11467000) is around 1,120 cfs. Flow at Healdsburg is around 540 cfs (USGS 11464000). Flow at the mouth of Dry Creek (USGS 11465350) is around 110 cfs.

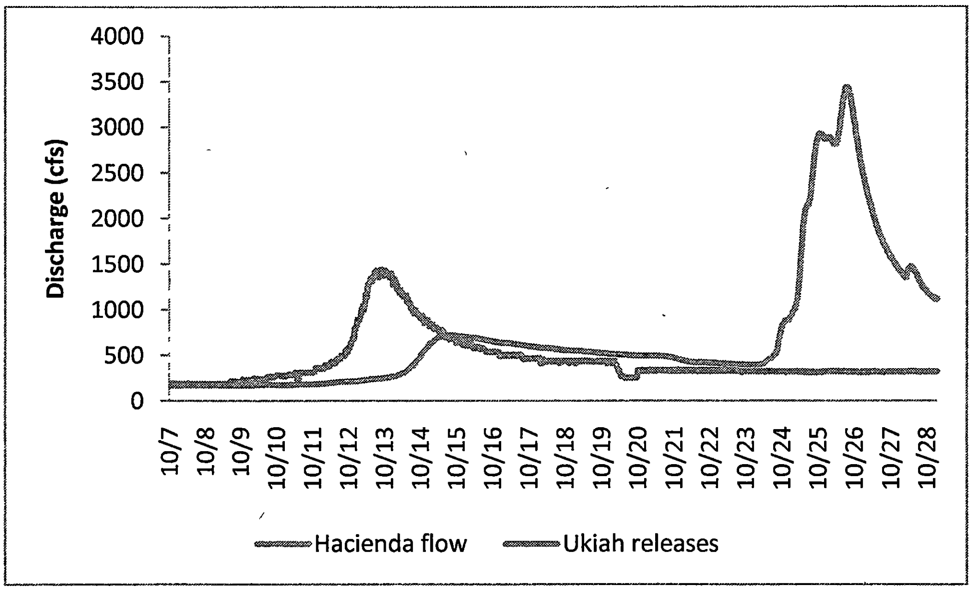


Figure 1. Discharge (cfs) from 10/7/2010 to 10/26/2010 taken at the USGS Ukiah stream gauge (11462000) and the USGS Hacienda stream gauge (11467000).

The impending storm http://cdec4gov.water.ca.gov/guidance_plots/GVB_gp.html has necessitated the deflation of Mirabel Dam. Peak flow is forecast to rise above 5,000 cfs over the next few days. The underwater camera system relies on counting fish as they move through fish ladders at the Mirabel inflatable dam. Unfortunately the Water Agency will not be able to monitor the Chinook run while the dam is deflated which may be for the duration of the season. The Water Agency is considering re-inflating the dam in order to continue monitoring the Adult Chinook run if prolonged dry weather is forecast. Other than Chinook redd surveys it is likely that the Water Agency will not be collecting any other fisheries monitoring data for the remainder of the season. Therefore this memorandum represents the final weekly update of Fisheries and Water Quality Monitoring Activities. Results from the 2010 Chinook redd surveys will be available in the form of an annual report

Current Release and River Gauge Data

Table 1. Release (cfs) from Coyote Valley (USGS 1126 2000) and Warm Springs Dams (USGS 1146 5000) on Monday of each week during the 2010 monitoring season.

Date	Coyote Valley Dam	Warm Springs Dam
12-Jul	170	116
19-Jul	166	113
26-Jul	173	114
2-Aug	202	113
9-Aug	222	117
16-Aug	188	115
23-Aug	180	102
30-Aug	180	104
6-Sep	204	104
13-Sep	170	101
20-Sep	172	100
27-Sep	187	104
4-Oct	180	102
11-Oct	365	101
18-Oct	440	107
25-Oct	214	100

Please see the following link and attached Excel spreadsheet for recent reservoir releases and daily average flow at Russian River gauges.
http://www.scwa.ca.gov/current-water-supply-levels/

Operations and Reservoir Release Changes

The Water Agency began deflating the Mirabel dam on October 27, 2010 in anticipation of an impending storm.

Recent Fisheries Monitoring Activities

Video monitoring of the adult Chinook migration past the Mirabel inflatable dam began on September 1, 2010. The first Chinook for the season was observed on September 23, 2010. As of October 27, 2010 1,832 adult Chinook have been observed passing the rubber dam (Table 2). The total coho count this year is 19 fish. This exceeds last year's total coho return of 17 fish and the coho migration period is just beginning. Six adult steelhead have been observed (Table 2). Please note that fish could not be positively identified to the species level on October 25, 2010 and October 26, 2010 due to high turbidity.

Table 2. The number of adult Chinook, Coho, and Steelhead observed on the Wohler underwater camera system each week during the 2010 monitoring season. Please note that fish could not be positively identified to the species level on October 25, 2010 and October 26, 2010 due to high turbidity.

Week	Chinook	Coho	Steelhead
1-Sep	0	0	0
8-Sep	0	0	0
15-Sep	0	0	0
22-Sep	0	0	0
29-Sep	3	0	0
6-Oct	663	1	0
12-Oct	51	2	0
20-Oct	906	6	6
26-Oct	209	10	0
Total	1,832	19	6

The Water Agency has completed the 2010 fish trapping season. On October 7, 2010 the water agency removed the estuary fyke net which consists of a modified fyke net, a passive integrated transponder antenna, and an underwater video camera. Additional traps were operated at Austin Creek, Dutch Bill Creek, Green Valley Creek (UC Cooperative Extension), Wohler, and Dry Creek. Season totals are shown in Table 3. These numbers represent total catch per species and have not been adjusted for trap efficiency. They are not population estimates.

Table 3. Steelhead and coho (Russian River Coho Salmon Captive Broodstock Program (RRCCBP)) parr and smolt as well as Chinook smolts captured during the 2010 trapping season at the at Austin Creek, Dutch Bill Creek, Green Valley Creek (UC cooperative extension), Wohler, and Dry Creek fish traps. These numbers represent total catch per species and have not been adjusted for trap efficiency. They are not population estimates.

	Chinook	Coho (RRCSCBP)		steelhead	
Tributary	smolt	parr	smolt	parr	smolt
Dry Creek	5,179	1	20	2,030	62
Mainstem	2,368	0	179	422	47
Dutch Bill Creek	4	3	221	58	5
Austin Creek	24	1,910	102	4,733	239
Green Valley Creek	11	0	1,650	15	35

If you have any questions or concerns about this update, please contact Justin Smith, Environmental Specialist, at 707-292-7673 or jpsmith@scwa.ca.gov.

Corlin Gabriel

From:	Justin Smith
Sent:	Thursday, October 21, 2010 5:41 PM
To:	' (dick.butler@noaa.gov)'; (amckannay; 'bcowan@waterboards.ca.gov'; 'carmor@dfg.ca.gov'; CGray@dfg.ca.gov; 'Efren Carrillo'; 'Eric Larson'; Jkassel@waterboards.ca.gov; Justin Smith; 'rfadness@waterboards.ca.gov'; rfitzgerald; Rick Rogers; 'Susan Upchurch'; William Hearn
Cc:	Alan Lilly; Ann DuBay; Brad Sherwood; Chris Delaney; Cory O'Donnell; David Cook; David Manning; Donald Seymour; George Lincoln; Grant Davis; Gregg Horton; Heather Bauman; Hody Wilson; Jay Jasperse; Jeff Church; Jessica Martini Lamb; Jill Golis; Jim Zambenini; Joan Hultberg; Kevin Booker; Michael Thompson; Michael Wheeler; Miguel Huerta; Nathan Baskett; Pam Jeane; Records; Renee Webber; Shawn Chase; Spencer Bader; Steve Shupe; stuart kirkham; Tim Anderson
Subject:	State Board TUCP Order Russian River Fisheries and Flow Update for 10-21-2010
Attachments:	TUC Weekly Update 10-21-10.docx; Copy of RivReport_10-14 Through10-20-2010.xlsx
Categories:	Records Request

Greetings Colleagues,

This message transmits the Sonoma County Water Agency's 16th weekly update of Fisheries Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. This weekly update includes adult Chinook counts at the Wohler dam, fish trapping information gathered for the season, as well as recent flow and water quality data.

Justin Smith
Environmental Specialist
Sonoma County Water Agency
(707)-292-7673

Full record with attachments in DocuShare.

CG

CF/42-0.19-9 SWRCB Order Approving Temporary Urgency Change in Permits 12947A, 12949, 12950 & 16596 for 2010

CNG

Sonoma County Water Agency
State Water Resources Control Board Order WR 2010-0018-DWR
Russian River Fisheries and Water Quality Monitoring Plan
Agency Update October 21, 2010

This memorandum represents the 16th weekly update of Fisheries and Water Quality Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. The U.S. Army Corps of Engineers have ramped up releases from Coyote Valley Dam to reduce storage in Lake Mendocino to prepare the reservoir for potential flood control operations this fall. Flows at Ukiah (USGS 11462000) peaked at approximately 1,440 cubic feet per second (cfs) on Tuesday, October 12, and have recently receded to around 250 cfs. There is some lag time between peak releases from Coyote Valley Dam and the arrival of the peak flow at downstream sites. Flow at Hacienda peaked at 720 cfs on October 14, 2010 about 48 hours after the peak flow at Ukiah (Figure 1). Currently flow at Hacienda is around 420 cfs (USGS 11467000). Flow at Healdsburg is around 385 cfs (USGS 11464000). The flow at the mouth of Dry Creek (USGS 11465350) is around 85 cfs.

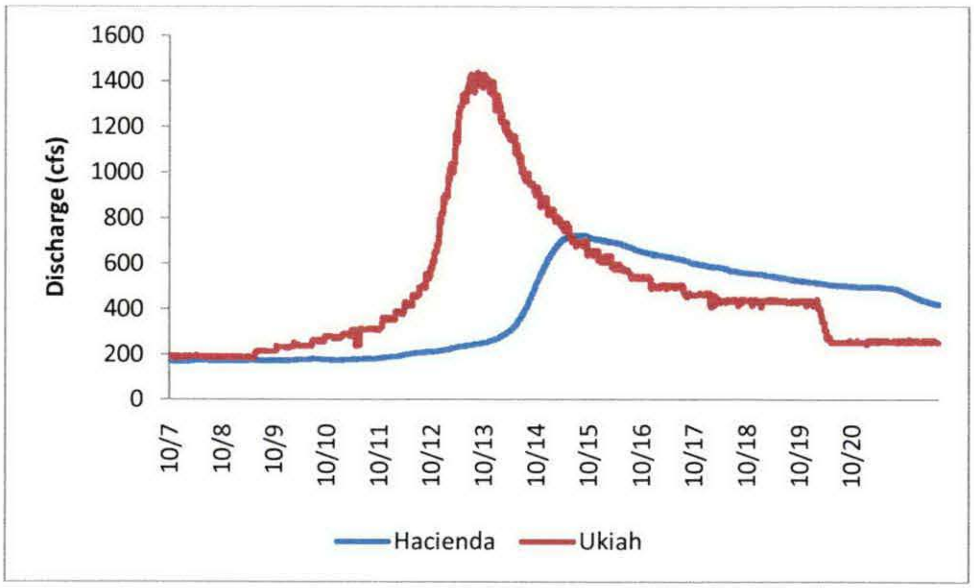


Figure 1. Discharge (cfs) from 10/7/2010 to 10/21/2010 taken at the USGS Ukiah stream gauge (11462000) and the USGS Hacienda stream gauge (11467000).

Current Release and River Gauge Data

Table 1. Release (cfs) from Coyote Valley (USGS 1126 2000) and Warm Springs Dams (USGS 1146 5000) on Monday of each week during the 2010 monitoring season.

Date	Coyote Valley Dam	Warm Springs Dam
5-Jul	170	115
12-Jul	170	116
19-Jul	166	113
26-Jul	173	114
2-Aug	202	113
9-Aug	222	117
16-Aug	188	115
23-Aug	180	102
30-Aug	180	104
6-Sep	204	104
13-Sep	170	101
20-Sep	172	100
27-Sep	187	104
4-Oct	180	102
11-Oct	365	101
18-Oct	440	107

Please see the following link and attached Excel spreadsheet for recent reservoir releases and daily average flow at Russian River gauges.
http://www.scwa.ca.gov/current-water-supply-levels/

Operations and Reservoir Release Changes

None to report.

Recent Fisheries Monitoring Activities

The Water Agency has installed the camera system to monitor the adult Chinook run at the Wohler/Mirabel rubber dam. Video review began on September 1, 2010. The first Chinook for the season was observed on September 23, 2010. As of October 20, 2010 1,623 adult Chinook have been observed passing the rubber dam (Table 2).

Table 2. The number of adult Chinook observed on the Wohler underwater camera system per week during the 2010 monitoring season.

Week	Chinook
1-Sep	0
8-Sep	0
15-Sep	0
22-Sep	0
29-Sep	3
6-Oct	663
12-Oct	51
20-Oct	906
Total	1,623

The Water Agency has completed the 2010 fish trapping season. On October 7 the water agency removed the estuary fyke net which consists of a modified fyke net, a passive integrated transponder antenna, and an underwater video camera. Additional traps were operated at Austin Creek, Dutch Bill Creek, Green Valley Creek (UC Cooperative Extension), Wohler, and Dry Creek. Season totals are shown in Table 3. These numbers represent total catch per species and have not been adjusted for trap efficiency. They are not population estimates.

Table 3. Steelhead and coho (Russian River Coho Salmon Captive Broodstock Program (RRCCBP)) parr and smolt as well as Chinook smolts captured during the 2010 trapping season at the at Austin Creek, Dutch Bill Creek, Green Valley Creek (UC cooperative extension), Wohler, and Dry Creek fish traps. These numbers represent total catch per species and have not been adjusted for trap efficiency. They are not population estimates.

	Chinook	Coho (RRCSCBP)		steelhead	
Tributary	smolt	parr	smolt	parr	smolt
Dry Creek	5,179	1	20	2,030	62
Mainstem	2,368	0	179	422	47
Dutch Bill Creek	4	3	221	58	5
Austin Creek	24	1,910	102	4,733	239
Green Valley Creek	11	0	1,650	15	35

Water Quality Monitoring

Maximum daily water temperatures and minimum daily dissolved oxygen levels are summarized in the following figures for Hopland, Diggers Bend, and Hacienda. An interesting note is that the 7 day running average of the maximum daily water temperature at Hopland has been significantly cooler this August and September when compared to the average of past years' maximum daily water temperatures (Figure 1).

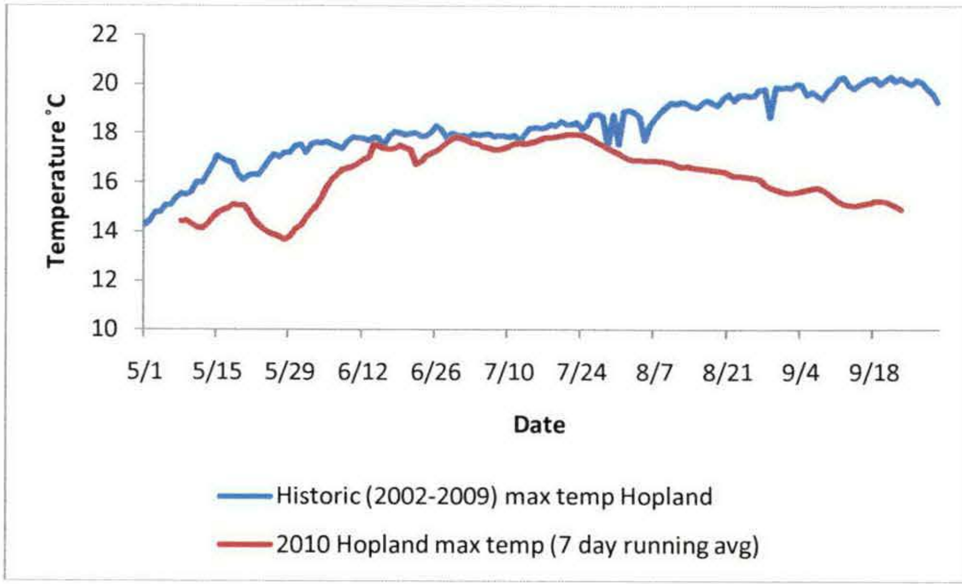


Figure 1. The average maximum daily temperature from 2002-2009 shown with the 7 day running average of the maximum daily water temperature in 2010. Data collected at the USGS gauge (11462500) near Hopland. Please note that this gauge has not updated temperature data since September 23, 2010.

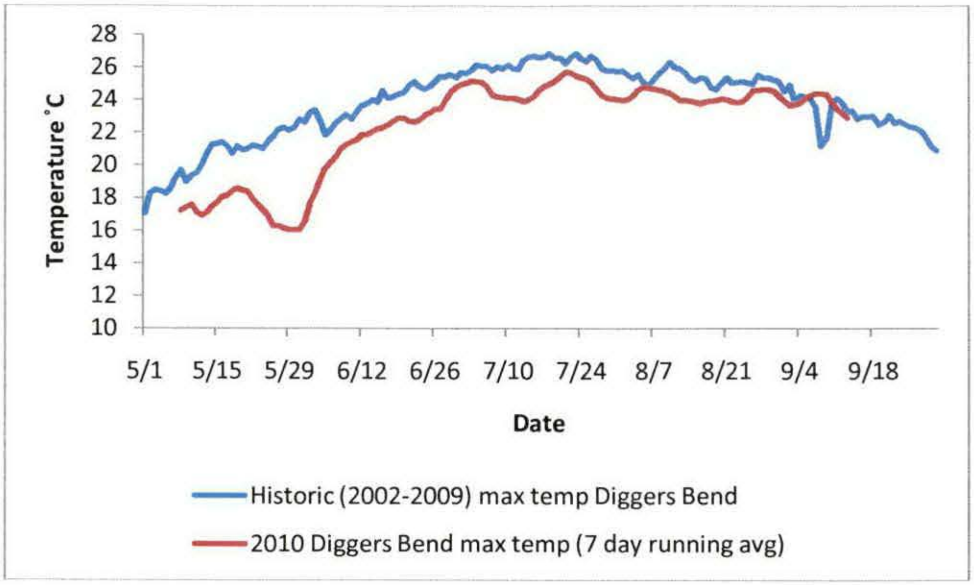


Figure 2. The average maximum daily temperature from 2002-2009 shown with the 7 day running average of the maximum daily water temperature in 2010. Data collected at the USGS gauge (11463980) near Diggers Bend. Please note that this gauge has not updated temperature data since September 14, 2010.

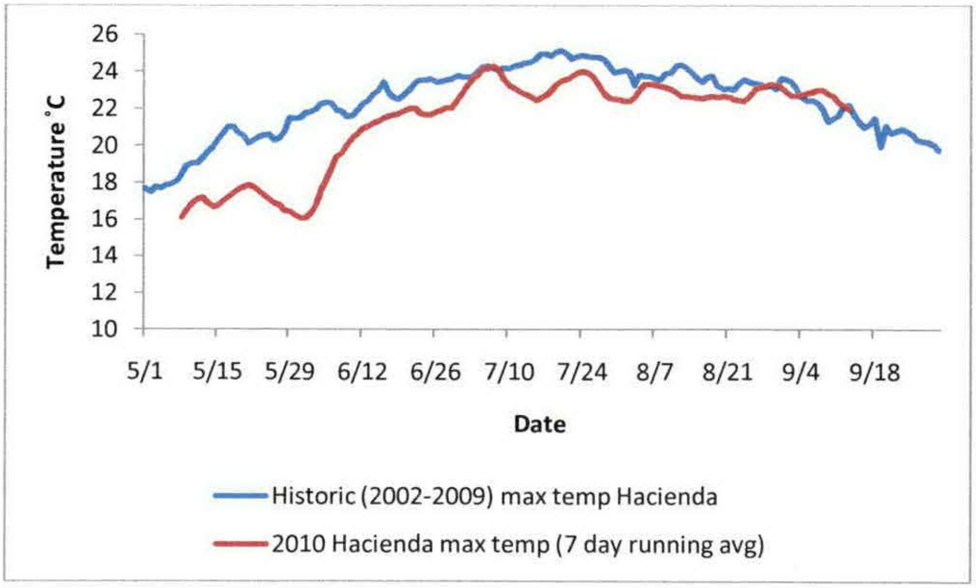


Figure 3. The average maximum daily temperature from 2002-2009 shown with the 7 day running average of the maximum daily water temperature in 2010. Data collected at the USGS gauge (1146700) near Hacienda. Please note that this gauge has not updated temperature data since September 23, 2010.

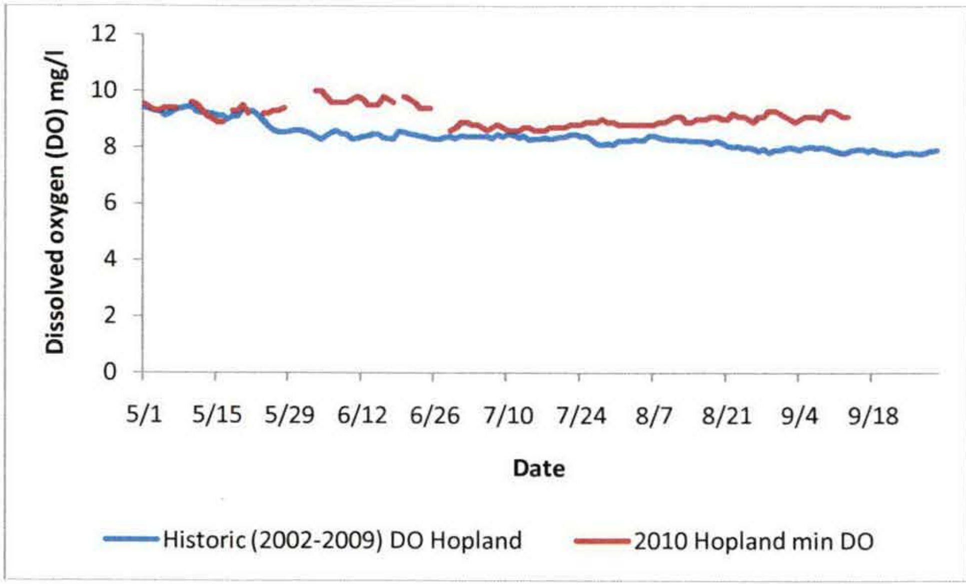


Figure 4. The average minimum daily dissolved oxygen from 2002-2009 shown with the minimum daily dissolved oxygen recorded in 2010. Data collected at the USGS gauge (11462500) near Hopland. Please note that this gauge has not updated dissolved oxygen data since September 23, 2010.

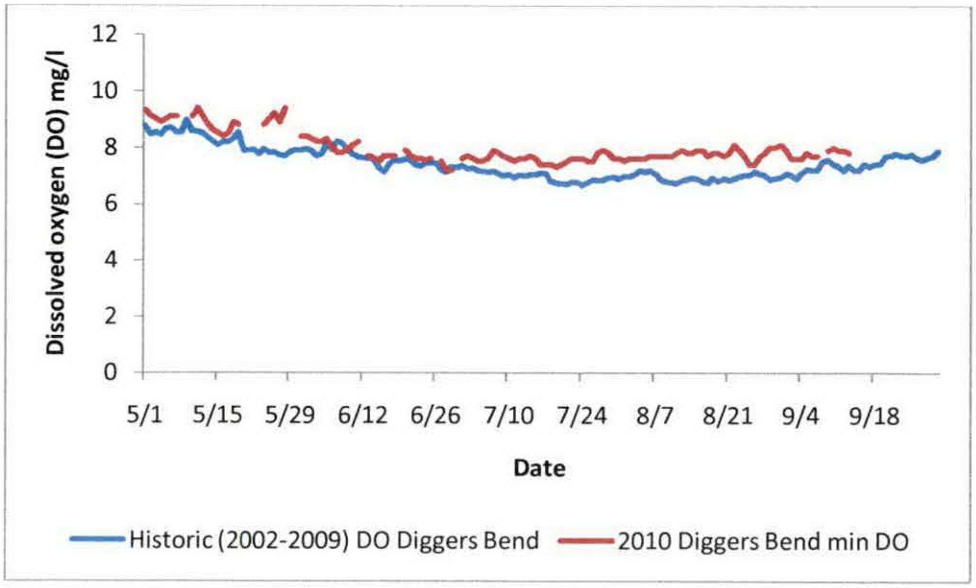


Figure 5. The average minimum daily dissolved oxygen from 2002-2009 shown with the minimum daily dissolved oxygen recorded in 2010. Data collected at the USGS gauge (11463980) near Diggers Bend. Please note that this gauge has not updated dissolved oxygen data since September 14, 2010.

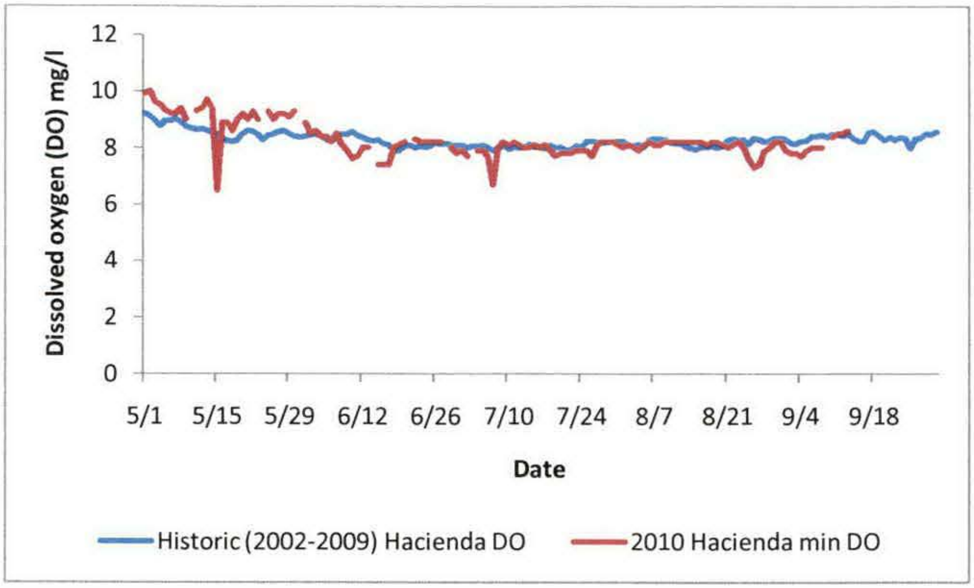


Figure 6. The average minimum daily dissolved oxygen from 2002-2009 shown with the minimum daily dissolved oxygen recorded in 2010. Data collected at the USGS gauge (114700) near Hacienda. Please note that slight dips in dissolved oxygen occurred in previous years, but may not appear in this figure as they have been averaged out over the course of the 8 year data set. Also note that this gauge has not updated dissolved oxygen data since September 23, 2010.

Additional Information

The Water Agency is completing the final 2010 estuary fish seining survey on October 21, 2010. Stomach contents of steelhead will be collected through the non-lethal process of gastric lavage. Invertebrate samples were collected the previous week.

If you have any questions or concerns about this update, please contact Justin Smith, Environmental Specialist, at 707-292-7673 or jpsmith@scwa.ca.gov.

Corlin Gabriel

From:	Justin Smith
Sent:	Thursday, October 14, 2010 6:11 PM
To:	' (dick.butler@noaa.gov)'; (amckannay; 'bcowan@waterboards.ca.gov'; 'carmor@dfg.ca.gov'; CGray@dfg.ca.gov; 'Efren Carrillo'; 'Eric Larson'; Jkassel@waterboards.ca.gov; Justin Smith; 'rfadness@waterboards.ca.gov'; rfitzgerald; Rick Rogers; 'Susan Upchurch'; William Hearn
Cc:	Alan Lilly; Ann DuBay; Brad Sherwood; Chris Delaney; Cory O'Donnell; David Cook; David Manning; Donald Seymour; George Lincoln; Grant Davis; Gregg Horton; Heather Bauman; Hody Wilson; Jay Jasperse; Jeff Church; Jessica Martini Lamb; Jill Golis; Jim Zambenini; Joan Hultberg; Kevin Booker; Michael Thompson; Michael Wheeler; Miguel Huerta; Nathan Baskett; Pam Jeane; Records; Renee Webber; Shawn Chase; Spencer Bader; Steve Shupe; stuart kirkham; Tim Anderson
Subject:	State Board TUCP Order Russian River Fisheries and Flow Update for 10-14-2010
Attachments:	TUC Weekly Update 10-14-10.docx; Copy of RivReport_10-7 Through10-14-2010.xls
Categories:	Records Request

Greetings Colleagues,

This message transmits the Sonoma County Water Agency's 15th weekly update of Fisheries Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. This weekly update includes adult Chinook counts at the Wohler dam, fish trapping information gathered for the season, as well as recent flow and water quality data.

Justin Smith
Environmental Specialist
Sonoma County Water Agency
(707)-292-7673

Sonoma County Water Agency
State Water Resources Control Board Order WR 2010-0018-DWR
Russian River Fisheries and Water Quality Monitoring Plan
Agency Update October 14, 2010

This memorandum represents the 15th weekly update of Fisheries and Water Quality Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. The Army Corps of Engineers have ramped up releases from Coyote Valley Dam to reduce storage in Lake Mendocino to prepare the reservoir for potential flood control operations this fall. Releases are scheduled to peak at approximately 1,000 cubic feet per second (cfs) on Tuesday, October 12, and then drop back down to 320 cfs by Saturday, October 17. There is some lag time between peak releases from Coyote Valley Dam and the arrival of the peak flow at downstream sites. Flow at Ukiah has already peaked and is currently receding while flow at Hacienda has yet to peak (Figure 1). Currently flow at Healdsburg is around 770 cfs (USGS 11464000). The flow at the mouth of Dry Creek (USGS 11465350) is around 85 cfs. Flow at Hacienda is around 720 cfs (USGS 11467000).

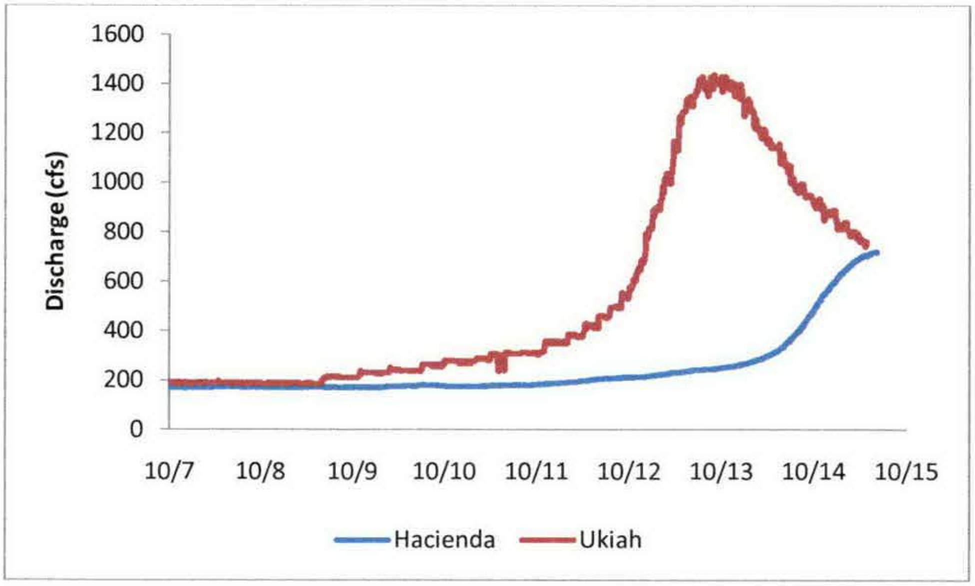


Figure 1. Discharge (cfs) from 10/7/2010 to 10/14/2010 taken at the USGS Ukiah stream gauge (11462000) and the USGS Hacienda stream gauge (11467000).

The Water Agency breached the estuary on October 12, 2010. The water surface elevation at the time of the breach was 7 feet on the Jenner gauge. The mouth of the estuary is currently open.

Current Release and River Gauge Data

Table 1. Release (cfs) from Coyote Valley (USGS 1126 2000) and Warm Springs Dams (USGS 1146 5000) on Monday of each week during the 2010 monitoring season.

Date	Coyote Valley Dam	Warm Springs Dam
5-Jul	170	115
12-Jul	170	116
19-Jul	166	113
26-Jul	173	114
2-Aug	202	113
9-Aug	222	117
16-Aug	188	115
23-Aug	180	102
30-Aug	180	104
6-Sep	204	104
13-Sep	170	101
20-Sep	172	100
27-Sep	187	104
4-Oct	180	102
11-Oct	365	101

Please see the following link and attached Excel spreadsheet for recent reservoir releases and daily average flow at Russian River gauges.
http://www.scwa.ca.gov/current-water-supply-levels/

Operations and Reservoir Release Changes

None to report.

Recent Fisheries Monitoring Activities

The Water Agency has installed the camera system to monitor the adult Chinook run at the Wohler/Mirabel rubber dam. Video review began on September 1, 2010. The first Chinook for the season was observed on September 23, 2010. 717 adult Chinook have been observed passing the rubber dam as of October 12, 2010 (Table 2).

Table 2. The number of adult Chinook observed on the Wohler underwater camera system per week.

Week	Chinook
1-Sep	0
8-Sep	0
15-Sep	0
22-Sep	0
29-Sep	3
6-Oct	663
12-Oct	51
Total	717

The Water Agency has completed the 2010 fish trapping season. On October 7 the water agency removed the estuary fyke net which consists of a modified fyke net, a passive integrated transponder antenna, and an underwater video camera. Additional traps were operated at Austin Creek, Dutch Bill Creek, Green Valley Creek (UC Cooperative Extension), Wohler, and Dry Creek. Season totals are shown in Table 3. These numbers represent total catch per species and have not been adjusted for trap efficiency. They are not population estimates.

Table 3. Steelhead and coho (Russian River Coho Salmon Captive Broodstock Program (RRCCBP)) parr and smolt as well as Chinook smolts captured during the 2010 trapping season at the at Austin Creek, Dutch Bill Creek, Green Valley Creek (UC cooperative extension), Wohler, and Dry Creek fish traps. These numbers represent total catch per species and have not been adjusted for trap efficiency. They are not population estimates.

	Chinook	Coho (RRCSCBP)		steelhead	
Tributary	smolt	parr	smolt	parr	smolt
Dry Creek	5,179	1	20	2,030	62
Mainstem	2,368	0	179	422	47
Dutch Bill Creek	4	3	221	58	5
Austin Creek	24	1,910	102	4,733	239
Green Valley Creek	11	0	1,650	15	35

Water Quality Monitoring

Maximum daily water temperatures and minimum daily dissolved oxygen levels are summarized in the following figures for Hopland, Diggers Bend, and Hacienda. An interesting note is that the 7 day running average of the maximum daily water temperature at Hopland has been significantly cooler this August and September when compared to the average of past years' maximum daily water temperatures (Figure 1).

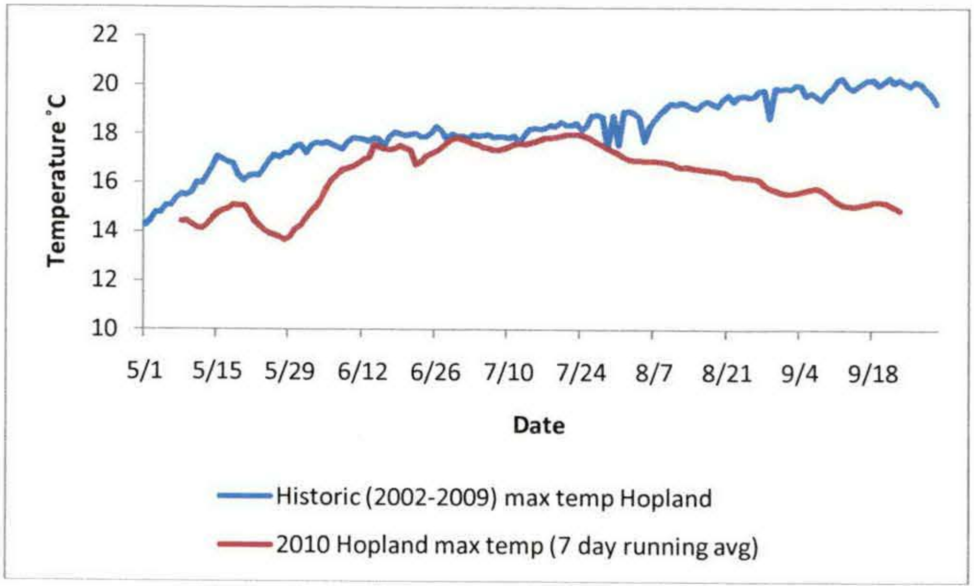


Figure 1. The average maximum daily temperature from 2002-2009 shown with the 7 day running average of the maximum daily water temperature in 2010. Data collected at the USGS gauge (11462500) near Hopland. Please note that this gauge has not updated temperature data since September 23, 2010.

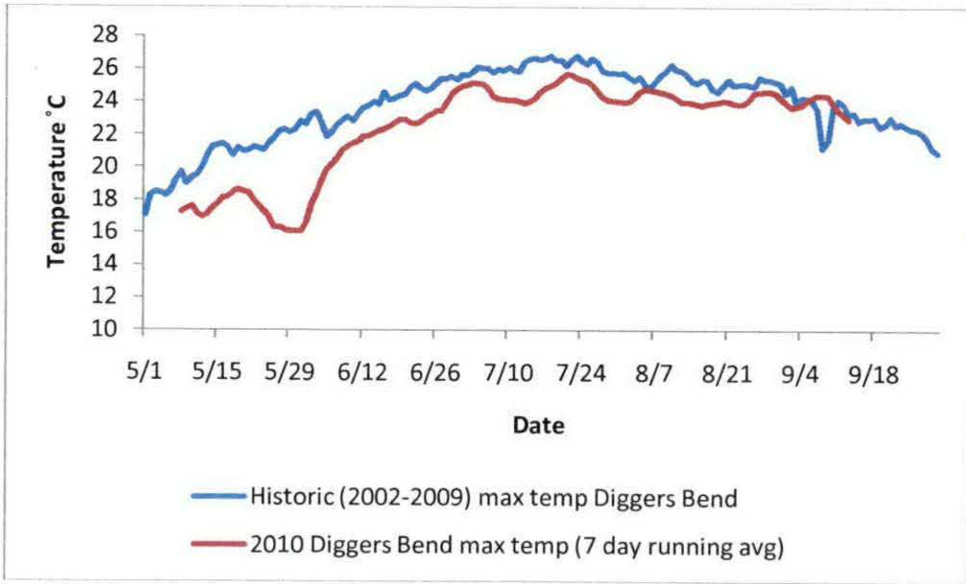


Figure 2. The average maximum daily temperature from 2002-2009 shown with the 7 day running average of the maximum daily water temperature in 2010. Data collected at the USGS gauge (11463980) near Diggers Bend. Please note that this gauge has not updated temperature data since September 14, 2010.

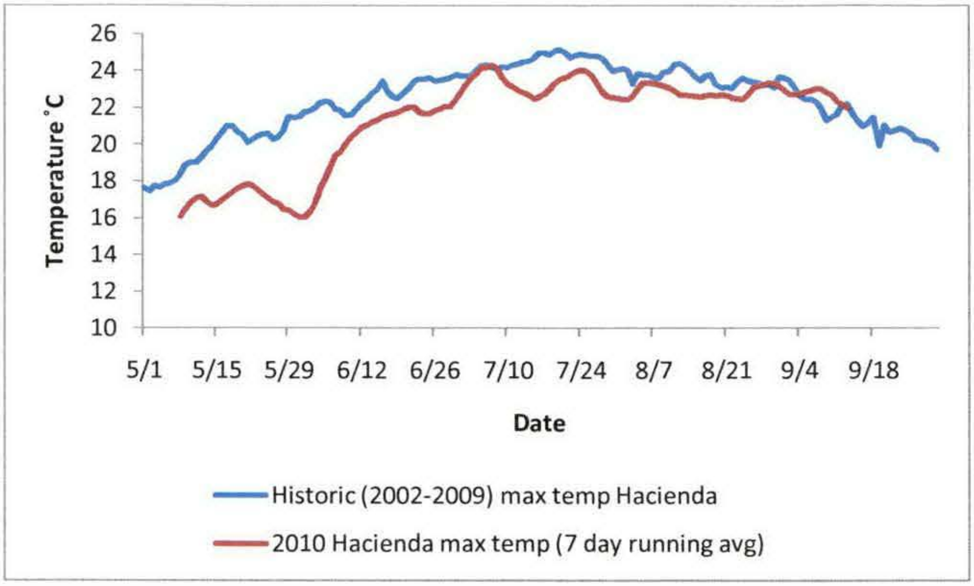


Figure 3. The average maximum daily temperature from 2002-2009 shown with the 7 day running average of the maximum daily water temperature in 2010. Data collected at the USGS gauge (1146700) near Hacienda. Please note that this gauge has not updated temperature data since September 23, 2010.

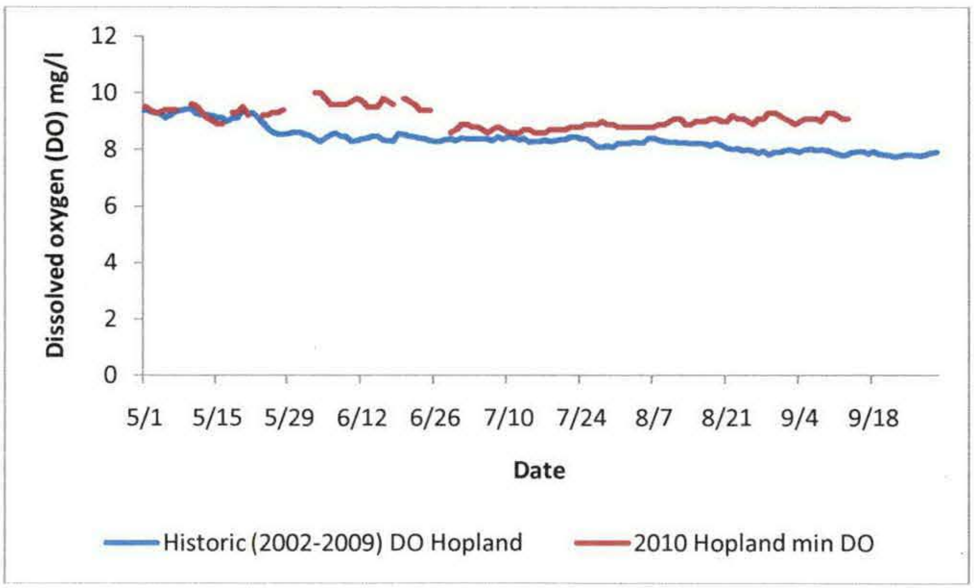


Figure 4. The average minimum daily dissolved oxygen from 2002-2009 shown with the minimum daily dissolved oxygen recorded in 2010. Data collected at the USGS gauge (11462500) near Hopland. Please note that

this gauge has not updated dissolved oxygen data since September 23, 2010.

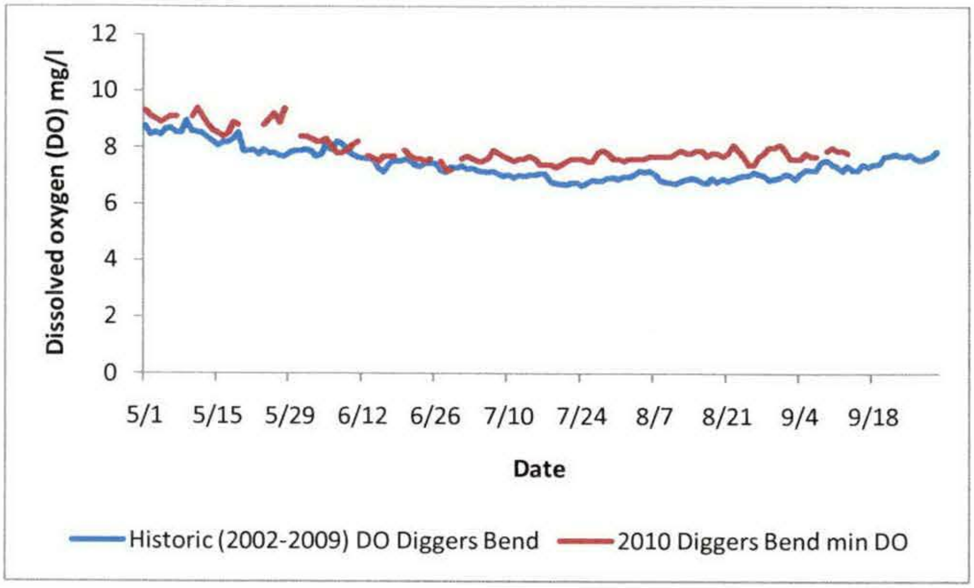


Figure 5. The average minimum daily dissolved oxygen from 2002-2009 shown with the minimum daily dissolved oxygen recorded in 2010. Data collected at the USGS gauge (11463980) near Diggers Bend. Please note that this gauge has not updated dissolved oxygen data since September 14, 2010.

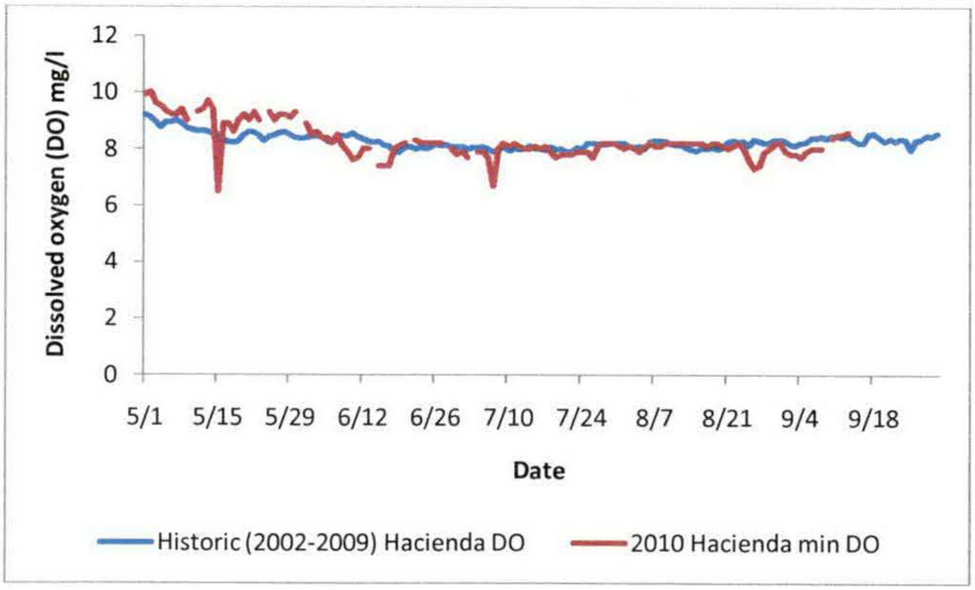


Figure 6. The average minimum daily dissolved oxygen from 2002-2009 shown with the minimum daily dissolved oxygen recorded in 2010. Data collected at the USGS gauge (114700) near Hacienda. Please note that slight dips in dissolved oxygen occurred in previous years, but may not

appear in this figure as they have been averaged out over the course of the 8 year data set. Also note that this gauge has not updated dissolved oxygen data since September 23, 2010.

Additional Information

The Water Agency is conducting the final 2010 estuary fish seining survey over the course of the next five days. Stomach contents of steelhead will be collected through the non-lethal process of gastric lavage. Invertebrate samples were collected this week.

If you have any questions or concerns about this update, please contact Justin Smith, Environmental Specialist, at 707-292-7673 or jpsmith@scwa.ca.gov.

Corlin Gabriel

From: Justin Smith
Sent: Thursday, October 07, 2010 5:46 PM
To: ' (dick.butler@noaa.gov)'; (amckannay; 'bcowan@waterboards.ca.gov'; 'carmor@dfg.ca.gov'; CGray@dfg.ca.gov; 'Efren Carrillo'; 'Eric Larson'; Jkassel@waterboards.ca.gov; Justin Smith; 'rfadness@waterboards.ca.gov'; rfitzgerald; Rick Rogers; 'Susan Upchurch'; William Hearn
Cc: Alan Lilly; Ann DuBay; Brad Sherwood; Chris Delaney; Cory O'Donnell; David Cook; David Manning; Donald Seymour; George Lincoln; Grant Davis; Gregg Horton; Heather Bauman; Hody Wilson; Jay Jasperse; Jeff Church; Jessica Martini Lamb; Jill Golis; Jim Zambenini; Joan Hultberg; Kevin Booker; Michael Thompson; Michael Wheeler; Miguel Huerta; Nathan Baskett; Pam Jeane; Records; Renee Webber; Shawn Chase; Spencer Bader; Steve Shupe; stuart kirkham; Tim Anderson
Subject: State Board TUCP Order Russian River Fisheries and Flow Update for 10-07-2010
Attachments: TUC Weekly Update 10-7-10.docx; Copy of RivReport_9-30 Through10-7-2010.xls

Categories: Records Request

Greetings Colleagues,

This message transmits the Sonoma County Water Agency's fourteenth weekly update of Fisheries Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. This weekly update includes adult Chinook counts at the Wohler dam, fish trapping information gathered for the season, as well as recent flow and water quality data.

Justin Smith
Environmental Specialist
Sonoma County Water Agency
(707)-292-7673

Sonoma County Water Agency
State Water Resources Control Board Order WR 2010-0018-DWR
Russian River Fisheries and Water Quality Monitoring Plan
Agency Update October 7, 2010

This memorandum represents the 14th weekly update of Fisheries and Water Quality Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. Currently flow at Healdsburg is around 160 cfs (USGS 11464000). Flow at Diggers Bend (USGS 11463980) is around 155 cfs. The flow at the mouth of Dry Creek (USGS 11465350) is around 110 cfs. Flow at Hacienda is around 165 cfs (USGS 11467000).

The Water Agency Breached the estuary on October 1, 2010. The water surface elevation at the time of the breach was 7.6 feet on the Jenner gauge. As a result of high wave conditions, the estuary closed on Monday, October 4. The Water Agency is tentatively scheduled to breach the Russian River estuary on Monday, October 11. Waves are forecasted to be between 11 and 14 feet on Monday, so if conditions are considered unsafe for crews to operate on the beach, implementation may be postponed until Tuesday or even Wednesday. Water Agency staff will arrive early Monday morning to assess conditions for an afternoon breaching event.

The U.S. Army Corp of Engineers (Corps) is scheduled on Friday, October 8, to begin ramping releases from Coyote Valley Dam to reduce storage in Lake Mendocino to prepare the reservoir for potential flood control operations this fall. Releases are scheduled to peak to approximately 1,000 cubic feet per second (cfs) on Tuesday, October 12, and then dropping back down to 320 cfs by Saturday, October 17. The Water Agency consulted with the National Marine Fisheries Service and the California Department of Fish and Game on this issue and it was collectively decided that the best course of action is to breach the Estuary in advance of the high flows from the Corps' releases reaching the Estuary.

Current Release and River Gauge Data

Table 1. Release (cfs) from Coyote Valley (USGS 1126 2000) and Warm Springs Dams (USGS 1146 5000) on the first day of the week starting on May 24, 2010.

Date	Coyote Valley Dam	Warm Springs Dam
5-Jul	170	115
12-Jul	170	116
19-Jul	166	113
26-Jul	173	114
2-Aug	202	113
9-Aug	222	117
16-Aug	188	115
23-Aug	180	102
30-Aug	180	104
6-Sep	204	104
13-Sep	170	101
20-Sep	172	100
27-Sep	187	104
4-Oct	180	102

Please see the following link and attached Excel spreadsheet for recent reservoir releases and daily average flow at Russian River gauges.
http://www.scwa.ca.gov/current-water-supply-levels/

Operations and Reservoir Release Changes

None to report.

Recent Fisheries Monitoring Activities

The Water Agency has installed the camera system to monitor the adult Chinook run at the Wohler/Mirabel rubber dam. Video review began on September 1, 2010. The first Chinook for the season was observed on September 23, 2010. To date 666 adult Chinook have been observed (Table 2).

Table 2. The number of adult Chinook observed on the Wohler underwater camera system per week.

Week	Chinook
1-Sep	0
8-Sep	0
15-Sep	0
22-Sep	0
29-Sep	3
6-Oct	663
Total	666

The Water Agency conducted a dive survey for adult Chinook in the pool immediately downstream from the Healdsburg Memorial Dam and in the PG&E hole (approximately 200 m upstream of the Memorial Dam). Four healthy looking adult Chinook were observed.

The Water Agency has completed the 2010 fish trapping season. Traps were operated at Austin Creek, Dutch Bill Creek, Green Valley Creek (UC Cooperative Extension), Wohler, and Dry Creek. Season totals are shown in Table 3. These numbers represent total catch per species and have not been adjusted for trap efficiency. They are not population estimates.

Table 3. Steelhead and coho (Russian River Coho Salmon Captive Broodstock Program (RRCCBP)) parr and smolt as well as Chinook smolts captured during the 2010 trapping season at the at Austin Creek, Dutch Bill Creek, Green Valley Creek (UC cooperative extension), Wohler, and Dry Creek fish traps. These numbers represent total catch per species and have not been adjusted for trap efficiency. They are not population estimates.

	Chinook	Coho (RRCSCBP)		steelhead	
Tributary	smolt	parr	smolt	parr	smolt
Dry Creek	5,179	1	20	2,030	62
Mainstem	2,368	0	179	422	47
Dutch Bill Creek	4	3	221	58	5
Austin Creek	24	1,910	102	4,733	239
Green Valley Creek	11	0	1,650	15	35

Water Quality Monitoring

Maximum daily water temperatures and minimum daily dissolved oxygen levels are summarized in the following figures for Hopland, Diggers Bend, and Hacienda. An interesting note is that the 7 day running average of the maximum daily water temperature at Hopland has been significantly cooler this August and September when compared to the average of past years' maximum daily water temperatures (Figure 1).

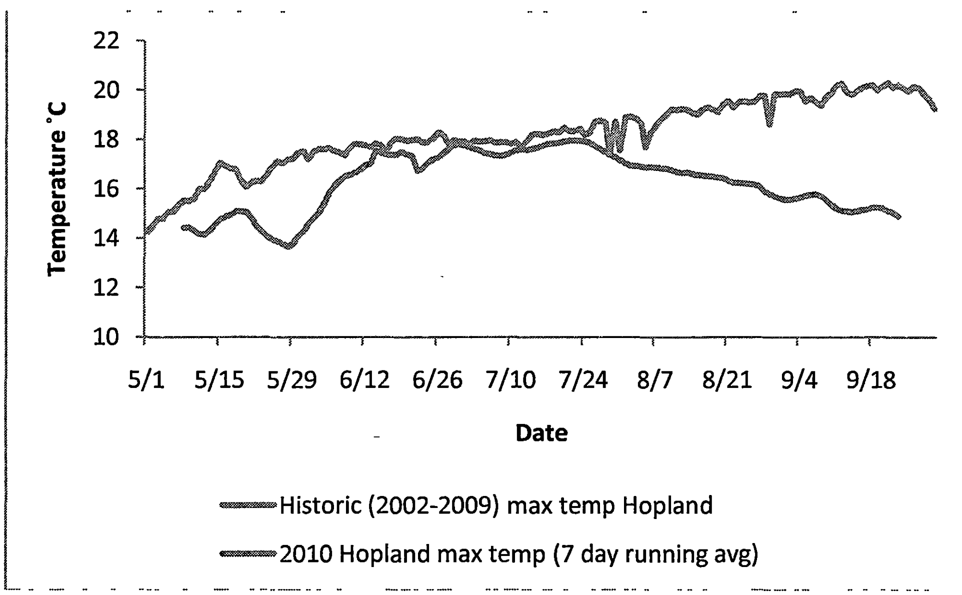


Figure 1. The average maximum daily temperature from 2002-2009 shown with the 7 day running average of the maximum daily water temperature in 2010. Data collected at the USGS gauge (11462500) near Hopland. Please note that this gauge has not updated temperature data since September 23, 2010.

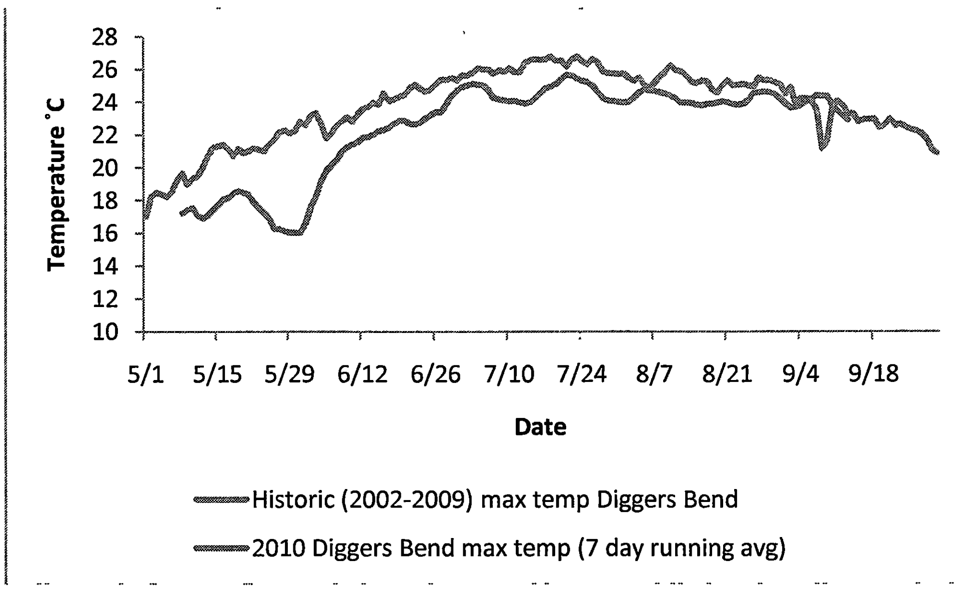


Figure 2. The average maximum daily temperature from 2002-2009 shown with the 7 day running average of the maximum daily water temperature in 2010. Data collected at the USGS gauge (11463980) near Diggers Bend. Please note that this gauge has not updated temperature data since September 14, 2010.

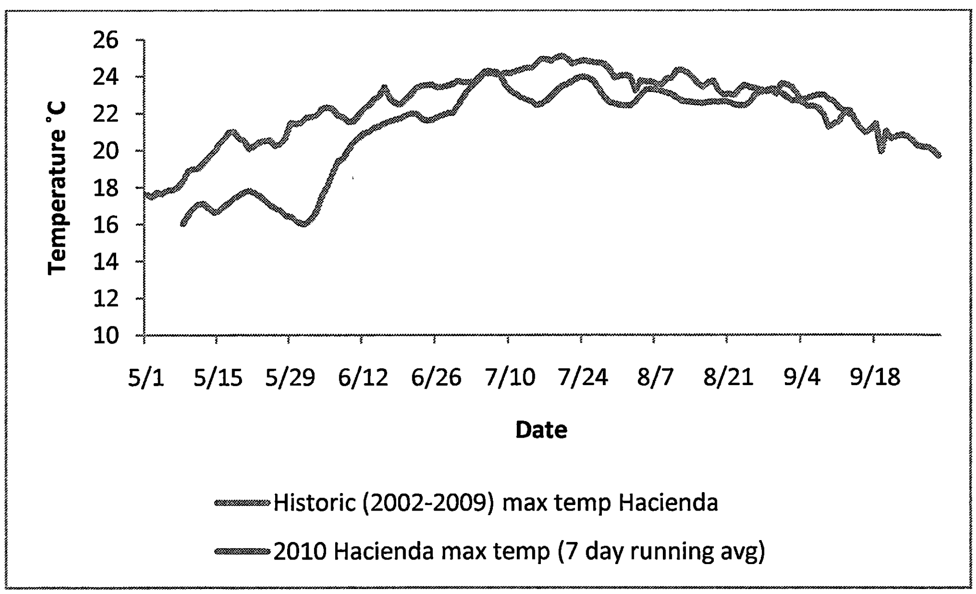


Figure 3. The average maximum daily temperature from 2002-2009 shown with the 7 day running average of the maximum daily water temperature in 2010. Data collected at the USGS gauge (1146700) near Hacienda. Please note that this gauge has not updated temperature data since September 23, 2010.

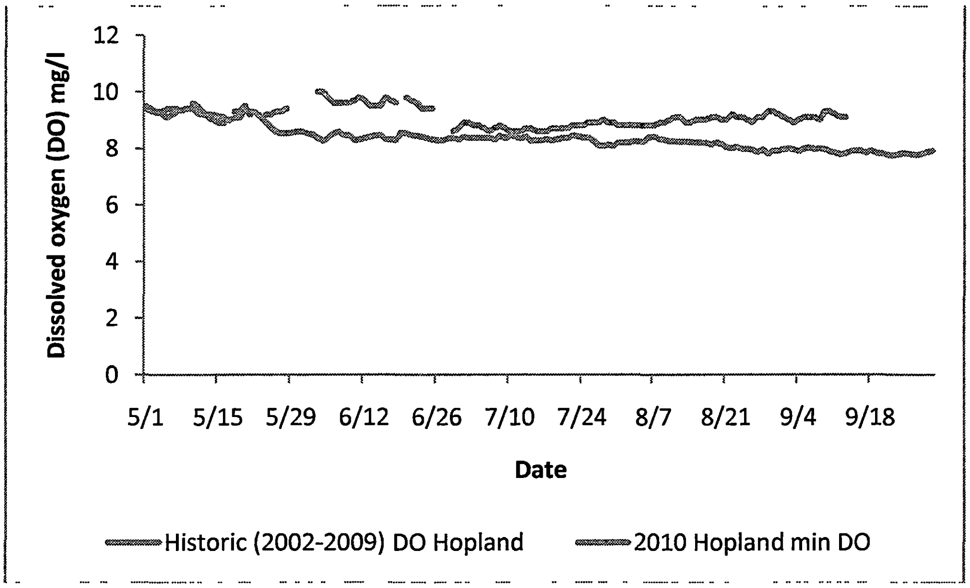


Figure 4. The average minimum daily dissolved oxygen from 2002-2009 shown with the minimum daily dissolved oxygen recorded in 2010. Data collected at the USGS gauge (11462500) near Hopland. Please note that this gauge has not updated dissolved oxygen data since September 23, 2010.

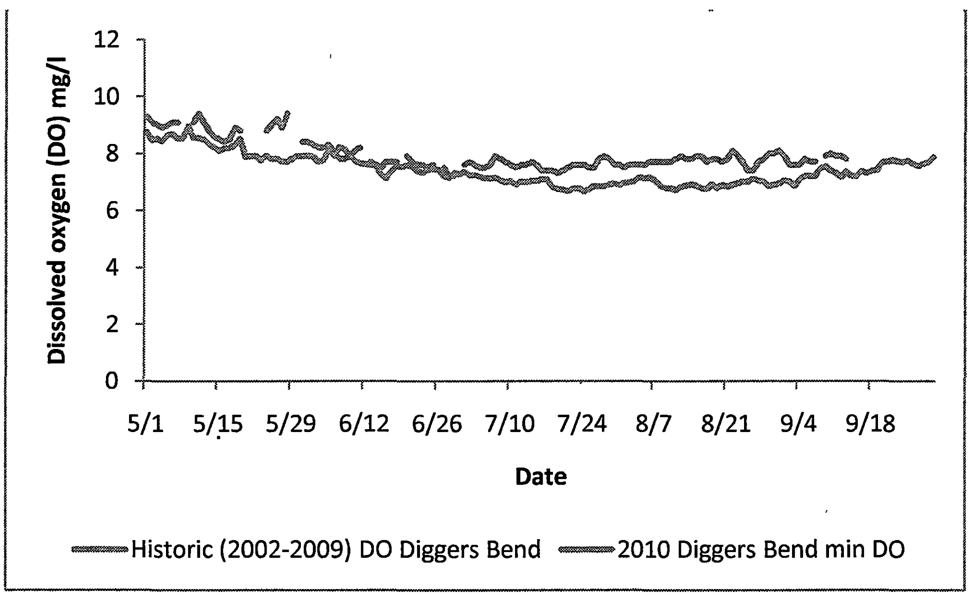


Figure 5. The average minimum daily dissolved oxygen from 2002-2009 shown with the minimum daily dissolved oxygen recorded in 2010. Data collected at the USGS gauge (11463980) near Diggers Bend. Please note that this gauge has not updated dissolved oxygen data since September 14, 2010.

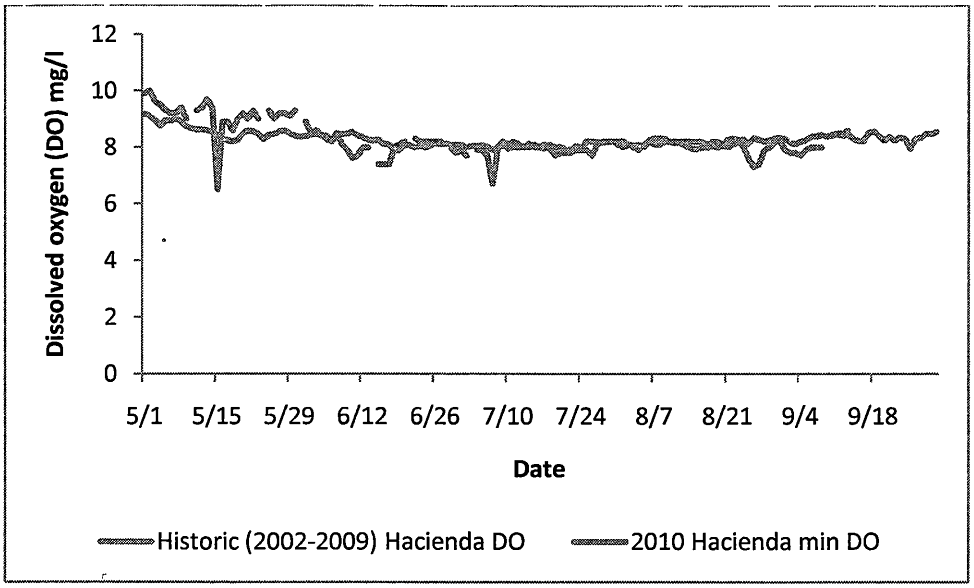


Figure 6. The average minimum daily dissolved oxygen from 2002-2009 shown with the minimum daily dissolved oxygen recorded in 2010. Data collected at the USGS gauge (114700) near Hacienda. Please note that slight dips in dissolved oxygen occurred in previous years, but may not appear in this figure as they have been averaged out over the course of the 8 year data set. Also note that this gauge has not updated dissolved oxygen data since September 23, 2010.

Additional Information

If you have any questions or concerns about this update, please contact Justin Smith, Environmental Specialist, at 707-292-7673 or jpsmith@scwa.ca.gov.

Corlin Gabriel

From: Justin Smith
Sent: Thursday, September 30, 2010 5:29 PM
To: ' (dick.butler@noaa.gov)'; (amckannay; 'bcowan@waterboards.ca.gov'; 'carmor@dfg.ca.gov'; CGray@dfg.ca.gov; 'Efren Carrillo'; 'Eric Larson'; Jkassel@waterboards.ca.gov; Justin Smith; 'rfadness@waterboards.ca.gov'; rfitzgerald; Rick Rogers; 'Susan Upchurch'; William Hearn
Cc: Alan Lilly; Ann DuBay; Brad Sherwood; Chris Delaney; Cory O'Donnell; David Cook; David Manning; Donald Seymour; George Lincoln; Grant Davis; Gregg Horton; Heather Bauman; Hody Wilson; Jay Jasperse; Jeff Church; Jessica Martini Lamb; Jill Golis; Jim Zambenini; Joan Hultberg; Kevin Booker; Michael Thompson; Michael Wheeler; Miguel Huerta; Nathan Baskett; Pam Jeane; Records; Renee Webber; Shawn Chase; Spencer Bader; Steve Shupe; stuart kirkham; Tim Anderson
Subject: State Board TUC Order Russian River Fisheries and Flow Update for 9-30-10
Attachments: TUC Weekly Update 9-30-10.docx; Copy of RivReport_9-22 Through9-29-2010.xls

Categories: Records Request

Greetings Colleagues,

This message transmits the Sonoma County Water Agency's thirteenth weekly update of Fisheries Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. This weekly update includes fish trapping information gathered for the season as well as recent flow and water quality data.

Justin Smith
Environmental Specialist
Sonoma County Water Agency
(707)-292-7673

Sonoma County Water Agency
State Water Resources Control Board Order WR 2010-0018-DWR
Russian River Fisheries and Water Quality Monitoring Plan
Agency Update September 30, 2010

This memorandum represents the 13th weekly update of Fisheries and Water Quality Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. Currently flow at Healdsburg is around 145 cfs (USGS 11464000). Flow at Diggers Bend (USGS 11463980) is around 130 cfs. The flow at the mouth of Dry Creek (USGS 11465350) is around 85 cfs. Flow at Hacienda is around 140 cfs (USGS 11467000).

The barrier beach at the mouth of the Russian River is still intact. The Water Agency had planned on implementing the lagoon outlet channel on September 29, 2010 however the swell was too large to safely operate equipment on the beach. The Water Agency attempted to breach the estuary on the morning of September 30, 2010, but the first attempt was unsuccessful. Breaching the estuary is planned for the afternoon of September 30, 2010.

Current Release and River Gauge Data

Table 1. Release (cfs) from Coyote Valley (USGS 1126 2000) and Warm Springs Dams (USGS 1146 5000) on the first day of the week starting on May 24, 2010.

Date	Coyote Valley Dam	Warm Springs Dam
5-Jul	170	115
12-Jul	170	116
19-Jul	166	113
26-Jul	173	114
2-Aug	202	113
9-Aug	222	117
16-Aug	188	115
23-Aug	180	102
30-Aug	180	104
6-Sep	204	104
13-Sep	170	101
20-Sep	172	100
30-Sep	187	104

Please see the following link and attached Excel spreadsheet for recent reservoir releases and daily average flow at Russian River gauges.
http://www.scwa.ca.gov/current-water-supply-levels/

Operations and Reservoir Release Changes

On September 29, 2010 the Water Agency requested a 10 cfs increase from the Coyote Valley Dam at Lake Mendocino changing the release rate from 159 cfs to 169 cfs.

Recent Fisheries Monitoring Activities

The Water Agency has installed the camera system to monitor the adult Chinook run at the Wohler/Mirabel rubber dam. Video review began on September 1, 2010. The first Chinook for the season was observed on September 23, 2010. Three adult Chinook have been observed to date (Table 2).

Table 2. The number of adult Chinook observed on the Wohler underwater camera system per week.

Week	Chinook
1-Sep	0
8-Sep	0
15-Sep	0
22-Sep	0
29-Sep	3
Total	3

The Water Agency has completed the 2010 fish trapping season. Traps were operated at Austin Creek, Dutch Bill Creek, Green Valley Creek (UC Cooperative Extension), Wohler, and Dry Creek. Season totals are shown in Table 2. These numbers represent total catch per species and have not been adjusted for trap efficiency. They are not population estimates.

Table 2. Steelhead and coho (Russian River Coho Salmon Captive Broodstock Program (RRCCBP)) parr and smolt as well as Chinook smolts captured during the 2010 trapping season at the at Austin Creek, Dutch Bill Creek, Green Valley Creek (UC cooperative extension), Wohler, and Dry Creek fish traps. These numbers represent total catch per species and have not been adjusted for trap efficiency. They are not population estimates.

	Chinook	Coho (RRCSCBP)		steelhead	
Tributary	smolt	parr	smolt	parr	smolt
Dry Creek	5,179	1	20	2,030	62
Mainstem	2,368	0	179	422	47
Dutch Bill Creek	4	3	221	58	5
Austin Creek	24	1,910	102	4,733	239
Green Valley Creek	11	0	1,650	15	35

Water Quality Monitoring

Maximum daily water temperatures and minimum daily dissolved oxygen levels are summarized in the following figures for Hopland, Diggers Bend, and Hacienda. An interesting note is that the 7 day running average of the maximum daily water temperature at Hopland has been significantly cooler this August and September when compared to the average of past years' maximum daily water temperatures (Figure 1).

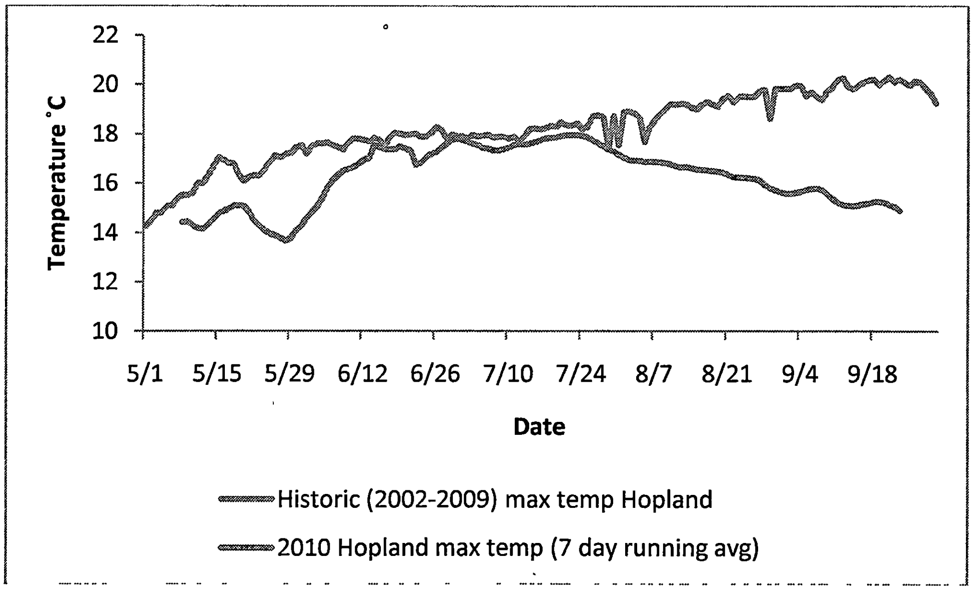


Figure 1. The average maximum daily temperature from 2002-2009 shown with the 7 day running average of the maximum daily water temperature in 2010. Data collected at the USGS gauge (11462500) near Hopland. Please note that this gauge has not updated temperature data since September 23, 2010.

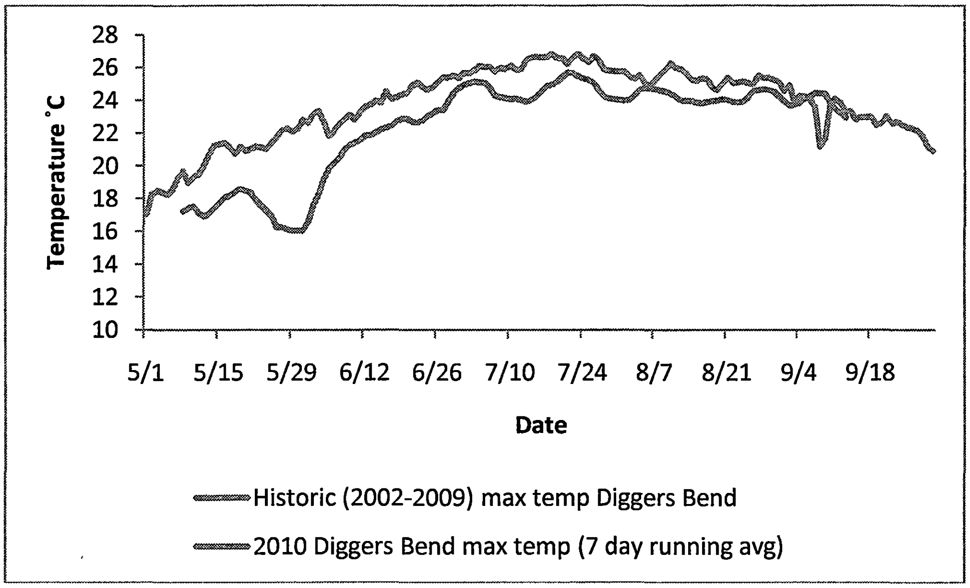


Figure 2. The average maximum daily temperature from 2002-2009 shown with the 7 day running average of the maximum daily water temperature in 2010. Data collected at the USGS gauge (11463980) near Diggers Bend. Please note that this gauge has not updated temperature data since September 14, 2010.

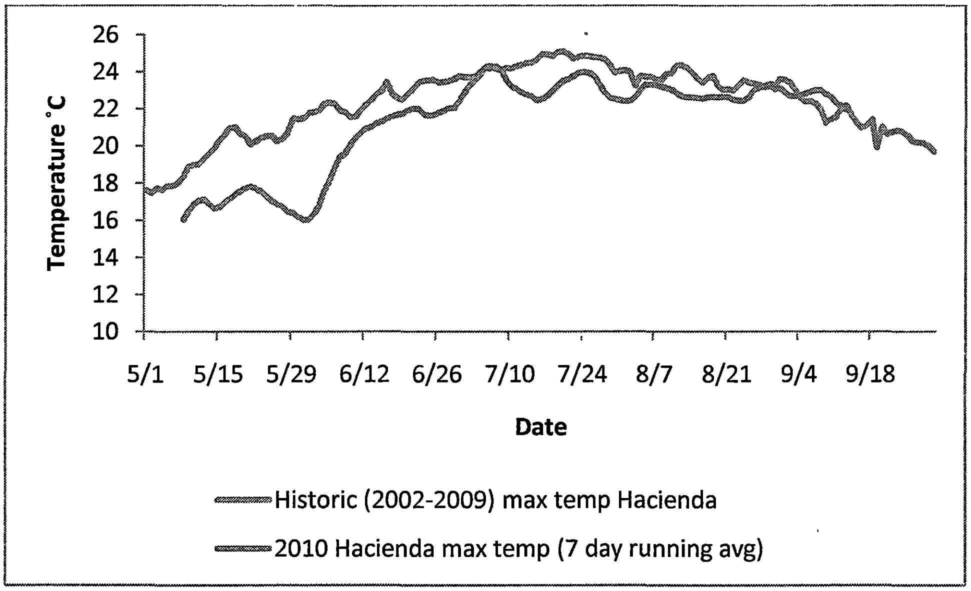
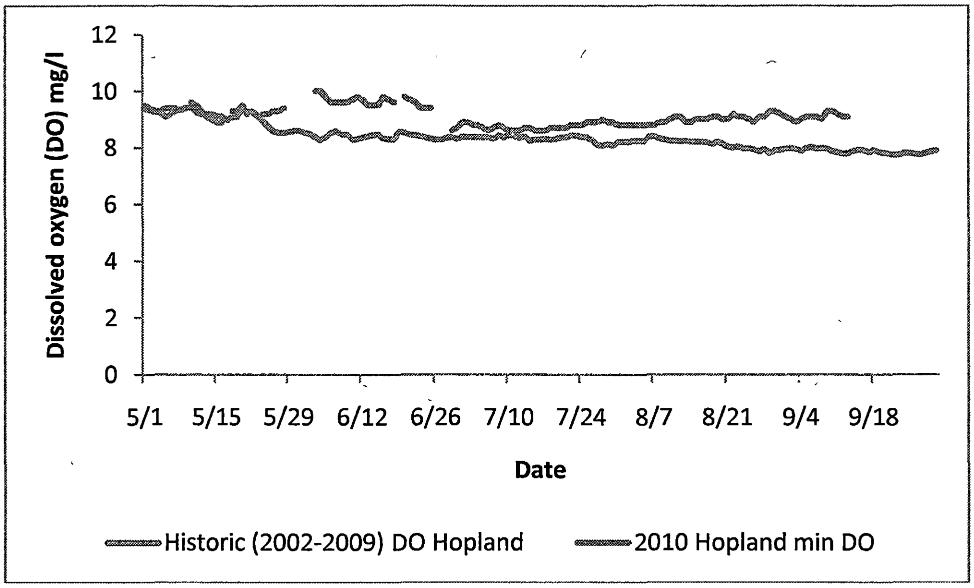


Figure 3. The average maximum daily temperature from 2002-2009 shown with the 7 day running average of the maximum daily water temperature in 2010. Data collected at the USGS gauge (1146700) near Hacienda. Please note that this gauge has not updated temperature data since September 23, 2010.



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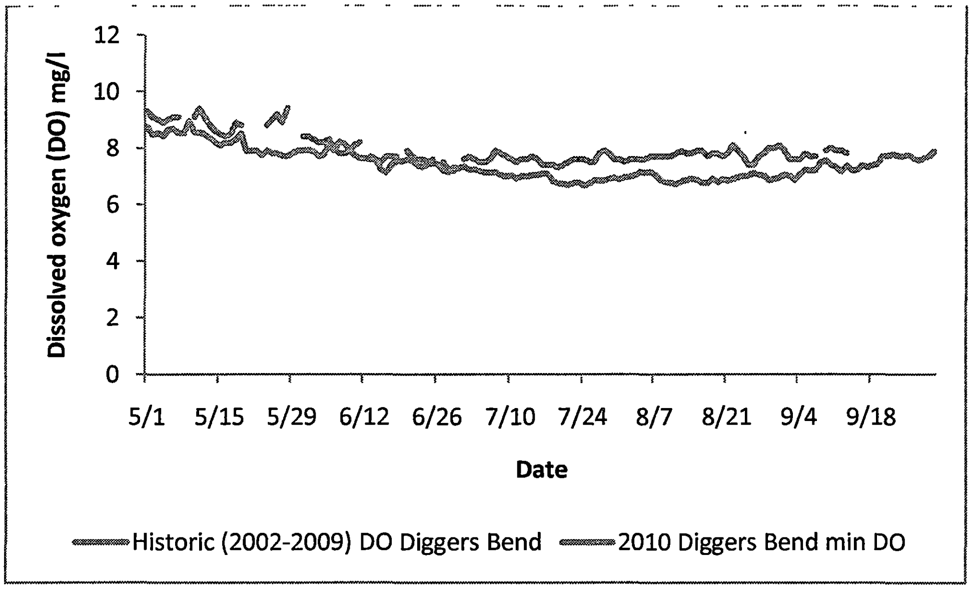

Figure 5. The average minimum daily dissolved oxygen from 2002-2009 shown with the minimum daily dissolved oxygen recorded in 2010. Data collected at the USGS gauge (11463980) near Diggers Bend. Please note that this gauge has not updated dissolved oxygen data since September 14, 2010.

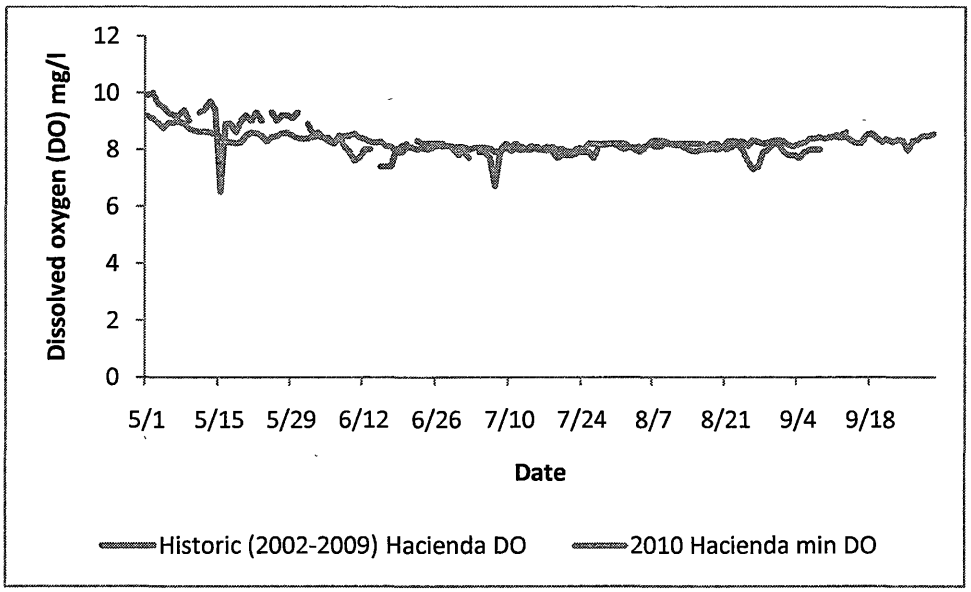

Figure 6. The average minimum daily dissolved oxygen from 2002-2009 shown with the minimum daily dissolved oxygen recorded in 2010. Data collected at the USGS gauge (114700) near Hacienda. Please note that slight dips in dissolved oxygen occurred in previous years, but may not appear in this figure as they have been averaged out over the course of the 8 year data set. Also note that this gauge has not updated dissolved oxygen data since September 23, 2010.

Additional Information

If you have any questions or concerns about this update, please contact Justin Smith, Environmental Specialist, at 707-292-7673 or jpsmith@scwa.ca.gov.

Corlin Gabriel

From: Justin Smith
Sent: Thursday, September 23, 2010 6:24 PM
To: ' (dick.butler@noaa.gov)'; (amckannay; 'bcowan@waterboards.ca.gov'; 'carmor@dfg.ca.gov'; CGray@dfg.ca.gov; 'Efren Carrillo'; 'Eric Larson'; Jkassel@waterboards.ca.gov; Justin Smith; 'rfadness@waterboards.ca.gov'; rfitzgerald; Rick Rogers; 'Susan Upchurch'; William Hearn
Cc: Alan Lilly; Ann DuBay; Brad Sherwood; Chris Delaney; Cory O'Donnell; David Cook; David Manning; Donald Seymour; George Lincoln; Grant Davis; Gregg Horton; Heather Bauman; Hody Wilson; Jay Jasperse; Jeff Church; Jessica Martini Lamb; Jill Golis; Jim Zambenini; Joan Hultberg; Kevin Booker; Michael Thompson; Michael Wheeler; Miguel Huerta; Nathan Baskett; Pam Jeane; Records; Renee Webber; Shawn Chase; Spencer Bader; Steve Shupe; stuart kirkham; Tim Anderson
Subject: State Board TUC Order Russian River Fisheries and Flow Update for 9-23-10
Attachments: TUC Weekly Update 9-23-10.docx; Copy of RivReport_9-15 Through9-22-2010.xls

Greetings Colleagues,

This message transmits the Sonoma County Water Agency's twelfth weekly update of Fisheries Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. This weekly update includes fish trapping information gathered for the season as well as recent flow and water quality data.

Justin Smith
Environmental Specialist
Sonoma County Water Agency
(707)-292-7673

CF/42-0.19-9 SWRCB Order Approving Temporary Urgency Change in Permits 12947A, 12949, 12950 & 16596 for 2010

Full record with attachments in DocuShare

Corlin Gabriel

From: Justin Smith
Sent: Thursday, September 16, 2010 6:42 PM
To: ' (dick.butler@noaa.gov)'; (amckannay; 'bcowan@waterboards.ca.gov'; 'carmor@dfg.ca.gov'; CGray@dfg.ca.gov; 'Efren Carrillo'; 'Eric Larson'; Jkassel@waterboards.ca.gov; Justin Smith; 'rfadness@waterboards.ca.gov'; rfitzgerald; Rick Rogers; 'Steve Herrera'; 'Susan Upchurch'; William Hearn
Cc: Alan Lilly; Ann DuBay; Brad Sherwood; Chris Delaney; Cory O'Donnell; David Cook; David Manning; Donald Seymour; George Lincoln; Grant Davis; Gregg Horton; Heather Bauman; Hody Wilson; Jay Jasperse; Jeff Church; Jessica Martini Lamb; Jill Golis; Jim Zambenini; Joan Hultberg; Kevin Booker; Michael Thompson; Michael Wheeler; Miguel Huerta; Nathan Baskett; Pam Jeane; Records; Renee Webber; Shawn Chase; Spencer Bader; Steve Shupe; Tim Anderson
Subject: State Board TUC Order Russian River Fisheries and Flow Update for 9-16-10
Attachments: TUC Weekly Update 9-15-10.docx; Copy of RivReport_9-8 Through9-15-2010.xls

Greetings Colleagues,

This message transmits the Sonoma County Water Agency's eleventh weekly update of Fisheries Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. This weekly update includes fish trapping information gathered for the season to date and recent flow data.

Justin Smith
Environmental Specialist
Sonoma County Water Agency
(707)-292-7673

CF/42-0.19-9 SWRCB Order Approving Temporary Urgency Change in Permits 12947A, 12949, 12950 & 16596 for 2010
.
Full record with attachments in DocuShare

Corlin Gabriel

From: Justin Smith
Sent: Thursday, September 09, 2010 6:11 PM
To: ' (dick.butler@noaa.gov)'; (amckannay; 'bcowan@waterboards.ca.gov'; 'carmor@dfg.ca.gov'; CGray@dfg.ca.gov; 'Efren Carrillo'; 'Eric Larson'; Jkassel@waterboards.ca.gov; Justin Smith; 'rfadness@waterboards.ca.gov'; rfitzgerald; Rick Rogers; 'Steve Herrera'; 'Susan Upchurch'; William Hearn
Cc: Alan Lilly; Ann DuBay; Brad Sherwood; Chris Delaney; Cory O'Donnell; David Cook; David Manning; Donald Seymour; George Lincoln; Grant Davis; Gregg Horton; Heather Bauman; Hody Wilson; Jay Jasperse; Jeff Church; Jessica Martini Lamb; Jill Golis; Jim Zambenini; Joan Hultberg; Kevin Booker; Michael Thompson; Michael Wheeler; Miguel Huerta; Nathan Baskett; Pam Jeane; Records; Renee Webber; Shawn Chase; Spencer Bader; Steve Shupe; Tim Anderson
Subject: State Board TUC Order Russian River Fisheries and Flow Update for 9-9-10
Attachments: TUC Weekly Update 9-9-10.docx; Copy of RivReport_9-2 Through9-8-2010.xls

Greetings Colleagues,

This message transmits the Sonoma County Water Agency's tenth weekly update of Fisheries Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR.

Justin Smith
Environmental Specialist
Sonoma County Water Agency
(707)-292-7673

Corlin Gabriel

From: Justin Smith
Sent: Friday, September 03, 2010 2:07 PM
To: ' (dick.butler@noaa.gov)'; (amckannay; 'bcowan@waterboards.ca.gov'; 'carmor@dfg.ca.gov'; CGray@dfg.ca.gov; 'Efren Carrillo'; 'Eric Larson'; Jkassel@waterboards.ca.gov; Justin Smith; 'rfadness@waterboards.ca.gov'; rfitzgerald; Rick Rogers; 'Steve Herrera'; 'Susan Upchurch'; William Hearn
Cc: Alan Lilly; Ann DuBay; Brad Sherwood; Chris Delaney; Cory O'Donnell; David Cook; David Manning; Donald Seymour; George Lincoln; Grant Davis; Gregg Horton; Heather Bauman; Hody Wilson; Jay Jasperse; Jeff Church; Jessica Martini Lamb; Jill Golis; Jim Zambenini; Joan Hultberg; Kevin Booker; Michael Thompson; Michael Wheeler; Miguel Huerta; Nathan Baskett; Pam Jeane; Records; Renee Webber; Shawn Chase; Spencer Bader; Steve Shupe; Tim Anderson
Subject: State Board TUC Order Russian River Fisheries and Flow Update for 9-2-10
Attachments: TUC Weekly Update 9-2-10.docx; Copy of RivReport_8-25 Through9-1-2010.xls

Greetings Colleagues,

This message transmits the Sonoma County Water Agency's ninth weekly update of Fisheries Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. This weekly update includes fish trapping information gathered for the season to date and recent flow data.

Justin Smith
Environmental Specialist
Sonoma County Water Agency
(707)-292-7673

CF/42-0.19-9 SWRCB Order Approving Temporary Urgency Change in Permits 12947A, 12949, 12950 & 16596 for 2010
.
Full record with attachments in DocuShare

State W   er Resources Contro   oard

Division of Water Rights
1001 I Street, 14th Floor ♦ Sacramento, California 95814 ♦ 916.341.5300
P.O. Box 2000 ♦ Sacramento, California 95812-2000
Fax: 916.341.5400 ♦ www.waterboards.ca.gov/waterrights

Linda S. Adams
Secretary for Environmental Protection

Arnold Schwarzenegger
Governor

ORIGINAL DOCUMENT
SONOMA COUNTY WATER AGENCY
TO JEANE SEYMOUR, MARTINI-LAMB, CHURCH, LINCOLN
SEP - 1 2010

In Reply Refer to:
KIW:129191A et al.

AUG 30 2010

CF/42-0.19-9 SWRCB Order Approving Temporary Urgency Change in Permits 12947A, 12949, 12950 & 16596 for 2010

Mr. Grant Davis
General Manager
Sonoma County Water Agency
404 Aviation Blvd
Santa Rosa, CA 95403-9019

Dear Mr. Davis:

WATER QUALITY MONITORING PLAN REQUIRED BY TERM 8 OF ORDER WR 2010-0018-DWR APPROVING SONOMA COUNTY WATER AGENCY'S PETITION FOR TEMPORARY URGENCY CHANGE OF PERMITS 12947A, 12949, 12950, AND 16596 (APPLICATIONS 12919A, 15736, 15737, 19351)

The State Water Resources Control Board (State Water Board), Division of Water Rights (Division) staff has reviewed the Water Quality Monitoring Plan (Monitoring Plan) submitted by the Sonoma County Water Agency (SCWA) as required by Term 8 of Order WR 2010-0018-DWR (Order). Term 8 of the Order requires that the Monitoring Plan provide information to evaluate potential changes to water quality and availability of aquatic habitat for salmonids resulting from the proposed permanent changes to Decision 1610 minimum instream flows that are mandated by the Biological Opinion. The Monitoring Plan should build upon previous water quality studies that have been conducted in the Russian River, and estuary water quality monitoring required by the Biological Opinion, and provide information to support the development of a CEQA document required for permanent changes to Decision 1610. Staff's suggested changes to the proposed Monitoring Plan follow.

Russian River Estuary Study

The scope of the Russian River Estuary Study is sufficient to meet the requirements of Term 8 of the Order. However, staff is concerned that the proposed laboratory reporting levels (LRL) for nutrient samples identified in Table Five may not be suitable for evaluating the impact of the change in flow on the ecosystem response to biostimulatory substances. Nutrient concentrations reported by SCWA for some parameters during prior seasons were less than the LRLs listed in Table Five in the Monitoring Report. The Division recommends consulting with the Regional Board regarding appropriate LRLs and revising the Monitoring Plan as necessary. The Regional Board's Surface Water Ambient Monitoring Program should be able to provide data to aide in determining the appropriate reporting levels.

Mainstem Russian River Study

The Mainstem Russian River Study includes plans to collect grab samples from various sites and analyze the samples for a variety of water quality parameters, including trace elements, major ions, organic wastewater compounds and human use pharmaceuticals. Though this information may be useful to other ongoing efforts, it is not necessary in meeting the objectives

vew

of Term 8 of the Order. A monitoring plan similar in scope to SCWA's 2009 Water Quality Monitoring Plan will adequately address the requirements of Term 8 of the Order. In order to meet the objectives of Term 8, the following parameters should be evaluated: Water temperature, pH, dissolved oxygen, specific conductivity, bacteria, nutrients, and algae.

The Mainstem Russian River Study includes plans for three sampling events. The proposed frequency of the monitoring events is insufficient to meet the objectives of Term 8. The Monitoring Plan should be revised to provide for monitoring at an adequate number of sites on a weekly basis. SCWA should endeavor to begin the weekly monitoring as soon as possible (e.g. within a week of the date of this letter) and continue the monitoring through October 15, 2010.

Table Two in the Monitoring Plan lists a suite of nutrients and laboratory reporting levels evaluated by the USGS as part of the Mainstem Russian River Study. SCWA should collect weekly grab samples at the five permanent water quality sonde sites (Russian River near Hopland, Russian River at Digger Bend, Russian River near Guerneville, SCWA's Russian River diversion facility at Mirabel, and Johnson's Beach) and the seasonal water quality sondes sites (Russian River near Cloverdale and Russian River near Jimtown) and have the samples analyzed for the suite of nutrients listed in Table Two. As discussed above, the Division recommends consulting with the Regional Board regarding appropriate laboratory reporting levels and revising the Monitoring Plan as necessary.

Additional Monitoring

As discussed in section 5.3.2 of the Monitoring Plan, the Regional Board is conducting a seasonal bacteriological sampling program at Russian River beaches with high body contact recreation in cooperation with the Sonoma County Department of Environmental Health. Each organization reports the data from the sampling program on their respective website. The Division encourages SCWA to compile and evaluate this data in a summary report of the 2010 monitoring program for the Order as part of the requirements of Term 8.

Summary Report

SCWA should summarize all data collected during the 2010 water quality monitoring program. The summary report should include an evaluation of whether, and to what extent, the reduced flows authorized by the Order caused any impacts to water quality or availability of aquatic habitat for salmonids. The report should be submitted to the Division by December 31, 2010.

Division staff requests that SCWA consider the comments contained herein to develop a revised monitoring plan for use during the 2010 and future monitoring seasons. A complete plan that is adequate for use in future monitoring seasons will ensure collection of a continuous, comparable, and comprehensive data set.

Should you have further questions in this matter, please contact Katy Washburn at (916) 341-5386 or kwashburn@waterboards.ca.gov

Sincerely,

James W. Kassel
for Victoria A. Whitney
Deputy Director for Water Rights

Corlin Gabriel

From:	Justin Smith
Sent:	Thursday, August 26, 2010 5:39 PM
To:	' (dick.butler@noaa.gov)'; (amckannay; 'bcowan@waterboards.ca.gov'; 'carmor@dfg.ca.gov'; CGray@dfg.ca.gov; 'Efren Carrillo'; 'Eric Larson'; Jkassel@waterboards.ca.gov; Justin Smith; 'rfadness@waterboards.ca.gov'; rfitzgerald; Rick Rogers; 'Steve Herrera'; 'Susan Upchurch'; William Hearn
Cc:	Alan Lilly; Ann DuBay; Brad Sherwood; Chris Delaney; Cory O'Donnell; David Cook; David Manning; Donald Seymour; George Lincoln; Grant Davis; Gregg Horton; Heather Bauman; Hody Wilson; Jay Jasperse; Jeff Church; Jessica Martini Lamb; Jill Golis; Jim Zambenini; Joan Hultberg; Kevin Booker; Michael Thompson; Michael Wheeler; Miguel Huerta; Nathan Baskett; Pam Jeane; Records; Renee Webber; Shawn Chase; Spencer Bader; Steve Shupe; Tim Anderson
Attachments:	TUC Weekly Update 8-26-10.docx; Copy of RivReport_8-18 Through8-25-2010.xls
Categories:	Records Request

Greetings Colleagues,

This message transmits the Sonoma County Water Agency's eighth weekly update of Fisheries Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. This weekly update includes fish trapping information gathered for the season to date, estuary seining information, recent flow data, and information regarding the Agency's dive surveys for juvenile salmonids in the upper Russian River.

Justin Smith
Environmental Specialist
Sonoma County Water Agency
(707)-292-7673

Sonoma County Water Agency
State Water Resources Control Board Order WR 2010-0018-DWR
Russian River Fisheries and Water Quality Monitoring Plan
Agency Update August 26, 2010

This memorandum represents the eighth weekly update of Fisheries and Water Quality Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. Due to hot weather and conservative reservoir management, flow approached the State Board's ordered minimum in the upper Russian River for the first time this season. Currently flow at Healdsburg is around 145 cfs (USGS 11464000), but the gauge at this location is influenced by the Healdsburg Memorial Dam. The Diggers Bend gauge (USGS 11463980) does not seem to be influenced by the Healdsburg Memorial Dam. Flow at Diggers Bend is around 125 cfs. The Flow at the mouth of Dry Creek is about 80 cfs (USGS 11465350) and flow at Hacienda is around 125 cfs (USGS 11467000). The Agency has summarized recent monitoring activities as follows:

Current Release and River Gauge Data

Table 1. Release (cfs) from Coyote Valley (USGS 1126 2000) and Warm Springs Dams (USGS 1146 5000) on the first day of the week starting on May 24, 2010.

Date	Coyote Valley Dam	Warm Springs Dam
24-May	195	240
31-May	170	242
7-Jun	173	145
14-Jun	170	104
21-Jun	170	104
28-Jun	166	104
5-Jul	170	115
12-Jul	170	116
19-Jul	166	113
26-Jul	173	114
2-Aug	202	113
9-Aug	222	117
16-Aug	188	115
23-Aug	180	102

Please see the following link and attached Excel spreadsheet for recent reservoir releases and daily average flow at Russian River gauges.
http://www.scwa.ca.gov/current-water-supply-levels/

Operations and Reservoir Release Changes

On August 20, 2010 the Agency requested that the release rate at the Warms Springs Dam be reduced by 10 CFS. This changed the targeted the release rate from 114 cfs to a new target release rate of 104 cfs.

On August 23, 2010 the Agency requested a release rate increase of 10 cfs at the Coyote Valley Dam. This release rate increase changed the set point from 159 cfs to 169 cfs.

On August 24, 2010 due to anticipated irrigation demand, the Agency requested a 20 cfs release rate increase at the Coyote Valley Dam. This shifted the target release rate from 169 cfs to 189.

Recent Fisheries Monitoring Activities

The following figure summarizes the season trap catches to date. Please note that the Estuary passive fyke net and the Dry Creek rotary screw trap are the only traps that the Agency is operating at this point in the trapping season. The numbers of fish reported here have not been adjusted for trap efficiency. They are daily catches and not outmigration estimates.

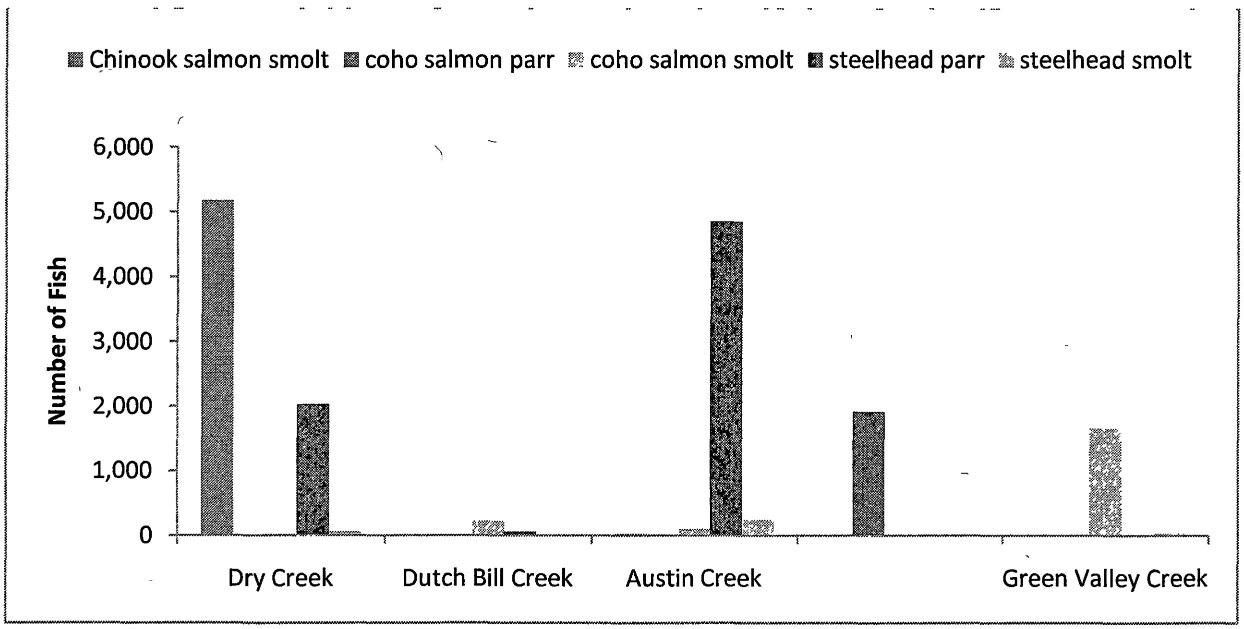

Figure 1. Total catch per species as of August 22, 2010, at each of the downstream migrant traps operated by the Agency and at the Green Valley Creek trap operated by UC Cooperative Extension. The Dutch Bill Creek, Wohler, and Austin Creek fish traps were removed on July 13, July 16, and July 19, 2010 respectively. Please note that the numbers of fish reported here

have not been adjusted for trap efficiency. They are daily catches and not outmigration estimates.

From August 18, 2010 to August 25, 2010 the Agency conducted a dive survey for steelhead and native freshwater fish in the Russian River between Dry Creek and the Coyote Valley Dam. In total seven 500 meter sites were surveyed (Healdsburg downstream of the confluence with Dry Creek, Geyserville upstream of the 128 bridge, Alexander Valley downstream of the Crocker Road Bridge, Cloverdale near Cominsky Station Road, Hopland near Squaw Rock, Hopland near the Highway 175 bridge, Ukiah near the confluence of the east and west fork of the Russian River). These sites corresponded with sites used in 2009. For detailed methods see the SCWA document titled Results of the Fisheries Monitoring Plan to Meet the State Water Resources Control Board Order WR 2009-0034 EXEC.

Upstream of Healdsburg visibility was poor and ranged from 0.5 m to 1.5 meters making it difficult to detect salmonids. In total 9,655 fish were observed during the survey, 8855 of these fish consisted of native cyprinids (minnows) and catostomids (suckers). These two families dominated the fish community at all sample sites. Salmonids were only observed at 2 sample sites. Two steelhead were observed at the Alexander Valley sample site and 9 steelhead were observed downstream of the confluence of the Russian River and Dry Creek. We suspect that steelhead were present at other sites, but atht visibility was too pore to detect them. A total of 724 Russian River tule perch, a fish endemic to the Russian River, were observed during the survey.

Water Quality Monitoring

Maximum daily water temperatures and minimum daily dissolved oxygen levels are summarized in the following figures for Hopland, Diggers Bend, and Hacienda.

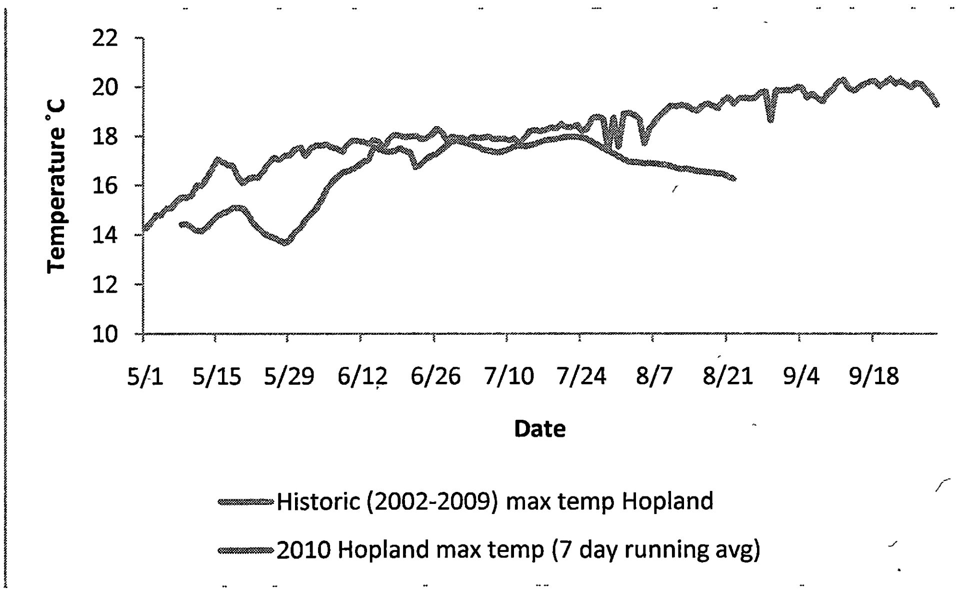

Figure 2. The average maximum daily temperature from 2002-2009 shown with the 7 day running average of the maximum daily water temperature in 2010. Data collected at the USGS gauge (11462500) near Hopland.

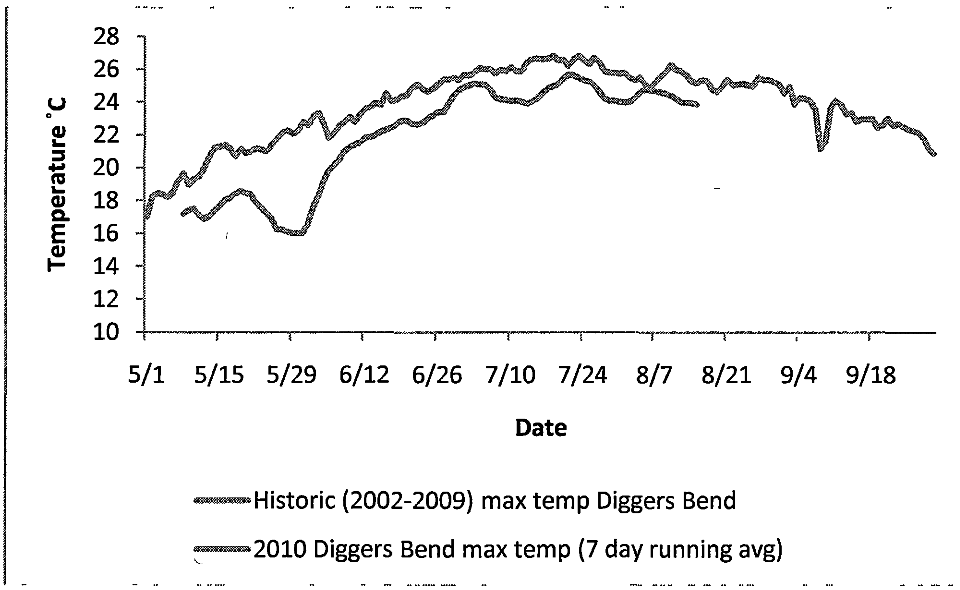

Figure 3. The average maximum daily temperature from 2002-2009 shown with the 7 day running average of the maximum daily water temperature in 2010. Data collected at the USGS gauge (11463980) near Diggers Bend. Please note that this gauge has not updated temperature since August 15, 2010.

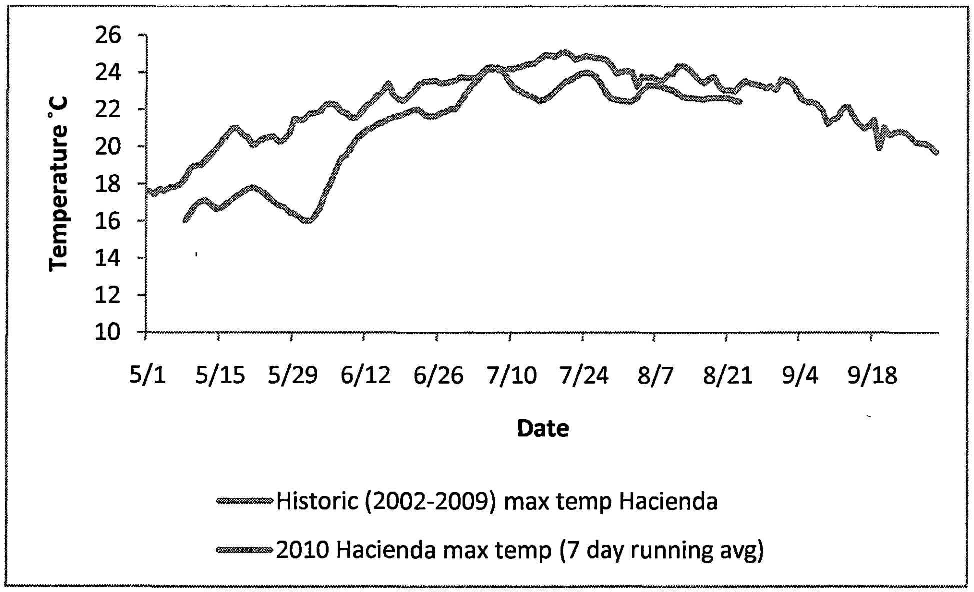

Figure 4. The average maximum daily temperature from 2002-2009 shown with the 7 day running average of the maximum daily water temperature in 2010. Data collected at the USGS gauge (1146700) near Hacienda.

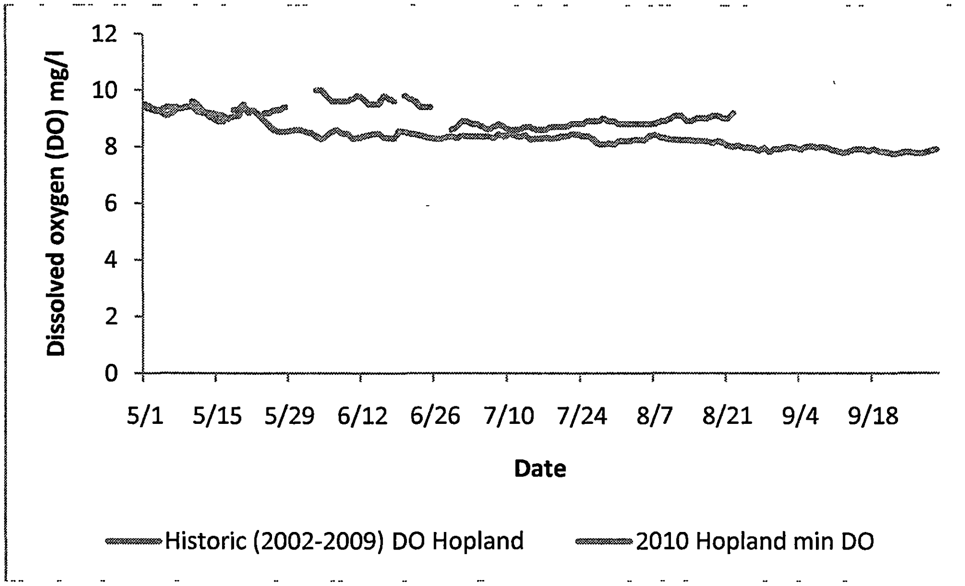

Figure 5. The average minimum daily dissolved oxygen from 2002-2009 shown with the minimum daily dissolved oxygen recorded in 2010. Data collected at the USGS gauge (11462500) near Hopland.

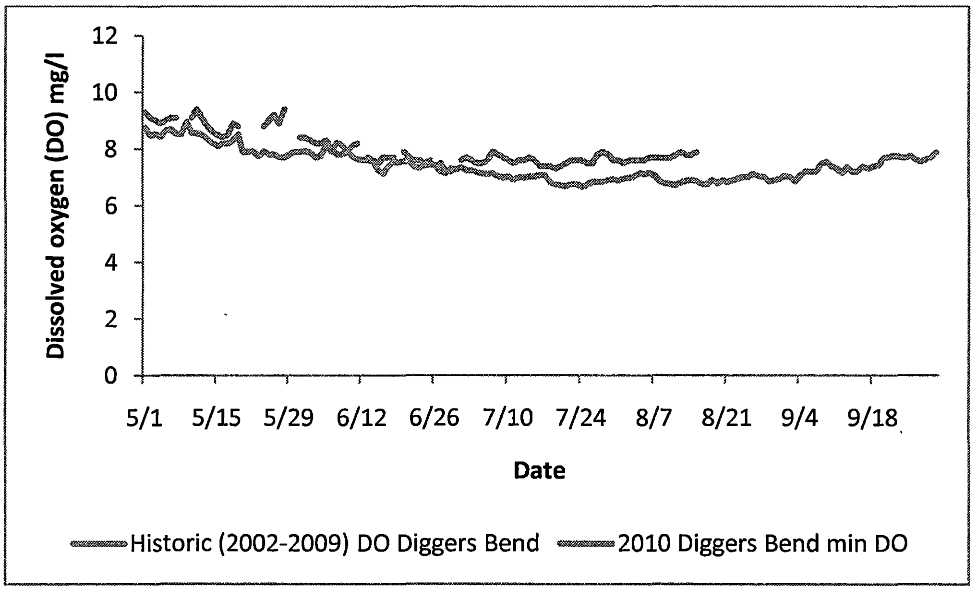

Figure 6. The average minimum daily dissolved oxygen from 2002-2009 shown with the minimum daily dissolved oxygen recorded in 2010. Data collected at the USGS gauge (11463980) near Diggers Bend. Please note that this gauge has not updated DO since August 14, 2010.

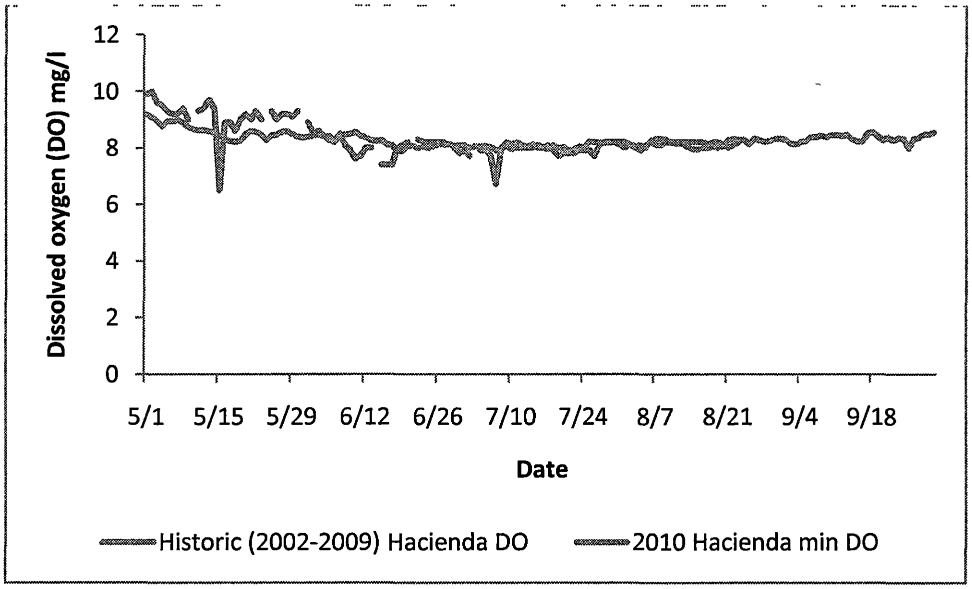

Figure 7. The average minimum daily dissolved oxygen from 2002-2009 shown with the minimum daily dissolved oxygen recorded in 2010. Data collected at the USGS gauge (114700) near Hacienda. Please note that slight dips in dissolved oxygen occurred in previous years, but may not appear in this figure as they have been averaged out over the course of the 8 year data set.

Additional Information

The USGS is conducting their second round of water quality sampling this week. All samples are being analyzed for nutrients, major ions, trace metals, total and dissolved organic carbon, and a broad suite of organic wastewater compounds. In addition, water samples collected at surface-water sites located at Russian River near Hopland, Russian River at Digger Bend near Healdsburg, Russian River near Guerneville and at Russian River at Casini Ranch will be analyzed for human-use pharmaceuticals. Final results are not expected to be released until late this year.

The Agency completed another round of estuary seining, fish diet sampling, and macro invertebrate trapping in the Russian River estuary. In total 98 steelhead, 6 Chinook, and 11 coho were captured during the August surveys. Steelhead fork length ranged from 81 mm to 235 mm with an average fork length of 130 mm (figure 8).

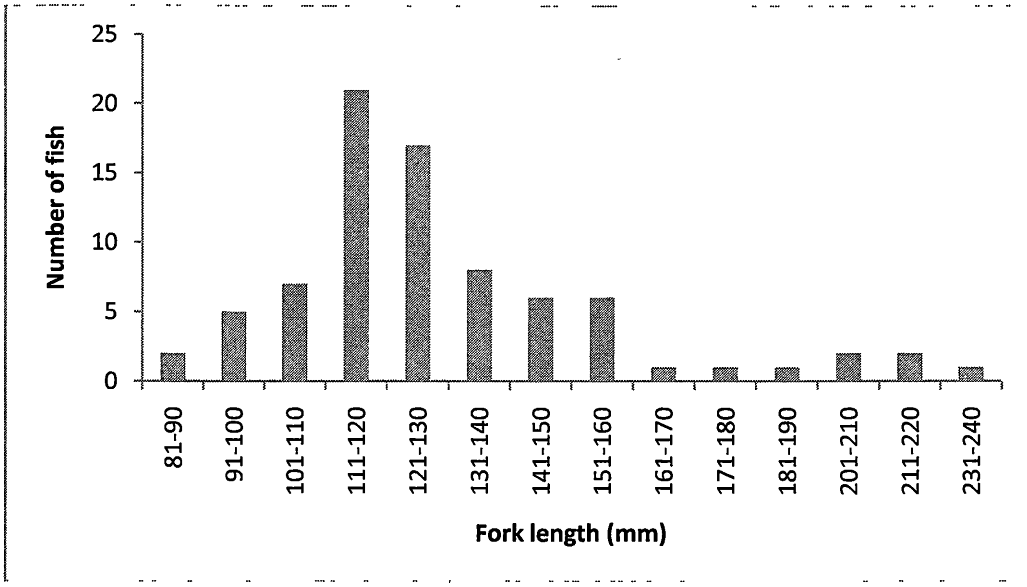

Figure 8. length frequency of steelhead captured during August 2010 estuary seining and diet surveys.

Of the steelhead captured during estuary seining and diet surveys 11 were PIT tag recaptures. The average growth rate is 1.1 mm/d for length and 0.4 g/d for weight, but the growth rate is variable. All the fish were originally PIT tagged in Austin Creek with the exception of 2 steelhead that were PIT tagged on 7/13 at Heron Rookery) (Table 2).

Table 1. PIT tagged steelhead recaptured during estuary seining. The date, location, length, and weight at first capture and at recapture are show. Also shown is the days between capture and the average daily growth rate in millimeters per day and grams per day.

Location of first capture	Date PIT applied	Length when applied	Weight when applied	Date at recapture	Location of recapture	Days between captures	Length at recapture	Weight at recapture	Growth rate in mm/d	Growth rate in g/day
Austin	6/3	63	2.6	6/10	Freezeout	7	74	5.1	1.57	0.36
Austin	5/26	62	2.6	6/15	Cassini's	20	90	NA	1.40	NA
Austin	5/27	61	2.1	6/15	Cassini's	19	90	NA	1.53	NA
Austin	6/4	64	2.6	6/15	Cassini's	11	70	NA	0.55	NA
Austin	5/26	69	3.6	7/12	Moscow Rd	47	132	35.5	1.34	0.68
Austin	6/2	63	2.4	7/13	Heron	41	113	16	1.22	0.33
Austin	6/12	65	2.8	7/13	Heron	31	101	12.1	1.16	0.30
Austin	5/26	61	2.6	8/19	Sheephouse	85	172	69.4	1.31	0.79
Austin	6/24	63	2.5	8/19	Sheephouse	56	107	13.2	0.79	0.19
Heron	7/13	86	2.5	8/19	Sheephouse	37	116	20.2	0.81	0.48
Heron	7/13	100	10.7	8/19	Heron	37	121	22.4	0.57	0.32
Average:		**69**	**3.4**					**Average:**	**1.11**	**0.43**

During the last week of June and first week of July the Agency caught 2,151 coho parr at the Austin Creek fish trap. These coho raged in size from 74 mm to 108 mm (n=71) (Figure 9). Since mid July the Agency has captured 15 RRCBP coho during estuary seining surveys. Coho ranged in size from 89 mm to 139 mm and 9.2 g to 31 g. They were detected at the river mouth, patty's bar, and at bridge haven. Temperature at the surface ranged from 17.4 to 21 deg C. The salinity at the surface ranged from 3.2-10.1 ppt depending on the site. The 139 mm coho captured at the mouth had sea lice on it (Table 3). None of these coho were PIT recaptures so when and where they were originally stocked is unknown. These coho could be small smolts that have stayed in the estuary since the spring or they could be parr that moved out of Austin Creek in the summer.

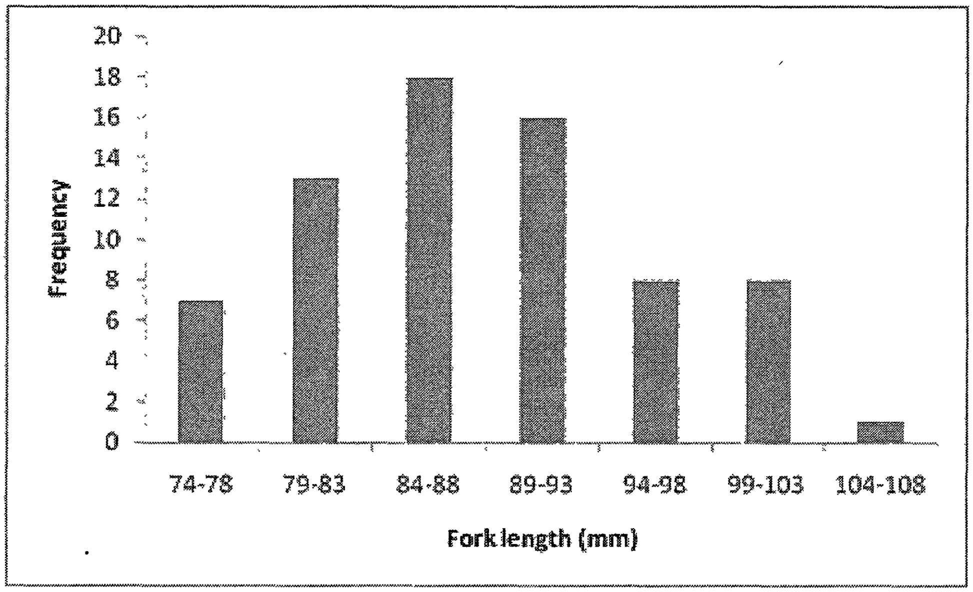

Figure 9. Length frequency (fork length in mm) of RRCBP coho parr captured at the Austin Creek fish trap between June 25, 2010 and July 8, 2010. A sample of 71 coho were measured out of the 2,151 detected at the trap during this period of time.

Table 3. RRCBP coho captured in the estuary since July 8, 2010 shown with capture location and water quality conditions (temperature and salinity) at the surface and bottom. Also show is the date of capture and the fork length in mm and weight in g of each fish.

Species	Date	location	Fork length	weight	comments	Surface temp ©	Surface salinity (ppt)	bottom temp ©	bottom salinity (ppt)
Coho	7/14/2010	River mouth	98	8.9		18.5	10.1	17.5	17
Coho	7/19/2010	Bridge Haven	97			21	3.2	15.1	29.7
Coho	7/19/2010	Bridge Haven	89	9.2		21	3.2	15.1	29.7
Coho	7/19/2010	Pattys Bar	94	9.9		20	3.3	15.2	28.5
Coho	8/17/2010	Pattys Bar	112	17.8		18.7	4.1	14.1	30.7
Coho	8/17/2010	Pattys Bar	129	27		18.7	4.1	14.1	30.7
Coho	8/17/2010	Pattys Bar	112	19.2		18.7	4.1	14.1	30.7
Coho	8/16/2010	River mouth	126	25.5		17.4	5.4	12.5	31.8
Coho	8/16/2010	River mouth	117	20.3		17.4	5.4	12.5	31.8
Coho	8/16/2010	River mouth	121	22.6		17.4	5.4	12.5	31.8
Coho	8/16/2010	River mouth	122	22		17.4	5.4	12.5	31.8
Coho	8/16/2010	River mouth	136	31.6	sea lice	17.4	5.4	12.5	31.8
Coho	8/16/2010	River mouth	118	22		17.4	5.4	12.5	31.8
Coho	8/16/2010	River mouth	116	18.9		17.4	5.4	12.5	31.8
Coho	8/16/2010	River mouth	114	18.5		17.4	5.4	12.5	31.8

If you have any questions or concerns about this update, please contact Justin Smith, Environmental Specialist, at 707-292-7673 or jpsmith@scwa.ca.gov.

Corlin Gabriel

From: Justin Smith
Sent: Thursday, August 19, 2010 6:27 PM
To: ' (dick.butler@noaa.gov)'; (amckannay; 'bcowan@waterboards.ca.gov'; 'carmor@dfg.ca.gov'; CGray@dfg.ca.gov; 'Efren Carrillo'; 'Eric Larson'; Jkassel@waterboards.ca.gov; Justin Smith; 'rfadness@waterboards.ca.gov'; rfitzgerald; Rick Rogers; 'Steve Herrera'; 'Susan Upchurch'; William Hearn
Cc: Alan Lilly; Ann DuBay; Brad Sherwood; Chris Delaney; Cory O'Donnell; David Cook; David Manning; Donald Seymour; George Lincoln; Grant Davis; Gregg Horton; Heather Bauman; Hody Wilson; Jay Jasperse; Jeff Church; Jessica Martini Lamb; Jill Golis; Jim Zambenini; Joan Hultberg; Kevin Booker; Michael Thompson; Michael Wheeler; Miguel Huerta; Nathan Baskett; Pam Jeane; Records; Renee Webber; Shawn Chase; Spencer Bader; Steve Shupe; Tim Anderson
Subject: State Board TUC Order Russian River Fisheries and Flow Update for 8-19-10
Attachments: TUC Weekly Update 8-19-10.docx; Copy of RivReport_8-11 Through8-18-2010.xls

Greetings Colleagues,

This message transmits the Sonoma County Water Agency's seventh weekly update of Fisheries Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. This weekly update includes fish trapping information gathered for the season to date and recent flow data.

Justin Smith
Environmental Specialist
Sonoma County Water Agency
(707)-292-7673

Corlin Gabriel

From: Justin Smith
Sent: Thursday, August 12, 2010 1:38 PM
To: ' (dick.butler@noaa.gov)'; (amckannay; 'bcowan@waterboards.ca.gov'; 'carmor@dfg.ca.gov'; CGray@dfg.ca.gov; 'Efren Carrillo'; 'Eric Larson'; Jkassel@waterboards.ca.gov; Justin Smith; 'rfadness@waterboards.ca.gov'; rfitzgerald; Rick Rogers; 'Steve Herrera'; 'Susan Upchurch'; William Hearn
Cc: Alan Lilly; Ann DuBay; Brad Sherwood; Chris Delaney; Cory O'Donnell; David Cook; David Manning; Donald Seymour; George Lincoln; Grant Davis; Gregg Horton; Heather Bauman; Hody Wilson; Jay Jasperse; Jeff Church; Jessica Martini Lamb; Jill Golis; Jim Zambenini; Joan Hultberg; Kevin Booker; Michael Thompson; Michael Wheeler; Miguel Huerta; Nathan Baskett; Pam Jeane; Records; Renee Webber; Shawn Chase; Spencer Bader; Steve Shupe; Tim Anderson
Subject: State Board TUC Order Russian River Fisheries and Flow Update for 8-12-10
Attachments: TUC Weekly Update 8-12-10.docx; Copy of RivReport_7-31 Through8-11-2010.xls

Greetings Colleagues,

This message transmits the Sonoma County Water Agency's sixth weekly update of Fisheries Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. This weekly update includes fish trapping information gathered for the season to date and recent flow data.

Justin Smith
Environmental Specialist
Sonoma County Water Agency
(707)-292-7673

CF/42-0.19-9 SWRCB Order Approving Temporary Urgency Change in Permits 12947A, 12949, 12950 & 16596 for 2010

Full record with attachments in DocuShare

CMr

Corlin Gabriel

From: Justin Smith
Sent: Thursday, August 05, 2010 3:53 PM
To: ' (dick.butler@noaa.gov)'; (amckannay; 'bcowan@waterboards.ca.gov'; 'carmor@dfg.ca.gov'; CGray@dfg.ca.gov; 'Efren Carrillo'; 'Eric Larson'; Jkassel@waterboards.ca.gov; Justin Smith; 'rfadness@waterboards.ca.gov'; rfitzgerald; Rick Rogers; 'Steve Herrera'; 'Susan Upchurch'; William Hearn
Cc: Alan Lilly; Ann DuBay; Brad Sherwood; Chris Delaney; Cory O'Donnell; David Cook; David Manning; Donald Seymour; George Lincoln; Grant Davis; Gregg Horton; Heather Bauman; Hody Wilson; Jay Jasperse; Jeff Church; Jessica Martini Lamb; Jill Golis; Jim Zambenini; Joan Hultberg; Kevin Booker; Michael Thompson; Michael Wheeler; Miguel Huerta; Nathan Baskett; Pam Jeane; Records; Renee Webber; Shawn Chase; Spencer Bader; Steve Shupe; Tim Anderson
Subject: State Board TUC Order Russian River Fisheries and Flow Update for 8-5-10
Attachments: TUC Weekly Update 8-5-10.docx; Copy of RivReport_7-28 Through8-4-2010.xls

Greetings Colleagues,

This message transmits the Sonoma County Water Agency's fifth weekly update of Fisheries Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. This weekly update includes fish trapping information gathered for the season to date, recent flow data, and a summary of recent sampling in the Russian River estuary.

Justin Smith
Environmental Specialist
Sonoma County Water Agency
(707)-292-7673

CF/42-0.19-9 SWRCB Order Approving Temporary Urgency Change in Permits 12947A, 12949, 12950 & 16596 for 2010

Full record with attachments in DocuShare

cnb

Corlin Gabriel

From: Justin Smith
Sent: Thursday, July 29, 2010 4:26 PM
To: ' (dick.butler@noaa.gov)'; (amckannay; 'bcowan@waterboards.ca.gov'; 'carmor@dfg.ca.gov'; CGray@dfg.ca.gov; 'Efren Carrillo'; 'Eric Larson'; Jkassel@waterboards.ca.gov; Justin Smith; 'rfadness@waterboards.ca.gov'; rfitzgerald; Rick Rogers; 'Steve Herrera'; 'Susan Upchurch'; William Hearn
Cc: Alan Lilly; Ann DuBay; Brad Sherwood; Chris Delaney; Cory O'Donnell; David Cook; David Manning; Donald Seymour; George Lincoln; Grant Davis; Gregg Horton; Heather Bauman; Hody Wilson; Jay Jasperse; Jeff Church; Jessica Martini Lamb; Jill Golis; Jim Zambenini; Joan Hultberg; Kevin Booker; Michael Thompson; Michael Wheeler; Miguel Huerta; Nathan Baskett; Pam Jeane; Records; Renee Webber; Shawn Chase; Spencer Bader; Steve Shupe; Tim Anderson
Subject: State Board TUC Order Russian River Fisheries and Flow Update for 7-29-10
Attachments: TUC Weekly Update 7-29-10.docx; Copy of RivReport_7-21 Through7-28-2010.xls

Greetings Colleagues,

This message transmits the Sonoma County Water Agency's fourth weekly update of Fisheries Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. This weekly update includes fish trapping information gathered for the season to date, recent flow data, and a summary of recent sampling in the Russian River estuary.

Justin Smith
Environmental Specialist
Sonoma County Water Agency
(707)-292-7673

Corlin Gabriel

From: Justin Smith
Sent: Thursday, July 22, 2010 6:23 PM
To: David Manning; William Hearn; (amckannay; 'Eric Larson'; ' (dick.butler@noaa.gov)'; 'rfadness@waterboards.ca.gov'; Rick Rogers; rfitzgerald; 'carmor@dfg.ca.gov'; 'bcowan@waterboards.ca.gov'; 'Efren Carrillo'; 'Susan Upchurch'; 'Steve Herrera'; 'Jkassel@waterboards.ca.gov'; 'CGray@dfg.ca.gov'
Cc: Alan Lilly; Ann DuBay; Brad Sherwood; Chris Delaney; Cory O'Donnell; Donald Seymour; George Lincoln; Grant Davis; Heather Bauman; Hody Wilson; Jay Jasperse; Jeff Church; Jessica Martini Lamb; Jill Golis; Jim Zambenini; Joan Hultberg; Kevin Booker; Michael Thompson; Pam Jeane; Records; Renee Webber; Shawn Chase; Spencer Bader; Steve Shupe; Tim Anderson; David Cook; Nathan Baskett; Gregg Horton; Shawn Chase; Michael Wheeler; Miguel Huerta
Subject: State Board TUC Order Russian River Fisheries and Flow Update for 7-22-10
Attachments: TUCP Weekly Update 7-22-10.docx; Copy of RivReport_7-14 Through7-21-2010.xls

Greetings Colleagues,

This message transmits the Sonoma County Water Agency's third weekly update of Fisheries Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. This weekly update includes fish trapping information gathered for the season to date, recent flow data, and a summary of recent sampling in the Russian River estuary.

Justin Smith
Environmental Specialist
Sonoma County Water Agency
(707)-292-7673

Corlin Gabriel

From: Justin Smith
Sent: Thursday, July 15, 2010 5:39 PM
To: David Manning; William Hearn; (amckannay; 'Eric Larson'; ' (dick.butler@noaa.gov)'; 'rfadness@waterboards.ca.gov'; Rick Rogers; rfitzgerald; 'carmor@dfg.ca.gov'; 'bcowan@waterboards.ca.gov'; 'Efren Carrillo'; 'Susan Upchurch'; 'Steve Herrera'
Cc: Alan Lilly; Ann DuBay; Brad Sherwood; Chris Delaney; Cory O'Donnell; Donald Seymour; George Lincoln; Grant Davis; Heather Bauman; Hody Wilson; Jay Jasperse; Jeff Church; Jessica Martini Lamb; Jill Golis; Jim Zambenini; Joan Hultberg; Kevin Booker; Michael Thompson; Pam Jeane; Records; Renee Webber; Shawn Chase; Spencer Bader; Steve Shupe; Tim Anderson; David Cook; Nathan Baskett; Gregg Horton; Shawn Chase; Michael Wheeler; Miguel Huerta
Subject: State Board TUC Order Russian River Fisheries and Flow Update for 7-15-10
Attachments: TUCP Weekly Update 7-15-10.docx; Copy of RivReport_7-7 Through7-14-2010.xls

Greetings Colleagues,

This message transmits the Sonoma County Water Agency's second weekly update of Fisheries Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. This weekly update includes fish trapping information gathered for the season to date, recent flow data, and a summary of recent sampling in the Russian River estuary.

Justin Smith
Environmental Specialist
Sonoma County Water Agency
(707)-292-7673

Corlin Gabriel

From: David Manning
Sent: Thursday, July 08, 2010 5:57 PM
To: William Hearn; (amckannay; 'Eric Larson'; ' (dick.butler@noaa.gov)'; 'rfadness@waterboards.ca.gov'; Rick Rogers; rfitzgerald; 'carmor@dfg.ca.gov'; 'bcowan@waterboards.ca.gov'; 'Efren Carrillo'; 'Susan Upchurch'; 'Steve Herrera'
Cc: Alan Lilly; Ann DuBay; Brad Sherwood; Chris Delaney; Cory O'Donnell; David Manning; Donald Seymour; George Lincoln; Grant Davis; Heather Bauman; Hody Wilson; Jay Jasperse; Jeff Church; Jessica Martini Lamb; Jill Golis; Jim Zambenini; Joan Hultberg; Kevin Booker; Michael Thompson; Pam Jeane; Records; Renee Webber; Shawn Chase; Spencer Bader; Steve Shupe; Tim Anderson; David Cook; Nathan Baskett; Justin Smith
Subject: State Board TUC Order Russian River Fisheries and Flow Update for 7-8-10
Attachments: TUCP Weekly Update 7-8-10.docx; Copy of RivReport_6-30 Through7-7-2010 (2).xls

Greetings Colleagues,

Hope everyone's summer is off to a good start. This message transmits the Sonoma County Water Agency's first weekly update of Fisheries Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. This first "weekly" update includes fish trapping information gathered for the season to date, recent flow data, and a summary of recent sampling in the Russian River estuary. Future weekly updates will include less detailed information but as we enter this low flow season, after a very wet spring, we thought it would be helpful to bring all up to speed on our sampling activities.

This year, a fisheries biologist on my staff, Environmental Specialist Justin Smith, will be preparing and transmitting these updates. Justin's contact info is 707-547-1995 or jpsmith@scwa.ca.gov. Please contact me or Justin if you have any questions. We look forward to working with you this season.

Many Thanks,
Dave M.

David J. Manning
Principal Environmental Specialist
Sonoma County Water Agency
404 Aviation Blvd., Santa Rosa, CA 95403
(707) 547-1988 office
(707) 975-4430 mobile
(707) 524-3782 fax
dmanning@scwa.ca.gov

Sonoma County Water Agency
State Water Resources Control Board Order WR 2010-0018-DWR
Russian River Fisheries and Water Quality Monitoring Plan
Agency Update July 8, 2010

This memorandum represents the first weekly update of Fisheries and Water Quality Monitoring Activities in compliance with State Water Resources Control Board (SWRCB) Order WR 2010-0018-DWR. On June 28, daily average flow at Hacienda Bridge dropped below 300 cfs for the first time in 2010. Due to an unusually wet spring and high tributary inflow river flows have not approached the minimum allowed by the order until recently. Currently flow at Healdsburg is slightly above 200 cfs (USGS 11464000), flow at the mouth of Dry Creek approximately 80 cfs (USGS 11465350) and flow at Hacienda is around 220 cfs (USGS 11467000). The Agency is not currently modeling Lake Mendocino storage as this has been a relatively wet year and lake storage is above average for this time of year, 103,566 acre feet on July 6, 2010. The Agency has summarized recent monitoring activities as follows:

Current Release and River Gauge Data

Table 1. Release (cfs) from Coyote Valley (USGS 1126 2000) and Warm Springs Dams (USGS 1146 5000) on the first day of the week starting on May 24, 2010.

Date	Coyote Valley Dam	Warm Springs Dam
24-May	195	240
31-May	170	242
7-Jun	173	145
14-Jun	170	104
21-Jun	170	104
28-Jun	166	104
5-Jul	170	115

Please see the following link and attached Excel spreadsheet for recent reservoir releases and daily average flow at Russian River gauges.
http://www.scwa.ca.gov/current-water-supply-levels/

Operations and Reservoir Release Changes

On July 2, 2010 an additional 20 cfs was requested by the Agency at Coyote Valley Dam. This will changed the set point to 170 cfs from 150 cfs.

The Wohler/Mirabel rubber dam was inflated in a notched configuration on June 16, 2010 to form the Wohler pool. On June 30, 2010 the notch was removed when the dam was fully inflated.

Recent Fisheries Monitoring Activities

Due to late spring rains and higher than normal stream discharge the fish traps operated by the Agency were installed later than in a typical year (Table 2). The Dry Creek fish trapping station was installed on April 20, 2010 and over 4,200 Chinook smolts have been captured to date. The Wohler/Mirabel fish trapping station was installed on May 3, 2010 and over 2,300 Chinook smolts have been captured to date (Figure 1).

This year the Agency has added three new lower river fish trapping sites Austin Creek, Dutch Bill Creek, and Green Valley Creek (operated by the UC Cooperative Extension (UCCE)) and modified the estuary fyke net (Table 2). Salmonid catch data is summarized in Figure 1.

Table 2. 2010 trap location, trap type, date the trap was installed and discharge taken from a USGS gauge near the trapping site on date of installation. Note that a pipe trap was tested for a short period of time in Austin Creek between the times that the rotary screw trap and funnel net were operated.

Trapping site	Trap type	Date installed	Discharge (cfs)
Austin Creek	Rotary screw trap, replaced with funnel net	15-Apr	332
Dutch Bill creek	Funnel net, replaced with pipe trap	20-Apr	N/A
Dry Creek	Rotary screw trap	20-Apr	201
Wohler/Mirabel	Rotary screw trap	3-May	1690
Duncans Mills (estuary)	Passive fyke net	20-May	982

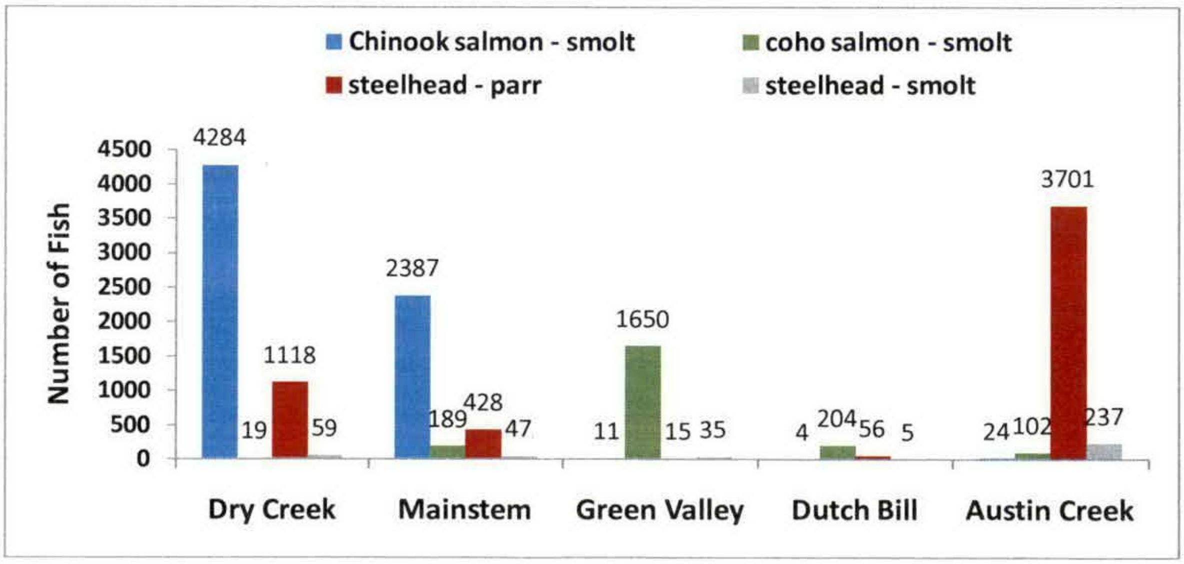

Figure 1. Total catch per species as of 6/29/10 at each of the downstream migrant traps operated by the Agency and at the Green Valley Creek trap operated by UCCE. Note all coho caught by the Agency are from the Russian River coho captive broodstock program (RRCBP).

The estuary fyke net now consists of an underwater video camera and a passive integrated transponder (PIT) antenna. Fish are no longer captured at the estuary fyke net, but instead are detected by the camera and PIT antenna as they swim through the trap. Steelhead parr are marked with PIT tags at the Wohler/Mirabel, Austin Creek, Dutch Bill Creek, and Green Valley Creek fish traps (Table 3). As of July 6, the Agency had PIT tagged 994 steelhead parr in Austin Creek. The Agency has since suspended PIT tagging efforts in Austin Creek because the Agency is only permitted to PIT tag 1000 steelhead in Austin Creek. In addition to the steelhead parr PIT tagged at the traps operated by the Agency, the UCCE marked steelhead parr captured in their Green Valley Creek trap. However, only 60 mm fork length or larger steelhead parr can be PIT tagged. Due to this restriction in conjunction with low steelhead catches the UCCE was only able to PIT tag 16 steelhead parr captured during the period the Green Valley Creek trap was operated.

Table 3. Number of steelhead parr PIT tagged at Wohler/Mirabel, Dutch Bill Creek, Austin Creek, and Green Valley Creek during the 2010 trapping season.

Trap	Steelhead parr PIT tagged
Wohler/Mirabel	84
Dutch Bill Creek	43
Austin Creek	994
Green Valley Creek	16
Total	1,137

Steelhead PIT tagged in lower river tributaries and at the Wohler/Mirabel fish traps can then be detected on downstream antennas in Austin Creek and at the fyke net. As of June 30, 2010 43 PIT tagged fish have been detected at the fyke net however a portion of those fish were Russian River coho captive broodstock program (RRCBP) PIT tagged coho. A total of 63 steelhead have been observed on the fyke net camera however only 8 of the 42 days of video have been reviewed.

Water Quality Monitoring

Upper Russian River: U.S. Geological Survey (USGS) completed phase 1 of their water quality sampling outlined in the Russian River Water Quality Monitoring Plan for the Sonoma County Water Agency 2010 Temporary Urgency Change (TUC). This survey took place between June 14 and June 18, 2010. The samples are being analyzed by laboratories operated by the USGS and results have not been received yet. For a list of constituents to be sampled during USGS water quality sampling please refer to Tables 2-4 of the Russian River Water Quality Monitoring Plan for the Sonoma County Water

Agency 2010 Temporary Urgency Change (TUC). The next sampling event is scheduled for August.

Additional Information

On July 4, the mouth of the Russian River closed for the first time in 2010. The Agency initiated a pre-outlet construction pinniped survey on July 7, 2010. The construction of the outlet channel and corresponding pinniped survey is planned for Thursday, July 8. A post construction pinniped survey will take place on July 9. The estuary camera that records images of the barrier beach and outlet channel became fully operational on June 29. The camera is recording images every half hour and will be downloaded bi-weekly.

In the estuary, monthly seining, invertebrate sampling, and fish diet sampling began on May 3. Two seining surveys have been completed that each consisted of 50 deployments of the seine. Fish diet samples were collected during the seining survey. The next round of seining and fish diet sampling is scheduled for July 12, 2010. To date 107 steelhead (4 of which were previously PIT tagged in Austin Creek), 244 Chinook smolts, and 45 RRCBP coho smolts have been captured during seining. Diet samples were collected from a subset of the captured steelhead and Chinook. Invertebrate sampling for salmonid prey items takes place the week prior to each seining event. Benthic cores, insect fall-out traps, epibenthic net pulls and epibenthic sled tows are taken at 6 sample sites. In addition vertical plankton tows are taken at the river mouth and at Cassini Ranch.

The Agency has deployed fifteen datasondes at nine stations in the estuary/lagoon and tributaries. They are recording hourly measurements of temperature, dissolved oxygen, salinity, specific conductance, and pH.

The six estuary stations were deployed the last week of April. The two tributary sondes (Willow Creek and Austin Creek) were deployed the first week of May, and the Monte Rio (lagoon station) was deployed the first week of June.

Early observations show high flows have resulted in a thicker freshwater layer than has been observed in prior years. This has also served to limit salinity intrusion within the estuary. As of Mid-June, the water column was entirely fresh water as far downstream as Heron Rookery and there was observed to be at least a 3 meter deep freshwater lens at Sheephouse Creek. Anoxic salt water intruded into the Heron Rookery hole at the 8 meter depth on June 16 and has persisted to date. However, fresh water is still being observed at the 3 meter depth and dissolved oxygen conditions remain good in the 6 to 9 mg/L range, diurnally. The water column is still entirely fresh at Freezeout Creek and dissolved oxygen levels remain good in the 6 to 9 mg/L range diurnally.

Temperatures are currently warm in the freshwater layer with little cooling occurring between the furthest upstream stations and the furthest downstream. Water temperatures were observed to increase with air temperatures as the season progressed through late spring, with a significant increase observed in the last week of May/first week of June as air temperatures rose above 26 degrees Celsius. Currently, high daily water temperatures are reaching 22 to 23 degrees Celsius in the freshwater layer at all stations, including the mouth.

Monte Rio temperatures are slightly lower than some of the estuary stations, with the highest value recorded just below 22 degrees Celsius. Dissolved oxygen remains good with lows in the 7 mg/L range. Currently hyperoxic conditions are occurring diurnally with concentrations as high as 18 mg/L.

Austin Creek temperatures are ranging from 16 to 20 degrees Celsius and dissolved oxygen is good in the 8 to 10 mg/L range, diurnally. Willow Creek temperatures range from 11 to 17 degrees Celsius and dissolved oxygen concentrations range from 8 and 12 mg/L, diurnally.

Grab sampling has been conducted once so far this season at five stations, on June 22, and will be conducted again on July 6th. The stations include the Jenner Boat Ramp, Bridgehaven below Willow Creek, Duncans Mills, Cassini Ranch, and Monte Rio below Dutch Bill Creek. Constituents analyzed include nitrogen, phosphorus, organic carbon, chlorophyll a, coliform, enterococci, and turbidity. Sampling results have not been received from the lab yet.

If you have any questions or concerns about this update please contact Environmental Specialist, Justin Smith at 707-547-1947 or jpsmith@scwa.ca.gov.

SONOMA COUNTY WATER AGENCY

FILE:CF/42-0.19-9 SWRCB ORDER APPROVING TEMPORARY URGENCY CHANGE IN PERMITS 12947A, 12949, 12950 & 16596 FOR 2010

June 28, 2010

TO: WAC AND TAC MEMBERS

RE: State Water Resources Control Board Order WR 2010-0018-DWR

On April 6, 2010, the Sonoma County Water Agency (SCWA) filed a petition with the State Water Resources Control Board (State Board) requesting approval of a Temporary Urgency Change to its water rights permits pursuant to California Water Code section 1435. The petition requested temporary modifications to the Russian River in-stream flow requirements as mandated by the Russian River Biological Opinion for the improvement of juvenile salmonid habitat. On May 24, 2010, the State Board issued Order WR 2010-0018-DWR (Order), copy enclosed, approving the Temporary Urgency Change Petition. The Order temporarily amends the SCWA's water rights permits to include 17 additional provisions. Several of these provisions will require cooperation and collaboration between the SCWA and its water contractors. These provisions include:

- Provision 11 - SCWA shall prepare a Water Conservation Status Report for SCWA's service area and other areas served by Lake Mendocino. The report shall specify the water conservation measures being implemented during May through November, 2010. The report shall be submitted to the Deputy Director by December 31, 2010;

- Provision 12 - SCWA shall provide any relevant updates to the estimated future water savings from conservation measures presented in the report submitted under Term 17 of Order WR 2009-0034-EXEC, including components of the Governor's 20x2020 Water Conservation Plan (February 2010), consisting of, but not limited to, each water contractor's gallons per capita per day calculation, water use targets and implementation plan to achieve those targets. The report shall be submitted to the Deputy Director by March 1, 2011;

- Provision 13 - SCWA shall be responsible for ensuring that all of its water contractors require their dedicated irrigation customers be assigned a water budget designed to achieve a maximum applied water allowance (MAWA) of 60 percent ETo, exceeding the State's requirements. SCWA shall report back to the Deputy Director by December 31, 2010 regarding the actual MAWA achieved by each of its contractors during May through November, 2010;

- Provision 15 – SCWA shall evaluate (1) physical conditions and integrity of its transmission system pipelines, and (2) opportunities for increased automated operational data sharing between the SCWA and its water contractors' respective systems, with the goal of reducing water loss and promoting increases in water use efficiency. SCWA shall require that each of its water contractors provide an assessment of unaccounted water associated with their distribution systems. This assessment shall include, as appropriate, any programs or projects identified by each water contractor to reduce unaccounted water and system losses. SCWA shall update the Deputy Director on the progress of these efforts By June 30, 2011; and

- Provision 16 – During the term of the Order, SCWA shall work with its contractors to conjunctively manage surface and groundwater resources within SCWA's service area. Such management should emphasize the conservation and replenishment of groundwater resources and utilization of available surface water supplies to the extent feasible. SCWA shall provide an update to the Deputy Director regarding the progress of these efforts by December 31, 2010.

A recent memorandum prepared by the SCWA's staff to the Technical Advisory Committee (TAC) specifically addresses Provisions 11, 12 and 13 and proposes that their implementation be coordinated between the SCWA's Water Conservation staff and members of the TAC and/or TAC Water Conservation Subcommittee. A copy of the memorandum is enclosed.

The SCWA is also proposing to coordinate addressing Provisions 15 and 16 through TAC members. The SCWA's staff will be contacting TAC members in the next several weeks to discuss the provisions and develop a process to meet their requirements. Close cooperation with the water contractors and a timely exchange of information is critical to meeting the intent and goals of the State Board's conditions. Please call me if you have any questions regarding the Temporary Urgency Change Petition or the Order approving it.

Sincerely,

Grant Davis
General Manager

Encs

c Don Seymour, Pam Jeane, Jay Jasperse, Steve Shupe, Jill Golis, Tim Anderson

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STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

DIVISION OF WATER RIGHTS

ORDER WR 2010–0018-DWR

IN THE MATTER OF PERMITS 12947A, 12949, 12950, AND 16596
(APPLICATIONS 12919A, 15736, 15737, 19351)

SONOMA COUNTY WATER AGENCY

SOURCES: Dry Creek and Russian River

COUNTIES: Sonoma and Mendocino Counties

ORDER APPROVING TEMPORARY URGENCY CHANGE

BY THE DEPUTY DIRECTOR FOR WATER RIGHTS:

1.0 SUBSTANCE OF PETITION

On April 6, 2010, the Sonoma County Water Agency (SCWA) filed a petition with the State Water Resources Control Board (State Water Board) requesting approval of a Temporary Urgency Change to the subject permits pursuant to California Water Code section 1435. The petition requests the following temporary modifications to the Russian River in-stream flow requirements as mandated by the Russian River Biological Opinion (Biological Opinion) for the improvement of juvenile salmonid habitat:

(1) From May 1 through October 15, 2010, in-stream flow requirements for the upper Russian River (from its confluence with the East Fork of the Russian River to its confluence with Dry Creek) be reduced from 185 cubic feet per second (cfs) to 125 cfs; and

(2) From May 1 through October 15, 2010 in-stream flow requirements for the lower Russian River (downstream of its confluence with Dry Creek) be reduced from 125 cfs to 70 cfs, with the understanding that SCWA will typically maintain approximately 85 cfs at the Hacienda gage as practicably feasible.

No changes to the in-stream flow requirements for Dry Creek are requested. The petition is made to comply with mandates in the Biological Opinion that was issued by the National Marine Fisheries Service (NMFS) on September 24, 2008.

2.0 BACKGROUND

SCWA's petition involves the following permits.

- Permit 12947A is for year-round direct diversion of 92 cubic feet per second (cfs) from the Russian River and storage of 122,500 acre-feet per annum (afa) in Lake Mendocino.

- Permit 12949 is for year-round direct diversion of 20 cfs from the Russian River at the Wohler and Mirabel Park Intakes near Forestville.

- Permit 12950 is for direct diversion of 60 cfs from the Russian River at the Wohler and Mirabel Park Intakes from April 1 through September 30 of each year.

- Permit 16596 is for year-round direct diversion of 180 cfs from the Russian River and storage of 245,000 afa in Lake Sonoma from October 1 of each year to May 1 of the succeeding year.

With the petition SCWA submitted a document prepared by its staff titled, "Sonoma County Water Agency, In-stream Flow Analysis for 2010 Temporary Urgency Change Petition" (Analysis) dated April 2010. The Analysis provides: (1) a summary of minimum in-stream flows required under Decision 1610; (2) an assessment of current water supply conditions of the Russian River System; (3) a summary of the Biological Opinion issued by National Marine Fisheries Service (NMFS) mandating SCWA to petition the State Board for temporary changes in minimum in-stream flow requirements in the Russian River; and (4) a summary of the criteria for approving a temporary urgency change petition. The Analysis indicates that, unlike the Temporary Urgency Change Petitions filed by SCWA in 2004, 2007 and 2009, which requested reductions in minimum in-stream flow requirements in response to low storage levels in Lake Mendocino, the petition being filed in 2010 is mandated by the Biological Opinion in order to benefit threatened and endangered fish species. Water supply storage in Lake Mendocino as of April 1, 2010 was approximately 83,000 acre-feet, significantly higher than in 2007 (71,406 acre-feet) and 2009 (56,666 acre-feet).

Under the federal Endangered Species Act (ESA), steelhead, coho salmon and Chinook salmon in the Russian River watershed are listed as threatened or endangered species. Coho salmon is also listed as endangered under the California Endangered Species Act (CESA). In September 2008, NMFS issued the Russian River Biological Opinion (Biological Opinion). The Biological Opinion is the culmination of more than a decade of consultation under Section 7 of the ESA among SCWA, U.S. Army Corps of Engineers (Corps), and NMFS regarding the impacts on the survival of these listed fish species of SCWA's and the Corps' water supply and flood control operations in the Russian River watershed.

Studies conducted during the consultation period that ultimately led to this Biological Opinion indicate that summer flows in the Upper Russian River and Dry Creek required by Decision 1610 are too high for optimal juvenile salmonid habitat. NMFS also concluded in the Biological Opinion that the historical practice of breaching the sandbar that builds up and frequently closes the mouth of the Russian River during the summer and fall may adversely affect the listed species. NMFS concluded in the Biological Opinion that it might be better for juvenile steelhead and salmon if the sandbar is kept closed during these times, to allow for the formation of a seasonal freshwater lagoon in the estuary. Minimum in-stream flows required by Decision 1610 result in flows into the estuary that make it difficult to maintain a freshwater lagoon while preventing flooding of adjacent properties.

Without the requested modifications to the in-stream flow requirements, the high summer time flows required by Decision 1610 will continue to jeopardize the recovery of coho salmon and steelhead in the Russian River and its tributaries.

Following is the language contained in SCWA's permits regarding minimum in-stream flow requirements:

Term 20 of SCWA's Permit 12947A states:

For the protection of fish and wildlife, and for the maintenance of recreation in the Russian River, permittee shall pass through or release from storage at Lake Mendocino sufficient water to maintain:

(A) A continuous stream flow in the East Fork Russian River from Coyote Dam to its confluence with the Russian River of 25 cfs at all times.

(B) The following minimum flows in the Russian River between the East Fork Russian River and Dry Creek:

(1) During normal water supply conditions when the combined water in storage, including dead storage, in Lake Pillsbury and Lake Mendocino on May 31 of any year exceeds 150,000 af or 90 percent of the estimated water supply storage capacity of the reservoirs, whichever is less:

From June 1 through August 31	185 cfs
From September 1 through March 31	150 cfs
From April 1 through May 31	185 cfs

(2) During normal water supply conditions and when the combined water in storage, including dead storage, in Lake Pillsbury and Lake Mendocino on May 31 of any year is between 150,000 af or 90 percent of the estimated water supply storage capacity of the reservoirs, whichever is less, and 130,000 af or 80 percent of the estimated water supply storage capacity of the reservoirs, whichever is less:

From June 1 through March 31	150 cfs
From April 1 through May 31	185 cfs
If from October 1 through December 31, storage in Lake Mendocino is less than 30,000 acre-feet	75 cfs

(3) During normal water supply conditions and when the combined water in storage, including dead storage, in Lake Pillsbury and Lake Mendocino on May 31 of any year is less than 130,000 af or 80 percent of the estimated water supply storage capacity of the reservoirs, whichever is less:

From June 1 through December 31	75 cfs
From January 1 through March 31	150 cfs
From April 1 through May 31	185 cfs

(4) During dry water supply conditions — 75 cfs

(5) During critical water supply conditions — 25 cfs

(C) The following minimum flows in the Russian River between its confluence with Dry Creek and the Pacific Ocean to the extent that such flows cannot be met by releases from storage at Lake Sonoma under Permit 16596 issued on Application 19351:

(1) During normal water supply conditions	125 cfs
(2) During dry water supply conditions	85 cfs
(3) During critical water supply conditions	35 cfs

For the purposes of the requirements in this term, the following definitions shall apply:

(1) Dry water supply conditions exist when cumulative inflow to Lake Pillsbury beginning on October 1 of each year is less than:

8,000 acre-feet as of January 1
39,200 acre-feet as of February 1
65,700 acre-feet as of March 1
114,500 acre-feet as of April 1
145,600 acre-feet as of May 1
160,000 acre-feet as of June 1

(2) Critical water supply conditions exist when cumulative inflow to Lake Pillsbury beginning on October 1 of each year is less than:

4,000 acre-feet as of January 1
20,000 acre-feet as of February 1
45,000 acre-feet as of March 1
50,000 acre-feet as of April 1
70,000 acre-feet as of May 1
75,000 acre-feet as of June 1

(3) Normal water supply conditions exist in the absence of defined dry or critical water supply conditions.

(4) The water supply condition designation for the months of July through December shall be the same as the designation for the previous June. Water supply conditions for January through June shall be predetermined monthly.

(5) Cumulative inflow to Lake Pillsbury is the calculated algebraic sum of releases from Lake Pillsbury, increases in storage in Lake Pillsbury, and evaporation from Lake Pillsbury.

(6) Estimated water supply storage space is the calculated reservoir volume below elevation 1,828.3 feet in Lake Pillsbury and below elevation 749.0 feet in Lake Mendocino. Both elevations refer to the National Geodetic Vertical Datum of 1929. The calculation shall use the most recent two reservoir volume surveys made by the U. S. Geological Survey, U. S. Army Corps of Engineers, or other responsible agency to determine the rate of sedimentation to be assumed from the date of the most recent reservoir volume survey.

Term 17 of both Permit 12949 and Permit 12950 require SCWA to allow sufficient water to bypass the points of diversion at the Wohler and Mirabel Park Intakes on the Russian River to maintain the following minimum flows to the Pacific Ocean:

(1)	During normal water supply conditions	125 cfs
(2)	During dry water supply conditions	85 cfs
(3)	During critical water supply conditions	35 cfs

Term 13 of Permit 16596 sets forth the following minimum flows for Dry Creek and the Russian River:

(A) The following minimum flows in Dry Creek between Warm Springs Dam and its confluence with the Russian River:

(1) During normal water supply conditions:

75 cfs from January 1 through April 30
80 cfs from May 1 through October 31
105 cfs from November 1 through December 30

(2) During dry or critical water supply conditions:

25 cfs from April 1 through October 31
75 cfs from November 1 through March 31

(B) The following minimum flows in the Russian River between its confluence with Dry Creek and the Pacific Ocean, unless the water level in Lake Sonoma is below elevation 292.0 feet with reference to the National Geodetic Vertical Datum of 1929, or unless prohibited by the United States Government:

(1)	During normal water supply conditions	125 cfs
(2)	During dry water supply conditions	85 cfs
(3)	During critical water supply conditions	35 cfs

Note: Permits 12949, 12950, and 16596 use the same water-year classification definitions as those listed in Permit 12947A. The water year classifications (Normal, Dry or Critical) were established in State Water Board Decision 1610 (D1610) and are based on cumulative inflow into Lake Pillsbury beginning October 1.

3.0 COMPLIANCE WITH CALIFORNIA ENVIRONMENTAL QUALITY ACT

SCWA has determined that the change qualifies for an exemption under the California Environmental Quality Act (CEQA). SCWA found that the change meets the Class 1, 6, 7, and 8 exemption criteria. The State Water Board has reviewed the information submitted by the SCWA and has made its own independent finding that the petition qualifies for an exemption under CEQA. A Class 7 exemption "consists of actions taken by regulatory agencies as authorized by state law or local ordinance to assure the maintenance, restoration, or enhancement of a natural resource where the regulatory process involves procedures for protection of the environment." (Cal. Code Regs, tit. 14, § 15307.) The proposed action will assure the maintenance of a natural resource, i.e., the in-stream resources of the Russian River, by increasing available salmonid rearing habitat in the upper Russian River and providing a lower, closer to natural inflow to the estuary between late spring and early fall, thereby enhancing the potential for maintaining a seasonal freshwater lagoon that could support increased production of juvenile steelhead. A Class 8 exemption "consists of actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment." (*Id.*, § 15308.) The proposed action will assure the maintenance of the environment in the same way as stated for the Class 7 exemption. According to NMFS, the proposed action is necessary to avoid jeopardizing the continued existence of coho salmon, listed as an endangered species under the ESA and CESA, and steelhead, listed as a threatened species under the ESA. The proposed action also will conserve water in Lake Mendocino to benefit adult Chinook salmon migrating upstream in the fall.

The proposed action consists of the operation of existing facilities involving negligible or no expansion of use beyond that existing and accordingly is categorically exempt from CEQA under a Class 1 exemption, which specifically includes maintenance of streamflows to protect fish and wildlife resources. (*Id.*, § 15301, subd. (i).) The proposed action still will be within the existing operational parameters established by Decision 1610. The proposed action does not request and will not expand SCWA use or increase the water supply available to SCWA for consumptive purposes.

In addition, a Class 6 exemption "consists of basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource. These [activities] may be . . . part of a study leading to an action which a public agency has not yet approved, adopted or funded." (*Id.*, § 15306.) The water quality and fishery information and data collected during the period that the proposed action is in effect will assist with the study and development of future permanent changes in the Decision 1610 in-stream flow requirements required by the NMFS, for which a separate petition is pending.

4.0 PUBLIC NOTICE OF THE PETITION

The State Water Board will issue and deliver to SCWA as soon as practicable, a notice of the temporary urgency change order pursuant to Water Code section 1438, subdivision (a). Pursuant to Water Code section 1438, subdivision (b)(1), SCWA is required to publish the notice in a newspaper having a general circulation, and that is published within the counties where the points of diversion lie. The State Water Board will also send a mailing list of known interested parties who have requested notice of proposed temporary urgency changes to SCWA, and SCWA will send copies of the notice to those interested parties via first class mail. The State Water Board will post on its website the notice of the temporary urgency change and a copy of the petition for temporary urgency change (and accompanying materials).

5.0 CRITERIA FOR APPROVING THE PROPOSED TEMPORARY URGENCY CHANGE

Water Code section 1435 provides that a permittee or licensee who has an urgent need to change the point of diversion, place of use, or purpose of use from that specified in the permit or license may petition for a conditional temporary change. The State Water Board's regulations set forth the filing and other procedural requirements applicable to petitions for temporary urgency changes. (Cal. Code Regs., tit. 23, §§ 805, 806.) The Board's regulations also clarify that a petition for a temporary urgency change in a permit or license other than a change in point of diversion, place of use, or purpose of use may be filed, subject to the same filing and procedural requirements that apply to changes in point of diversion, place of use, or purpose of use. (*Id.*, § 791, subd. (e).)

Before approving a temporary urgency change, the State Water Board must make the following findings:

1. the permittee or licensee has an urgent need to make the proposed change;
2. the proposed change may be made without injury to any other lawful user of water;
3. the proposed change may be made without unreasonable effect upon fish, wildlife, or other in-stream beneficial uses; and
4. the proposed change is in the public interest.

(Wat. Code, § 1435, subd. (b)(1-4).)

5.1 Urgency of the Proposed Change

Under Water Code section 1435, subdivision (c), an "urgent need" means "the existence of circumstances from which the board may in its judgment conclude that the proposed temporary change is necessary to further the constitutional policy that the water resources of the state be put to beneficial use to the fullest extent of which they are capable and that waste of water be prevented . . . ." However, the State Water Board shall not find the need urgent if it concludes that the petitioner has failed to exercise due diligence in petitioning for a change pursuant to other appropriate provisions of the Water Code.

Decision 1610 set in-stream flows that the State Water Board concluded, in 1986, would benefit both fishery and recreation uses and which would "preserve the fishery and recreation in the river and in Lake Mendocino to the greatest extent possible while serving the needs of the agricultural, municipal, domestic, and industrial uses which are dependent upon the water." (Decision 1610 at p. 21.) The State

Water Board also concluded in Decision 1610 that additional fishery studies should be done. (Decision 1610 at pp. 26-27.)

It no longer appears that the flows set by Decision 1610 continue to benefit both fishery and recreation uses. On September 24, 2008, NMFS issued its Biological Opinion, which evaluated the effects of the activities of SCWA and the Corps on three salmonid species listed as threatened or endangered under the federal Endangered Species Act. The Biological Opinion concluded that summertime flows in the Russian River, at the levels required by Decision 1610, were higher than optimal for the listed species. The Biological Opinion contained an extensive analysis of the impacts of existing in-stream flows on listed species. The Biological Opinion required SCWA to file a petition with the State Water Board to improve conditions for listed species by seeking permanent reductions in the minimum Russian River in-stream flow requirements contained in SCWA's existing water rights permits. The Biological Opinion also contains the following requirement:

> To help restore freshwater habitats for listed salmon and steelhead in the Russian River estuary, SCWA will pursue interim relief from D1610 minimum flow requirements by petitioning the SWRCB for changes to D1610 beginning in 2010 and for each year prior to the permanent change to D1610. These petitions will request that minimum bypass flows of 70 cfs be implemented at the USGS gage at the Hacienda Bridge between May 1 and October 15, with the understanding that for compliance purposes SCWA will typically maintain about 85 cfs at the Hacienda gage. For purposes of enhancing steelhead rearing habitats between the East Branch and Hopland, these petitions will request a minimum bypass flow of 125 cfs at the Healdsburg gage between May 1 and October 15. NMFS will support SCWA's petitions for these changes to D1610 in presentations before the SWRCB.

One of the species listed under the federal ESA (coho salmon) is also listed under CESA. The California Department of Fish and Game (DFG) has issued a consistency determination in which it determined that the incidental take statement issued to SCWA by NMFS in connection with the Biological Opinion was consistent with the provisions and requirements of CESA.

In this case, an "urgent need" for the proposed changes exist within the meaning of section 1435, subdivision (c). The proposed temporary changes are "necessary to further the constitutional policy that the water resources of the state be put to beneficial use to the fullest extent of which they are capable and that waste of water be prevented" within the meaning of section 1435, subdivision (c). As described in the Biological Opinion, the changes will improve habitat for the listed species by reducing in-stream flow and increasing storage for later fishery use, without unreasonably impairing other beneficial uses, thus maximizing the use of Russian River water resources. Moreover, given the listings of Chinook salmon, coho salmon, and steelhead under the federal ESA, there is a need for prompt action. In this case, there has been an extensive analysis of the needs of the fishery, fishery experts agree that in-stream flows appear to be too high, and the change will not affect the ability of SCWA to deliver water for approved beneficial uses in its service area.

5.2 No Injury to Any Other Lawful User of Water

Under this Order, SCWA still will be required to maintain specific flows in the Russian River from its most upstream point of diversion to the river's confluence with the ocean. Therefore, it is anticipated that all SCWA water contractors and other legal users of water will receive the water to which they are entitled during the reduced flows specified in this Order.

5.3 No Unreasonable Effect upon Fish, Wildlife, or Other Instream Beneficial Uses

This Order is based upon the analysis contained in the 2008 Biological Opinion, which has as its primary purpose improving conditions for the fishery resources. Improved conditions that result from this Order will be twofold First, the evidence in the Biological Opinion indicates that the streamflows required by Decision 1610 would be too high for optimum fishery habitat in both the river and in the estuary. Under this Order, these requirements will be reduced. Second, lowering in-stream flows will result in increased storage in Lake Mendocino. Although flows downstream from Coyote Valley Dam will be decreased upon approval of SCWA's petition, conservation of water in Lake Mendocino will allow enhanced management of the flows in early fall for the benefit of fish migration.

It is possible that reduced flows in the Russian River may impair some in-stream beneficial uses, principally recreation use. However, since 2004, Russian River flows have frequently been managed at decreased levels, both under Decision 1610 and under temporary urgency change orders. Notwithstanding lower flows, Russian River recreation has continued. Accordingly, although recreation uses may be affected, given the analysis in the Biological Opinion and the potential impacts to fisheries that could occur if the petition were not approved, any impact on recreation for this summer is reasonable under the circumstances.

5.4 The Proposed Change is in the Public Interest

As discussed above, the sole purpose of this Order is to improve conditions for listed Russian River salmonid species, as determined necessary by the NMFS and DFG. Approval of SCWA's petition to reduce in-stream flows to benefit the fishery will also maintain storage levels in Lake Mendocino for a longer period of time so that the water is available in the fall for fishery purposes. Given these circumstances, it is in the public interest to temporarily change in-stream flows for this beneficial use.

6.0 CONCLUSIONS

The State Water Board has adequate information in its files to make the evaluation required by Water Code section 1435.

I conclude that, based on the available evidence:

1. The permittee has an urgent need to make the proposed change;
2. The petitioned change will not operate to the injury of any other lawful user of water;
3. The petitioned change will not have an unreasonable effect upon fish, wildlife, or other in-stream beneficial uses; and
4. The petitioned change is in the public interest.

ORDER

NOW, THEREFORE, IT IS ORDERED THAT: the petition filed by Sonoma County Water Agency for temporary change in Permits 12947A, 12949, 12950, and 16596 is approved, in part.

All existing terms and conditions of the subject permits remain in effect, except as temporarily amended by the following provisions:

1. From May 25 until October 15, 2010, minimum flows in the Russian River, as specified in Term 20 of Permit 12947A, Term 17 of Permits 12949 and 12950, and Term 13 of Permit 16596, shall be modified as follows:

   - Minimum in-stream flow in the Russian River from its confluence with the East Fork of the Russian River to its confluence with Dry Creek shall be 125 cfs; and

   - Minimum in-stream flow in the Russian River from its confluence with Dry Creek to the Pacific Ocean shall be 70 cfs as measured at the U.S. Geological Survey (USGS) gage located at Hacienda Bridge, with the understanding that SCWA will typically maintain approximately 85 cfs at the gage as practicably feasible.

   For purposes of compliance with this term, minimum in-stream flow requirements shall be met on an instantaneous flow basis.

2. SCWA shall monitor and record daily numbers of adult Chinook salmon moving upstream past the Mirabel inflatable dam beginning no later than September 1, 2010, and continuing through at least November 15, 2010.

3. If adult Chinook salmon can enter the Russian River estuary, SCWA shall monitor numbers of adult Chinook salmon in representative deep pools in the lower Russian River downstream of the Mirabel inflatable dam on a weekly basis beginning September 15, 2010, and ending when 200 fish have passed Mirabel Dam, or sustained flows in the Russian River at Hacienda Bridge are greater than 125 cfs, or November 15, 2010, whichever is earlier.

4. SCWA shall monitor numbers of adult Chinook salmon at known spawning sites and in representative deep pools in the upper Russian River (Lake Mendocino to Healdsburg) on a weekly basis after the number of adult Chinook salmon counted at Mirabel Dam exceeds 200 fish. Weekly surveys will continue until November 15, 2010.

5. SCWA shall monitor juvenile salmonids and other native fishes by snorkel survey at six sites in the upper main stem Russian River (upstream of Mirabel) during August 2010. Snorkel survey sites will correspond to those locations monitored by SCWA in 2009.

6. SCWA shall monitor downstream movement of juvenile salmonids in Dry Creek, the main stem Russian River at Wohler, and at the upstream end of the Russian River estuary (when river conditions permit safe monitoring) through at least June 15, 2010 as more fully described in the Biological Opinion.

7. SCWA shall consult with NMFS and DFG on a weekly basis regarding the fisheries monitoring activities specified in Terms 2 through 6 of this Order. Any necessary revisions to Terms 2 through 6 shall be made upon approval by the State Water Board's Deputy Director for Water Rights (Deputy Director). Reporting of fisheries monitoring tasks described in Terms 2 through 6 shall be submitted to the Deputy Director by April 1, 2011 in accordance with NMFS and DFG annual reporting requirements as more fully described in the Biological Opinion.

8. SCWA shall prepare a Water Quality Monitoring Plan (Monitoring Plan) for the Russian River in consultation with: (1) the North Coast Regional Water Quality Control Board; (2) the United States Geological Survey; (3) NMFS; and (4) the Division of Water Rights. The objectives of the Monitoring Plan should be to provide information to evaluate potential changes to water quality and availability of aquatic habitat for salmonids resulting from the proposed permanent changes

to Decision 1610 minimum in-stream flows that are mandated by the Biological Opinion. Furthermore, the Monitoring Plan should build upon previous water quality studies that have been conducted in the Russian River and the estuary water quality monitoring required by the Biological Opinion, and provide information to support the development of a CEQA document required for permanent changes to Decision 1610. The Monitoring Plan shall be submitted to the Deputy Director for approval within 28 days of the date of this Order. SCWA shall implement the Monitoring Plan immediately upon approval by the Deputy Director.

9. This Order does not authorize any act that results in the taking of a threatened or endangered species, or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the federal Endangered Species Act (16 U.S.C.A. sections 1531 to 1544). If a "take" will result from any act authorized under this Order, the permittee shall obtain authorization for an incidental take permit prior to construction or operation. Permittee shall be responsible for meeting all requirements of the applicable Endangered Species Act for the temporary urgency change authorized under this Order.

10. The State Water Board reserves jurisdiction to supervise the temporary urgency change under this Order, and to coordinate or modify terms and conditions, for the protection of vested rights, fish, wildlife, in-stream beneficial uses and the public interest as future conditions may warrant.

11. SCWA shall prepare a Water Conservation Status Report for SCWA's service area and other areas served by Lake Mendocino. The report shall specify the water conservation measures being implemented during May through November, 2010. The report shall be submitted to the Deputy Director by December 31, 2010.

12. SCWA shall provide any relevant updates to the estimated future water savings from conservation measures presented in the report submitted under Term 17 of Order WR 2009-0034-EXEC, including components of the Governor's 20x2020 Water Conservation Plan (February 2010), consisting of, but not limited to, each water contractor's gallons per capita per day calculation, water use targets and implementation plan to achieve those targets. The report shall be submitted to the Deputy Director by March 1, 2011.

13. SCWA shall be responsible for ensuring that all of its water contractors require their dedicated irrigation customers be assigned a water budget designed to achieve a maximum applied water allowance (MAWA) of 60 percent ETo, exceeding the State's requirements. SCWA shall report back the Deputy Director by December 31, 2010 regarding the actual MAWA achieved by each of its contractors during May through November, 2010.

14. SCWA shall work with agricultural Russian River water users to pursue opportunities that will result in improved management of the Russian River by better anticipating periods of high water demand. SCWA shall provide an update to the Deputy Director regarding the progress of these efforts by December 31, 2010.

15. SCWA shall evaluate (1) physical conditions and integrity of its transmission system pipelines, and (2) opportunities for increased automated operational data sharing between the SCWA and its water contractors' respective systems, with the goal of reducing water loss and promoting increases in water use efficiency. SCWA shall require that each of its water contractors provide an assessment of unaccounted water associated with their distribution systems. This assessment shall include, as appropriate, any programs or projects identified by each water contractor to reduce unaccounted water and system losses. SCWA shall update the Deputy Director on the progress of these efforts by June 30, 2011.

16. During the term of the Order, SCWA shall work with its contractors to conjunctively manage surface and groundwater resources within SCWA's service area. Such management should emphasize the conservation and replenishment of groundwater resources and utilization of available surface water supplies to the extent feasible. SCWA shall provide an update to the Deputy Director regarding the progress of these efforts by December 31, 2010.

17. SCWA shall provide an update to the Deputy Director regarding the progress of the Santa Rosa Plain Groundwater Management Planning Program by December 31, 2010. The update shall include any progress being made towards implementation of groundwater recharge in the Santa Rosa basin.

STATE WATER RESOURCES CONTROL BOARD

James W. Kassel

for *Victoria A. Whitney*
Deputy Director for Water Rights

Dated: **MAY 24 2010**

SONOMA COUNTY WATER AGENCY

MEMORANDUM

Date: June 7, 2010

To: Technical Advisory Committee
TAC Water Conservation Subcommittee

From: Diane Lesko, SCWA Program Specialist

RE: SWRCB Order WR 2010-0018-DWR – Terms 11, 12 and 13

On May 24, 2010, Victoria A. Whitney, Deputy Director for Water Rights, California State Water Resources Control Board issued Order WR 2010-0018-DWR. This Order includes 17 terms, the following three which will require coordination between Agency water conservation staff and members of the TAC and/or TAC Water Conservation Subcommittee:

Term 11: SCWA shall prepare a Water Conservation Status Report for SCWA's service area and other areas served by Lake Mendocino. The report shall specify the water conservation measures being implemented during May through November, 2010. The report shall be submitted to the Deputy Director by December 31, 2010.

Term 12: SCWA shall provide any relevant updates to the estimated future water savings from conservation measures presented in the report submitted under Term 17 of Order WR 2009-0034-EXEC, including components of the Governor's 20x2020 Water Conservation Plan (February 2010), consisting of, but not limited to, each water contractor's gallons per capita per day calculation, water use targets and implementation plan to achieve those targets. The report shall be submitted to the Deputy Director by March 1, 2011.

Term 13: SCWA shall be responsible for ensuring that all of its water contractors require their dedicated irrigation customers be assigned a water budget designed to achieve a maximum applied water allowance (MAWA) of 60 percent ETo, exceeding the State's requirements. SCWA shall report back to the Deputy Director by December 31, 2010 regarding the actual MAWA achieved by each of its contractors during May through November, 2010.

I will be preparing a timeline for gathering the data and completing the requirements of these terms and will supply that information to you no later than Friday, June 18, 2010. Terms 11 and 12 will become more crucial later in the summer. However, Term 13 does require immediate action on your part. <u>Water contractors need to notify their dedicated irrigation accounts about this new requirement as soon as possible</u>.

I will need to receive the following information from you in order to respond to Term 13:

- How and when your dedicated irrigation customers were notified of the reduced water budget
- Actual MAWA achieved by these customers over the period of the Order (May – November, 2010)

I am happy to assist you in any way and hope to continue our collaborative efforts in responding to the SWRCB.

SONOMA
COUNTY
WATER
AGENCY

FILE:CF/42-0.19-9SWRCB ORDER APPROVING TEMPORARY URGENCY CHANGE IN PERMITS 12947A, 12949, 12950& 16596 (2010)

June 21, 2010

Ms. Victoria A. Whitney
Deputy Director for Water Rights
State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

RE: Water Quality Monitoring Plan as Required by Water Rights Order 2010-0018-DWR

Dear Ms. Whitney:

Enclosed please find a Water Quality Monitoring Plan (Plan) for the Russian River and Lake Mendocino. The Plan is submitted as meeting the requirements of the State Water Resources Control Board Division of Water Rights Order WR 2010-0018-DWR, Provisions 8. This plan was developed by the Sonoma County Water Agency (Agency) in consultation with the North Coast Regional Water Quality Control Board (NCRWQCB), United States Geological Survey (USGS), NOAA National Marine Fishery Service (NMFS), the California Department of Fish and Game (DFG), the Sonoma County Environmental Health Department (DEH) and the State Water Resources Control Board Division of Water Rights (Division). The review of comments received and consultation with all parties noted above has resulted in this water quality sampling and monitoring plan.

If you have any questions or comments, please do not hesitate to contact me directly.

Sincerely,

Don Seymour

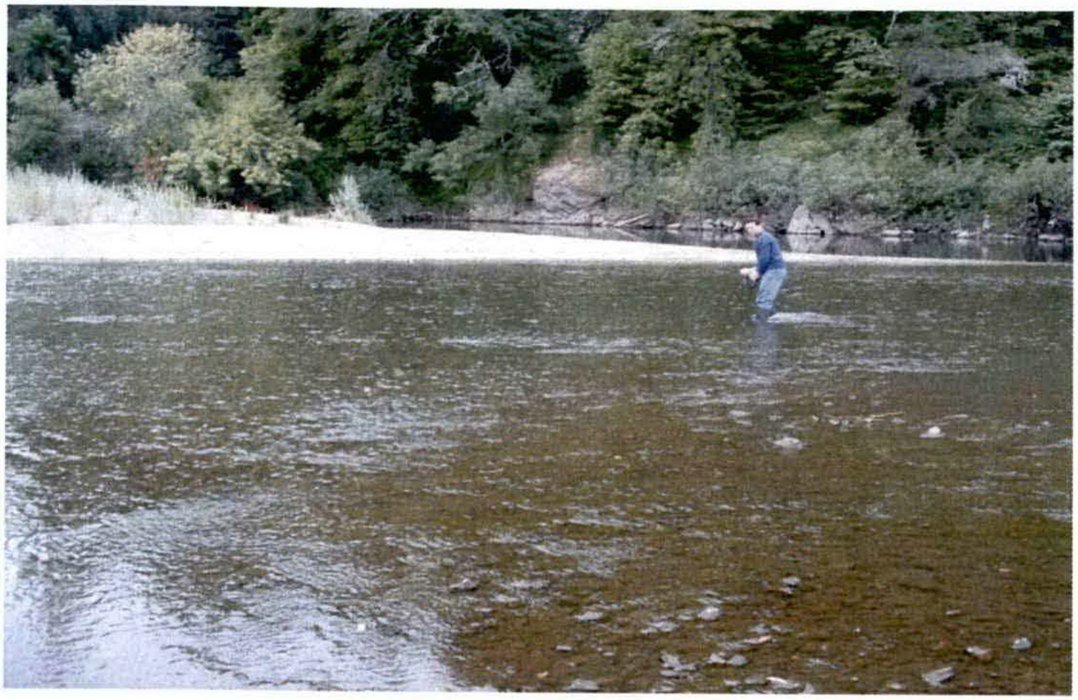
Donald J. Seymour, P.E.
Water Agency Principal Engineer

Enclosure: Water Quality Monitoring Plan

c Pamela Jeane, Jessica Martini-Lamb, Jeff Church, George Lincoln
Aaron Miller, State Water Resources Control Board, Division of Water Rights
Catherine Kuhlman, North Coast Regional Water Quality Control Board
Walt Kruse, Sonoma County Department of Health Services
Alan Lilly, Bartkiewicz, Kronick & Shanahan

RW\\fileserver\Data\CL\pinks\week 06-21-10\2010 WQ Final Trans.doc

Russian River Water Quality Monitoring Plan for the Sonoma County Water Agency 2010 Temporary Urgency Change (TUC)



Prepared by

Sonoma County Water Agency
404 Aviation Boulevard
Santa Rosa, CA 95403-9019

June 2010

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1.0 INTRODUCTION

The Sonoma County Water Agency (SCWA) petitioned the State Water Resources Control Board (State Board) to reduce minimum in-stream flows in the Russian River as required by the National Marine Fisheries Service's (NMFS) *Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed* (Russian River Biological Opinion, NMFS 2008). NMFS' Russian River Biological Opinion concluded that summer minimum in-stream flows required by the State Board's Decision 1610 in the upper Russian River and Dry Creek are too high for optimal juvenile steelhead habitat. NMFS also determined that the conversion of the tidally-influenced Russian River estuary into a closed freshwater lagoon during the summer months would provide improved habitat for rearing juvenile steelhead. Prior to the State Board approving the petition to permanently change minimum in-stream flows, the SCWA must undertake an environmental review, in accordance with the California Environmental Quality Act (CEQA), to assess potential impacts that could occur as a result of changed flows. As such, this monitoring plan will focus on water quality sampling and monitoring that would provide the data necessary to analyze potential impacts under CEQA.

2.0 BACKGROUND

Under the federal Endangered Species Act (ESA), steelhead, coho salmon and Chinook salmon in the Russian River watershed are listed as threatened or endangered species. Coho salmon is also listed as endangered under the California Endangered Species Act (CESA). In September 2008, NMFS issued the Russian River Biological Opinion (Biological Opinion), a culmination of more than a decade of consultation under Section 7 of the ESA among SCWA, U.S. Army Corps of Engineers (Corps), and NMFS regarding the impacts of SCWA's and Corps' water supply and flood control operations in the Russian River watershed on the survival of these listed fish species. The California Department of Fish and Game (CDFG) issued a consistency determination on November 9, 2009, finding that the Biological Opinion was consistent with the requirements of the CESA and adopting the measures identified in the Biological Opinion.

Studies conducted during the consultation period that ultimately led to the Biological Opinion indicate that summer flows required by Decision 1610 in the upper Russian River and Dry Creek are too high for optimal juvenile salmonid habitat. NMFS also concluded in the Biological Opinion that the historical practice of breaching the sandbar that builds up and frequently closes the mouth of the Russian River during the summer and fall may adversely affect the listed species. NMFS concluded in the Biological Opinion that it might be better for juvenile steelhead and salmon if the sandbar is kept closed during these times, to allow for the formation of a seasonal freshwater lagoon in the Russian River estuary. Minimum in-stream flows required by Decision 1610 result in flows into the estuary that make it difficult to maintain a freshwater lagoon while preventing flooding of adjacent properties.

Without the requested modifications to the in-stream flow requirements, the high summer time flows required by Decision 1610 will continue to jeopardize the recovery of coho salmon and steelhead in the Russian River and its tributaries.

Changing minimum in-stream flows will assure the maintenance of a natural resource, i.e., the in-stream resources of the Russian River, by increasing available salmonid rearing habitat in the upper Russian River and Dry Creek, and providing a lower, closer to natural inflow to the estuary between late spring and early fall, thereby enhancing the potential for maintaining a seasonal freshwater lagoon that could support increased production of juvenile steelhead.

3.0 OBJECTIVES

Objective of this sampling and analysis plan: Supplement existing data to provide a more complete basis for analyzing spatial and temporal water quality trends due to Biological Opinion-stipulated changes in river flow and estuary management.

4.0 PURPOSE AND NEED

One of the conditions in the order for the TUC petition states that SCWA prepare this Water Quality Monitoring Plan (Monitoring Plan) for the Russian River in consultation with: (1) the North Coast Regional Water Quality Control Board (NCRWQCB); (2) the United States Geological Survey (USGS); (3) NMFS; and (4) the Division of Water Rights (DWR). The purpose of the Monitoring Plan is to provide information to evaluate potential changes to water quality and availability of habitat for aquatic resources resulting from the proposed permanent changes to Decision 1610 minimum in-stream flows that are mandated by the Biological Opinion. Furthermore, the Monitoring Plan will build upon previous water quality studies that have been conducted in the Russian River and the estuary, and provide information to support the development of future CEQA documents required for permanent changes to Decision 1610 and changes in estuary management.

CEQA requires a Lead Agency to disclose to decision makers and the public the potential direct and indirect significant effects on the environment that may result from a proposed project and to identify ways to avoid or minimize potentially significant effects. A significant effect on the environment "means a substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance" (CEQA Guidelines Section 15382) that is "based to the extent possible on scientific and factual data" (CEQA Guidelines Section 15064). The "threshold of significance" or criteria that may be used to determine whether an effect is significant can be "a quantitative or qualitative standard, or set of criteria, pursuant to which the significance of a given environmental effect may be determined."[1]

The effort described in this monitoring plan is intended to support the SCWA's future CEQA compliance documents to disclose the potentially significant environmental effects of proposed changes to minimum instream flows and estuary management by utilizing available existing water quality data and building upon these data. Depending upon the environmental setting, the existing health or ecologic standards established for particular constituents, and the available data, evaluations of significance may be quantitative or qualitative.

Monitoring will be conducted to track potential changes to water quality associated with reduced flows in the mainstem Russian River and extended closure of the estuary during the dry season to form a summer lagoon at the mouth of the river. Mainstem and estuary monitoring will include continuous hourly monitoring of temperature, dissolved oxygen, pH, and specific conductance at several stations stretching from Ukiah to Jenner. In addition, the estuary will be monitored hourly to observe salinity concentration and stratification in the water column; as well as up and downstream migration of the salt water layer associated with tidal exchange, periods of lower instream flows, and extended sandbar closures. Water samples will also be collected and analyzed for several constituents by USGS and SCWA staff.

Regarding water quality monitoring to support the SCWA's CEQA compliance efforts, the following preliminary questions help explain the objective of the monitoring plan:

- What are the background levels of nutrients and pathogens under the current minimum in-stream flow levels? How do these background levels respond to changes in in-stream flow, considering other contributing factors?
- Does water temperature and dissolved oxygen respond to changes in minimum in-stream flows?

[1] Governor's Office of Planning and Research, Thresholds of Significance: Criteria for Defining Environmental Significance, CEQA Technical Advice Series, September 1994.

- Are there secondary biological effects related to changes in water quality related to in-stream flow changes (e.g. stress to fish, plants, invertebrates) and if so, what are they? Effects to public health/recreation?
- What are the background levels of nutrients and pathogens in the Estuary? How do the levels respond to managing the estuary as a closed summer lagoon, considering other contributing factors?
- Do water temperature, dissolved oxygen, and salinity respond to managing the estuary as a closed summer lagoon?
- Are there secondary biological effects related to changes in water quality as a result of managing the estuary as a closed summer lagoon (e.g. stress to fish, plants, invertebrates) and if so, what are they? Effects to public health/recreation?

5.0 SAMPLING AND ANALYSIS PLAN

5.1 Mainstem Russian River Study (USGS)

USGS will conduct the mainstem Russian River sampling effort. The effort will be conducted in two phases during 2010. Phase 1 will include one sampling event in late spring (week of June 14). Phase 2 will include two sampling events; summer and early fall (tentatively August and October). Table 1 contains a complete list of the eleven surface-water sites and four groundwater sites to be sampled during 2010. The surface water and groundwater sample locations are shown in Figures 1 and 2, respectively. To provide a consistent database, water samples will be collected from previously-sampled sites located along the Russian River between the city of Ukiah and the vicinity of the estuary near the town of Duncans Mills. These sites include reaches of the Russian River that have extensive recreational use.

The Russian River surface-water sites, in downstream order, include: Russian River near Hopland (site 2, USGS 11462500), located downstream from Lake Mendocino; Russian River near Cloverdale (site 3, USGS 11463000), located within the agricultural area of the Alexander Valley; Russian River at Digger Bend near Healdsburg (site 4, USGS 11463980), located within the city of Healdsburg and upstream from any hydrologic influence from Healdsburg Veterans Memorial beach; Russian River at Riverfront Park (site 6, USGS 383132122514901), located downstream from the confluence with Dry Creek and four to five miles from the city of Healdsburg's wastewater treatment plant; Russian River at Wohler Bridge (site 7, USGS 11465400), located within the SCWA's water supply facility; Russian River at Steelhead Beach (site 8, USGS 3829591225356010) located near the SCWA's water supply facility and downstream from the confluence with Mark West Creek; Russian River near

Guerneville (site 9, USGS 11467000), located just downstream of the Hacienda Bridge; Russian River at Johnsons Beach (site 11, USGS 11467002), within the resort area of Guerneville; Russian River at Monte Rio (site 13, USGS 382757123003801, which is located downstream from the Dutch Bill Creek confluence; and Russian River at Casini Ranch (site 14, USGS 382754123030501), a private campground with private beach access located near the town of Duncans Mills and below the Austin Creek confluence. The Russian River at Casini Ranch site is the furthest downstream site in order to minimize any tidal influences from the estuary. Refer to Figure 1 for a map of surface-water site locations.

The other surface-water site will be Mark West Creek (site 22, USGS 11466800), a small creek which originates in the Mayacama Mountains to the east of the Santa Rosa Plain and empties into the Russian River at Mirabel Heights between the SCWA's riverbank filtration facility and Steelhead Beach (Figure 2). Mark West Creek drains the Laguna de Santa Rosa, which receives seasonal discharge from Santa Rosa's Regional Wastewater Treatment Plant.

The previously-sampled groundwater sites were selected on the basis of their close proximity to the Russian River (Figure 2). The groundwater sites include: MW-93-14 (site 26, USGS 383002122530601) and TW-1 (site 30, USGS 383045122525701), located within the area of the SCWA's water supply facility; SB-OW-1a (site 27, USGS 383003122540401), located at Steelhead Beach; and HA-OW-4 (site 33, USGS 383132122514501) located within Riverfront Park.

All samples will be analyzed for nutrients, major ions, trace metals, total and dissolved organic carbon, a broad suite of organic wastewater compounds (polyaromatic hydrocarbons, disinfection-by-products, selected pesticides and herbicides, and personal care and household products such as fragrances and detergents), by laboratories operated by the USGS. In addition, water samples collected at surface-water sites located at Russian River near Hopland, Russian River at Digger Bend near Healdsburg, Russian River near Guerneville and at Russian River at Casini Ranch will be analyzed for human-use pharmaceuticals; these analyses will also be conducted by laboratories operated by the USGS. For a list of constituents to be sampled please refer to Tables 2-4 .

Surface-water samples will be collected and shipped to state-certified Alpha Analytical Laboratories, Incorporated (Ukiah, CA) where they will be analyzed for standard bacterial indicators (total and fecal coliform and enterococci). Ceramic tiles, as a substrate for the collection of algae samples, will be placed at 3 real-time water-quality data stations along the Russian River (Russian River near Hopland, Russian River at Digger Bend near Healdsburg and Russian River near Guerneville). These real-time water-quality data stations provide a continuous record of dissolved oxygen, pH, specific conductance, water temperature and turbidity at these Russian River sites. Data for these sites are available online through http://waterdata.usgs.gov/nwis. The tiles would be installed during the first sampling event in the late spring. The tiles placed at the three Russian River sites will be removed, chlorophyll-*a* and ash-free-dry mass per unit area of tile will be measured, and the tiles will be replaced back into the river. These measurements will be used to determine the production of algae in the Russian River at the three locations. Water samples may also be collected from production wells, if made available, and analyzed for some or all of the constituents listed above. USGS personnel will coordinate with SCWA to identify potential production wells that may be sampled. Groundwater samples will not be analyzed for standard bacterial indicators.

Quality-control (QC) samples will be collected to assess the validity of the water-quality data collected during the study. QC sample types used in this study will include the collection of field blanks and sequential replicate samples. All field blanks will be collected at the sampling site using dionized water and will be subjected to the same sampling equipment, field processing, preservation, storage and transportation, and laboratory analysis for the collection of environmental samples. The sequential replicate samples will be collected to evaluate any bias and (or) variability introduced by sampling procedures. Sampling methodology including: chain-of-custody procedures, sample labeling, storage and transport protocols, sample containers and sample collection methods, and decontamination will follow USGS Field Manual for the Collection of Water-Quality Data: U.S. Geological Survey Techniques of Water-Resources Investigations, Book 9, chapters A1-A9 (available online at http://pubs.water.usgs.gov/twri9A), in conjunction with protocols established by Alpha Labs and Sonoma County Water Agency. Discharge measurements and surface-water samples from the Russian River will also be collected using depth- and width-integrated sampling methods as outlined in the USGS Field Manual.

Furthermore, the USGS NWQL uses the laboratory reporting level (LRL) as a threshold for reporting analytical results. The LRL is set to minimize the reporting of false negatives (not detecting a compound when it actually is present in a sample) to less than one percent. The LRL usually is set at two times the long-term method detection level (LT-MDL). The LT-MDL is derived from the standard deviation of at least 24 MDL determinations made over an extended period of time. LT-MDLs continually are monitored and updated. The method detection limit (MDL) is the minimum concentration of a substance that can be measured and reported with 99-percent confidence that the concentration is greater than zero (at the MDL there is less than one percent chance of a false positive). Detections between the LRL and the LT-MDL will be reported as "estimated" concentrations.

The water-quality baseline established by the continuation of this study will provide additional information to evaluate potential changes to water quality resulting from the proposed permanent changes to minimum in-stream flows and estuary management during the summer months. This information will build on the results from previous water-quality studies that have been conducted within the Russian River Basin during summer flow to assess potential impacts on water-quality that could occur as a result of permanent changes to in-stream flow requirements.

5.1.1 Reporting (USGS)

A USGS Data Report describing the water quality of the Russian River Basin during summer flows will be prepared at the completion of the one-year monitoring program. The information from this report and previous datasets will be evaluated to support the SCWA's future CEQA compliance documents as described in section four. As the results become available SCWA staff will provide the data via its website as has been the process in previous years.

5.2 Russian River Estuary Study (SCWA)

5.2.1 Datasonde Deployment

Water quality monitoring will occur at nine stations in the lower, middle, and upper reaches of the Russian River estuary, including areas upstream from the estuary that become inundated during closed lagoon conditions. Seven stations will be located in the mainstem between the mouth of the river at Jenner and Monte Rio and two stations will be located at the confluences of Willow and Austin creeks, in areas that are subject to tidal and/or closed lagoon inundation. Refer to Figure 3 for a map of estuary water quality station locations.

SCWA staff will use several Yellow Springs Incorporated (YSI) 6600 series multi-parameter datasondes (sondes) equipped with a YSI 6560 combination conductivity/temperature sensor, a YSI 6561 pH sensor, and a YSI 6562 dissolved oxygen sensor to collect water quality parameters at all sites. Sondes will be programmed to record hourly measurements of water temperature (Celsius), dissolved oxygen (milligrams per liter, mg/L), specific conductance (microsiemens), salinity (parts per thousand, ppt), and hydrogen ion (pH). Sondes may also be equipped with a YSI 6136 turbidity sensor during the monitoring season to monitor turbidity at differing depths of the water column. Monitoring sites will be accessed by boat or by foot.

All sondes will be recalibrated following the manufacturer's 6-Series User Manual and data downloaded every two weeks by SCWA staff. The YSI temperature sensor utilizes a thermistor that does not require calibration or maintenance. However, thermistor accuracy will be checked against a National Institute of Standards and Technology (NIST) thermometer during initial deployment to ensure the sensor is functioning properly. The YSI 6560 conductivity sensor will be calibrated using a 10,000 microsiemen (μS/cm) standard. The YSI 6561 pH sensor will be calibrated to two points using buffer solutions of pH 7 and 10. The YSI 6562 dissolved oxygen sensor will be calibrated using the dissolved-oxygen-calibration chamber-in-air method where the calibration chamber is set-up with water and allowed to reach 100-percent saturation prior to calibration. The YSI 6136 turbidity sensor will be calibrated to two-points using standards of 0 and 1,000 NTU. The calibrated sensor will then be checked with a 500-NTU standard to confirm sensor accuracy in the range of values expected in the stream.

Field calibration and data collection will be conducted using the YSI 650 Multiparameter Display System (MDS) datalogger designed to work with the 6-Series datasondes. Data will be downloaded onto the YSI 650 MDS and then transferred to a PC, where data will undergo analysis by SCWA staff.

Estuary sites (Figure 3) include:

- Russian River @ Mouth at Goat Rock State Beach (2 YSI 6600 Datasondes)
- Russian River @ Patty's Rock upstream from Penny Island (2 YSI 6600 Datasondes)
- Russian River @ Bridgehaven downstream from the Highway 1 bridge (2 YSI 6600 Datasondes)
- Russian River @ Sheephouse Creek downstream of Sheephouse Creek (2 YSI 6600 Datasondes)
- Russian River @ Heron Rookery halfway between Sheephouse and Freezeout creeks (2 YSI 6600 Datasondes)
- Russian River @ Freezeout Creek downstream of Freezeout Creek (2 YSI 6600 Datasondes)
- Russian River @ Monte Rio downstream of Dutch Bill Creek (1 YSI 6600 Datasonde)
- Willow Creek (1 YSI 6600 Datasonde)
- Austin Creek (1 YSI 6600 Datasonde)

The six mainstem stations located in the lower, middle, and upper estuary between the Mouth and Freezeout Creek will have a vertical array of two datasondes. Monitoring stations will be comprised of a concrete anchor attached to a steel cable suspended from the surface by a large buoy with sondes attached at varying depths along the cable. The rationale for choosing these sites was to locate the deepest pools at various points throughout the Estuary to obtain the fullest vertical profiles possible and to monitor anoxic events and temperature or salinity stratification. The four stations in the lower and middle estuary that are predominantly saline will have sondes placed at the surface (approximately 1-meter depth) and mid-depth portions of the water column. The two stations in the upper estuary, where water is predominantly fresh, will be located at the mid-depth and bottom of the water column.

One additional mainstem station will be established upstream from the estuary in freshwater habitat that becomes inundated during sandbar closure events. This station at Monte Rio has not previously been observed to become saline and will have one sonde placed in the thalweg, or deepest part of the water column. The two tributary stations in Willow and Austin creeks will each have one sonde that will be placed in their respective thalwegs near the confluences with the Russian River.

Sondes will be located in this manner to track changes to water quality in the water column, vertically and longitudinally, within the estuary during reduced in-stream flows, tidal fluctuation and closure events. The placement of sondes in this manner will also allow SCWA staff to track changes to water quality that may be associated with the migration and stratification of the salt water layer within the estuary.

5.2.2 Nutrient/Bacterial/Algal Sampling

Water samples will be collected from five surface-water sites in the Russian River estuary (Figure 3). All samples will be analyzed for nutrients, chlorophyll *a*, standard bacterial indicators (total and fecal coliform, and enterococci), total and dissolved organic carbon, and turbidity (See Table 5). Sampling methodology including: chain-of-custody procedures, sample labeling, storage and transport protocols, sample containers and sample collection methods, and decontamination will follow USGS Field Manual for the Collection of Water-Quality Data: U.S. Geological Survey Techniques of Water-Resources Investigations, Book 9, chapters A1-A9 (available online at http://pubs.water.usgs.gov/twri9A), in conjunction with protocols established by Alpha Labs and SCWA. As identified in Table 5, Alpha Labs will be reporting the results at the MDL, however the data will be subject to their reporting protocols which will require that they flag the results as "Detected but below Reporting Limit; therefore, result is an estimated concentration, detected but not quantified (DNQ)".

Grab Samples will be collected every two weeks when flows are above D1610 normal year levels (125 cfs - measured at USGS gauging station 11467000, near Hacienda), and will be collected weekly when flows drop below D1610 normal year levels (125 cfs). See Figure 2 for a map of surface-water sampling locations.

Measurements of water temperature, pH, specific conductance, dissolved oxygen, and barometric pressure will be collected using a YSI 6600 datasonde and YSI 650MDS datalogger during water sample collection.

Russian River sites (Figure 3) include:

- Russian River @ Jenner Boat Ramp
- Russian River @ Bridgehaven below Willow Creek
- Russian River @ Duncans Mills above Freezeout Creek
- Russian River @ Casini Ranch below Austin Creek
- Russian River @ Monte Rio below Dutch Bill Creek

Additional focused sampling will also occur under certain conditions and following specific river management and operational events at the sites listed above.

- Removal of Vacation Beach Dam – 3 samples within 10 days after dam removal
- Sandbar Breach – 3 samples within 10 days after breach
- Lagoon Outlet Channel implementation – 3 samples within 10 days after implementation.

At the conclusion of any focused sampling event, regular sampling will resume following the schedule based on flows, as described above.

These analyses will continue the SCWA effort to establish a water-quality baseline for the Russian River estuary (including the area of inundation during closure) from Monte Rio to the river mouth at Jenner. The baseline established with these analyses will enable SCWA to assess the influence of reduced flows in the lower mainstem, a closed lagoon in the Russian River estuary, and the operation of a lagoon outlet channel across the river mouth sandbar, during summer flow.

5.2.3 Reporting (SCWA)

A report describing the results of the SCWA 2010 Russian River estuary water quality monitoring and sampling effort will be prepared as described in the Biological Opinion. The report will provide summaries of data observations recorded for each constituent sampled or monitored. The report may also provide recommendations for changes to monitoring and sampling efforts to be conducted in subsequent years. The information from this report will be used in a synthesis report being prepared by SCWA for the Biological Opinion that incorporates other estuary studies and discusses trends and observations relating to the proposed permanent changes to minimum in-stream flows and estuary management during the summer months.

5.3 Additional Monitoring

5.3.1 Permanent Datasondes

In coordination with the USGS SCWA maintains five multi-parameter water quality sondes on the Russian River located at Russian River near Hopland, Russian River at Digger Bend near Healdsburg and Russian River near Guerneville (aka Hacienda Bridge), SCWA's water supply facility at Mirabel, and Johnson's Beach. These five sondes are referred to as "permanent" because SCWA maintains them as part of its early warning detection system. The sondes take real time readings of water pH, temperature, dissolved oxygen content (DO), specific conductivity, turbidity, and depth, every 15 minutes and transmit the raw data via telemetry to the Agencies operations center. As previously noted, Russian River near Hopland, Russian River at Digger Bend and Russian River near Guerneville data is provided in cooperation with the USGS on its "Real-time Data for California" website. For those interested in the complete set of water quality data, SCWA offers an "email subscription" available to the public via SCWA's website.

In addition to the permanent sondes, in 2009 SCWA, in cooperation with the USGS, installed seasonal sondes with real-time telemetry at the USGS river gage station at Russian River near Cloverdale (north of Cloverdale at Commisky Station Road) and at the new gage station at the Russian River at Jimtown (Alexander Valley Road Bridge). These two additional sondes are included by the USGS on its "Real-time Data for California" website.

The data collected by the sondes described above and historical sonde data will be evaluated to support the SCWA's future CEQA compliance documents as described in section four.

5.3.2 Seasonal Bacterial Sampling (Beach Sampling)

The NCRWQCB in cooperation with the Sonoma County Environmental Health Department (DEH) conducts seasonal bacteriological sampling at Russian River beaches which experience the greatest body contact recreation.

The NCRWQCB seasonal sampling locations consist of: Camp Rose Beach; Healdsburg Veterans Memorial Beach; Steelhead Beach; Forestville Access Beach; Johnson's Beach; and Monte Rio Beach. Bacteriological samples are collected weekly beginning in June and continuing through September. The NCRWQCB expects to begin more specific and targeted sampling for pathogens upon completion of an in-house laboratory later this summer. The samples will be analyzed using the Colilert-18 quantitray MPN method for total coliform and *E. coli* and the Enterolert quantitray method for Enterococcus. Results from the sampling program are reported by the NCRWQCB and the DEH at their respective websites and on the DEH Beach Sampling Hotline.

The analyses resulting from the 2010 beach sampling program and any specific targeted sampling conducted by the NCRWQCB will be evaluated to support the SCWA's future CEQA compliance documents as described in section four.

Table 1. List of all the surface-water and groundwater sites to be sampled in the Russian River Basin, Mendocino and Sonoma Counties, California, 2010.

Map Site No.	Station No.	Station name	Site Type[1]
2	11462500	Russian River near Hopland CA	SW
3	11463000	Russian River near Cloverdale CA	SW
4	11463980	Russian River at Digger Bend near Healdsburg CA	SW
6	383132122514901	Russian River at Riverfront Park	SW
7	11465400	Russian River at Wohler Bridge	SW
8	382959122535601	Russian River at Steelhead Beach	SW
9	11467000	Russian River near Guerneville (Hacienda)	SW
11	11467002	Russian River at Johnsons Beach	SW
13	382757123003801	Russian River at Monte Rio	SW
14	382754123030501	Russian River at Casini Ranch	SW
22	11466800	Mark West Creek near Mirabel Heights	SW
26	383002122530601	8N/9W-32C1, MW-93-14	GW
28	383003122540403	8N/9W-31C5, SB-OW-1a	GW
30	383045122525701	8N/9W-29F1, TW-1	GW
33	383132122514501	8N/9W-21F1, HA-MW-4	GW

[1]SW – Surface-water, GW - Groundwater

Table 2. List of major-ions, selected trace elements, and nutrients to be analyzed in water samples collected from the Russian River Basin, Mendocino and Sonoma Counties, California, 2010.

Compound	USGS Parameter Code	CAS Number	Laboratory Reporting Level	Units
Major-ions and selected trace elements				
Acid neutralizing capacity (ANC), laboratory	90410	471-34-1	8	mg/L
Aluminum	01106	7429-90-5	4	µg/L
Antimony	01095	7440-36-0	0.04	µg/L
Arsenic	01000	7440-38-2	0.06	µg/L
Barium	01005	7440-39-3	0.4	µg/L
Beryllium	01010	7440-41-7	0.02	µg/L
Boron	01020	7440-42-8	4	µg/L
Bromide	71870	24959-67-9	0.02	mg/L
Cadmium	01025	7440-43-9	0.02	mg/L
Calcium	00915	7440-70-2	0.02	µg/L
Chloride	00940	16887-00-6	0.12	mg/L
Chromium	01030	7440-47-3	0.12	µg/L
Cobalt	01035	7440-48-4	0.02	µg/L
Copper	01040	7440-50-8	1	µg/L
Fluoride	00950	16984-48-8	0.08	mg/L
Iron	01046	7439-89-6	4	µg/L
Lead	01049	7439-92-1	0.06	µg/L
Lithium	01130	7439-93-2	1	µg/L
Magnesium	00925	7439-95-4	0.012	mg/L
Manganese	01056	7439-96-5	0.2	µg/L
Mercury	71890	7439-97-6	0.01	µg/L
Molybdenum	01060	7439-98-7	0.02	µg/L
Nickel	01065	7440-02-0	0.12	µg/L
Potassium	00935	7440-09-7	0.06	mg/L
Residue, 180°C (Total Dissolved Solids)	70300	---	10	mg/L
Selenium	01145	7782-49-2	0.06	µg/L
Silica	00955	7631-86-9	0.02	mg/L
Silver	01075	7440-22-4	0.008	µg/L
Sodium	00930	7440-23-5	0.12	mg/L
Strontium	01080	7440-24-6	0.8	µg/L
Sulfate	00945	14808-79-8	0.18	mg/L
Thallium	01057	7440-28-0	0.04	µg/L

Uranium, natural	22703	7440-61-1	0.006	µg/L
Vanadium	01085	7440-62-2	0.16	µg/L
Zinc	01090	7440-66-6	2	µg/L
Nutrients				
Nitrogen, ammonia as N	00608	7664-41-7	0.02	mg/L
Nitrogen, ammonia + organic nitrogen, total	00625	17778-88-0	0.1	mg/L
Nitrogen, ammonia + organic nitrogen	00623	17778-88-0	0.1	mg/L
Nitrogen, nitrite	00613	14797-65-0	0.002	mg/L
Nitrogen, nitrite + nitrate	00631	---	0.04	mg/L
Organic carbon, dissolved	00681	---	0.4	mg/L
Organic carbon, total	00680	---	0.6	mg/L
Phosphorus	00666	7723-14-0	0.006	mg/L
phosphorus, orthophosphate	00671	14265-44-2	0.008	mg/L
Phosphorus, total	00665	7723-14-0	0.008	mg/L

Table 3. List and primary uses of organic wastewater compounds to be analyzed in water samples collected from the Russian River Basin, Mendocino and Sonoma Counties, California, 2010.

Compound	USGS parameter code	CAS number	Laboratory reporting level	Uses
1,4-Dichlorobenzene	34572	106-46-7	0.04	Deodorizer
1-Methylnaphthalene	62054	90-12-0	0.04	Fuels
2,6-Dimethylnaphthalene	62055	581-42-0	0.12	Fuels
2-Methylnaphthalene	62056	91-57-6	0.04	Fuels
3-*beta*-Coprostanol	62057	360-68-9	2	Fecal sterol
3-Methyl-1H-indole (skatol)	62058	83-34-1	0.04	Fragrance
3-*tert*-Butyl-4-hydroxyanisole	62059	25013-16-5	0.6	Antioxidant
4-Cumylphenol	62060	599-64-4	0.1	Detergent metabolite
4-*n*-Octylphenol	62061	1806-26-4	0.16	Detergent metabolite
4-Nonylphenol	62085	84852-15-3	2	Detergent metabolite
4-Nonylphenol diethoxylates	62083	---	5	Detergent metabolite
4-*tert*-Octylphenol diethoxylates	61705	---	1	Detergent metabolite
4-*tert*-Octylphenol monoethoxylates	61706	---	1	Detergent metabolite
4-*tert*-Octylphenol	62062	140-66-9	1.4	Detergent metabolite
5-Methyl-1H-benzotriazole	62063	136-85-6	2	Anticorrosive
Acetophenone	62064	98-86-2	0.4	Fragrance
Acetyl hexamethyl tetrahydronaphthalene (AHTN)	62065	21145-77-7	0.5	Fragrance
Anthracene	34221	120-12-7	0.04	Combustion product
Anthraquinone	62066	84-65-1	0.16	Manufacturing
Benzo[*a*]pyrene	34248	50-32-8	0.08	Combustion product
Benzophenone	62067	119-61-9	0.12	Fixative
beta-Sitosterol	62068	83-46-5	4	Plant sterol
beta-Stigmastanol	62086	19466-47-8	2	Plant sterol
Bromacil	4029	314-40-9	1	Herbicide
Caffeine	50305	58-08-2	0.1	Stimulant
Camphor	62070	76-22-2	0.06	Flavorant
Carbaryl	82680	63-25-2	1	Insecticide
Carbazole	62071	86-74-8	0.04	Insecticide
Chlorpyrifos	38933	2921-88-2	0.12	Insecticide
Cholesterol	62072	57-88-5	2	Plant/animal sterol
Cotinine	62005	486-56-6	0.4	Nicotine metabolite

Diazinon	39572	333-41-5	0.08	Insecticide
d-Limonene	62073	5989-27-5	0.14	Fungicide
Fluoranthene	34377	206-44-0	0.04	Combustion product
Hexahydrohexamethyl cyclopentabenzopyran (HHCB)	62075	1222-05-5	0.5	Fragrance
Indole	62076	120-72-9	0.08	Pesticide inert
Isoborneol	62077	124-76-5	0.18	Fragrance
Isophorone	34409	78-59-1	0.08	Solvent
Isopropylbenzene (cumene)	62078	98-82-8	0.2	Fuels
Isoquinoline	62079	119-65-3	0.4	Flavorant
Menthol	62080	89-78-1	0.4	Fragrance
Metalaxyl	50359	57837-19-1	0.12	Fungicide
Methyl salicylate	62081	119-36-8	0.1	Liniment
Metolachlor	39415	51218-45-2	0.08	Herbicide
N-N-diethyl-*meta*-toluamide (DEET)	62082	134-62-3	0.14	Insect repellant
Naphthalene	34443	91-20-3	0.04	Combustion product
para-Cresol	62084	106-44-5	0.18	Wood preservative
Phenanthrene	34462	85-01-8	0.04	Combustion product
Prometon	4037	1610-18-0	0.2	Herbicide
Pyrene	34470	129-00-0	0.04	Combustion product
Tetrachloroethene	34476	127-18-4	0.12	Solvent, degreaser
Tribromomethane	34288	75-25-2	0.1	Chemical intermediate and solvent
Tributyl phosphate	62089	126-73-8	0.2	Flame retardant
Triclosan	62090	3380-34-5	0.2	Antimicrobial disinfectant
Triethyl citrate	62091	77-93-0	0.4	Cosmetics
Triphenyl phosphate	62092	115-86-6	0.12	Plasticizer
Tris(2-butoxyethyl) phosphate	62093	78-51-3	0.8	Plasticizer
Tris(2-chloroethyl) phosphate	62087	115-96-8	0.1	Flame retardant
Tris(dichloroisopropyl) phosphate	62088	13674-87-8	0.12	Flame retardant

[USGS parameter code is a 5-digit number assigned for identification and data storage purposes which is used in the U.S. Geological Survey National Water Information System (NWIS), to uniquely identify a specific constituent or property; CAS, Chemical Abstract Services number assigned by the American Chemical Society for identification and computer search purposes; —, CAS number not assigned; Laboratory reporting levels (LRL) is in micrograms per liter (mg/L). Lower values may be reported as estimated concentrations, indicated with an 'E', if compound is present.]

Table 4. List and primary uses of human-use pharmaceuticals to be analyzed for select water samples collected from the Russian River Basin, Mendocino and Sonoma Counties, California, 2010.

Compound	USGS parameter code	CAS number	Laboratory reporting level	Uses
1,7-Dimethylxanthine	62030	611-59-6	0.12	Precursor is a stimulant
Albuterol	62020	18559-94-9	0.06	Bronchodilator
Acetaminophen	62000	103-90-2	0.08	Analgesic
Carbamazepine	62793	298-46-4	0.04	Antiepileptic
Codeine	62003	76-57-3	0.04	opiate agonist
Dehydronifedipine	62004	67035-22-7	0.08	Precursor is a antianginal
Diltiazem	62008	42399-41-7	0.08	Antihypertensive
Diphenhydramine	62796	147-24-0	0.04	Antipruritic
Sulfamethoxazole	62021	723-46-6	0.16	Antibiotic
Thiabendazole	62801	148-79-8	0.06	Anthelmintic, fungicide
Trimethoprim	62023	738-70-5	0.02	Antibiotic
Warfarin	62024	81-81-2	0.1	Anticoagulant, rodenticide

[USGS parameter code is a 5-digit number assigned for identification and data storage purposes which is used in the U.S. Geological Survey National Water Information System (NWIS), to uniquely identify a specific constituent or property; CAS, Chemical Abstract Services number assigned by the American Chemical Society for identification and computer search purposes; —, CAS number not assigned; Laboratory reporting levels (LRL) is in micrograms per liter (mg/L). Lower values may be reported as estimated concentrations, indicated with an 'E', if compound is present.]

Table 5. List of bacterial indicators and nutrients to be analyzed in water samples collected from the Russian River Estuary, Sonoma County, California, 2010.

Compound	Test Method	Method Detection Limit (MDL)	Laboratory Reporting Limit (LRL/PQL[1])	Units
Nitrogen, ammonia as N	SM4500NH3C	0.1	0.2	mg/L
Ammonia Unionized	EPA600	0.0001	0.0005	mg/L
Nitrogen, ammonia + organic nitrogen, total	SM4500-N_{org} B	0.1	0.2	mg/L
Nitrogen, nitrate as N	EPA300.0	0.03	0.2	mg/L
Nitrogen, nitrite as N	EPA300.0	0.02	0.2	mg/L
Organic carbon, dissolved	SM5310C	0.04	0.3	mg/L
Organic carbon, total	SM5310C	0.04	0.3	mg/L
Phosphorus, orthophosphate	SM4500-P E	0.02	0.02	mg/L
Phosphorus, total	SM4500-P E	0.02	0.1	mg/L
Chlorophyll (a)	SM1020OH	0.00005	0.01	mg/L
Coliform, total	SM9221 (MTF)[2]	>2	>2	MPN[3]
Coliform, fecal	SM9221 (MTF)	>2	>2	MPN
Enterococci	SM9230 (MTF)	>2	>2	MPN
Turbidity	EPA180.1	0.02	0.1	NTU

Alpha Labs will be reporting the results at the MDL, however the data will be subject to their reporting protocols which will require that they flag the results as "Detected but below Reporting Limit; therefore, result is an estimated concentration, detected but not quantified (DNQ)".

[1] PQL - Practical Quantitation Limit

[2] MTF - multiple tube fermentation

[3] MPN - most probable number

Figure 1: Location of Surface-Water Sites in the Russian River Basin, Mendocino and Sonoma Counties, California

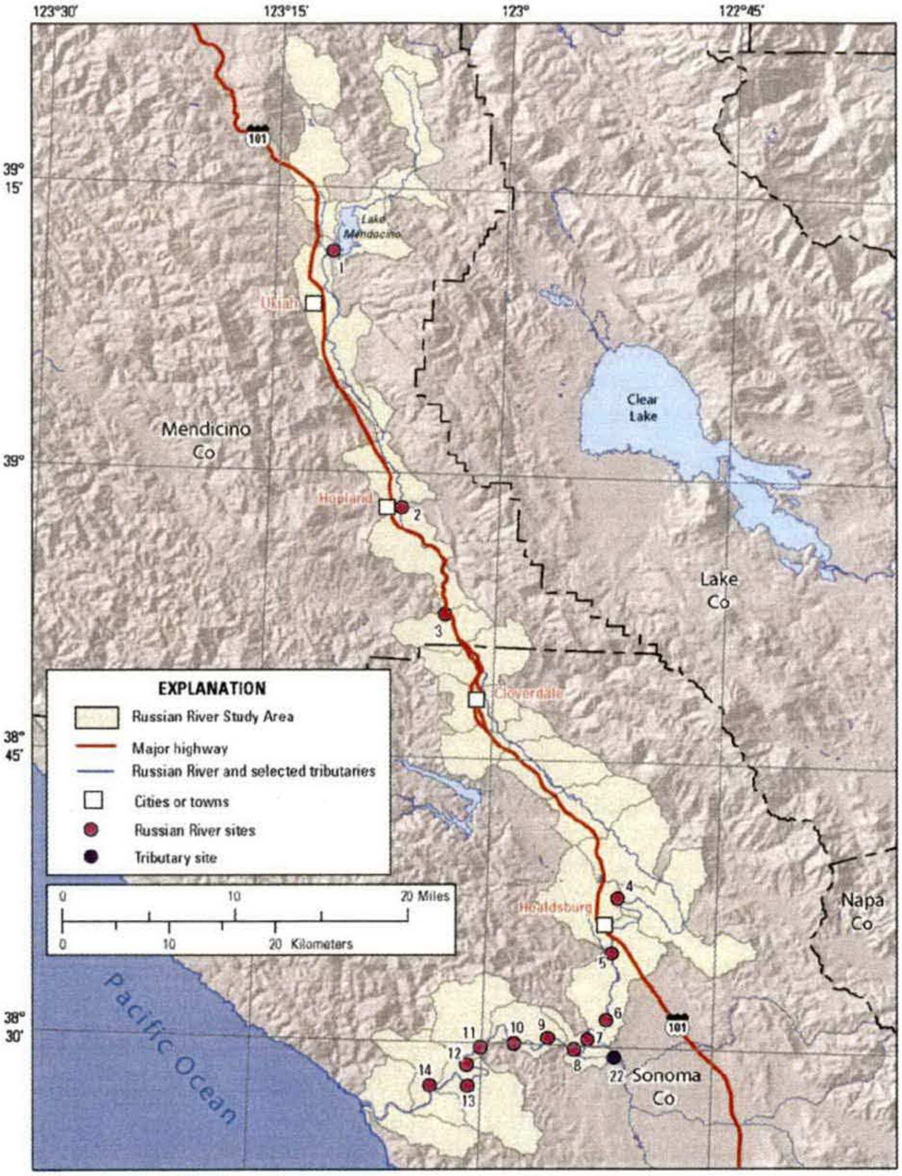


Figure 1. Location of surface-water sites in the Russian River Basin, Mendocino and Sonoma Counties, California.

RRIFR
Russian River Instream Flow and Restoration

Figure 2: Location of Groundwater Sites in the Lower Russian River Basin, Mendocino and Sonoma Counties, California

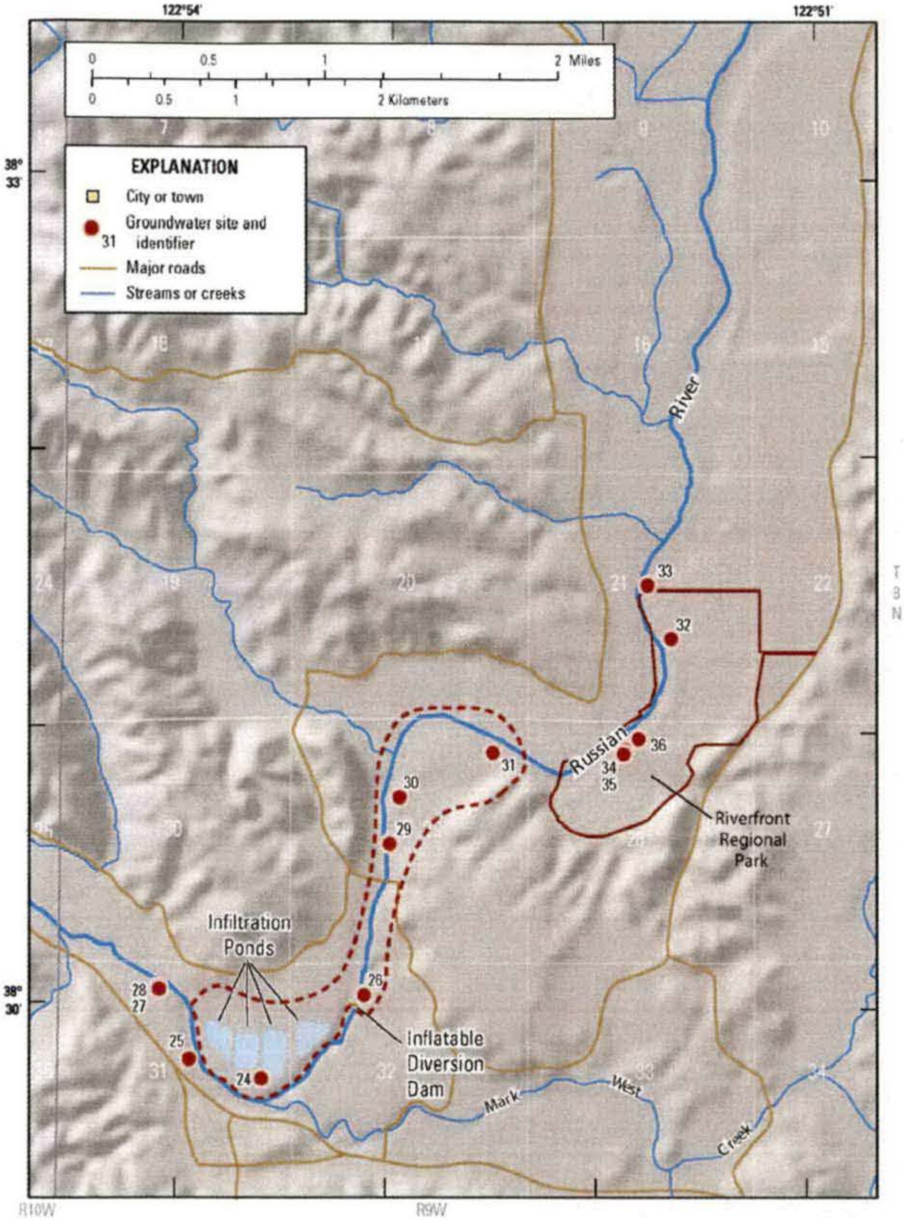
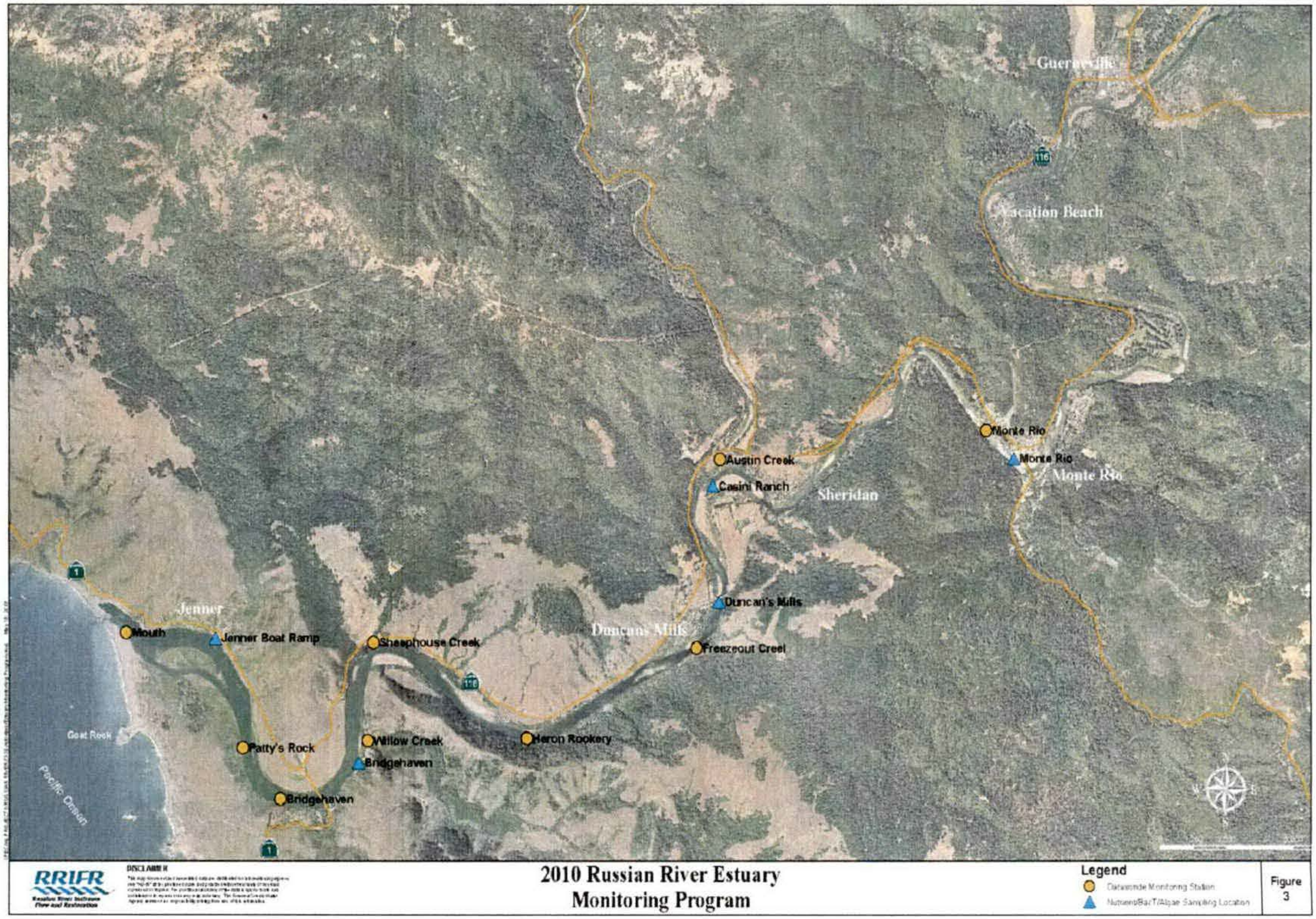


Figure 2. Location of groundwater sites in the Lower Russian River Basin, Sonoma County, California.

RRIFR
Russian River Instream Flow and Restoration

Figure 3: 2010 Russian River Estuary Monitoring Program



California Regional Water Quality Control Board
North Coast Region
Geoffrey M. Hales, Chairman

Linda S. Adams
Secretary for Environmental Protection

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Arnold Schwarzenegger
Governor

June 9, 2010

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General Manager
Sonoma County Water Agency
P.O. Box 11628
Santa Rosa, CA 95406

Aaron Miller
Permitting Section
SWRCB – Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812

Subject: Comments on the Sonoma County Water Agency's Draft Proposed Russian River Water Quality Monitoring Plan for the Sonoma County Water Agency 2010 Temporary Urgency Change

Dear Mr. Davis and Mr. Miller:

In accordance with Provision 8 of the State Water Resources Control Board Division of Water Right's Order WR 2010-0018-DWR (Order), the Sonoma County Water Agency (SCWA) prepared the Draft Proposed Russian River Water Quality Monitoring Plan for the Sonoma County Water Agency 2010 Temporary Urgency Change (Draft Monitoring Plan), dated June 2010. SCWA provided the Draft Monitoring Plan to Regional Water Board staff on May 25, 2010. On June 2, 2010 Regional Water Board staff met with SCWA staff and others to discuss the Draft Monitoring Plan. Our comments are summarized here for your consideration. These comments do not reflect a position of the Regional Water Board regarding the Russian River Biological Opinion, the 2010 Temporary Urgency Change, or potential permanent changes to Decision 1610 (D1610). Our review was limited to assessing whether the Draft Monitoring Plan meets the objectives, as stated in the Order.

Draft Monitoring Plan Objectives
The stated objectives of the Monitoring Plan are "to provide information to evaluate potential changes to water quality and availability of aquatic habitat for salmonids resulting from the proposed permanent changes to Decision 1610… and provide information to support the development of a CEQA document required for permanent changes to Decision 1610". We are concerned that the Draft Monitoring Plan is not sufficient to meet these objectives. In particular, we are concerned that the Draft Monitoring Plan will not provide enough data over a long enough time period to adequately assess any trend or change in water quality conditions. We believe that assessment of changes in water quality should involve statistical analysis. Statistical analysis of water quality data for trends often requires an adequate time period to detect a statistical change in constituent concentration. The amount of time required to detect a

trend is dependent on the sample variability. Constituents like bacterial indicators have a high ambient variability and therefore require longer monitoring time periods before a trend can be detected. If SCWA does not intend to conduct statistical analyses to evaluate potential changes to water quality resulting from the proposed permanent changes to D1610, then the Monitoring Plan should be redrafted to explain how the information collected will be assessed.

Water Quality Objectives of Concern
The following are the water quality objectives that we believe may be violated under the Order flows, and a brief explanation of why violations of these objectives are a concern.

> Bacteria: The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following: In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed 50/100 ml, nor shall more than ten percent of total samples during any 30-day period exceed 400/100 ml (State Department of Health Services).
>
> Our working hypothesis, supported in part by preliminary empirical analysis of available data, is that under a given loading of bacteria from existing sources, reduced flows provides less dilution, and may lead to higher bacteria concentrations.
>
> Biostimulatory Substances: Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.
>
> Biostimulatory substances include nitrogen and phosphorus. It is generally recognized that flow, along with channel morphology and riparian conditions, is a "risk cofactor" that can affect the biostimulatory response of nutrients in a waterbody. Assuming all factors other than flow are constant, a given concentration of nitrogen and phosphorus in a waterbody can lead to greater biostimulation, meaning more aquatic plant productivity, under lower flow conditions.
>
> Toxicity: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Water Board.
>
> The toxic parameters of concern are blue-green algae toxins. Algal productivity is a biostimulatory response. Algal biomass can include blue-green algae species. Some blue-green algae species produce algal toxins that can be harmful to humans, pets, and wildlife.

While we generally support monitoring for major ions, trace elements, organic wastewater compounds, and human use pharmaceuticals, we do not believe monitoring for these parameters is necessary for meeting the stated objectives of the Monitoring Plan. At our June 2, 2010 meeting SCWA staff mentioned that the grab samples collected as part of the Mainstem Russian River Study would be "flow-weighted" samples. We are not convinced that the expense of collecting flow-weighted samples, according to USGS field procedures, is necessary for meeting the stated objectives of the Monitoring Plan.

Reporting

Section 5.1.1 of the Draft Monitoring Plan states that an assessment of the potential impacts to water quality will be presented in an interpretative report, if additional funds are available. We strongly encourage SCWA to complete the interpretative report in order to support the CEQA review.

Thank you very much for the opportunity to comment.

Sincerely,

for Catherine Kuhlman
Executive Officer

Ukiah Daily Journal

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Ukiah, California 95482
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udjlegals@pacific.net

ORIGINAL DOCUMENT
SONOMA COUNTY WATER AGENCY

To Drake; Phelps

JUN - 4 2010

CF/42-0.19-9 SWRCB Order Approving Temporary Urgency Change in Permits 12947A, 12949, 12950 & 16596 for 2010

SONOMA COUNTY WATER AGENCY
PO BOX 11628
SANTA ROSA CA 95406

Legal No. **0003514680**

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA
COUNTY OF MENDOCINO

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer of the Ukiah Daily Journal, a newspaper of general circulation, printed and published daily in the City of Ukiah, County of Mendocino and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Mendocino, State of California, under the date of September 22, 1952, Case Number 9267; that the notice, of which the annexed is a printed copy (set in type not smaller than non-pareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

5/28/2010

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Dated at Ukiah, California,
May 28th, 2010

Signature

Annette Fashauer

ANNETTE FASHAUER, LEGAL CLERK

450-10

5-28/10

NOTICE OF STATE WATER RESOURCES CONTROL BOARD, DIVISION OF WATER RIGHTS ORDER APPROVING A TEMPORARY URGENCY CHANGE PETITION BY SONOMA COUNTY WATER AGENCY REGARDING PERMITS 12947A, 12949, 12950, AND 16596 (APPLICATION 12919A, 15737, 19351)

On May 24, 2010 the State Water Resources Control Board (State Water Board), Divison of Water Rights (Division) issued Order WR 2010-0018-DWR approving Sonoma County Water Agency's (SCWA) petition for a Temporary Urgency Change to the subject permits. SCWA submitted the petition pursuant to California Water Code Section 1435. The Order approves the reduction in minimum instream flow requirements for the Russian River as follows:

1. From May 25 through October 15, 2010, in-stream flow requirements for the upper Russian River (from its confluence with the East Fork of the Russian River to its confluence with Dry Creek) be reduced from 185 cubic feet per second (cfs) to 125 cfs; and

2. From May 25 through October 15, 2010, in-stream flow requirements for the lower Russian River (downstream of its confluence with Dry Creek) be reduced from 125 cfs to 70 cfs, with the understanding that the SCWA will typically maintain approximately 85 cfs at the Hacienda gage as practicably feasible.

No changes to the in-stream flow requirements for Dry Creek are requested. The petition is made to comply with mandates in the Biological Opinion that was issued by the National Marine Fisheries Service (NMFS) on September 24, 2008.

With the petition SCWA submitted a document prepared by its staff titled. "Sonoma County Water Agency, In-stream Flow Analysis for 2010 Temporary Urgency Change petition" (Analysis) dated April 2010. The Analysis provides: (1) a summary of minimum in-stream flows required under Decision 1610; (2) an assessment of current water supply conditions of the Russian River System; (3) a summary of the Biological Opinion issued by National Marine Fisheries Service (NMFS) mandating SCWA to petition the State Board for temporary changes in minimum in-stream flow requirements in the Russian River; and (4) a summary of the criteria for approving a temporary urgency change petition. The Analysis indicates that, unlike the Temporary Urgency Change Petitions filed by SCWA in 2004, 2007, and 2009, which requested reduction in minimum in-stream flow requirement in response to low storage levels in Lake Mendocino, the petition being filed in 2010 is mandated by the Biological Opinion in order to benefit threatened and endangered fish species. Water supply storage in Lake Mendocino as April 1, 2010 was approximately 83,000 acre-feet, significantly higher than in 2007 (71,406 acre-feet) and 2009 (56,666 acre-feet).

Under the Federal Endangered Species Act (ESA), steelhead, coho salmon and Chinook salmon in the Russian River watershed are listed as threatened or endangered species. Coho salmon is also listed as endangered under the California Endangered Species Act (CESA). in September 2008, the National Marine Fisheries Service (NMFS) issued the Russian River Biological Opinion (Biological Opinion). The Biological Opinion is the culmination of more than a decade of consultation under Section 7 of the ESA among SCWA, U.S. Army Corps of Engineers (Corps), and NMFS regarding the impacts of SCWA's and the Corps' water supply and flood control operations in the Russian River watershed on the survival of these listed fish species.

Studies conducted during the consultation period that ultimately led to this Biological Opinion indicate that summer flows in the Upper Russian River and Dry Creek required by state Water Board Decision 1610 are too high for optimal juvenile salmon habitat. NMFS also concluded in the Biological Opinion that the historical practice of breaching the sandbar that builds up and frequesntly closes the mouth of the Russian River during the summer and fall may adversely affect the listed species. NMFS concluded in the Biological Opinion that it might be better for juvenile steelhead and salmon if the sandbar is kept closed during these times, to allow for the formation of a seasonal freshwater lagoon in the estuary. Minimum in-stream flows required by State Water Board Decision 1610 result in flows into the estuary that makes it difficult to maintain a freshwater logoon while preventing flooding of adjacent properities.

Without the requested modifications to the in-stream flow requirements, the high summer time flows required by State Water Board Decision 1610 will continue to jeopardize the recovery of coho salmon and steelhead in the Russian River and its tributaries.

SCWA, as lead agency, as defined in the California Environmental Quality Act (CEQA), is proposing to prepare a Notice of Exemption for this project. The State Water Board, as responsible agency, has reviewed the information submitted by the SCWA and had determined that the petition qualifies for an exemption under CEQA.

A Class 7 exemption "consists of actions taken by regulatory agencies as authorized by state law or local ordinance to assure the maintenance, restoration, or enhancement of a natural resource where the regulatory process involves procedures for protection of the environment." (Title 14, California Code of Regulations, section 15307.) The proposed action will assure the maintenance of a natural resource, i.e., the instream resources of the Russian River. A Class 8 exemption "consists of actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment." (Title 14, California Code of Regulations, section 15308.) The proposed action will assure the maintenance of the environment, i.e., the instream environment of the Russian River.

This petition notice, SCWA's petition, and Order WR 2010-0018-DWR can be viewed at http://www.waterboards.ca.gov/waterrights/water_issues/programs/application/tranfers_tu_notices/index.shtml. Any interested person may file an objection to the Temporary Urgency Change. Comments and objections filed in response to this notice shall be submitted to the persons listed below and must be received by 5:00 p.m. on Wednesday, June 23, 2010.

Send comments and/or objections for both:

Aaron Miller
Permitting Section Division of Water Rights
State Water Resources Control Board
PO Box 2000
Sacramento, CA 95812
Email:
scwatucp@waterboards.ca.gov.

Grant Davis
General Manager
Sonoma County Water Agency
PO Box 11628
Santa Rosa, CA 95408

Voicemails with telephone comments or inquiries can be left on the Division of Water Rights' comment line dedicated to the SCWA peitition at (916) 552-9286

STEVEN HERERRA, MANAGER
Water Rights Permitting Section

Dated: May 24, 2010

Advertising Order Confirmation

The Ukiah DAILY JOURNAL

JUN 4 2010

Ad Order Number	Customer	Payor Customer	PO Number
0003514680	SONOMA COUNTY WATER AGENCY	SONOMA COUNTY WATER AGENCY	
Sales Rep.	**Customer Account**	**Payor Account**	**Ordered By**
efragoso	2117783	2117783	
Order Taker	**Customer Address**	**Payor Address**	**Customer Fax**
afashauer	PO BOX 11628 SANTA ROSA CA 95406 United States	PO BOX 11628 SANTA ROSA CA 95406 United States	
Order Source	**Customer Phone**	**Payor Phone**	**Customer EMail**
	707-526-5370	707-526-5370	

Current Queue	Invoice Text	Ad Order Notes	
Ready			

Tear Sheets	Proofs	Affidavits	Blind Box	Materials	Promo Type	Special Pricing
0	0	0				None

Ad Number	Color	Production Color	Ad Attributes	Production Method	Production Notes
0003514680-01				AdBooker	

External Ad Number	Ad Released	Pick Up	Ad Type
	No		NC Legal Liner

Product	Requested Placement	Requested Position	Run Dates	# Inserts
Ukiah Daily Journal	Legals CLS NC	General Legal NC-1076~	5/28/10	1
DUDJ CLSOnlineUpsell	Legals CLS NC	General Legal NC-1076~	5/28/10	1

Order Charges:

Net Amount	Tax Amount	Total Amount	Payment Method	Payment Amount	Amount Due
$383.63	$0.00	$383 63		$0.00	$383.63

If this confirmation includes an advertising proof, please check your proof carefully for errors, spelling, and/or typos Errors not marked on the returned proof are not subject to credit or refunds.

Please note· To meet our printer's deadline, we must have your proof returned by the published deadline, and as indicated by your sales rep. If we have not heard from you by that time, we will assume that your ad is correct, and it will run as is.

If you make any corrections to your proof, please indicate them clearly Second proofs are not available after published deadlines Second proofs will incur an additional charge, unless this is due to a serious error on our part

PROOF OF PUBLICATION

(2015.5 C.C.P.)

STATE OF CALIFORNIA

County of Sonoma

I am a citizen of the United States and a resident of the county aforesaid: I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer of The Press Democrat, a newspaper of general circulation, printed and published DAILY IN THE City of Santa Rosa, County of Sonoma; and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Sonoma, State of California, under the date of November 29, 1951, Case number 34831, that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates to wit:

The Press Democrat - Legal Notices
5/27 1x - 05/27/2010

I certify (or declare) under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct.

Dated at Santa Rosa, California, on

05/27/2010

Roxanne [signature]

SIGNATURE

ORIGINAL DOCUMENT
SONOMA COUNTY WATER AGENCY
To PHELPS
MAY 28 2010

CF/42-0.19-9 SWRCB Order Approving Temporary Urgency Change in Permits 12947A, 12949, 12950 & 16596 for 2010

This space for

Proof of Publicatic

NOTICE OF STATE WATER RESOURCES CONTROL BOARD, DIVISION OF WATER RIGHTS ORDER APPROVING A TEMPORARY URGENCY CHANGE PETITION BY SONOMA COUNTY WATER AGENCY REGARDING PERMITS 12947A, 12949, 12950, AND 16596 (APPLICATIONS 12919A, 15736, 15737, 19351)

On May 24, 2010 the State Water Resources Control Board (State Water Board), Division of Water Rights (Division) issued Order WR 2010-0018-DWR approving Sonoma County Water Agency's (SCWA) petition for a Temporary Urgency Change to the subject permits. SCWA submitted the petition pursuant to California Water Code section 1435 The Order approves the reduction in minimum in stream flow requirements for the Russian River as follows:

(1) From May 25 through October 15,2010, in-stream flow requirements for the upper Russian River (from its confluence with the East Fork of the Russian River to its confluence with Dry Creek) be reduced from 185 cubic feet per second (cfs) to 125 cfs; and

(2) From May 25 through October 15, 2010 in-stream flow requirements for the lower Russian River (downstream of its confluence with Dry Creek) be reduced from 125 cfs to70 cfs, with the understanding that the SCWA will typically maintain approximately 85 cfs at the Hacienda gage as practicably feasible.

No changes to the in-stream flow requirements for Dry Creek are requested. The petition is made to comply with mandates in the Biological Opinion that was issued by the National Marine Fisheries Service (NMFS) on September 24, 2008.

With the petition SCWA submitted a document prepared by its staff titled, "Sonoma County Water Agency, In-stream Flow Analysis for 2010 Temporary Urgency Change Petition"(Analysis) dated April 2010. The Analysis provides: (1) a summary of minimum in-stream flows required under Decision 1610; (2) an assessment of current water supply conditions of the Russian River System; (3) a summary of the Biological Opinion issued by National Marine Fisheries Service (NMFS) mandating SCWA to petition the State Board for temporary change sin minimum in-stream flow requirements in the Russian River; and (4) a summary of the criteria for approving a temporary urgency change petition. The Analysis indicates that, unlike the Temporary Urgency Change Petitions filed by SCWA in 2004, 2007 and 2009, which requested reductions in minimum in-stream flow requirements in response to low storage levels in Lake Mendocino, the petition being filed in 2010 is mandated by the Biological Opinion in order to benefit threatened and endangered fish species. Water supply storage in Lake Mendocino as of April 1,2010 was approximately 83,000 acre-feet, significantly higher than in 2007(71,406 acre-feet) and 2009 (56,666 acre-feet).

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... to the in-stream flow ...s required by State ...o jeopardize the ... Russian River ... "(Title 14, ... he proposed ...ltural resource, ...an River. A Class ... by regulatory agen- ...dinance, to assure the ...nent, or protection of the ...y process involves proce- ...ronment." (Title 14, California ...n 15308.) The proposed action ...e of the environment, i.e., the in ...e Russian River.

... SCWA's petition, and Order WR 2010- ...viewed athttp://www.waterboards.ca.gov/ ..._issues/programs/applications/transfers_ ...x.shtml. Any interested person may file an ... the Temporary Urgency Change. Comments and ... filed in response to this notice shall be submitted ...ersons listed below and must be received by 5:00 ...n Wednesday, June 23, 2010.

...nd comments and/or objections to both:

...aron Miller
Permitting Section
Division of Water Rights
State Water Resources Control Board
PO Box 2000
Sacramento, CA 95812
Email: scwatucp@waterboards.ca.gov.

Grant Davis
General Manager
Sonoma County Water Agency
P. O. Box 11628
Santa Rosa, CA 95406

Voicemails with telephone comments or inquiries can be left on the Division of Water Rights' comment line dedicated to the SCWA petition at (916) 552-9286.

STEVEN HERERRA,
MANAGER
Water Rights Permitting Section
DATED: May 24, 2010

2474772 - Pub. May 27, 2010 1tl.

NOTICE OF STATE WATER RESOURCES CONTROL BOARD, DIVISION OF WATER RIGHTS ORDER APPROVING A TEMPORARY URGENCY CHANGE PETITION BY SONOMA COUNTY WATER AGENCY REGARDING PERMITS 12947A, 12949, 12950, AND 16596 (APPLICATIONS 12919A, 15736, 15737, 19351)

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Without the requested modifications to the in-stream flow requirements, the high summer time flows required by State Water Board Decision 1610 will continue to jeopardize the recovery of coho salmon and steelhead in the Russian River and its tributaries.

SCWA, as lead agency, as defined in the California Environmental Quality Act (CEOA), is proposing to prepare a Notice of Exemption for this project. The State Water Board, as responsible agency, has reviewed the information submitted by the SCWA and has determined that the petition qualifies for an exemption under CEOA.

A Class 7 exemption "consists of actions taken by regulatory agencies as authorized by state law or local ordinance to assure the maintenance, restoration, or enhancement of a natural resource where the regulatory process involves procedures for protection of the environment."(Title 14, California Code of Regulations, section 15307.) The proposed action will assure the maintenance of a natural resource, i.e., the in stream resources of the Russian River. A Class 8exemption "consists of actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment." (Title 14, California Code of Regulations, section 15308.) The proposed action will assure the maintenance of the environment, i.e., the in stream environment of the Russian River.

This petition notice, SCWA's petition, and Order WR 2010-0018-DWR can be viewed athttp://www.waterboards.ca.gov/waterrights/water_issues/programs/applications/transfers_tu_notices/index.shtml. Any interested person may file an objection to the Temporary Urgency Change. Comments and objections filed in response to this notice shall be submitted to the persons listed below and must be received by 5:00 p.m. on Wednesday, June 23, 2010.

Send comments and/or objections to both:

Aaron Miller
Permitting Section
Division of Water Rights
State Water Resources Control Board
PO Box 2000
Sacramento, CA 95812
Email: scwatucp@waterboards.ca.gov.

Grant Davis
General Manager
Sonoma County Water Agency
P. O. Box 11628
Santa Rosa, CA 95406
Voicemails with telephone comments or inquiries can be left on the Division of Water Rights' comment line dedicated to the SCWA petition at (916) 552-9286.

STEVEN HERERRA,
MANAGER
Water Rights Permitting Section
DATED: May 24, 2010

2474772 - Pub. May 27, 2010 1ti.

AD NUMBER 2474772
RUN DATE May 27, 2010
SIZE 2x13.89
INITIALS CB

1001 I Street, 14th Floor ♦ Sacramento, California 95814 ♦ 916.341.5300
P.O. Box 2000 ♦ Sacramento, California 95812-2000
Fax: 916.341.5400 ♦ www.waterboards.ca.gov/waterrights

Linda S. Adams
Secretary for Environmental Protection

Arnold Schwarzenegger
Governor

MAY 24 2010

ORIGINAL DOCUMENT
SONOMA COUNTY WATER AGENCY
To DAVIS, JEANE, JASPERSE ; SCHRAM
JUN - 1 2010

In Reply Refer to:AM:129191A et al.

CF/42-0.19-9 SWRCB Order Approving Temporary Urgency Change in Permits 12947A, 12949, 12950 & 16596 for 2010

CERTIFIED MAIL

Mr. Grant Davis
General Manager
Sonoma County Water Agency
P. O. Box 11628
Santa Rosa, CA 95406

Dear Mr. Davis:

ORDER WR 2010-0018-DWR APPROVING SONOMA COUNTY WATER AGENCY'S PETITION FOR TEMPORARY URGENCY CHANGE OF PERMITS 12947A, 12949, 12950, AND 16596 (APPLICATIONS 12919A, 15736, 15737, 19351)

Enclosed is Order WR 2010-0018-DWR approving Sonoma County Water Agency's (SCWA) petition for temporary urgency change in the subject permits, with the addition of certain conditions.

California Water Code section 1438 requires that the petitioner provide public notice of its petition for temporary urgency change. Accordingly, enclosed is a copy of the public notice for SCWA to publish in the below-listed newspapers and to be distributed by hard copy to the enclosed mailing list. The Division of Water Rights will post the notice on its website at http://www.waterboards.ca.gov/waterrights/water_issues/programs/applications/transfers_tu_notices/index.shtml and distribute it through its electronic notification system.

As stated above, SCWA is directed to publish the notice, once only, in the following newspapers:

The Press Democrat
P. O. Box 569
Santa Rosa, CA 95402

Ukiah Daily Journal
P. O. Box 749
Ukiah, CA 95482-0749

The notice must be published in these newspapers as soon as practicable. The petitioner is responsible for all expenses associated with newspaper publication.

SCWA must file proof of publication with this office within 10 days of publication. Proof of publication shall consist of an affidavit of the publisher or foreman of the newspaper, attached to a copy of the notice, as published.

Parties filing objections to the petition shall furnish SCWA, as well as this office, a copy of their objections. We will then notify SCWA of the objections to which it must respond.

Should you have further questions in this matter, please contact Aaron Miller at (916) 341-5390 or amiller@waterboards.ca.gov

Sincerely,

Katy Washburn
for

Steven Hererra, Manager
Water Rights Permitting Section

Enclosures

State Water Resources Control Board

Division of Water Rights

1001 I Street, 14th Floor ♦ Sacramento, California 95814 ♦ 916 552-9286
Mailing Address P O. Box 2000 ♦ Sacramento, California 95812-2000
FAX. 916 341 5400 ♦ www waterboards.ca gov/waterrights

Linda S. Adams
Secretary for Environmental Protection

Arnold Schwarzenegger
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NOTICE OF STATE WATER RESOURCES CONTROL BOARD, DIVISION OF WATER RIGHTS ORDER APPROVING A TEMPORARY URGENCY CHANGE PETITION BY SONOMA COUNTY WATER AGENCY REGARDING PERMITS 12947A, 12949, 12950, AND 16596 (APPLICATIONS 12919A, 15736, 15737, 19351)

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STEVEN HERERRA, MANAGER
Water Rights Permitting Section

DATED: May 24, 2010

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

DIVISION OF WATER RIGHTS

ORDER WR 2010–0018-DWR

IN THE MATTER OF PERMITS 12947A, 12949, 12950, AND 16596 (APPLICATIONS 12919A, 15736, 15737, 19351)

SONOMA COUNTY WATER AGENCY

SOURCES: Dry Creek and Russian River

COUNTIES: Sonoma and Mendocino Counties

ORDER APPROVING TEMPORARY URGENCY CHANGE

BY THE DEPUTY DIRECTOR FOR WATER RIGHTS:

1.0 SUBSTANCE OF PETITION

On April 6, 2010, the Sonoma County Water Agency (SCWA) filed a petition with the State Water Resources Control Board (State Water Board) requesting approval of a Temporary Urgency Change to the subject permits pursuant to California Water Code section 1435. The petition requests the following temporary modifications to the Russian River in-stream flow requirements as mandated by the Russian River Biological Opinion (Biological Opinion) for the improvement of juvenile salmonid habitat:

(1) From May 1 through October 15, 2010, in-stream flow requirements for the upper Russian River (from its confluence with the East Fork of the Russian River to its confluence with Dry Creek) be reduced from 185 cubic feet per second (cfs) to 125 cfs; and

(2) From May 1 through October 15, 2010 in-stream flow requirements for the lower Russian River (downstream of its confluence with Dry Creek) be reduced from 125 cfs to 70 cfs, with the understanding that SCWA will typically maintain approximately 85 cfs at the Hacienda gage as practicably feasible.

No changes to the in-stream flow requirements for Dry Creek are requested. The petition is made to comply with mandates in the Biological Opinion that was issued by the National Marine Fisheries Service (NMFS) on September 24, 2008.

2.0 BACKGROUND

SCWA's petition involves the following permits.

- Permit 12947A is for year-round direct diversion of 92 cubic feet per second (cfs) from the Russian River and storage of 122,500 acre-feet per annum (afa) in Lake Mendocino.

- Permit 12949 is for year-round direct diversion of 20 cfs from the Russian River at the Wohler and Mirabel Park Intakes near Forestville.

- Permit 12950 is for direct diversion of 60 cfs from the Russian River at the Wohler and Mirabel Park Intakes from April 1 through September 30 of each year.

- Permit 16596 is for year-round direct diversion of 180 cfs from the Russian River and storage of 245,000 afa in Lake Sonoma from October 1 of each year to May 1 of the succeeding year.

With the petition SCWA submitted a document prepared by its staff titled, "Sonoma County Water Agency, In-stream Flow Analysis for 2010 Temporary Urgency Change Petition" (Analysis) dated April 2010. The Analysis provides: (1) a summary of minimum in-stream flows required under Decision 1610; (2) an assessment of current water supply conditions of the Russian River System; (3) a summary of the Biological Opinion issued by National Marine Fisheries Service (NMFS) mandating SCWA to petition the State Board for temporary changes in minimum in-stream flow requirements in the Russian River; and (4) a summary of the criteria for approving a temporary urgency change petition. The Analysis indicates that, unlike the Temporary Urgency Change Petitions filed by SCWA in 2004, 2007 and 2009, which requested reductions in minimum in-stream flow requirements in response to low storage levels in Lake Mendocino, the petition being filed in 2010 is mandated by the Biological Opinion in order to benefit threatened and endangered fish species. Water supply storage in Lake Mendocino as of April 1, 2010 was approximately 83,000 acre-feet, significantly higher than in 2007 (71,406 acre-feet) and 2009 (56,666 acre-feet).

Under the federal Endangered Species Act (ESA), steelhead, coho salmon and Chinook salmon in the Russian River watershed are listed as threatened or endangered species. Coho salmon is also listed as endangered under the California Endangered Species Act (CESA). In September 2008, NMFS issued the Russian River Biological Opinion (Biological Opinion). The Biological Opinion is the culmination of more than a decade of consultation under Section 7 of the ESA among SCWA, U.S. Army Corps of Engineers (Corps), and NMFS regarding the impacts on the survival of these listed fish species of SCWA's and the Corps' water supply and flood control operations in the Russian River watershed.

Studies conducted during the consultation period that ultimately led to this Biological Opinion indicate that summer flows in the Upper Russian River and Dry Creek required by Decision 1610 are too high for optimal juvenile salmonid habitat. NMFS also concluded in the Biological Opinion that the historical practice of breaching the sandbar that builds up and frequently closes the mouth of the Russian River during the summer and fall may adversely affect the listed species. NMFS concluded in the Biological Opinion that it might be better for juvenile steelhead and salmon if the sandbar is kept closed during these times, to allow for the formation of a seasonal freshwater lagoon in the estuary. Minimum in-stream flows required by Decision 1610 result in flows into the estuary that make it difficult to maintain a freshwater lagoon while preventing flooding of adjacent properties.

Without the requested modifications to the in-stream flow requirements, the high summer time flows required by Decision 1610 will continue to jeopardize the recovery of coho salmon and steelhead in the Russian River and its tributaries.

Following is the language contained in SCWA's permits regarding minimum in-stream flow requirements:

Term 20 of SCWA's Permit 12947A states:

For the protection of fish and wildlife, and for the maintenance of recreation in the Russian River, permittee shall pass through or release from storage at Lake Mendocino sufficient water to maintain:

(A) A continuous stream flow in the East Fork Russian River from Coyote Dam to its confluence with the Russian River of 25 cfs at all times.

(B) The following minimum flows in the Russian River between the East Fork Russian River and Dry Creek:

(1) During normal water supply conditions when the combined water in storage, including dead storage, in Lake Pillsbury and Lake Mendocino on May 31 of any year exceeds 150,000 af or 90 percent of the estimated water supply storage capacity of the reservoirs, whichever is less:

From June 1 through August 31	185 cfs
From September 1 through March 31	150 cfs
From April 1 through May 31	185 cfs

(2) During normal water supply conditions and when the combined water in storage, including dead storage, in Lake Pillsbury and Lake Mendocino on May 31 of any year is between 150,000 af or 90 percent of the estimated water supply storage capacity of the reservoirs, whichever is less, and 130,000 af or 80 percent of the estimated water supply storage capacity of the reservoirs, whichever is less:

From June 1 through March 31	150 cfs
From April 1 through May 31	185 cfs
If from October 1 through December 31, storage in Lake Mendocino is less than 30,000 acre-feet	75 cfs

(3) During normal water supply conditions and when the combined water in storage, including dead storage, in Lake Pillsbury and Lake Mendocino on May 31 of any year is less than 130,000 af or 80 percent of the estimated water supply storage capacity of the reservoirs, whichever is less:

From June 1 through December 31	75 cfs
From January 1 through March 31	150 cfs
From April 1 through May 31	185 cfs

(4) During dry water supply conditions — 75 cfs

(5) During critical water supply conditions — 25 cfs

(C) The following minimum flows in the Russian River between its confluence with Dry Creek and the Pacific Ocean to the extent that such flows cannot be met by releases from storage at Lake Sonoma under Permit 16596 issued on Application 19351:

(1) During normal water supply conditions	125 cfs
(2) During dry water supply conditions	85 cfs
(3) During critical water supply conditions	35 cfs

For the purposes of the requirements in this term, the following definitions shall apply:

(1) Dry water supply conditions exist when cumulative inflow to Lake Pillsbury beginning on October 1 of each year is less than:

8,000 acre-feet as of January 1
39,200 acre-feet as of February 1
65,700 acre-feet as of March 1
114,500 acre-feet as of April 1
145,600 acre-feet as of May 1
160,000 acre-feet as of June 1

(2) Critical water supply conditions exist when cumulative inflow to Lake Pillsbury beginning on October 1 of each year is less than:

4,000 acre-feet as of January 1
20,000 acre-feet as of February 1
45,000 acre-feet as of March 1
50,000 acre-feet as of April 1
70,000 acre-feet as of May 1
75,000 acre-feet as of June 1

(3) Normal water supply conditions exist in the absence of defined dry or critical water supply conditions.

(4) The water supply condition designation for the months of July through December shall be the same as the designation for the previous June. Water supply conditions for January through June shall be predetermined monthly.

(5) Cumulative inflow to Lake Pillsbury is the calculated algebraic sum of releases from Lake Pillsbury, increases in storage in Lake Pillsbury, and evaporation from Lake Pillsbury.

(6) Estimated water supply storage space is the calculated reservoir volume below elevation 1,828.3 feet in Lake Pillsbury and below elevation 749.0 feet in Lake Mendocino. Both elevations refer to the National Geodetic Vertical Datum of 1929. The calculation shall use the most recent two reservoir volume surveys made by the U. S. Geological Survey, U. S. Army Corps of Engineers, or other responsible agency to determine the rate of sedimentation to be assumed from the date of the most recent reservoir volume survey.

Term 17 of both Permit 12949 and Permit 12950 require SCWA to allow sufficient water to bypass the points of diversion at the Wohler and Mirabel Park Intakes on the Russian River to maintain the following minimum flows to the Pacific Ocean:

(1)	During normal water supply conditions	125 cfs
(2)	During dry water supply conditions	85 cfs
(3)	During critical water supply conditions	35 cfs

Term 13 of Permit 16596 sets forth the following minimum flows for Dry Creek and the Russian River:

(A) The following minimum flows in Dry Creek between Warm Springs Dam and its confluence with the Russian River:

(1) During normal water supply conditions.

75 cfs from January 1 through April 30
80 cfs from May 1 through October 31
105 cfs from November 1 through December 30

(2) During dry or critical water supply conditions:

25 cfs from April 1 through October 31
75 cfs from November 1 through March 31

(B) The following minimum flows in the Russian River between its confluence with Dry Creek and the Pacific Ocean, unless the water level in Lake Sonoma is below elevation 292.0 feet with reference to the National Geodetic Vertical Datum of 1929, or unless prohibited by the United States Government:

(1)	During normal water supply conditions	125 cfs
(2)	During dry water supply conditions	85 cfs
(3)	During critical water supply conditions	35 cfs

Note: Permits 12949, 12950, and 16596 use the same water-year classification definitions as those listed in Permit 12947A. The water year classifications (Normal, Dry or Critical) were established in State Water Board Decision 1610 (D1610) and are based on cumulative inflow into Lake Pillsbury beginning October 1.

3.0 COMPLIANCE WITH CALIFORNIA ENVIRONMENTAL QUALITY ACT

SCWA has determined that the change qualifies for an exemption under the California Environmental Quality Act (CEQA). SCWA found that the change meets the Class 1, 6, 7, and 8 exemption criteria. The State Water Board has reviewed the information submitted by the SCWA and has made its own independent finding that the petition qualifies for an exemption under CEQA. A Class 7 exemption "consists of actions taken by regulatory agencies as authorized by state law or local ordinance to assure the maintenance, restoration, or enhancement of a natural resource where the regulatory process involves procedures for protection of the environment." (Cal. Code Regs, tit. 14, § 15307.) The proposed action will assure the maintenance of a natural resource, i.e., the in-stream resources of the Russian River, by increasing available salmonid rearing habitat in the upper Russian River and providing a lower, closer to natural inflow to the estuary between late spring and early fall, thereby enhancing the potential for maintaining a seasonal freshwater lagoon that could support increased production of juvenile steelhead. A Class 8 exemption "consists of actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment." (*Id.*, § 15308.) The proposed action will assure the maintenance of the environment in the same way as stated for the Class 7 exemption. According to NMFS, the proposed action is necessary to avoid jeopardizing the continued existence of coho salmon, listed as an endangered species under the ESA and CESA, and steelhead, listed as a threatened species under the ESA. The proposed action also will conserve water in Lake Mendocino to benefit adult Chinook salmon migrating upstream in the fall.

The proposed action consists of the operation of existing facilities involving negligible or no expansion of use beyond that existing and accordingly is categorically exempt from CEQA under a Class 1 exemption, which specifically includes maintenance of streamflows to protect fish and wildlife resources. (*Id.*, § 15301, subd. (i).) The proposed action still will be within the existing operational parameters established by Decision 1610. The proposed action does not request and will not expand SCWA use or increase the water supply available to SCWA for consumptive purposes.

In addition, a Class 6 exemption "consists of basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource. These [activities] may be . . . part of a study leading to an action which a public agency has not yet approved, adopted or funded." (*Id.*, § 15306.) The water quality and fishery information and data collected during the period that the proposed action is in effect will assist with the study and development of future permanent changes in the Decision 1610 in-stream flow requirements required by the NMFS, for which a separate petition is pending.

4.0 PUBLIC NOTICE OF THE PETITION

The State Water Board will issue and deliver to SCWA as soon as practicable, a notice of the temporary urgency change order pursuant to Water Code section 1438, subdivision (a). Pursuant to Water Code section 1438, subdivision (b)(1), SCWA is required to publish the notice in a newspaper having a general circulation, and that is published within the counties where the points of diversion lie. The State Water Board will also send a mailing list of known interested parties who have requested notice of proposed temporary urgency changes to SCWA, and SCWA will send copies of the notice to those interested parties via first class mail. The State Water Board will post on its website the notice of the temporary urgency change and a copy of the petition for temporary urgency change (and accompanying materials).

5.0 CRITERIA FOR APPROVING THE PROPOSED TEMPORARY URGENCY CHANGE

Water Code section 1435 provides that a permittee or licensee who has an urgent need to change the point of diversion, place of use, or purpose of use from that specified in the permit or license may petition for a conditional temporary change. The State Water Board's regulations set forth the filing and other procedural requirements applicable to petitions for temporary urgency changes. (Cal. Code Regs., tit. 23, §§ 805, 806.) The Board's regulations also clarify that a petition for a temporary urgency change in a permit or license other than a change in point of diversion, place of use, or purpose of use may be filed, subject to the same filing and procedural requirements that apply to changes in point of diversion, place of use, or purpose of use. (*Id.*, § 791, subd. (e).)

Before approving a temporary urgency change, the State Water Board must make the following findings:

1. the permittee or licensee has an urgent need to make the proposed change;
2. the proposed change may be made without injury to any other lawful user of water;
3. the proposed change may be made without unreasonable effect upon fish, wildlife, or other in-stream beneficial uses; and
4. the proposed change is in the public interest.

(Wat. Code, § 1435, subd. (b)(1-4).)

5.1 Urgency of the Proposed Change

Under Water Code section 1435, subdivision (c), an "urgent need" means "the existence of circumstances from which the board may in its judgment conclude that the proposed temporary change is necessary to further the constitutional policy that the water resources of the state be put to beneficial use to the fullest extent of which they are capable and that waste of water be prevented . . . ." However, the State Water Board shall not find the need urgent if it concludes that the petitioner has failed to exercise due diligence in petitioning for a change pursuant to other appropriate provisions of the Water Code.

Decision 1610 set in-stream flows that the State Water Board concluded, in 1986, would benefit both fishery and recreation uses and which would "preserve the fishery and recreation in the river and in Lake Mendocino to the greatest extent possible while serving the needs of the agricultural, municipal, domestic, and industrial uses which are dependent upon the water." (Decision 1610 at p. 21.) The State

Water Board also concluded in Decision 1610 that additional fishery studies should be done. (Decision 1610 at pp. 26-27.)

It no longer appears that the flows set by Decision 1610 continue to benefit both fishery and recreation uses On September 24, 2008, NMFS issued its Biological Opinion, which evaluated the effects of the activities of SCWA and the Corps on three salmonid species listed as threatened or endangered under the federal Endangered Species Act. The Biological Opinion concluded that summertime flows in the Russian River, at the levels required by Decision 1610, were higher than optimal for the listed species. The Biological Opinion contained an extensive analysis of the impacts of existing in-stream flows on listed species. The Biological Opinion required SCWA to file a petition with the State Water Board to improve conditions for listed species by seeking permanent reductions in the minimum Russian River in-stream flow requirements contained in SCWA's existing water rights permits. The Biological Opinion also contains the following requirement:

> To help restore freshwater habitats for listed salmon and steelhead in the Russian River estuary, SCWA will pursue interim relief from D1610 minimum flow requirements by petitioning the SWRCB for changes to D1610 beginning in 2010 and for each year prior to the permanent change to D1610. These petitions will request that minimum bypass flows of 70 cfs be implemented at the USGS gage at the Hacienda Bridge between May 1 and October 15, with the understanding that for compliance purposes SCWA will typically maintain about 85 cfs at the Hacienda gage. For purposes of enhancing steelhead rearing habitats between the East Branch and Hopland, these petitions will request a minimum bypass flow of 125 cfs at the Healdsburg gage between May 1 and October 15. NMFS will support SCWA's petitions for these changes to D1610 in presentations before the SWRCB.

One of the species listed under the federal ESA (coho salmon) is also listed under CESA. The California Department of Fish and Game (DFG) has issued a consistency determination in which it determined that the incidental take statement issued to SCWA by NMFS in connection with the Biological Opinion was consistent with the provisions and requirements of CESA.

In this case, an "urgent need" for the proposed changes exist within the meaning of section 1435, subdivision (c). The proposed temporary changes are "necessary to further the constitutional policy that the water resources of the state be put to beneficial use to the fullest extent of which they are capable and that waste of water be prevented" within the meaning of section 1435, subdivision (c). As described in the Biological Opinion, the changes will improve habitat for the listed species by reducing in-stream flow and increasing storage for later fishery use, without unreasonably impairing other beneficial uses, thus maximizing the use of Russian River water resources. Moreover, given the listings of Chinook salmon, coho salmon, and steelhead under the federal ESA, there is a need for prompt action. In this case, there has been an extensive analysis of the needs of the fishery, fishery experts agree that in-stream flows appear to be too high, and the change will not affect the ability of SCWA to deliver water for approved beneficial uses in its service area.

5.2 No Injury to Any Other Lawful User of Water

Under this Order, SCWA still will be required to maintain specific flows in the Russian River from its most upstream point of diversion to the river's confluence with the ocean. Therefore, it is anticipated that all SCWA water contractors and other legal users of water will receive the water to which they are entitled during the reduced flows specified in this Order.

5.3 No Unreasonable Effect upon Fish, Wildlife, or Other Instream Beneficial Uses

This Order is based upon the analysis contained in the 2008 Biological Opinion, which has as its primary purpose improving conditions for the fishery resources. Improved conditions that result from this Order will be twofold. First, the evidence in the Biological Opinion indicates that the streamflows required by Decision 1610 would be too high for optimum fishery habitat in both the river and in the estuary. Under this Order, these requirements will be reduced. Second, lowering in-stream flows will result in increased storage in Lake Mendocino. Although flows downstream from Coyote Valley Dam will be decreased upon approval of SCWA's petition, conservation of water in Lake Mendocino will allow enhanced management of the flows in early fall for the benefit of fish migration.

It is possible that reduced flows in the Russian River may impair some in-stream beneficial uses, principally recreation use. However, since 2004, Russian River flows have frequently been managed at decreased levels, both under Decision 1610 and under temporary urgency change orders. Notwithstanding lower flows, Russian River recreation has continued. Accordingly, although recreation uses may be affected, given the analysis in the Biological Opinion and the potential impacts to fisheries that could occur if the petition were not approved, any impact on recreation for this summer is reasonable under the circumstances.

5.4 The Proposed Change is in the Public Interest

As discussed above, the sole purpose of this Order is to improve conditions for listed Russian River salmonid species, as determined necessary by the NMFS and DFG. Approval of SCWA's petition to reduce in-stream flows to benefit the fishery will also maintain storage levels in Lake Mendocino for a longer period of time so that the water is available in the fall for fishery purposes. Given these circumstances, it is in the public interest to temporarily change in-stream flows for this beneficial use.

6.0 CONCLUSIONS

The State Water Board has adequate information in its files to make the evaluation required by Water Code section 1435.

I conclude that, based on the available evidence:

1. The permittee has an urgent need to make the proposed change;
2. The petitioned change will not operate to the injury of any other lawful user of water;
3. The petitioned change will not have an unreasonable effect upon fish, wildlife, or other in-stream beneficial uses; and
4. The petitioned change is in the public interest.

ORDER

NOW, THEREFORE, IT IS ORDERED THAT: the petition filed by Sonoma County Water Agency for temporary change in Permits 12947A, 12949, 12950, and 16596 is approved, in part

All existing terms and conditions of the subject permits remain in effect, except as temporarily amended by the following provisions:

1. From May 25 until October 15, 2010, minimum flows in the Russian River, as specified in Term 20 of Permit 12947A, Term 17 of Permits 12949 and 12950, and Term 13 of Permit 16596, shall be modified as follows:

   - Minimum in-stream flow in the Russian River from its confluence with the East Fork of the Russian River to its confluence with Dry Creek shall be 125 cfs; and

   - Minimum in-stream flow in the Russian River from its confluence with Dry Creek to the Pacific Ocean shall be 70 cfs as measured at the U.S. Geological Survey (USGS) gage located at Hacienda Bridge, with the understanding that SCWA will typically maintain approximately 85 cfs at the gage as practicably feasible.

   For purposes of compliance with this term, minimum in-stream flow requirements shall be met on an instantaneous flow basis.

2. SCWA shall monitor and record daily numbers of adult Chinook salmon moving upstream past the Mirabel inflatable dam beginning no later than September 1, 2010, and continuing through at least November 15, 2010.

3. If adult Chinook salmon can enter the Russian River estuary, SCWA shall monitor numbers of adult Chinook salmon in representative deep pools in the lower Russian River downstream of the Mirabel inflatable dam on a weekly basis beginning September 15, 2010, and ending when 200 fish have passed Mirabel Dam, or sustained flows in the Russian River at Hacienda Bridge are greater than 125 cfs, or November 15, 2010, whichever is earlier.

4. SCWA shall monitor numbers of adult Chinook salmon at known spawning sites and in representative deep pools in the upper Russian River (Lake Mendocino to Healdsburg) on a weekly basis after the number of adult Chinook salmon counted at Mirabel Dam exceeds 200 fish. Weekly surveys will continue until November 15, 2010

5. SCWA shall monitor juvenile salmonids and other native fishes by snorkel survey at six sites in the upper main stem Russian River (upstream of Mirabel) during August 2010. Snorkel survey sites will correspond to those locations monitored by SCWA in 2009.

6. SCWA shall monitor downstream movement of juvenile salmonids in Dry Creek, the main stem Russian River at Wohler, and at the upstream end of the Russian River estuary (when river conditions permit safe monitoring) through at least June 15, 2010 as more fully described in the Biological Opinion.

7. SCWA shall consult with NMFS and DFG on a weekly basis regarding the fisheries monitoring activities specified in Terms 2 through 6 of this Order. Any necessary revisions to Terms 2 through 6 shall be made upon approval by the State Water Board's Deputy Director for Water Rights (Deputy Director). Reporting of fisheries monitoring tasks described in Terms 2 through 6 shall be submitted to the Deputy Director by April 1, 2011 in accordance with NMFS and DFG annual reporting requirements as more fully described in the Biological Opinion.

8. SCWA shall prepare a Water Quality Monitoring Plan (Monitoring Plan) for the Russian River in consultation with: (1) the North Coast Regional Water Quality Control Board; (2) the United States Geological Survey; (3) NMFS; and (4) the Division of Water Rights. The objectives of the Monitoring Plan should be to provide information to evaluate potential changes to water quality and availability of aquatic habitat for salmonids resulting from the proposed permanent changes

to Decision 1610 minimum in-stream flows that are mandated by the Biological Opinion. Furthermore, the Monitoring Plan should build upon previous water quality studies that have been conducted in the Russian River and the estuary water quality monitoring required by the Biological Opinion, and provide information to support the development of a CEQA document required for permanent changes to Decision 1610. The Monitoring Plan shall be submitted to the Deputy Director for approval within 28 days of the date of this Order. SCWA shall implement the Monitoring Plan immediately upon approval by the Deputy Director.

9. This Order does not authorize any act that results in the taking of a threatened or endangered species, or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the federal Endangered Species Act (16 U.S.C.A. sections 1531 to 1544). If a "take" will result from any act authorized under this Order, the permittee shall obtain authorization for an incidental take permit prior to construction or operation. Permittee shall be responsible for meeting all requirements of the applicable Endangered Species Act for the temporary urgency change authorized under this Order.

10. The State Water Board reserves jurisdiction to supervise the temporary urgency change under this Order, and to coordinate or modify terms and conditions, for the protection of vested rights, fish, wildlife, in-stream beneficial uses and the public interest as future conditions may warrant.

11. SCWA shall prepare a Water Conservation Status Report for SCWA's service area and other areas served by Lake Mendocino. The report shall specify the water conservation measures being implemented during May through November, 2010. The report shall be submitted to the Deputy Director by December 31, 2010.

12. SCWA shall provide any relevant updates to the estimated future water savings from conservation measures presented in the report submitted under Term 17 of Order WR 2009-0034-EXEC, including components of the Governor's 20x2020 Water Conservation Plan (February 2010), consisting of, but not limited to, each water contractor's gallons per capita per day calculation, water use targets and implementation plan to achieve those targets. The report shall be submitted to the Deputy Director by March 1, 2011.

13. SCWA shall be responsible for ensuring that all of its water contractors require their dedicated irrigation customers be assigned a water budget designed to achieve a maximum applied water allowance (MAWA) of 60 percent ETo, exceeding the State's requirements. SCWA shall report back the Deputy Director by December 31, 2010 regarding the actual MAWA achieved by each of its contractors during May through November, 2010.

14. SCWA shall work with agricultural Russian River water users to pursue opportunities that will result in improved management of the Russian River by better anticipating periods of high water demand. SCWA shall provide an update to the Deputy Director regarding the progress of these efforts by December 31, 2010.

15. SCWA shall evaluate (1) physical conditions and integrity of its transmission system pipelines, and (2) opportunities for increased automated operational data sharing between the SCWA and its water contractors' respective systems, with the goal of reducing water loss and promoting increases in water use efficiency. SCWA shall require that each of its water contractors provide an assessment of unaccounted water associated with their distribution systems. This assessment shall include, as appropriate, any programs or projects identified by each water contractor to reduce unaccounted water and system losses. SCWA shall update the Deputy Director on the progress of these efforts by June 30, 2011.

16. During the term of the Order, SCWA shall work with its contractors to conjunctively manage surface and groundwater resources within SCWA's service area. Such management should emphasize the conservation and replenishment of groundwater resources and utilization of available surface water supplies to the extent feasible. SCWA shall provide an update to the Deputy Director regarding the progress of these efforts by December 31, 2010.

17. SCWA shall provide an update to the Deputy Director regarding the progress of the Santa Rosa Plain Groundwater Management Planning Program by December 31, 2010. The update shall include any progress being made towards implementation of groundwater recharge in the Santa Rosa basin.

STATE WATER RESOURCES CONTROL BOARD

James W. Kassel

for *Victoria A. Whitney*
Deputy Director for Water Rights

Dated: **MAY 24 2010**

NOTICE OF EXEMPTION

PHELPS

CF/42-0.19-9 SWRCB Order Approving Temporary Urgency Change in Permits 12947A, 12949, 12950 & 16596 for 2010

To: X Office of Planning & Research
1400 Tenth Street, Room 121
Sacramento, CA 95814

X County Clerk
County of Sonoma
Santa Rosa, CA 95401

X County Clerk
County of Mendocino
Ukiah, CA 95482

From: Sonoma County Water Agency
404 Aviation Boulevard
Santa Rosa, CA 95403

2010-E0030
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SONOMA COUNTY WATER AGENCY
04/08/2010 03:36 PM
Fee: $0 Pgs: 1 of 1
OFFICIAL RECORDS
Susan M. Ranochak - Clerk-Recorder
Mendocino County, CA

Project Title: Petition by Sonoma County Water Agency Requesting Approval of a Temporary Urgency Change in Permits 12947A, 12949, 12950, and 16596 in Mendocino and Sonoma Counties (Applications 12919A, 15736, 15737, and 19351): 2010 Temporary Changes to Minimum Instream Flow Requirements of Decision 1610

Project Location: The proposed action is to temporarily change the required minimum instream flows in the Russian River in Mendocino and Sonoma Counties. Figure 1 shows the minimum instream-flow requirements in the water-right permits of the Sonoma County Water Agency (SCWA) for its Russian River Project that are in effect now and that will remain in effect if the proposed action is not approved. The proposed action is to temporarily change some of these requirements, to the "Temporary Changes" shown in Figure 2, for the period from May 1, 2010 through October 15, 2010. Communities and cities along the Russian River include Ukiah, Hopland, Cloverdale, Geyserville, Healdsburg, Forestville, Mirabel Park, Rio Nido, Guerneville, Monte Rio, Duncans Mills, and Jenner.

Project Background: The National Marine Fisheries Service (NMFS) issued its *Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed* (Russian River BO) on September 24, 2008.[1] NMFS concluded in the Russian River BO that the continued operations of Coyote Valley Dam and Warm Springs Dam by the U.S. Army Corps of Engineers and SCWA in a manner similar to recent historic practices, together with SCWA's stream channel maintenance activities and estuary management, are likely to jeopardize and adversely modify critical habitat for endangered Central California Coast coho salmon and threatened Central California Coast steelhead.

SCWA controls and coordinates water supply releases from the Coyote Valley Dam and Warm Springs Dam projects in accordance with the requirements of Decision 1610, adopted by the State Water Resources Control Board (SWRCB) in 1986. NMFS' Russian River BO states that changes to Decision 1610 minimum instream flow requirements will enable alternative flow management scenarios that will increase available rearing habitat in Dry Creek and the upper Russian River, and provide a lower, closer to natural inflow to the estuary between late spring and early fall, thereby enhancing the potential for

[1] NMFS' Russian River BO may be accessed online at www.sonomacountywater.org and may be reviewed at SCWA's office at 404 Aviation Boulevard, Santa Rosa, CA.

POSTED FROM 4/9/10 TO: 5/10/10

maintaining a seasonal freshwater lagoon that will likely support increased production of juvenile steelhead and salmon.[2]

As required by NMFS' Russian River BO, in September 2009 SCWA filed a petition with the SWRCB to make permanent changes to the Decision 1610 minimum instream flow requirements. This petition presently is pending before the SWRCB. The SWRCB will not act on this petition until the necessary environmental impact report is prepared and the water-rights issues associated with this petition are resolved. This process is expected to take several years.

Until the SWRCB issues an order on this petition, SCWA must maintain the minimum instream flows specified in Decision 1610, with resulting impacts to listed salmonids, unless temporary changes to these requirements are authorized by the SWRCB. To help restore freshwater habitats for listed salmon and steelhead in the Russian River estuary NMFS' Russian River BO requires that SCWA petition the SWRCB for temporary changes to minimum instream flow requirements beginning in 2010 and for each year thereafter until the SWRCB issues an order on SCWA's petition for the permanent changes to the Decision 1610 minimum instream flow requirements. The temporary changes include a reduction in the minimum instream flow to 70 cubic feet per second (cfs) in the lower Russian River between May 1 and October 15, with the understanding that, because of the need to maintain an operational buffer above this minimum requirement, SCWA will typically maintain a flow of about 85 cfs at this point. Additionally, for the purposes of enhancing steelhead rearing habitat between the East Fork and Hopland, the temporary changes include a reduction in the minimum instream flow to 125 cfs in the upper Russian River between May 1 and October 15.[3] NMFS' Russian River BO only requires petitions for temporary changes to minimum streamflows on the mainstem Russian River, and not on Dry Creek. This petition therefore does not seek changes in required Dry Creek flows, which will be maintained at the levels currently required by Decision 1610.

The permanent and temporary changes to Decision 1610 minimum instream flows specified by NMFS in the Russian River BO are summarized in Figure 2. NMFS' Russian River BO states that, in addition to providing the expected fishery benefits, the revised minimum instream flow requirements should promote water conservation and seek to limit effects on in-stream river recreation.[4]

Description of Project: To comply with the requirements of NMFS' Russian River BO, SCWA is filing a temporary urgency change petition with the SWRCB that asks the SWRCB to make the following changes in the instream flow requirements for the Russian River mainstem that are specified in Decision 1610 and SCWA's water right permits between May 1 through October 15, 2010: (a) a minimum instream flow requirement of 125 cfs in the upper Russian River (upstream of the confluence with Dry Creek and downstream of the confluence of the East and West Forks) and (b) 70 cfs in the lower Russian River (downstream of its confluence with Dry Creek), with the understanding that for compliance purposes SCWA will typically maintain a flow of about 85 cfs at this point.

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[2] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p. 243. September 2008.

[3] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p 247. September 2008.

[4] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p. 244. September 2008.

Decision 1610 specifies the minimum flow requirements for Dry Creek and the Russian River (see Figure 1). These requirements vary based on defined hydrologic conditions. If approved, the requested reductions in Russian River instream flow requirements will be in effect May 1 through October 15, 2010. Under Normal water supply conditions, minimum flows during this time period could be as high as 185 cfs in the upper Russian River, 125 cfs in the lower Russian River, and 80 cfs in Dry Creek. Under the proposed change, minimum flows could be as low as 125 cfs in the upper Russian River and 70 cfs in the lower Russian River. No change in the Dry Creek requirements is proposed and the minimum flow requirement in Dry Creek will remain at 80 cfs. The proposed changes in Russian River instream flow requirements will not result in any unusual circumstances, because the proposed minimum instream flow requirements are within the range of those that already occur during Dry and Critical water supply conditions under Decision 1610. In addition, due to low rainfall and other factors, flows in the river during the last three years have been similar to or lower than the proposed changes. For example, compared to summer 2009, the requested minimum flows are slightly higher for the lower Russian River and substantially higher for the upper Russian River.

During the period that the proposed temporary flow changes are in effect, SCWA will also monitor water quality and fish, and collect and report information and data related to monitoring activities, as required by NMFS' Russian River BO. This information will assist with the study and development of required future permanent flow changes.

Name of Public Agency Approving Project: State Water Resources Control Board- Division of Water Rights

Name of Person or Agency Carrying Out Project: Sonoma County Water Agency

Exempt Status: (Check one)

___	Ministerial (Sec. 21080(b)(1); 15268)	
___	Declared Emergency (Sec. 21080(b)(3); 15269(a));	
___	Emergency Project (Sec.21080 (b)(4); 15269(b)(c));	
X	Categorical Exemption. State type and section number:	State CEQA Guidelines 15307: Actions by Regulatory Agencies for Protection of Natural Resources
		State CEQA Guidelines 15308: Actions by Regulatory Agencies for Protection of the Environment
		State CEQA Guidelines 15301(i): Existing Facilities
		State CEQA Guidelines 15306: Information Collection
___	Statutory Exemptions. State Code number:	

Reasons why project is exempt: The proposed action is categorically exempt from the California Environmental Quality Act (CEQA) under the State CEQA Guidelines Sections 15307, 15308, 15301(i), and 15306.

A. Actions by Regulatory Agencies for Protection of Natural Resources and the Environment

Guidelines Sections 15307 and 15308 provide that actions taken by regulatory agencies to assure the maintenance, restoration or enhancement of a natural resource and the environment are categorically exempt from CEQA. If approved, the proposed changes in Russian River instream flow requirements will increase available rearing habitat in the upper Russian River and provide a lower, closer to natural inflow

to the estuary between late spring and early fall, thereby enhancing the potential for maintaining a seasonal freshwater lagoon that could support increased production of juvenile steelhead. NMFS' Russian River BO states that these changes are necessary to avoid jeopardizing the continued existence of the listed species.[5] The proposed changes also will conserve water in Lake Mendocino to benefit adult Chinook salmon migrating upstream in the fall.

B. Existing Facilities
Guidelines Section 15301(i) provides, generally, that the operation of existing facilities involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination is categorically exempt from CEQA. Subdivision (i) of Section 15301 specifically includes maintenance of streamflows to protect fish and wildlife resources. SCWA's petition to the SWRCB to change to the instream flow requirements specified in NMFS' Russian River BO does not request and will not expand SCWA use or increase the water supply available to SCWA for consumptive purposes. The proposed change in Russian River instream flow requirements still will be within the existing operational parameters established by Decision 1610.

C. *Information Collection*
Guidelines Section 15306 provides that basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource are categorically exempt from CEQA. These activities may be part of a study leading to an action which a public agency has not yet approved, adopted or funded. The water quality and fishery information and data collected during the period that the proposed temporary flow changes are in effect will assist with the study and development of the required future permanent flow changes.

Lead Agency Contact Person: Erica Phelps Area Code/Telephone: 707-547-1934

Signature: ____________ Date: APR 5 2010 Title: General Manager

X Lead Agency ___ Applicant
Date Received for filing at OPR:

[5] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p. 247. September 2008.

Cumulative inflow to Lake Pillsbury (Acre Feet) as of

	1/1	2/1	3/1	4/1	5/1	6/1	
NORMAL	≥8,000	≥39,200	≥65,700	≥114,500	≥145,600	≥160,000	Water Supply Conditions Prevailing on 6/1 Apply Through 12/31
DRY	<8,000	<39,200	<65,700	<114,500	<145,600	<160,000	
CRITICAL DRY	<4,000	<20,000	<45,000	<50,000	<70,000	<75,000	

LEGEND

All flows are minimums, expressed in cubic feet per second.

★ - Unless Lake Sonoma Elevation is below 292.0, or if prohibited by the United States Government.

AF - Acre Feet

● - USGS Stream Gage Compliance Points

East Fork

Coyote Dam

Mouth East Fork Russian River

ALWAYS East Fork Russian River Coyote Dam to Russian River 25 CFS

Russian River

NORMAL

1/1 - 3/31 150 CFS
4/1 - 5/31 185 CFS

If Combined Storage in Lake Pillsbury and Lake Mendocino on May 31 is

Normal	Normal - Dry Spring 1	Normal - Dry Spring 2
150,000 AF or >90% of Total Storage 6/1 - 8/31 185 CFS 9/1 - 12/31 150 CFS	130,000 - 150,000 AF or 80-90% of Total Storage whichever is less 6/1 - 12/31 150 CFS	<130,000 AF or <80% of Total Storage 6/1 - 12/31 75 CFS

If Lake Mendocino <30,000 AF Storage
10/1 - 12/31 75 CFS

DRY

75 CFS

CRITICAL DRY

25 CFS

Dry Creek

NORMAL

1/1 - 4/30 75 CFS
5/1 - 10/31 80 CFS
11/1 - 12/31 105 CFS

DRY

4/1 - 10/31 25 CFS
11/1 - 3/31 75 CFS

CRITICAL DRY

4/1 - 10/31 25 CFS
11/1 - 3/31 75 CFS

Mouth Dry Creek

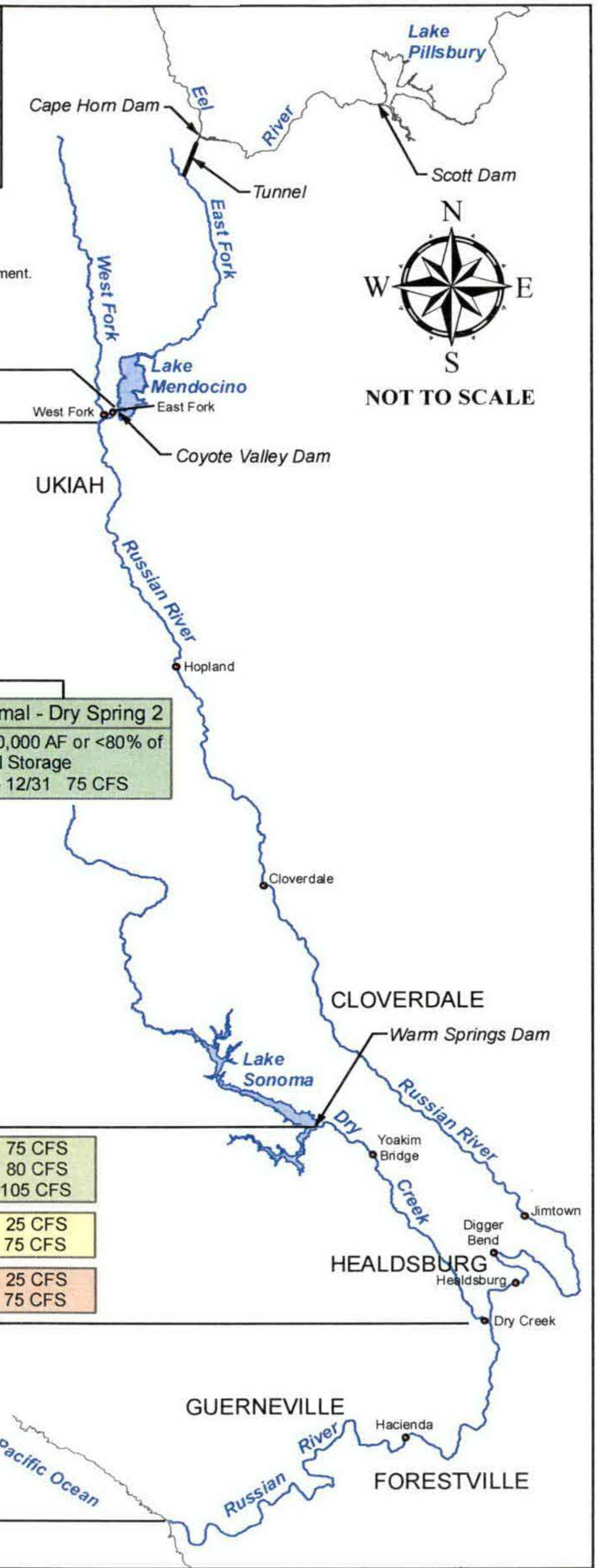
Russian River

NORMAL 125 CFS★

DRY 85 CFS★

CRITICAL DRY 35 CFS★

Mouth Russian River



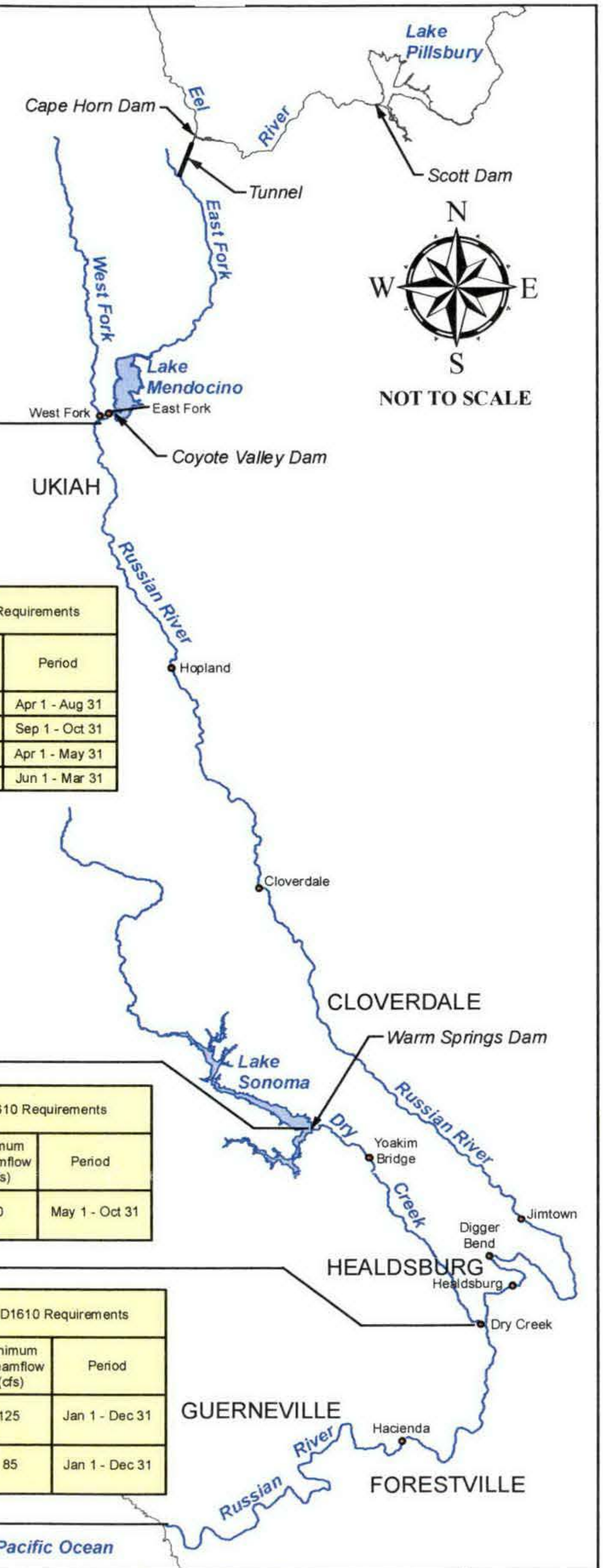
SPECIAL PROJECTS/ 7323-RRIFR-D1610/2010-USGS-GAGE-STREAMFLOW.mxd APRIL 5, 2010

SONOMA COUNTY WATER AGENCY

Russian River Basin
Streamflow Requirements

Per State Water Resources Control Board Decision 1610, April 1986

Figure 1



LEGEND

AF - Acre Feet

●- USGS Stream Gage Compliance Points

Upper Russian River

Water Supply Conditions	NMFS Biological Opinion Proposed Changes				D1610 Requirements	
	Temporary Changes		Permanent Changes			
	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period
Normal	125	May 1 - Oct 15	125	Jun 1 - Oct 31	185	Apr 1 - Aug 31
					150	Sep 1 - Oct 31
Normal - Dry Spring 1	125	May 1 - Oct 15	125	Jun 1 - Oct 31	185	Apr 1 - May 31
					150	Jun 1 - Mar 31

Dry Creek

Water Supply Conditions	NMFS Biological Opinion Proposed Changes				D1610 Requirements	
	Temporary Changes		Permanent Changes			
	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period
Normal	-	-	40	May 1 - Oct 31	80	May 1 - Oct 31

Lower Russian River

Water Supply Conditions	NMFS Biological Opinion Proposed Changes				D1610 Requirements	
	Temporary Changes		Permanent Changes			
	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period
Normal	70 (85 cfs w/ buffer)	May 1 - Oct 15	70 (85 cfs w/ buffer)	Jan 1 - Dec 31	125	Jan 1 - Dec 31
Dry	-	-	70 (85 cfs w/ buffer)	Jan 1 - Dec 31	85	Jan 1 - Dec 31

SPECIAL PROJECTS/7323-RRIFR-D1610/2010-USGS-GAGE-STREAMFLOW.mxd April 1, 2010

SONOMA COUNTY WATER AGENCY

Russian River Biological Opinion
Proposed Minimum Instream Flow Changes

Per National Marine Fisheries Service's Biological Opinion Issued September 24, 2008

Figure 2

Susan M. Ranochak, Clerk-Recorder
Mendocino County, CA
501 Low Gap Rd., Room 1020
Ukiah, Ca 95482

Receipt: 10-5208

Product	Name		Extended
NTDETER2008	Notice Of Determination 2008		$0.00
		# Pages	1
		Document #	2010-E0030
		# Negative Decl	1
		# Mitigated Negative Decl	0
		# EIR	0
		# Cert Reg Pogram	0
		# Conformed Labels	4
		No Charge Item	true
Total			$0.00
Change (Cash)			$0.00

Thank You!

Thu Apr 08 15:36:09 PDT 2010 kathy

This notice was posted on APR . . 2010
and will remain posted for a period of thirty days
until MAY 07 2010

NOTICE OF EXEMPTION

CF/42-0.19-9 SWRCB Order Approving Temporary Urgency Change in Permits 12947A, 12949, 12950 & 16596 for 2010

Lead/Appr PHELPS MAY 12 2010

To: X Office of Planning & Research
1400 Tenth Street, Room 121
Sacramento, CA 95814

X County Clerk
County of Sonoma
Santa Rosa, CA 95401

X County Clerk
County of Mendocino
Ukiah, CA 95482

10-0407-3

From: Sonoma County Water Agency
404 Aviation Boulevard
Santa Rosa, CA 95403

JANICE ATKINSON, Co. Clerk
BY: DEPUTY CLERK

Project Title: Petition by Sonoma County Water Agency Requesting Approval of a Temporary Urgency Change in Permits 12947A, 12949, 12950, and 16596 in Mendocino and Sonoma Counties (Applications 12919A, 15736, 15737, and 19351): 2010 Temporary Changes to Minimum Instream Flow Requirements of Decision 1610

Project Location: The proposed action is to temporarily change the required minimum instream flows in the Russian River in Mendocino and Sonoma Counties. Figure 1 shows the minimum instream-flow requirements in the water-right permits of the Sonoma County Water Agency (SCWA) for its Russian River Project that are in effect now and that will remain in effect if the proposed action is not approved. The proposed action is to temporarily change some of these requirements, to the "Temporary Changes" shown in Figure 2, for the period from May 1, 2010 through October 15, 2010. Communities and cities along the Russian River include Ukiah, Hopland, Cloverdale, Geyserville, Healdsburg, Forestville, Mirabel Park, Rio Nido, Guerneville, Monte Rio, Duncans Mills, and Jenner.

(\$ 50 368)

Project Background: The National Marine Fisheries Service (NMFS) issued its *Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed* (Russian River BO) on September 24, 2008.[1] NMFS concluded in the Russian River BO that the continued operations of Coyote Valley Dam and Warm Springs Dam by the U.S. Army Corps of Engineers and SCWA in a manner similar to recent historic practices, together with SCWA's stream channel maintenance activities and estuary management, are likely to jeopardize and adversely modify critical habitat for endangered Central California Coast coho salmon and threatened Central California Coast steelhead.

SCWA controls and coordinates water supply releases from the Coyote Valley Dam and Warm Springs Dam projects in accordance with the requirements of Decision 1610, adopted by the State Water Resources Control Board (SWRCB) in 1986. NMFS' Russian River BO states that changes to Decision 1610 minimum instream flow requirements will enable alternative flow management scenarios that will increase available rearing habitat in Dry Creek and the upper Russian River, and provide a lower, closer to natural inflow to the estuary between late spring and early fall, thereby enhancing the potential for

[1] NMFS' Russian River BO may be accessed online at www.sonomacountywater.org and may be reviewed at SCWA's office at 404 Aviation Boulevard, Santa Rosa, CA.

399332

maintaining a seasonal freshwater lagoon that will likely support increased production of juvenile steelhead and salmon.[2]

As required by NMFS' Russian River BO, in September 2009 SCWA filed a petition with the SWRCB to make permanent changes to the Decision 1610 minimum instream flow requirements. This petition presently is pending before the SWRCB. The SWRCB will not act on this petition until the necessary environmental impact report is prepared and the water-rights issues associated with this petition are resolved. This process is expected to take several years.

Until the SWRCB issues an order on this petition, SCWA must maintain the minimum instream flows specified in Decision 1610, with resulting impacts to listed salmonids, unless temporary changes to these requirements are authorized by the SWRCB. To help restore freshwater habitats for listed salmon and steelhead in the Russian River estuary NMFS' Russian River BO requires that SCWA petition the SWRCB for temporary changes to minimum instream flow requirements beginning in 2010 and for each year thereafter until the SWRCB issues an order on SCWA's petition for the permanent changes to the Decision 1610 minimum instream flow requirements. The temporary changes include a reduction in the minimum instream flow to 70 cubic feet per second (cfs) in the lower Russian River between May 1 and October 15, with the understanding that, because of the need to maintain an operational buffer above this minimum requirement, SCWA will typically maintain a flow of about 85 cfs at this point. Additionally, for the purposes of enhancing steelhead rearing habitat between the East Fork and Hopland, the temporary changes include a reduction in the minimum instream flow to 125 cfs in the upper Russian River between May 1 and October 15.[3] NMFS' Russian River BO only requires petitions for temporary changes to minimum streamflows on the mainstem Russian River, and not on Dry Creek. This petition therefore does not seek changes in required Dry Creek flows, which will be maintained at the levels currently required by Decision 1610.

The permanent and temporary changes to Decision 1610 minimum instream flows specified by NMFS in the Russian River BO are summarized in Figure 2. NMFS' Russian River BO states that, in addition to providing the expected fishery benefits, the revised minimum instream flow requirements should promote water conservation and seek to limit effects on in-stream river recreation.[4]

Description of Project: To comply with the requirements of NMFS' Russian River BO, SCWA is filing a temporary urgency change petition with the SWRCB that asks the SWRCB to make the following changes in the instream flow requirements for the Russian River mainstem that are specified in Decision 1610 and SCWA's water right permits between May 1 through October 15, 2010: (a) a minimum instream flow requirement of 125 cfs in the upper Russian River (upstream of the confluence with Dry Creek and downstream of the confluence of the East and West Forks) and (b) 70 cfs in the lower Russian River (downstream of its confluence with Dry Creek), with the understanding that for compliance purposes SCWA will typically maintain a flow of about 85 cfs at this point.

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[2] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p. 243. September 2008.

[3] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p 247. September 2008.

[4] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p. 244. September 2008.

Decision 1610 specifies the minimum flow requirements for Dry Creek and the Russian River (see Figure 1). These requirements vary based on defined hydrologic conditions. If approved, the requested reductions in Russian River instream flow requirements will be in effect May 1 through October 15, 2010. Under Normal water supply conditions, minimum flows during this time period could be as high as 185 cfs in the upper Russian River, 125 cfs in the lower Russian River, and 80 cfs in Dry Creek. Under the proposed change, minimum flows could be as low as 125 cfs in the upper Russian River and 70 cfs in the lower Russian River. No change in the Dry Creek requirements is proposed and the minimum flow requirement in Dry Creek will remain at 80 cfs. The proposed changes in Russian River instream flow requirements will not result in any unusual circumstances, because the proposed minimum instream flow requirements are within the range of those that already occur during Dry and Critical water supply conditions under Decision 1610. In addition, due to low rainfall and other factors, flows in the river during the last three years have been similar to or lower than the proposed changes. For example, compared to summer 2009, the requested minimum flows are slightly higher for the lower Russian River and substantially higher for the upper Russian River.

During the period that the proposed temporary flow changes are in effect, SCWA will also monitor water quality and fish, and collect and report information and data related to monitoring activities, as required by NMFS' Russian River BO. This information will assist with the study and development of required future permanent flow changes.

Name of Public Agency Approving Project: State Water Resources Control Board- Division of Water Rights

Name of Person or Agency Carrying Out Project: Sonoma County Water Agency

Exempt Status: (Check one)

___	Ministerial (Sec. 21080(b)(1); 15268)	
___	Declared Emergency (Sec. 21080(b)(3); 15269(a));	
___	Emergency Project (Sec.21080 (b)(4); 15269(b)(c));	
X	Categorical Exemption. State type and section number:	State CEQA Guidelines 15307: Actions by Regulatory Agencies for Protection of Natural Resources
		State CEQA Guidelines 15308: Actions by Regulatory Agencies for Protection of the Environment
		State CEQA Guidelines 15301(i): Existing Facilities
		State CEQA Guidelines 15306: Information Collection
___	Statutory Exemptions. State Code number:	

Reasons why project is exempt: The proposed action is categorically exempt from the California Environmental Quality Act (CEQA) under the State CEQA Guidelines Sections 15307, 15308, 15301(i), and 15306.

A. Actions by Regulatory Agencies for Protection of Natural Resources and the Environment
Guidelines Sections 15307 and 15308 provide that actions taken by regulatory agencies to assure the maintenance, restoration or enhancement of a natural resource and the environment are categorically exempt from CEQA. If approved, the proposed changes in Russian River instream flow requirements will increase available rearing habitat in the upper Russian River and provide a lower, closer to natural inflow

to the estuary between late spring and early fall, thereby enhancing the potential for maintaining a seasonal freshwater lagoon that could support increased production of juvenile steelhead. NMFS' Russian River BO states that these changes are necessary to avoid jeopardizing the continued existence of the listed species.[5] The proposed changes also will conserve water in Lake Mendocino to benefit adult Chinook salmon migrating upstream in the fall.

B. Existing Facilities
Guidelines Section 15301(i) provides, generally, that the operation of existing facilities involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination is categorically exempt from CEQA. Subdivision (i) of Section 15301 specifically includes maintenance of streamflows to protect fish and wildlife resources. SCWA's petition to the SWRCB to change to the instream flow requirements specified in NMFS' Russian River BO does not request and will not expand SCWA use or increase the water supply available to SCWA for consumptive purposes. The proposed change in Russian River instream flow requirements still will be within the existing operational parameters established by Decision 1610.

C. *Information Collection*
Guidelines Section 15306 provides that basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource are categorically exempt from CEQA. These activities may be part of a study leading to an action which a public agency has not yet approved, adopted or funded. The water quality and fishery information and data collected during the period that the proposed temporary flow changes are in effect will assist with the study and development of the required future permanent flow changes.

Lead Agency Contact Person: Erica Phelps Area Code/Telephone: 707-547-1934

Signature: ______________ Date: APR 5 2010 Title: General Manager

X Lead Agency ___ Applicant
Date Received for filing at OPR:

[5] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p. 247. September 2008.

Cumulative inflow to Lake Pillsbury (Acre Feet) as of

	1/1	2/1	3/1	4/1	5/1	6/1	
NORMAL	≥8,000	≥39,200	≥65,700	≥114,500	≥145,600	≥160,000	Water Supply Conditions Prevailing on 6/1 Apply Through 12/31
DRY	<8,000	<39,200	<65,700	<114,500	<145,600	<160,000	
CRITICAL DRY	<4,000	<20,000	<45,000	<50,000	<70,000	<75,000	

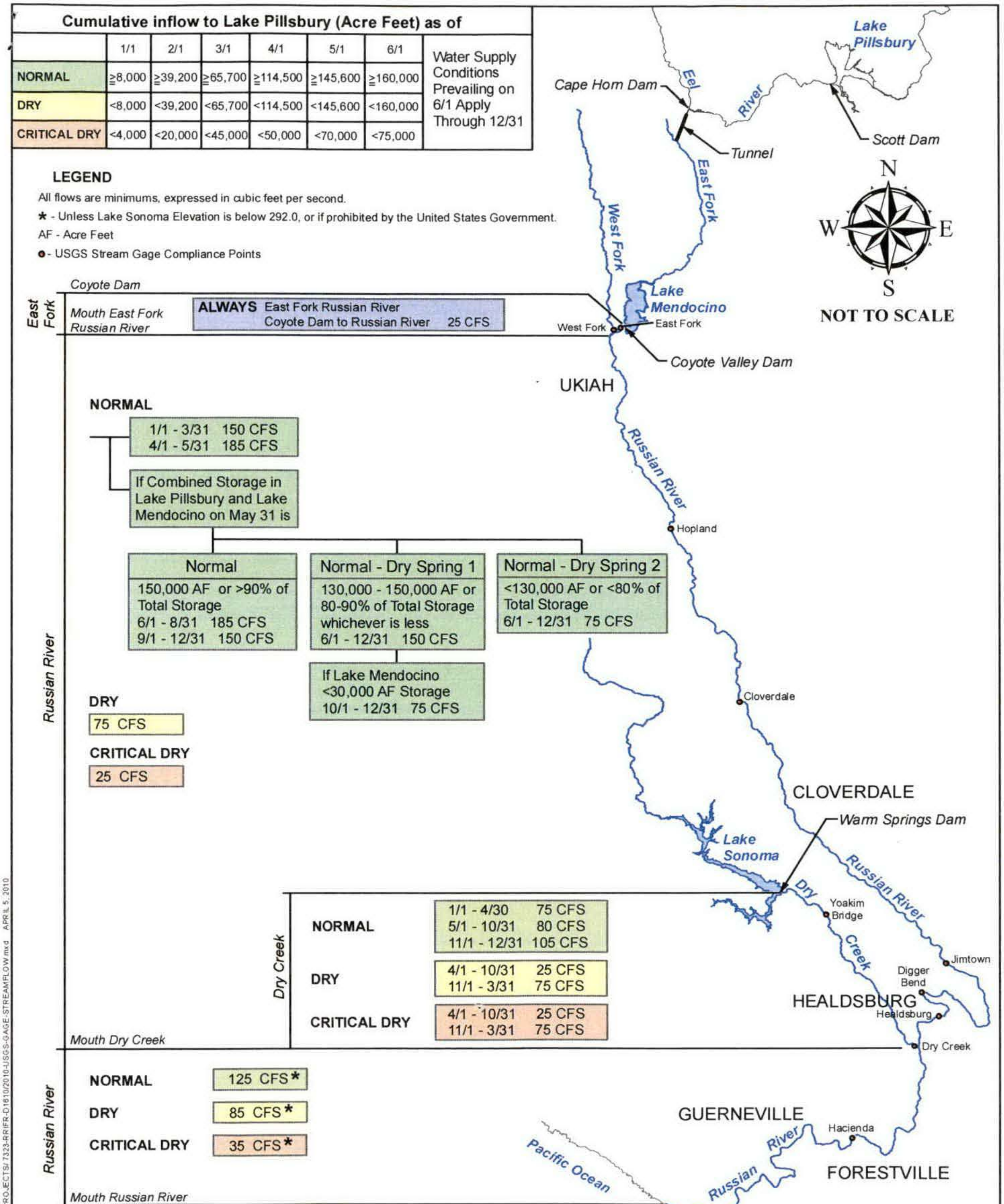
LEGEND

All flows are minimums, expressed in cubic feet per second.

★ - Unless Lake Sonoma Elevation is below 292.0, or if prohibited by the United States Government.

AF - Acre Feet

● - USGS Stream Gage Compliance Points

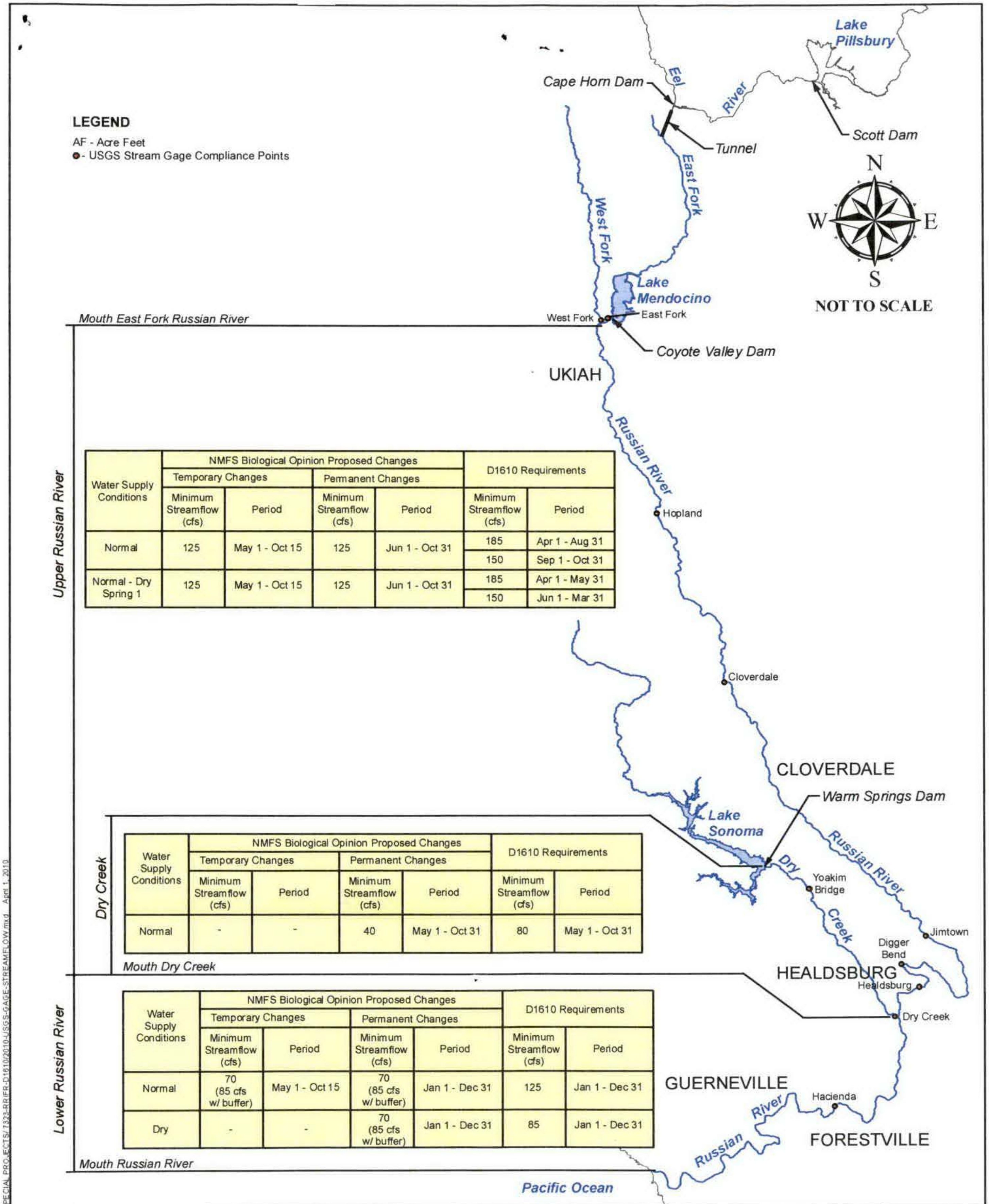


SPECIAL PROJECTS/ 7323-RRIFR-D1610/2010-USGS-GAGE-STREAMFLOW.mxd APRIL 5, 2010

SONOMA COUNTY WATER AGENCY

Russian River Basin
Streamflow Requirements
Per State Water Resources Control Board Decision 1610, April 1986

Figure 1



Upper Russian River

Water Supply Conditions	NMFS Biological Opinion Proposed Changes				D1610 Requirements	
	Temporary Changes		Permanent Changes			
	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period
Normal	125	May 1 - Oct 15	125	Jun 1 - Oct 31	185	Apr 1 - Aug 31
					150	Sep 1 - Oct 31
Normal - Dry Spring 1	125	May 1 - Oct 15	125	Jun 1 - Oct 31	185	Apr 1 - May 31
					150	Jun 1 - Mar 31

Dry Creek

Water Supply Conditions	NMFS Biological Opinion Proposed Changes				D1610 Requirements	
	Temporary Changes		Permanent Changes			
	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period
Normal	-	-	40	May 1 - Oct 31	80	May 1 - Oct 31

Lower Russian River

Water Supply Conditions	NMFS Biological Opinion Proposed Changes				D1610 Requirements	
	Temporary Changes		Permanent Changes			
	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period
Normal	70 (85 cfs w/ buffer)	May 1 - Oct 15	70 (85 cfs w/ buffer)	Jan 1 - Dec 31	125	Jan 1 - Dec 31
Dry	-	-	70 (85 cfs w/ buffer)	Jan 1 - Dec 31	85	Jan 1 - Dec 31

SPECIAL_PROJECTS/7323-RRIFR-D1610/2010-USGS-GAGE-STREAMFLOW.mxd April 1, 2010

SONOMA COUNTY WATER AGENCY

Russian River Biological Opinion
Proposed Minimum Instream Flow Changes

Per National Marine Fisheries Service's Biological Opinion Issued September 24, 2008

Figure 2

State of California—The Resources Agency
DEPARTMENT OF FISH AND GAME
2010 ENVIRONMENTAL FILING FEE CASH RECEIPT

RECEIPT# 399332

STATE CLEARING HOUSE # *(If applicable)*

EE INSTRUCTIONS ON REVERSE. TYPE OR PRINT CLEARLY

EAD AGENCY Sonoma County Water Agency	DATE 4/7/10
COUNTY/STATE AGENCY OF FILING Sonoma	DOCUMENT NUMBER 10-0407-3
ROJECT TITLE ... by Sonoma County Water Agency ...	
ROJECT APPLICANT NAME Sonoma County Water Agency	PHONE NUMBER 707 547 1934
ROJECT APPLICANT ADDRESS 404 Aviation Blvd	CITY Santa Rosa — STATE CA — ZIP CODE 95403

ROJECT APPLICANT *(Check appropriate box):*

- [x] Local Public Agency
- [ ] School District
- [ ] Other Special District
- [ ] State Agency
- [ ] Private Entity

APPLICABLE FEES:

[ ]	Environmental Impact Report (EIR)	$2,792.25	$
[ ]	Mitigated/Negative Declaration (ND)(MND)	$2,010.25	$
[ ]	Application Fee Water Diversion *(State Water Resources Control Board Only)*	$850.00	$
[ ]	Projects Subject to Certified Regulatory Programs (CRP)	$949.50	$
[ ]	County Administrative Fee	$50.00	$ Ø
[ ]	Project that is exempt from fees		
[x]	Notice of Exemption / Statutory…		
[ ]	DFG No Effect Determination (Form Attached)		
[ ]	Other		$

AYMENT METHOD:

- [ ] Cash
- [ ] Credit
- [ ] Check
- [ ] Other

TOTAL RECEIVED $ Ø

SIGNATURE X

TITLE Dep Clerk

WHITE - PROJECT APPLICANT YELLOW - DFG/ASB PINK - LEAD AGENCY GOLDEN ROD - COUNTY CLERK FG 753 5a (Rev 11/09)

SONOMA
COUNTY
WATER
AGENCY

FILE:42-0.19-9 SWRCB ORDER APPROVING TEMPORARY
URGENCY CHANGE IN PERMITS 12947A, 12949, 12950& 16596
FOR (2010)

April 7, 2010

SENT VIA FEDEX PRIORITY OVERNIGHT

Mendocino County Assessor-County Clerk-Recorder
501 Low Gap Road, Room 1020
Ukiah, California 95482

RE: Sonoma County Water Agency Petition Requesting Approval of a Temporary Urgency Change in Permits 12947A, 12949, 12950, and 16596 in Mendocino and Sonoma Counties (Applications 12919A, 15736, 15737, and 19351): 2010 Temporary Changes to Minimum Instream Flow Requirements of Decision 1610

Dear County Clerk:

The Sonoma County Water Agency (Agency) has prepared a Notice of Exemption (NOE) pursuant to the California Environmental Quality Act (CEQA). CEQA requires that the Notice of Exemption (NOE) is available for public inspection to applicable county clerks within the project area. The NOE must be posted in the Mendocino county clerk's office within 24 hours of receiving it and for 30 days. (CEQA Guidelines15062(c)(2)). This NOE is exempt from filing fees pursuant to Government Code 6103 "Neither the state nor any county shall pay or deposit any fee for the filing of any document or paper, for the performance of any official service..."

Enclosed you will find five copies of the NOE. Please post one copy for 30 days. Please conform four copies and return them to me in the stamped and addressed envelope provided. Please include a receipt waiving payment of CA Department of Fish and Game and County Clerk filing fees. The Agency appreciates your assistance with this matter. If you have any questions, please call me at (707) 547-1905.

Sincerely,

Connie Barton

Connie Barton
Environmental Specialist

Encs 5 copies of NOE

RW\\fileserver\data\cl\pinks\week 04-05-10\letter to mendo re noe 2010.docx

RW

NOTICE OF EXEMPTION

To: X Office of Planning & Research
1400 Tenth Street, Room 121
Sacramento, CA 95814

X County Clerk
County of Sonoma
Santa Rosa, CA 95401

X County Clerk
County of Mendocino
Ukiah, CA 95482

From: Sonoma County Water Agency
404 Aviation Boulevard
Santa Rosa, CA 95403

Project Title: Petition by Sonoma County Water Agency Requesting Approval of a Temporary Urgency Change in Permits 12947A, 12949, 12950, and 16596 in Mendocino and Sonoma Counties (Applications 12919A, 15736, 15737, and 19351): 2010 Temporary Changes to Minimum Instream Flow Requirements of Decision 1610

Project Location: The proposed action is to temporarily change the required minimum instream flows in the Russian River in Mendocino and Sonoma Counties. Figure 1 shows the minimum instream-flow requirements in the water-right permits of the Sonoma County Water Agency (SCWA) for its Russian River Project that are in effect now and that will remain in effect if the proposed action is not approved. The proposed action is to temporarily change some of these requirements, to the "Temporary Changes" shown in Figure 2, for the period from May 1, 2010 through October 15, 2010. Communities and cities along the Russian River include Ukiah, Hopland, Cloverdale, Geyserville, Healdsburg, Forestville, Mirabel Park, Rio Nido, Guerneville, Monte Rio, Duncans Mills, and Jenner.

Project Background: The National Marine Fisheries Service (NMFS) issued its *Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed* (Russian River BO) on September 24, 2008.[1] NMFS concluded in the Russian River BO that the continued operations of Coyote Valley Dam and Warm Springs Dam by the U.S. Army Corps of Engineers and SCWA in a manner similar to recent historic practices, together with SCWA's stream channel maintenance activities and estuary management, are likely to jeopardize and adversely modify critical habitat for endangered Central California Coast coho salmon and threatened Central California Coast steelhead.

SCWA controls and coordinates water supply releases from the Coyote Valley Dam and Warm Springs Dam projects in accordance with the requirements of Decision 1610, adopted by the State Water Resources Control Board (SWRCB) in 1986. NMFS' Russian River BO states that changes to Decision 1610 minimum instream flow requirements will enable alternative flow management scenarios that will increase available rearing habitat in Dry Creek and the upper Russian River, and provide a lower, closer to natural inflow to the estuary between late spring and early fall, thereby enhancing the potential for

[1] NMFS' Russian River BO may be accessed online at www.sonomacountywater.org and may be reviewed at SCWA's office at 404 Aviation Boulevard, Santa Rosa, CA.

maintaining a seasonal freshwater lagoon that will likely support increased production of juvenile steelhead and salmon.[2]

As required by NMFS' Russian River BO, in September 2009 SCWA filed a petition with the SWRCB to make permanent changes to the Decision 1610 minimum instream flow requirements. This petition presently is pending before the SWRCB. The SWRCB will not act on this petition until the necessary environmental impact report is prepared and the water-rights issues associated with this petition are resolved. This process is expected to take several years.

Until the SWRCB issues an order on this petition, SCWA must maintain the minimum instream flows specified in Decision 1610, with resulting impacts to listed salmonids, unless temporary changes to these requirements are authorized by the SWRCB. To help restore freshwater habitats for listed salmon and steelhead in the Russian River estuary NMFS' Russian River BO requires that SCWA petition the SWRCB for temporary changes to minimum instream flow requirements beginning in 2010 and for each year thereafter until the SWRCB issues an order on SCWA's petition for the permanent changes to the Decision 1610 minimum instream flow requirements. The temporary changes include a reduction in the minimum instream flow to 70 cubic feet per second (cfs) in the lower Russian River between May 1 and October 15, with the understanding that, because of the need to maintain an operational buffer above this minimum requirement, SCWA will typically maintain a flow of about 85 cfs at this point. Additionally, for the purposes of enhancing steelhead rearing habitat between the East Fork and Hopland, the temporary changes include a reduction in the minimum instream flow to 125 cfs in the upper Russian River between May 1 and October 15.[3] NMFS' Russian River BO only requires petitions for temporary changes to minimum streamflows on the mainstem Russian River, and not on Dry Creek. This petition therefore does not seek changes in required Dry Creek flows, which will be maintained at the levels currently required by Decision 1610.

The permanent and temporary changes to Decision 1610 minimum instream flows specified by NMFS in the Russian River BO are summarized in Figure 2. NMFS' Russian River BO states that, in addition to providing the expected fishery benefits, the revised minimum instream flow requirements should promote water conservation and seek to limit effects on in-stream river recreation.[4]

Description of Project: To comply with the requirements of NMFS' Russian River BO, SCWA is filing a temporary urgency change petition with the SWRCB that asks the SWRCB to make the following changes in the instream flow requirements for the Russian River mainstem that are specified in Decision 1610 and SCWA's water right permits between May 1 through October 15, 2010: (a) a minimum instream flow requirement of 125 cfs in the upper Russian River (upstream of the confluence with Dry Creek and downstream of the confluence of the East and West Forks) and (b) 70 cfs in the lower Russian River (downstream of its confluence with Dry Creek), with the understanding that for compliance purposes SCWA will typically maintain a flow of about 85 cfs at this point.

---

[2] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p. 243. September 2008.
[3] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p 247. September 2008.
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Decision 1610 specifies the minimum flow requirements for Dry Creek and the Russian River (see Figure 1). These requirements vary based on defined hydrologic conditions. If approved, the requested reductions in Russian River instream flow requirements will be in effect May 1 through October 15, 2010. Under Normal water supply conditions, minimum flows during this time period could be as high as 185 cfs in the upper Russian River, 125 cfs in the lower Russian River, and 80 cfs in Dry Creek. Under the proposed change, minimum flows could be as low as 125 cfs in the upper Russian River and 70 cfs in the lower Russian River. No change in the Dry Creek requirements is proposed and the minimum flow requirement in Dry Creek will remain at 80 cfs. The proposed changes in Russian River instream flow requirements will not result in any unusual circumstances, because the proposed minimum instream flow requirements are within the range of those that already occur during Dry and Critical water supply conditions under Decision 1610. In addition, due to low rainfall and other factors, flows in the river during the last three years have been similar to or lower than the proposed changes. For example, compared to summer 2009, the requested minimum flows are slightly higher for the lower Russian River and substantially higher for the upper Russian River.

During the period that the proposed temporary flow changes are in effect, SCWA will also monitor water quality and fish, and collect and report information and data related to monitoring activities, as required by NMFS' Russian River BO. This information will assist with the study and development of required future permanent flow changes.

Name of Public Agency Approving Project: State Water Resources Control Board- Division of Water Rights

Name of Person or Agency Carrying Out Project: Sonoma County Water Agency

Exempt Status: (Check one)

___ Ministerial (Sec. 21080(b)(1); 15268)

___ Declared Emergency (Sec. 21080(b)(3); 15269(a));

___ Emergency Project (Sec.21080 (b)(4); 15269(b)(c));

X Categorical Exemption. State type and section number:
- State CEQA Guidelines 15307: Actions by Regulatory Agencies for Protection of Natural Resources
- State CEQA Guidelines 15308: Actions by Regulatory Agencies for Protection of the Environment
- State CEQA Guidelines 15301(i): Existing Facilities
- State CEQA Guidelines 15306: Information Collection

___ Statutory Exemptions. State Code number:

Reasons why project is exempt: The proposed action is categorically exempt from the California Environmental Quality Act (CEQA) under the State CEQA Guidelines Sections 15307, 15308, 15301(i), and 15306.

A. Actions by Regulatory Agencies for Protection of Natural Resources and the Environment

Guidelines Sections 15307 and 15308 provide that actions taken by regulatory agencies to assure the maintenance, restoration or enhancement of a natural resource and the environment are categorically exempt from CEQA. If approved, the proposed changes in Russian River instream flow requirements will increase available rearing habitat in the upper Russian River and provide a lower, closer to natural inflow

to the estuary between late spring and early fall, thereby enhancing the potential for maintaining a seasonal freshwater lagoon that could support increased production of juvenile steelhead. NMFS' Russian River BO states that these changes are necessary to avoid jeopardizing the continued existence of the listed species.[5] The proposed changes also will conserve water in Lake Mendocino to benefit adult Chinook salmon migrating upstream in the fall.

B. Existing Facilities

Guidelines Section 15301(i) provides, generally, that the operation of existing facilities involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination is categorically exempt from CEQA. Subdivision (i) of Section 15301 specifically includes maintenance of streamflows to protect fish and wildlife resources. SCWA's petition to the SWRCB to change to the instream flow requirements specified in NMFS' Russian River BO does not request and will not expand SCWA use or increase the water supply available to SCWA for consumptive purposes. The proposed change in Russian River instream flow requirements still will be within the existing operational parameters established by Decision 1610.

C. *Information Collection*

Guidelines Section 15306 provides that basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource are categorically exempt from CEQA. These activities may be part of a study leading to an action which a public agency has not yet approved, adopted or funded. The water quality and fishery information and data collected during the period that the proposed temporary flow changes are in effect will assist with the study and development of the required future permanent flow changes.

Lead Agency Contact Person: Erica Phelps Area Code/Telephone: 707-547-1934

Signature: ________ Date: APR 5 2010 Title: General Manager

X Lead Agency ___ Applicant

Date Received for filing at OPR:

[5] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p. 247. September 2008.

Cumulative inflow to Lake Pillsbury (Acre Feet) as of							
	1/1	2/1	3/1	4/1	5/1	6/1	Water Supply Conditions Prevailing on 6/1 Apply Through 12/31
NORMAL	≥8,000	≥39,200	≥65,700	≥114,500	≥145,600	≥160,000	
DRY	<8,000	<39,200	<65,700	<114,500	<145,600	<160,000	
CRITICAL DRY	<4,000	<20,000	<45,000	<50,000	<70,000	<75,000	

LEGEND

All flows are minimums, expressed in cubic feet per second

* - Unless Lake Sonoma Elevation is below 292 0, or if prohibited by the United States Government

AF - Acre Feet

● - USGS Stream Gage Compliance Points

East Fork

Coyote Dam

Mouth East Fork Russian River

ALWAYS East Fork Russian River: Coyote Dam to Russian River 25 CFS

Russian River

NORMAL

1/1 - 3/31 150 CFS
4/1 - 5/31 185 CFS

If Combined Storage in Lake Pillsbury and Lake Mendocino on May 31 is

Normal
150,000 AF or >90% of Total Storage
6/1 - 8/31 185 CFS
9/1 - 12/31 150 CFS

Normal - Dry Spring 1
130,000 - 150,000 AF or 80-90% of Total Storage whichever is less
6/1 - 12/31 150 CFS

If Lake Mendocino <30,000 AF Storage
10/1 - 12/31 75 CFS

Normal - Dry Spring 2
<130,000 AF or <80% of Total Storage
6/1 - 12/31 75 CFS

DRY

75 CFS

CRITICAL DRY

25 CFS

Dry Creek

NORMAL
1/1 - 4/30 75 CFS
5/1 - 10/31 80 CFS
11/1 - 12/31 105 CFS

DRY
4/1 - 10/31 25 CFS
11/1 - 3/31 75 CFS

CRITICAL DRY
4/1 - 10/31 25 CFS
11/1 - 3/31 75 CFS

Mouth Dry Creek

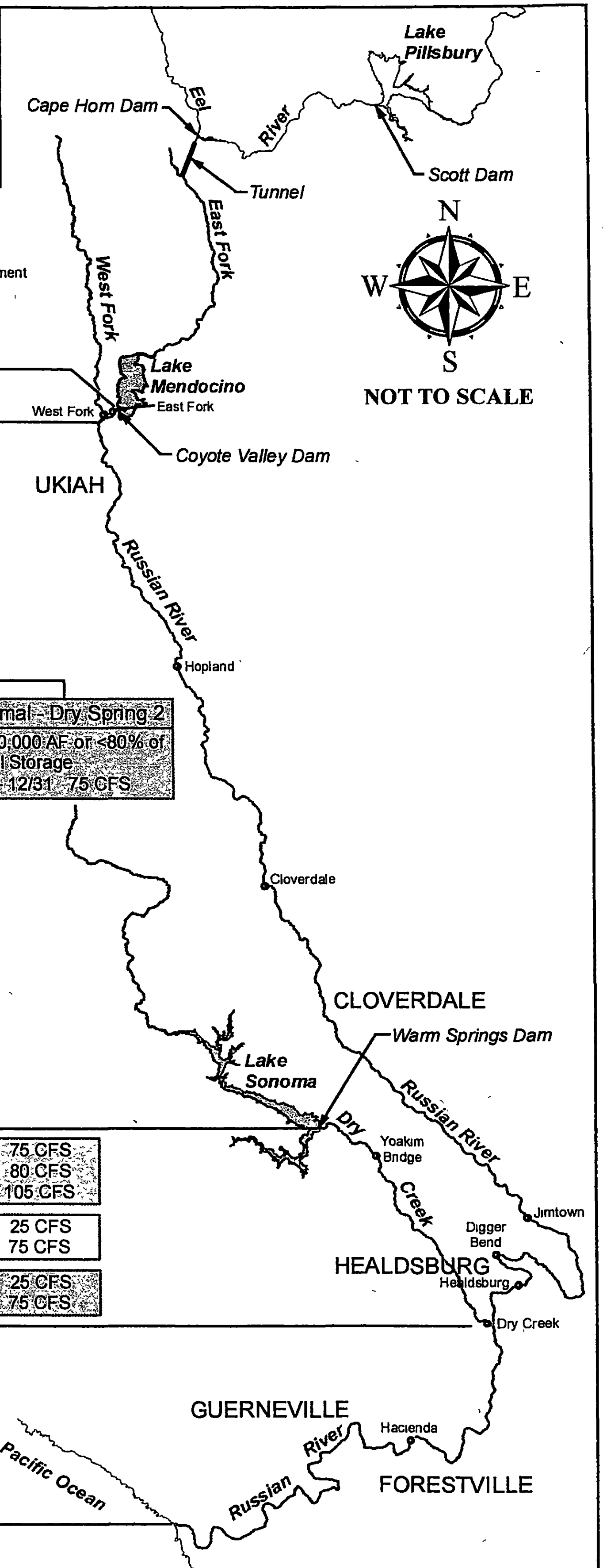
Russian River

NORMAL 125 CFS*

DRY 85 CFS*

CRITICAL DRY 35 CFS*

Mouth Russian River



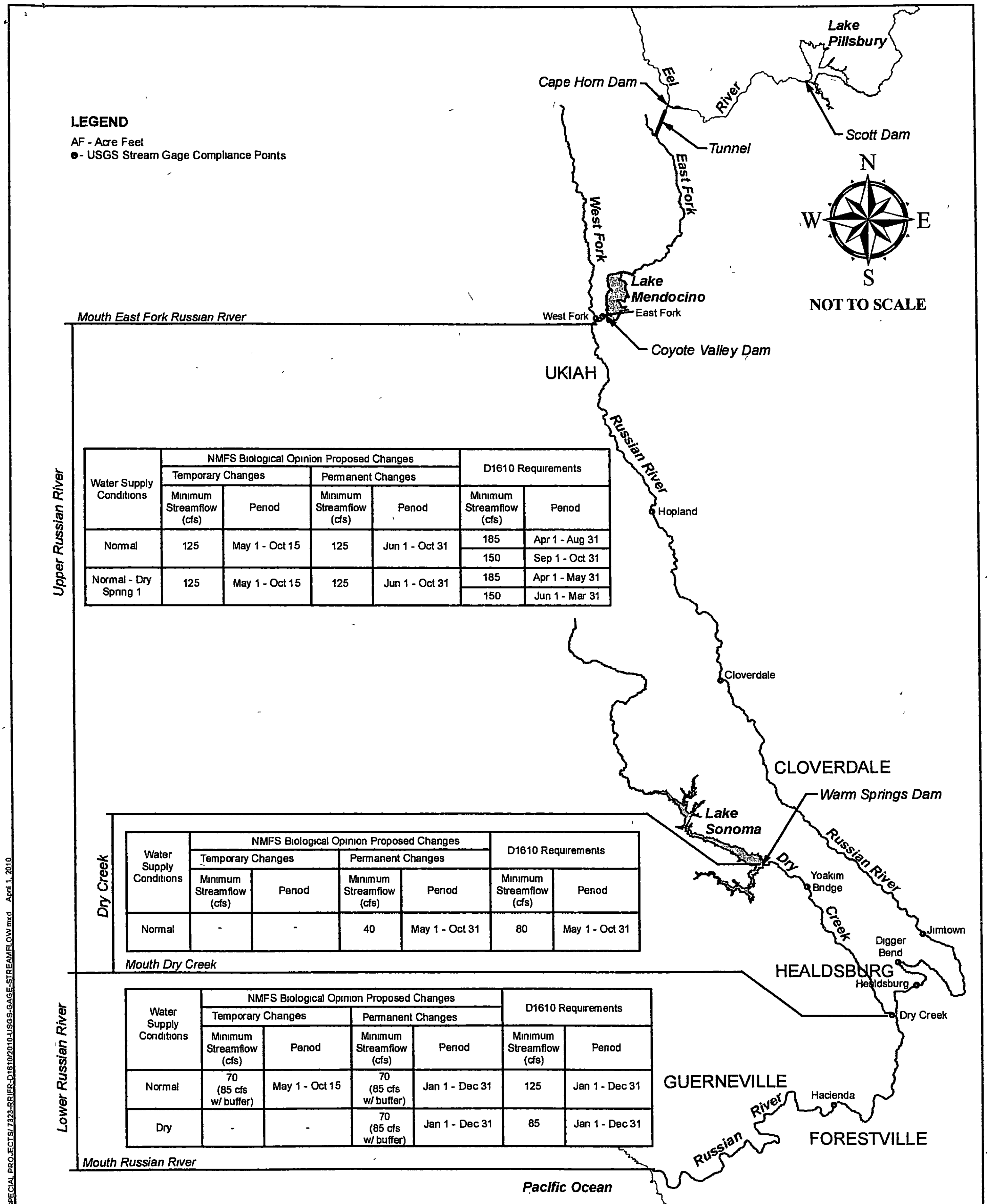
SPECIAL PROJECTS/ 7323-RRIFR-D1610/2010-USGS-GAGE-STREAMFLOW mxd APRIL 5, 2010

SONOMA COUNTY WATER AGENCY

Russian River Basin
Streamflow Requirements

Per State Water Resources Control Board Decision 1610, April 1986

Figure 1



Upper Russian River

Water Supply Conditions	NMFS Biological Opinion Proposed Changes: Temporary Changes – Minimum Streamflow (cfs)	Period	Permanent Changes – Minimum Streamflow (cfs)	Period	D1610 Requirements – Minimum Streamflow (cfs)	Period
Normal	125	May 1 - Oct 15	125	Jun 1 - Oct 31	185	Apr 1 - Aug 31
					150	Sep 1 - Oct 31
Normal - Dry Spring 1	125	May 1 - Oct 15	125	Jun 1 - Oct 31	185	Apr 1 - May 31
					150	Jun 1 - Mar 31

Dry Creek

Water Supply Conditions	NMFS Biological Opinion Proposed Changes: Temporary Changes – Minimum Streamflow (cfs)	Period	Permanent Changes – Minimum Streamflow (cfs)	Period	D1610 Requirements – Minimum Streamflow (cfs)	Period
Normal	-	-	40	May 1 - Oct 31	80	May 1 - Oct 31

Lower Russian River

Water Supply Conditions	NMFS Biological Opinion Proposed Changes: Temporary Changes – Minimum Streamflow (cfs)	Period	Permanent Changes – Minimum Streamflow (cfs)	Period	D1610 Requirements – Minimum Streamflow (cfs)	Period
Normal	70 (85 cfs w/ buffer)	May 1 - Oct 15	70 (85 cfs w/ buffer)	Jan 1 - Dec 31	125	Jan 1 - Dec 31
Dry	-	-	70 (85 cfs w/ buffer)	Jan 1 - Dec 31	85	Jan 1 - Dec 31

SPECIAL PROJECTS/ 7323-RRIFR-D1610/2010-USGS-GAGE-STREAMFLOW.mxd April 1, 2010

Russian River Biological Opinion
Proposed Minimum Instream Flow Changes
Per National Marine Fisheries Service's Biological Opinion Issued September 24, 2008

Figure 2

SONOMA COUNTY WATER AGENCY

FILE:42-0.19-9 SWRCB ORDER APPROVING TEMPORARY
URGENCY CHANGE IN PERMITS 12947A, 12949, 12950& 16596
FOR (2010)

April 7, 2010

SENT VIA FEDEX PRIORITY OVERNIGHT

Office of Planning & Research
State Clearinghouse
1400 Tenth Street
Sacramento, California 95814

RE: Sonoma County Water Agency Petition Requesting Approval of a Temporary Urgency Change in Permits 12947A, 12949, 12950, and 16596 in Mendocino and Sonoma Counties (Applications 12919A, 15736, 15737, and 19351): 2010 Temporary Changes to Minimum Instream Flow Requirements of Decision 1610

Dear State Clearinghouse:

Enclosed for your review are three copies of a Notice of Exemption (NOE) under the California Environmental Quality Act. Please date stamp two copies of the NOE and return it to the Sonoma County Water Agency using the enclosed self-addressed stamped envelope. Thank you for your assistance. If you have any questions, please call me at (707) 547-1095.

Sincerely,

Connie Barton

Connie Barton
Environmental Specialist

Encs 3 copies of NOE

RW\\fileserver\data\cl\pinks\week 04-05-10\letter to opr re noe 2010.docx

NOTICE OF EXEMPTION

To: X Office of Planning & Research
1400 Tenth Street, Room 121
Sacramento, CA 95814

X County Clerk
County of Sonoma
Santa Rosa, CA 95401

X County Clerk
County of Mendocino
Ukiah, CA 95482

From: Sonoma County Water Agency
404 Aviation Boulevard
Santa Rosa, CA 95403

Project Title: Petition by Sonoma County Water Agency Requesting Approval of a Temporary Urgency Change in Permits 12947A, 12949, 12950, and 16596 in Mendocino and Sonoma Counties (Applications 12919A, 15736, 15737, and 19351): 2010 Temporary Changes to Minimum Instream Flow Requirements of Decision 1610

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Project Background: The National Marine Fisheries Service (NMFS) issued its *Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed* (Russian River BO) on September 24, 2008.[1] NMFS concluded in the Russian River BO that the continued operations of Coyote Valley Dam and Warm Springs Dam by the U.S. Army Corps of Engineers and SCWA in a manner similar to recent historic practices, together with SCWA's stream channel maintenance activities and estuary management, are likely to jeopardize and adversely modify critical habitat for endangered Central California Coast coho salmon and threatened Central California Coast steelhead.

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maintaining a seasonal freshwater lagoon that will likely support increased production of juvenile steelhead and salmon.[2]

As required by NMFS' Russian River BO, in September 2009 SCWA filed a petition with the SWRCB to make permanent changes to the Decision 1610 minimum instream flow requirements. This petition presently is pending before the SWRCB. The SWRCB will not act on this petition until the necessary environmental impact report is prepared and the water-rights issues associated with this petition are resolved. This process is expected to take several years.

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Description of Project: To comply with the requirements of NMFS' Russian River BO, SCWA is filing a temporary urgency change petition with the SWRCB that asks the SWRCB to make the following changes in the instream flow requirements for the Russian River mainstem that are specified in Decision 1610 and SCWA's water right permits between May 1 through October 15, 2010: (a) a minimum instream flow requirement of 125 cfs in the upper Russian River (upstream of the confluence with Dry Creek and downstream of the confluence of the East and West Forks) and (b) 70 cfs in the lower Russian River (downstream of its confluence with Dry Creek), with the understanding that for compliance purposes SCWA will typically maintain a flow of about 85 cfs at this point.

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[3] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p 247. September 2008.

[4] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p. 244. September 2008.

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Name of Public Agency Approving Project: State Water Resources Control Board- Division of Water Rights

Name of Person or Agency Carrying Out Project: Sonoma County Water Agency

Exempt Status: (Check one)

___	Ministerial (Sec. 21080(b)(1); 15268)	
___	Declared Emergency (Sec. 21080(b)(3); 15269(a));	
___	Emergency Project (Sec.21080 (b)(4); 15269(b)(c));	
X	Categorical Exemption. State type and section number:	State CEQA Guidelines 15307: Actions by Regulatory Agencies for Protection of Natural Resources
		State CEQA Guidelines 15308: Actions by Regulatory Agencies for Protection of the Environment
		State CEQA Guidelines 15301(i): Existing Facilities
		State CEQA Guidelines 15306: Information Collection
___	Statutory Exemptions. State Code number:	

Reasons why project is exempt: The proposed action is categorically exempt from the California Environmental Quality Act (CEQA) under the State CEQA Guidelines Sections 15307, 15308, 15301(i), and 15306.

A. Actions by Regulatory Agencies for Protection of Natural Resources and the Environment

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to the estuary between late spring and early fall, thereby enhancing the potential for maintaining a seasonal freshwater lagoon that could support increased production of juvenile steelhead. NMFS' Russian River BO states that these changes are necessary to avoid jeopardizing the continued existence of the listed species.[5] The proposed changes also will conserve water in Lake Mendocino to benefit adult Chinook salmon migrating upstream in the fall.

B. Existing Facilities

Guidelines Section 15301(i) provides, generally, that the operation of existing facilities involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination is categorically exempt from CEQA. Subdivision (i) of Section 15301 specifically includes maintenance of streamflows to protect fish and wildlife resources. SCWA's petition to the SWRCB to change to the instream flow requirements specified in NMFS' Russian River BO does not request and will not expand SCWA use or increase the water supply available to SCWA for consumptive purposes. The proposed change in Russian River instream flow requirements still will be within the existing operational parameters established by Decision 1610.

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Lead Agency Contact Person: Erica Phelps Area Code/Telephone: 707-547-1934

Signature: ____________ Date: APR 5 2010 Title: General Manager

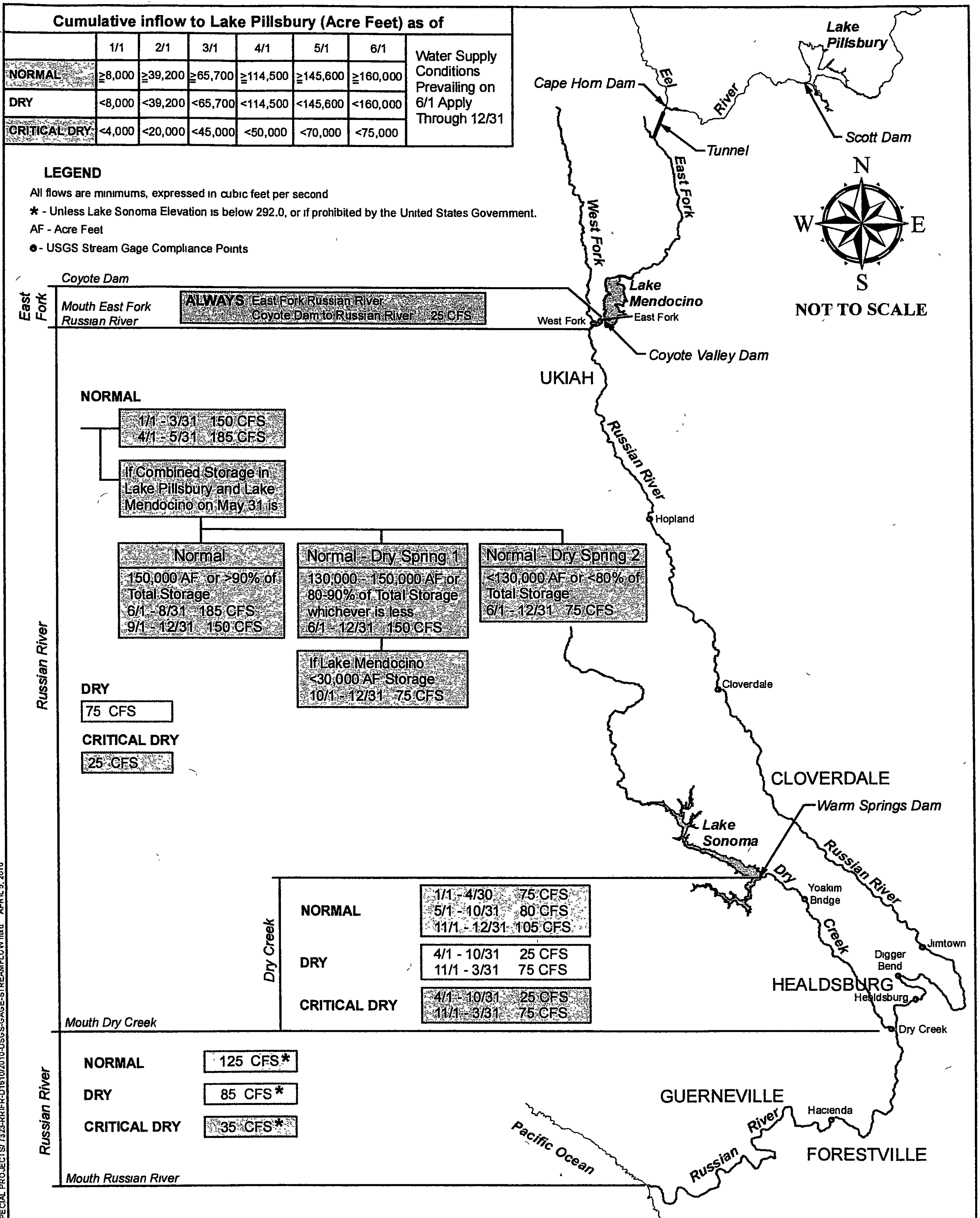
X Lead Agency ___ Applicant

Date Received for filing at OPR:

[5] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p. 247. September 2008.

Cumulative inflow to Lake Pillsbury (Acre Feet) as of

	1/1	2/1	3/1	4/1	5/1	6/1	
NORMAL	≥8,000	≥39,200	≥65,700	≥114,500	≥145,600	≥160,000	Water Supply Conditions Prevailing on 6/1 Apply Through 12/31
DRY	<8,000	<39,200	<65,700	<114,500	<145,600	<160,000	
CRITICAL DRY	<4,000	<20,000	<45,000	<50,000	<70,000	<75,000	



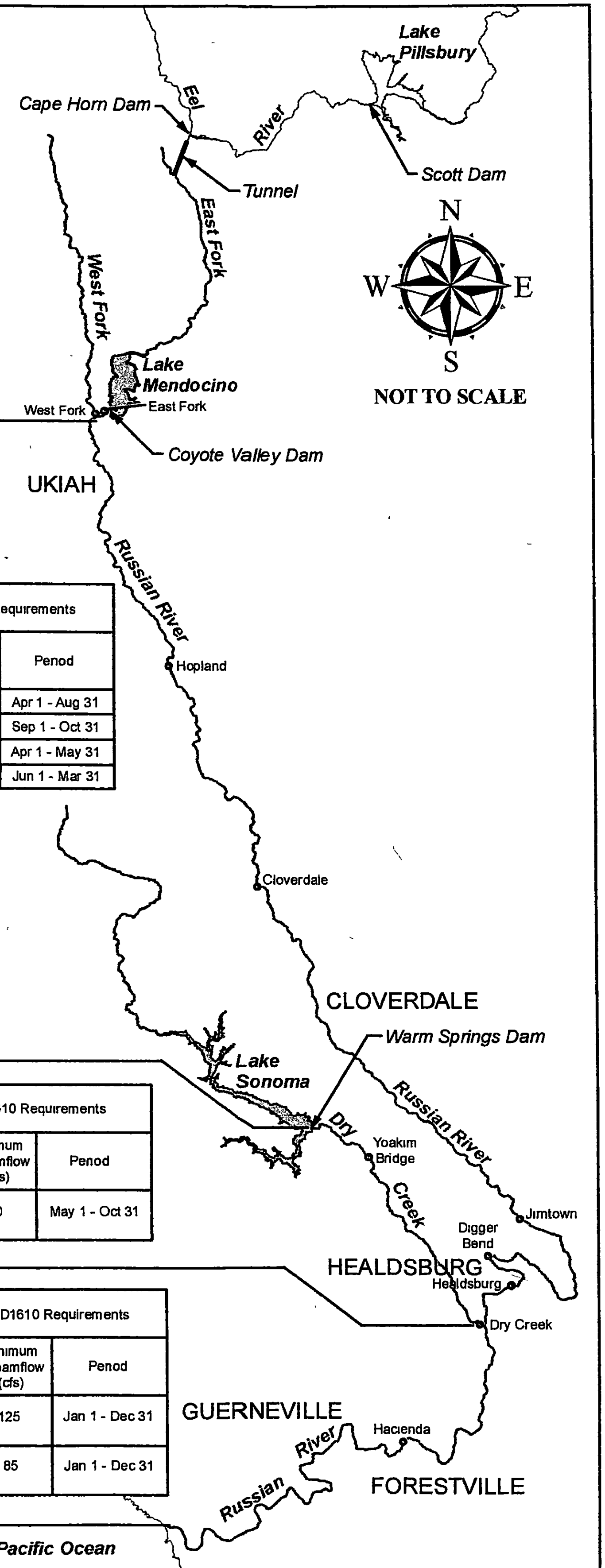
SONOMA COUNTY WATER AGENCY

Russian River Basin
Streamflow Requirements
Per State Water Resources Control Board Decision 1610, April 1986

Figure 1

LEGEND

AF - Acre Feet
⊙- USGS Stream Gage Compliance Points



Mouth East Fork Russian River

Upper Russian River

Water Supply Conditions	NMFS Biological Opinion Proposed Changes				D1610 Requirements	
	Temporary Changes		Permanent Changes			
	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period
Normal	125	May 1 - Oct 15	125	Jun 1 - Oct 31	185	Apr 1 - Aug 31
					150	Sep 1 - Oct 31
Normal - Dry Spring 1	125	May 1 - Oct 15	125	Jun 1 - Oct 31	185	Apr 1 - May 31
					150	Jun 1 - Mar 31

Dry Creek

Water Supply Conditions	NMFS Biological Opinion Proposed Changes				D1610 Requirements	
	Temporary Changes		Permanent Changes			
	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period
Normal	-	-	40	May 1 - Oct 31	80	May 1 - Oct 31

Mouth Dry Creek

Lower Russian River

Water Supply Conditions	NMFS Biological Opinion Proposed Changes				D1610 Requirements	
	Temporary Changes		Permanent Changes			
	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period
Normal	70 (85 cfs w/ buffer)	May 1 - Oct 15	70 (85 cfs w/ buffer)	Jan 1 - Dec 31	125	Jan 1 - Dec 31
Dry	-	-	70 (85 cfs w/ buffer)	Jan 1 - Dec 31	85	Jan 1 - Dec 31

Mouth Russian River

SPECIAL PROJECTS/7323-RRIFR-D1610/2010-USGS-GAGE-STREAMFLOW.mxd April 1, 2010

SONOMA COUNTY WATER AGENCY

Russian River Biological Opinion
Proposed Minimum Instream Flow Changes

Per National Marine Fisheries Service's Biological Opinion Issued September 24, 2008

Figure 2

Clerical Temp2

From:	Pam Jeane
Sent:	Monday, April 05, 2010 4:47 PM
To:	'Vicky Whitney'
Cc:	Steve Herrera; 'Aaron Miller'; Records
Subject:	2010 Temporary Urgency Change Petition
Attachments:	2010 TUCP pakage b-w.pdf
Categories:	Orange Category

CF/42-0.19-9 SWRCB Order Approving Temporary Urgency Change in Permits 12947A, 12949, 12950 & 16596 for 2010 (ID 2474)

Vicky:
Attached for you consideration is our Petition for Temporary Urgency Change along with supporting documents. The original, signed copy (along with checks to cover the required fees) is being overnight-mailed to you. We will be creating a more readable, color version of this tomorrow. Once it's done, I'll email it to you.

If you have any questions or concerns, please let me know.

Pamela Jeane
Deputy Chief Engineer - Operations
Sonoma County Water Agency
707-521-1864
Cell: 707-975-2128

SONOMA COUNTY WATER AGENCY

April 4, 2010

Victoria Whitney, Deputy Director of Water Rights
State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

RE: Petition for Temporary Urgency Change—Permits 12947A, 12949, 12950, and 16596

Dear Ms. Whitney:

Enclosed is a Petition for Temporary Urgency Change to modify the minimum in-stream flow requirements for the Russian River as established by Decision 1610 for Permits 12947A, 12949, 12950 and 16596. Accompanying the petition are the following:

1) A supporting analysis document: *In-Stream Flow Analysis for 2010 Temporary Urgency Change Petition*
2) Notice of Exemption
3) California Department of Fish and Game (DFG) Review Fee Payment
4) State Water Resources Control Board (SWRCB) Petition Fee Payment

The petition is being submitted as required by the Russian River Biological Opinion issued by NOAA National Marine Fisheries Services in September of 2008. The Sonoma County Water Agency requests that the Division of Water Rights act expeditiously to approve the requested changes to minimum in-stream flows as identified in the Russian River Biological Opinion.

I look forward to working with the State Water Resources Control Board and Division of Water Rights staff on this important conservation effort.

Sincerely,

Grant Davis
General Manager

C Dick Butler – NMFS
William Hearn – NMFS

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P.O. Box 11628 - Santa Rosa, CA 95406 - 404 Aviation Boulevard - Santa Rosa, CA 95403 - (707) 526-5370 - Fax (707) 544-6123

State of California
State Water Resources Control Board
DIVISION OF WATER RIGHTS
P.O. Box 2000, Sacramento, CA 95812-2000
Info: (916) 341-5300, FAX: (916) 341-5400, Web: http://www.waterrights.ca.gov

PETITION FOR TEMPORARY URGENCY CHANGE

(Water Code 1435)

__X__ Change in Instream Flow Requirements

Applications # 12919A, 15736, 15737, 19351 Permits # 12947A, 12949, 12950, 16596

I (we) Sonoma County Water Agency hereby petition for a temporary urgency change(s) noted above
(Water Right Holders Name)
and described as follows:

The Sonoma County Water Agency requests that the State Water Resources Control Board make the following temporary changes to the Decision 1610 (D-1610) instream flow requirements for the period from May 1 through October 15: (a) reduce the D-1610 requirements in the Upper Russian River (from its confluence with the East Fork to its confluence with Dry Creek) to 125 cfs for Normal and Normal—Dry Spring 1 water supply conditions; (b) reduce the D-1610 requirements in the Lower Russian River (downstream of its confluence with Dry Creek) to 70 cfs for Normal and Dry water supply conditions.

These temporary changes are requested to comply with the National Marine Fisheries Service's *Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed* (September 24, 2008).

Point of Diversion or Rediversion (Give coordinate distances from section corner or California Coordinates, and the 40-acre subdivision in which the present and proposed points lie.)
Present see permits Proposed no change

Place of Use (If irrigation, then state number of acres to be irrigated within each 40-acre tract.)
Present see permits Proposed no change

Purpose of Use
Present see permits Proposed no change

Does the proposed use serve to preserve or enhance wetlands habitat, fish and wildlife resources, or recreation in or on the water (See WC 1707)? No (yes/no)

****This question was answered 'No' because this petition is not being filed under Water Code section 1707. However, the requested temporary changes will benefit fish resources, for the reasons stated in NMFS's Biological Opinion.*

The temporary urgency change(s) is to be effective from May 1, 2010 to October 15, 2010
(Cannot exceed 180 days)

Will this temporary urgency change be made without injury to any lawful user of water? Yes (yes/no)

Will this temporary urgency change be made without unreasonable effect upon fish, wildlife, and other instream beneficial uses? Yes (yes/no)

State the "Urgent Need" (Water Code 1435(c)) that is the basis of this temporary urgency change petition (attach additional information as necessary):
see attachment *In-Stream Flow Analysis for 2010 Temporary Urgency Change Petition*

If the point of diversion or rediversion is being changed, is any person(s) taking water from the stream between the old point of diversion or rediversion and the proposed point?
Not Applicable (yes/no)

Are there any persons taking water from the stream between the old point of return flow and the new point of return flow? Not Applicable (yes/no)
If yes, give name and address, as well as any other person(s) known to you who may be affected by the proposed change.

I (we) consulted the California Department of Fish and Game concerning this proposed temporary change. Yes (yes/no)
If yes, state the name and phone number of the person contacted and the opinion concerning the potential effects of your proposed temporary urgency change on fish and wildlife and state the measures required for mitigation.

The Agency has been coordinating activities related to the Biological Opinion and DFG's Consistency Determination with Richard Fitzgerald (707-944-5568) and Eric Larson (707-944-5528) from California Department of Fish and Game (DFG).

Contacts at NOAA National Marine Fisheries Service for the Biological Opinion are Dr. William Hearn (707-575-6062) and Dick Butler (707-575-6058).

THIS TEMPORARY URGENCY CHANGE DOES NOT INVOLVE AN INCREASE IN THE AMOUNT OF THE APPROPRIATION OR SEASON OF USE. THIS TEMPORARY URGENCY CHANGE IS REQUESTED FOR A PERIOD OF ONE HUNDRED EIGHTY DAYS OR LESS.

I (we) declare under penalty of perjury that the above is true and correct to the best of my (our) knowledge and belief.

Dated April 4, 2010 at Santa Rosa, California

Signature(s)

(707) 521-6210
Telephone No.

404 Aviation Boulevard, Santa Rosa, CA 95403-9019
(Address)

NOTE: All petitions must be accompanied by the **filing fee, (see fee schedule at www.waterrights.ca.gov)** made payable to the State Water Resources Control Board and an **$850 fee** made payable to the Department of Fish and Game must accompany this petition. Separate petitions are required for each water right.

NOTICE OF EXEMPTION

To: X Office of Planning & Research
1400 Tenth Street, Room 121
Sacramento, CA 95814

X County Clerk
County of Sonoma
Santa Rosa, CA 95401

X County Clerk
County of Mendocino
Ukiah, CA 95482

From: Sonoma County Water Agency
404 Aviation Boulevard
Santa Rosa, CA 95403

Project Title: Petition by Sonoma County Water Agency Requesting Approval of a Temporary Urgency Change in Permits 12947A, 12949, 12950, and 16596 in Mendocino and Sonoma Counties (Applications 12919A, 15736, 15737, and 19351): 2010 Temporary Changes to Minimum Instream Flow Requirements of Decision 1610

Project Location: The proposed action is to temporarily change the required minimum instream flows in the Russian River in Mendocino and Sonoma Counties. Figure 1 shows the minimum instream-flow requirements in the water-right permits of the Sonoma County Water Agency (SCWA) for its Russian River Project that are in effect now and that will remain in effect if the proposed action is not approved. The proposed action is to temporarily change some of these requirements, to the "Temporary Changes" shown in Figure 2, for the period from May 1, 2010 through October 15, 2010. Communities and cities along the Russian River include Ukiah, Hopland, Cloverdale, Geyserville, Healdsburg, Forestville, Mirabel Park, Rio Nido, Guerneville, Monte Rio, Duncans Mills, and Jenner.

Project Background: The National Marine Fisheries Service (NMFS) issued its *Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed* (Russian River BO) on September 24, 2008.[1] NMFS concluded in the Russian River BO that the continued operations of Coyote Valley Dam and Warm Springs Dam by the U.S. Army Corps of Engineers and SCWA in a manner similar to recent historic practices, together with SCWA's stream channel maintenance activities and estuary management, are likely to jeopardize and adversely modify critical habitat for endangered Central California Coast coho salmon and threatened Central California Coast steelhead.

SCWA controls and coordinates water supply releases from the Coyote Valley Dam and Warm Springs Dam projects in accordance with the requirements of Decision 1610, adopted by the State Water Resources Control Board (SWRCB) in 1986. NMFS' Russian River BO states that changes to Decision 1610 minimum instream flow requirements will enable alternative flow management scenarios that will increase available rearing habitat in Dry Creek and the upper Russian River, and provide a lower, closer to natural inflow to the estuary between late spring and early fall, thereby enhancing the potential for

[1] NMFS' Russian River BO may be accessed online at www.sonomacountywater.org and may be reviewed at SCWA's office at 404 Aviation Boulevard, Santa Rosa, CA.

maintaining a seasonal freshwater lagoon that will likely support increased production of juvenile steelhead and salmon.[2]

As required by NMFS' Russian River BO, in September 2009 SCWA filed a petition with the SWRCB to make permanent changes to the Decision 1610 minimum instream flow requirements. This petition presently is pending before the SWRCB. The SWRCB will not act on this petition until the necessary environmental impact report is prepared and the water-rights issues associated with this petition are resolved. This process is expected to take several years.

Until the SWRCB issues an order on this petition, SCWA must maintain the minimum instream flows specified in Decision 1610, with resulting impacts to listed salmonids, unless temporary changes to these requirements are authorized by the SWRCB. To help restore freshwater habitats for listed salmon and steelhead in the Russian River estuary NMFS' Russian River BO requires that SCWA petition the SWRCB for temporary changes to minimum instream flow requirements beginning in 2010 and for each year thereafter until the SWRCB issues an order on SCWA's petition for the permanent changes to the Decision 1610 minimum instream flow requirements. The temporary changes include a reduction in the minimum instream flow to 70 cubic feet per second (cfs) in the lower Russian River between May 1 and October 15, with the understanding that, because of the need to maintain an operational buffer above this minimum requirement, SCWA will typically maintain a flow of about 85 cfs at this point. Additionally, for the purposes of enhancing steelhead rearing habitat between the East Fork and Hopland, the temporary changes include a reduction in the minimum instream flow to 125 cfs in the upper Russian River between May 1 and October 15.[3] NMFS' Russian River BO only requires petitions for temporary changes to minimum streamflows on the mainstem Russian River, and not on Dry Creek. This petition therefore does not seek changes in required Dry Creek flows, which will be maintained at the levels currently required by Decision 1610.

The permanent and temporary changes to Decision 1610 minimum instream flows specified by NMFS in the Russian River BO are summarized in Figure 2. NMFS' Russian River BO states that, in addition to providing the expected fishery benefits, the revised minimum instream flow requirements should promote water conservation and seek to limit effects on in-stream river recreation.[4]

Description of Project: To comply with the requirements of NMFS' Russian River BO, SCWA is filing a temporary urgency change petition with the SWRCB that asks the SWRCB to make the following changes in the instream flow requirements for the Russian River mainstem that are specified in Decision 1610 and SCWA's water right permits between May 1 through October 15, 2010: (a) a minimum instream flow requirement of 125 cfs in the upper Russian River (upstream of the confluence with Dry Creek and downstream of the confluence of the East and West Forks) and (b) 70 cfs in the lower Russian River (downstream of its confluence with Dry Creek), with the understanding that for compliance purposes SCWA will typically maintain a flow of about 85 cfs at this point.

[2] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p. 243. September 2008.

[3] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p 247. September 2008.

[4] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p. 244. September 2008.

Decision 1610 specifies the minimum flow requirements for Dry Creek and the Russian River (see Figure 1). These requirements vary based on defined hydrologic conditions. If approved, the requested reductions in Russian River instream flow requirements will be in effect May 1 through October 15, 2010. Under Normal water supply conditions, minimum flows during this time period could be as high as 185 cfs in the upper Russian River, 125 cfs in the lower Russian River, and 80 cfs in Dry Creek. Under the proposed change, minimum flows could be as low as 125 cfs in the upper Russian River and 70 cfs in the lower Russian River. No change in the Dry Creek requirements is proposed and the minimum flow requirement in Dry Creek will remain at 80 cfs. The proposed changes in Russian River instream flow requirements will not result in any unusual circumstances, because the proposed minimum instream flow requirements are within the range of those that already occur during Dry and Critical water supply conditions under Decision 1610. In addition, due to low rainfall and other factors, flows in the river during the last three years have been similar to or lower than the proposed changes. For example, compared to summer 2009, the requested minimum flows are slightly higher for the lower Russian River and substantially higher for the upper Russian River.

During the period that the proposed temporary flow changes are in effect, SCWA will also monitor water quality and fish, and collect and report information and data related to monitoring activities, as required by NMFS' Russian River BO. This information will assist with the study and development of required future permanent flow changes.

Name of Public Agency Approving Project: State Water Resources Control Board- Division of Water Rights

Name of Person or Agency Carrying Out Project: Sonoma County Water Agency

Exempt Status: (Check one)

___ Ministerial (Sec. 21080(b)(1); 15268) ______

___ Declared Emergency (Sec. 21080(b)(3); 15269(a)); ______

___ Emergency Project (Sec.21080 (b)(4); 15269(b)(c));

X Categorical Exemption. State type and section number:
- State CEQA Guidelines 15307: Actions by Regulatory Agencies for Protection of Natural Resources
- State CEQA Guidelines 15308: Actions by Regulatory Agencies for Protection of the Environment
- State CEQA Guidelines 15301(i): Existing Facilities
- State CEQA Guidelines 15306: Information Collection

___ Statutory Exemptions. State Code number: ______

Reasons why project is exempt: The proposed action is categorically exempt from the California Environmental Quality Act (CEQA) under the State CEQA Guidelines Sections 15307, 15308, 15301(i), and 15306.

A. Actions by Regulatory Agencies for Protection of Natural Resources and the Environment
Guidelines Sections 15307 and 15308 provide that actions taken by regulatory agencies to assure the maintenance, restoration or enhancement of a natural resource and the environment are categorically exempt from CEQA. If approved, the proposed changes in Russian River instream flow requirements will increase available rearing habitat in the upper Russian River and provide a lower, closer to natural inflow

to the estuary between late spring and early fall, thereby enhancing the potential for maintaining a seasonal freshwater lagoon that could support increased production of juvenile steelhead. NMFS' Russian River BO states that these changes are necessary to avoid jeopardizing the continued existence of the listed species.[5] The proposed changes also will conserve water in Lake Mendocino to benefit adult Chinook salmon migrating upstream in the fall.

B. Existing Facilities
Guidelines Section 15301(i) provides, generally, that the operation of existing facilities involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination is categorically exempt from CEQA. Subdivision (i) of Section 15301 specifically includes maintenance of streamflows to protect fish and wildlife resources. SCWA's petition to the SWRCB to change to the instream flow requirements specified in NMFS' Russian River BO does not request and will not expand SCWA use or increase the water supply available to SCWA for consumptive purposes. The proposed change in Russian River instream flow requirements still will be within the existing operational parameters established by Decision 1610.

C. *Information Collection*
Guidelines Section 15306 provides that basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource are categorically exempt from CEQA. These activities may be part of a study leading to an action which a public agency has not yet approved, adopted or funded. The water quality and fishery information and data collected during the period that the proposed temporary flow changes are in effect will assist with the study and development of the required future permanent flow changes.

Lead Agency Contact Person: ~~Erica Phelps~~ Area Code/Telephone: 707-547-1934

Signature: ______________ Date: 4-5-10 Title: General Manager

X Lead Agency ___ Applicant
Date Received for filing at OPR:

[5] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p. 247. September 2008.

Cumulative inflow to Lake Pillsbury (Acre Feet) as of

	1/1	2/1	3/1	4/1	5/1	6/1	Water Supply Conditions Prevailing on 6/1 Apply Through 12/31
NORMAL	≥8,000	≥39,200	≥65,700	≥114,500	≥145,600	≥160,000	
DRY	<8,000	<39,200	<65,700	<114,500	<145,600	<160,000	
CRITICAL DRY	<4,000	<20,000	<45,000	<50,000	<70,000	<75,000	

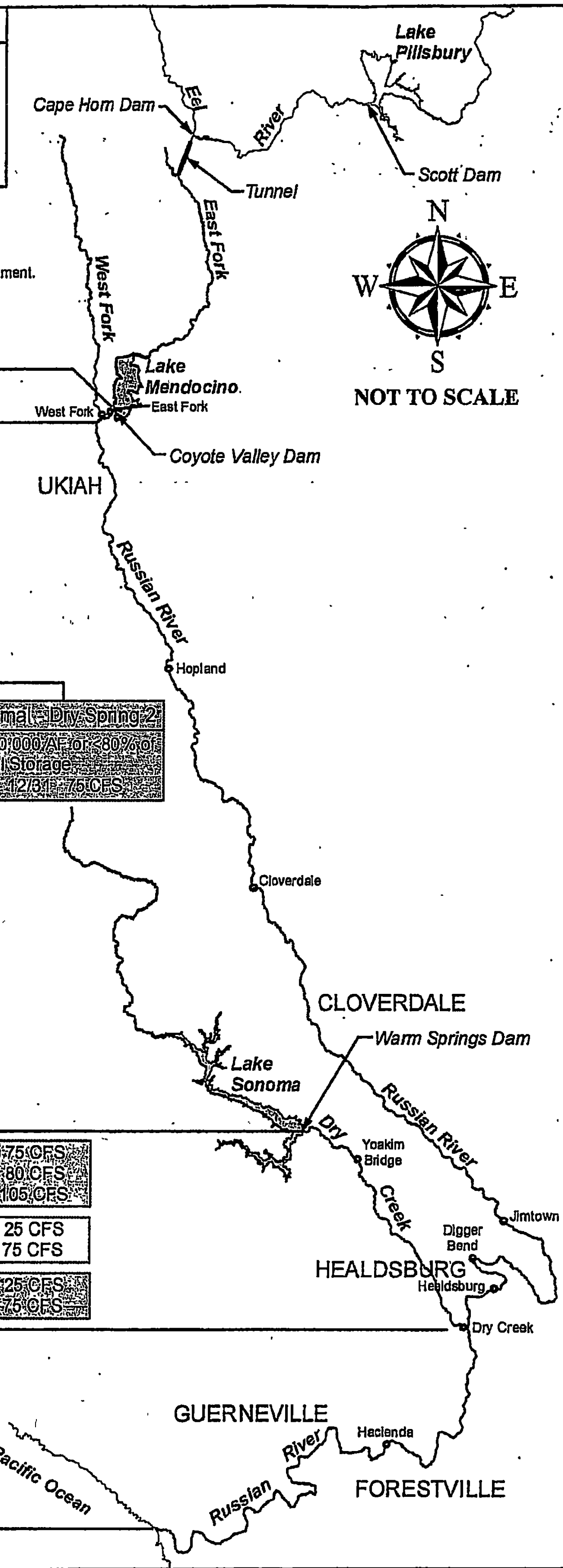
LEGEND

All flows are minimums, expressed in cubic feet per second.

* - Unless Lake Sonoma Elevation is below 292.0, or if prohibited by the United States Government.

AF - Acre Feet

● - USGS Stream Gage Compliance Points



East Fork

Coyote Dam

Mouth East Fork Russian River

ALWAYS: East Fork Russian River Coyote Dam to Russian River - 25 CFS

Russian River

NORMAL

1/1 - 3/31 - 150 CFS
4/1 - 5/31 - 185 CFS

If Combined Storage in Lake Pillsbury and Lake Mendocino on May 31 is:

- **Normal:** 150,000 AF or 90% of Total Storage; 6/1 - 8/31 - 185 CFS; 9/1 - 12/31 - 150 CFS
- **Normal - Dry Spring 1:** 130,000 - 150,000 AF or 80-90% of Total Storage whichever is less; 6/1 - 12/31 - 150 CFS
  - If Lake Mendocino <30,000 AF Storage: 10/1 - 12/31 - 75 CFS
- **Normal - Dry Spring 2:** <130,000 AF or <80% of Total Storage; 6/1 - 12/31 - 75 CFS

DRY

75 CFS

CRITICAL DRY

25 CFS

Dry Creek

NORMAL	1/1 - 4/30 75 CFS 5/1 - 10/31 80 CFS 11/1 - 12/31 105 CFS
DRY	4/1 - 10/31 25 CFS 11/1 - 3/31 75 CFS
CRITICAL DRY	4/1 - 10/31 25 CFS 11/1 - 3/31 75 CFS

Mouth Dry Creek

Russian River

NORMAL	125 CFS*
DRY	85 CFS*
CRITICAL DRY	35 CFS*

Mouth Russian River

SPECIAL PROJECTS/7323-RRIFR-D1610/2010-USGS-GAGE-STREAMFLOW.mxd APRIL 5, 2010

SONOMA WATER

Russian River Basin
Streamflow Requirements

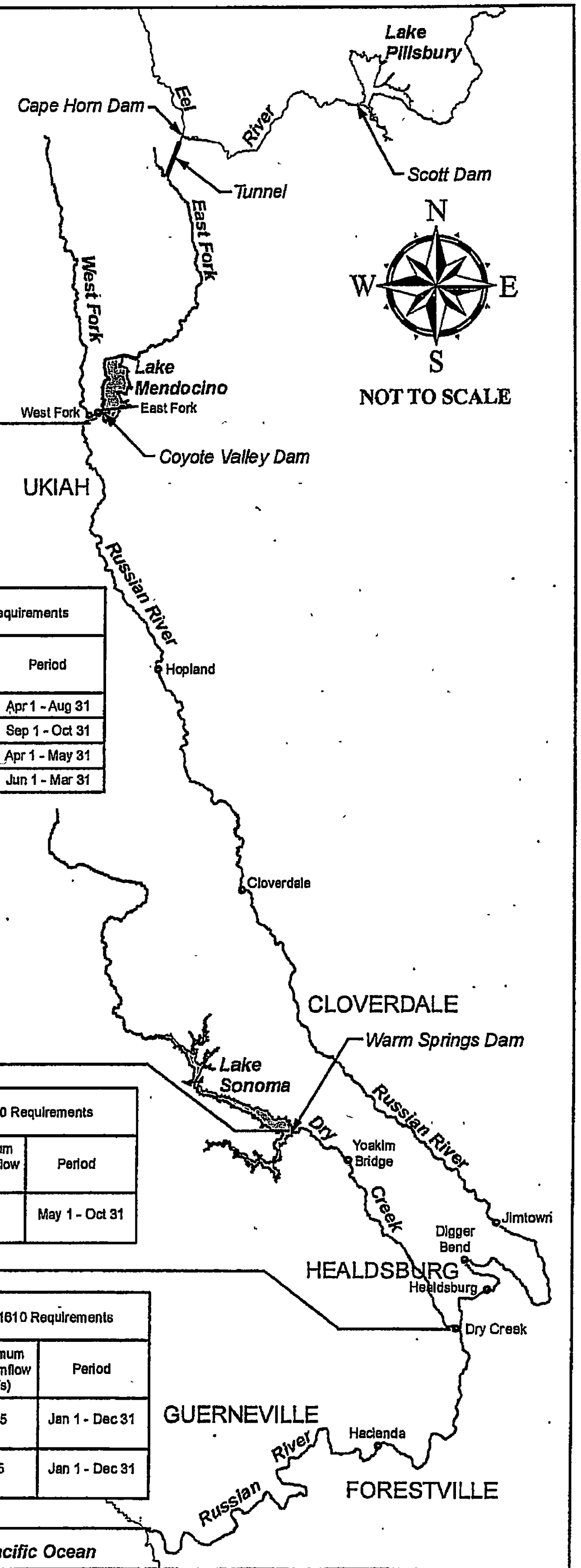
Per State Water Resources Control Board Decision 1610, April 1986

Figure 1

LEGEND

AF - Acre Feet

- USGS Stream Gage Compliance Points



Mouth East Fork Russian River

Upper Russian River

Water Supply Conditions	NMFS Biological Opinion Proposed Changes				D1610 Requirements	
	Temporary Changes		Permanent Changes			
	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period
Normal	125	May 1 - Oct 15	125	Jun 1 - Oct 31	185	Apr 1 - Aug 31
					150	Sep 1 - Oct 31
Normal - Dry Spring 1	125	May 1 - Oct 15	125	Jun 1 - Oct 31	185	Apr 1 - May 31
					150	Jun 1 - Mar 31

Dry Creek

Water Supply Conditions	NMFS Biological Opinion Proposed Changes				D1610 Requirements	
	Temporary Changes		Permanent Changes			
	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period
Normal	-	-	40	May 1 - Oct 31	80	May 1 - Oct 31

Mouth Dry Creek

Lower Russian River

Water Supply Conditions	NMFS Biological Opinion Proposed Changes				D1610 Requirements	
	Temporary Changes		Permanent Changes			
	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period
Normal	70 (85 cfs w/ buffer)	May 1 - Oct 15	70 (85 cfs w/ buffer)	Jan 1 - Dec 31	125	Jan 1 - Dec 31
Dry	-	-	70 (85 cfs w/ buffer)	Jan 1 - Dec 31	85	Jan 1 - Dec 31

Mouth Russian River

SPECIAL PROJECTS/7323-RRIFR-D1610/2010-USGS-GAGE-STREAMFLOW.mxd April 1, 2010

SONOMA COUNTY WATER AGENCY

Russian River Biological Opinion
Proposed Minimum Instream Flow Changes

Per National Marine Fisheries Service's Biological Opinion Issued September 24, 2008

Figure 2

April 2010

Sonoma County Water Agency

In-Stream Flow Analysis for 2010 Temporary Urgency Change Petition

1.0 BACKGROUND

The Sonoma County Water Agency (Water Agency) controls and coordinates water supply releases from the Coyote Valley Dam and Warm Springs Dam projects in accordance with the provisions of Decision 1610, which the State Water Board adopted on April 17, 1986. Decision 1610 specifies the minimum flow requirements for the Russian River and Dry Creek. These minimum flow requirements vary based on water supply conditions, which are also specified by Decision 1610.

1.1 Minimum Flow Requirements

Decision 1610 requires a minimum flow of 25 cubic feet per second (cfs) in the East Fork Russian River from Coyote Valley Dam to the confluence with the West Fork of the Russian River under all water supply conditions. From this point to Dry Creek, the required minimum Russian River flows are 185 cfs from April through August and 150 cfs from September through March during *Normal* water supply conditions, 75 cfs during *Dry* water supply conditions and 25 cfs during *Critical* water supply conditions. Decision 1610 further specifies two variations of the *Normal* water supply condition, commonly known as *Dry Spring 1* and *Dry Spring 2*. These conditions provide for lower required minimum flows in the Upper Russian River during times when the combined storage in Lake Pillsbury and Lake Mendocino on May 31 is unusually low. *Dry Spring 1* exists if the combined storage in Lake Pillsbury and Lake Mendocino is less than 150,000 acre-feet on May 31. Under *Dry Spring 1*, the required minimum flow in the Upper Russian River between the confluence of the East Fork and West Fork and Healdsburg is 150 cfs from June through March, with a reduction to 75 cfs during October through December if Lake Mendocino storage is less than 30,000 AF during those months. *Dry Spring 2* exists if the combined storage in Lake Pillsbury and Lake Mendocino is less than 130,000 acre-feet on May 31. Under *Dry Spring 2*, the Upper Russian River required minimum flows are 75 cfs from June through December and 150 cfs from January through March.

From Dry Creek to the Pacific Ocean, the required minimum flows are 125 cfs during *Normal* conditions, 85 cfs during *Dry* water supply conditions and 35 cfs during *Critical* conditions.

In Dry Creek, the required minimum flows are 75 cfs from January through April, 80 cfs from May through October, and 105 cfs in November and December during *Normal* conditions. During *Dry* and *Critical* conditions, these required minimum flows are 25 cfs from April through October, and 75 cfs from November through March.

Figure 1 shows all of the required minimum in-stream flows specified in Decision 1610 by river reach, the gaging stations used to monitor compliance, and the definitions of the various water supply conditions.

Cumulative Inflow to Lake Pillsbury (Acre Feet) as of

	1/1	2/1	3/1	4/1	5/1	6/1	
NORMAL	≥8,000	≥39,200	≥65,700	≥114,500	≥145,600	≥160,000	Water Supply Conditions Prevailing on 6/1 Apply Through 12/31
DRY	<8,000	<39,200	<65,700	<114,500	<145,600	<160,000	
CRITICAL DRY	<4,000	<20,000	<45,000	<50,000	<70,000	<75,000	

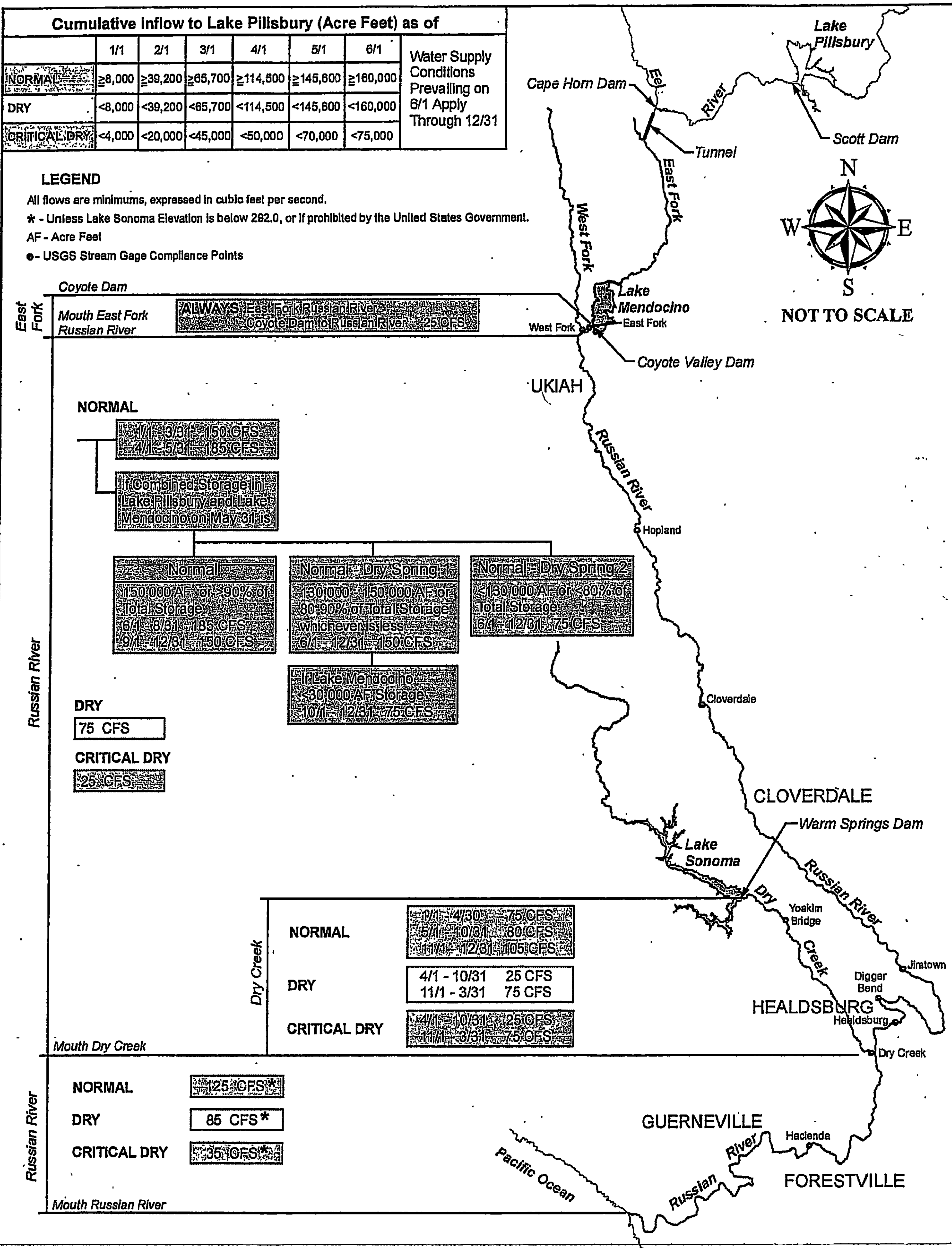
LEGEND

All flows are minimums, expressed in cubic feet per second.

* - Unless Lake Sonoma Elevation is below 292.0, or if prohibited by the United States Government.

AF - Acre Feet

● - USGS Stream Gage Compliance Points



SONOMA COUNTY WATER AGENCY

Russian River Basin
Streamflow Requirements
Per State Water Resources Control Board Decision 1610, April 1986

Figure 1

SPECIAL PROJECTS/1323-BR/FR-D1610/2010-USGS-GAGE-STREAMFLOW.mxd APRIL 5, 2010

1.2 Water Supply Conditions

There are three main water supply conditions that are defined in Decision 1610 to provide for adjustments in minimum instream flow requirements based on the hydrologic conditions in the Russian River system. These water supply conditions are determined based on criteria for the calculated cumulative inflow into Lake Pillsbury from October 1 to the first day of each month from January to June. Decision 1610 defines cumulative inflow as the algebraic sum of releases from Lake Pillsbury, increases in storage in Lake Pillsbury and evaporation from Lake Pillsbury.

Dry water supply conditions exist when cumulative inflow to Lake Pillsbury from October 1 to the date specified below is less than:

- 8,000 acre-feet as of January 1;
- 39,200 acre-feet as of February 1;
- 65,700 acre-feet as of March 1;
- 114,500 acre-feet as of April 1;
- 145,600 acre-feet as of May 1; and
- 160,000 acre-feet as of June 1.

Critical water supply conditions exist when cumulative inflow to Lake Pillsbury from October 1 to the date specified below is less than:

- 4,000 acre-feet as of January 1:
- 20,000 acre-feet as of February 1;
- 45,000 acre-feet as of March 1;
- 50,000 acre-feet as of April 1;
- 70,000 acre-feet as of May 1; and
- 75,000 acre-feet as of June 1.

Normal water supply conditions exist whenever a *Dry* or *Critical* water supply condition is not present. As indicated above, Decision 1610 further specifies three variations of the *Normal* water supply condition based on the combined storage in Lake Pillsbury and Lake Mendocino on May 31. These three variations of the *Normal* water supply condition determine the required minimum in-stream flows for the Upper Russian River from the confluence of the East Fork and the West Fork to the Russian River's confluence with Dry Creek. This provision of Decision 1610 does not modify the required minimum in-stream flows in Dry Creek or the Lower Russian River (the Russian River between its confluence with Dry Creek and the Pacific Ocean). A summary of the required minimum flows in the Russian River for *Normal*, *Normal — Dry Spring 1* and *Normal — Dry Spring 2* water supply conditions is provided below:

1. Normal: When the combined water in storage in Lake Pillsbury and Lake Mendocino on May 31 of any year exceeds 150,000 acre-feet or 90 percent of the estimated water supply storage capacity of the reservoirs, whichever is less:

From June 1 through August 31	185 cfs
From September 1 through March 31	150 cfs
From April 1 through May 31	185 cfs

2. Normal—Dry Spring 1: When the combined water in storage in Lake Pillsbury and Lake Mendocino on May 31 of any year is between 150,000 acre-feet or 90 percent of the estimated water supply storage capacity of the reservoirs, which ever is less, and 130,00 acre-feet or 80 percent or the estimated water supply storage capacity of the reservoirs, whichever is less:

From June 1 through March 31	150 cfs
From April 1 through May 31	185 cfs
If from October 1 through December 31, storage in Lake Mendocino is less than 30,000 acre-feet	75 cfs

3. Normal—Dry Spring 2: When the combined water in storage in Lake Pillsbury and Lake Mendocino on May 31 of any year is less than 130,000 acre-feet or 80 percent of the estimated water supply storage capacity of the reservoirs, which ever is less:

From June 1 through December 31	75 cfs
From January 1 through March 31	150 cfs
From April 1 through May 31	185 cfs

2.0 PROJECTED WATER SUPPLY CONDITIONS

From October 1, 2009 to April 1, 2010, the cumulative inflow into Lake Pillsbury was 266,956 acre-feet. Consequently, the water supply condition is categorized as *Normal*. Based on this designation, the Decision 1610 required minimum in-stream flows in the Upper Russian River (from the East Fork Russian River to the Russian River's confluence of Dry Creek) will be 150 cfs until March 31 and 185 cfs between April 1 and May 31. The required minimum in-stream flows starting June 1 will be determined based on the combined storage of Lake Pillsbury and Lake Mendocino on May 31. Based on the current combined storage in Lake Pillsbury and Lake Mendocino and the observed water supply conditions to date, the Water Agency anticipates the water supply conditions as of June 1 will likely be *Normal* or *Normal — Dry Spring 1*. Consequently, the Decision 1610 required minimum in-stream flows in the Upper Russian River will likely be either 185 cfs or 150 cfs.

3.0 RUSSIAN RIVER BIOLOGICAL OPINION

Under the federal Endangered Species Act (ESA), steelhead, coho salmon and Chinook salmon in the Russian River watershed are listed as threatened or endangered species. Coho salmon is also listed as endangered under the California Endangered Species Act (CESA). In September 2008, the National Marine Fisheries Service (NMFS) issued the Russian River Biological Opinion (Biological Opinion). This Biological Opinion was the culmination of more than a decade of consultation under Section 7 of the ESA by the Water Agency and U.S. Army Corps of Engineers (Corps) with NMFS regarding the impacts of the Water Agency's and Corps' water supply and flood control operations in the Russian River watershed on the survival of these listed fish species.

Studies conducted during the consultation period that ultimately led to this Biological Opinion indicate that summer flows in the Upper Russian River and Dry Creek required by Decision 1610 are too high for optimal juvenile salmonid habitat. NMFS also concluded in the Biological Opinion that the historical practice of breaching the sandbar that builds up and frequently closes the mouth of the Russian River during the summer and fall may also adversely affect the listed species. NMFS concluded in the Biological Opinion that it might be better for juvenile steelhead and salmon if the sandbar is kept closed during these times, to allow for the formation of a seasonal freshwater lagoon in the estuary. However, the minimum in-stream flows required by Decision 1610 result in flows into the estuary that are so high that it is difficult to maintain a freshwater lagoon while preventing flooding of adjacent properties.

To address these issues, the Biological Opinion requires the Water Agency and Corps to implement a series of actions to modify existing water supply and flood control activities that, in concert with habitat enhancement, are intended to minimize impacts to listed salmon species and enhance their habitats within the Russian River and its tributaries. The Water Agency is responsible for the following actions under the Biological Opinion:

- Petitioning the State Water Board to modify permanently the requirements for minimum in-stream flows in the Russian River and Dry Creek;
- Enhancing salmonid habitat in Dry Creek and its tributaries;
- Developing a bypass pipeline around Dry Creek, if habitat enhancement is unsuccessful;
- Changing Russian River estuary management;
- Improving water diversion infrastructure at the Agency's Wohler and Mirabel facilities;
- Modifying flood control maintenance activities on the mainstem Russian River and its tributaries; and
- Continuing to participate in the Coho Broodstock program.

The Biological Opinion acknowledges that implementing permanent changes to the minimum in-stream flow requirements for the Russian River and Dry Creek will take several years, including the time needed for review under the California Environmental Quality Act (CEQA) and the National Environmental Polity Act (NEPA) and compliance with state and federal regulations. Consequently, the Biological Opinion mandates that the Water Agency file annual petitions with the State Water Board for temporary changes to the Decision 1610 minimum in-stream flow requirements, starting in 2010 and for each year thereafter until the State Water Board has issued an order on the Agency's petition for permanent changes to the Decision 1610 minimum in-stream flow requirements. The Biological Opinion requires the Water Agency to request that the minimum in-stream flow requirements be temporarily changed to the following values:

- 70 cfs at the U.S. Geological Survey (USGS) gage located at Hacienda Bridge, between May 1 and October 15, with the understanding that, because of the need for an operational buffer above this minimum requirement, the Water Agency will typically maintain approximately 85 cfs at this gage; and

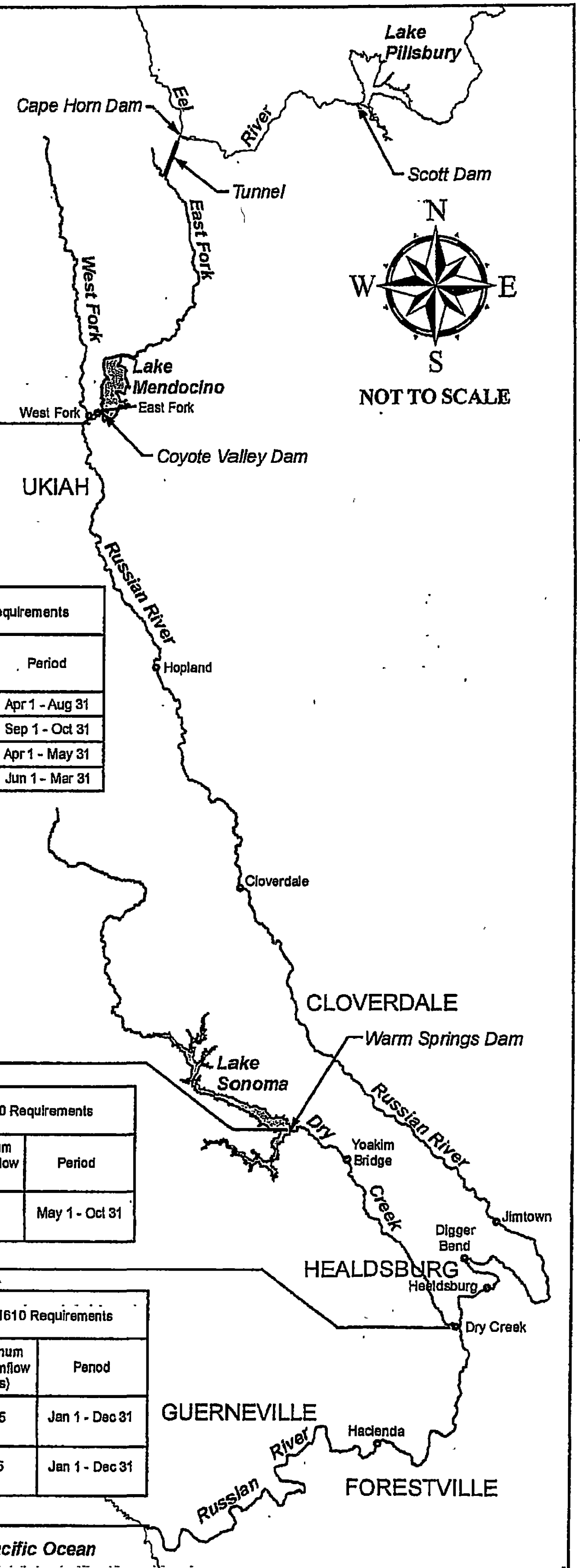
- 125 cfs at the USGS gage located at Healdsburg between May 1 and October 15.

The temporary changes to Decision 1610 minimum in-stream flows specified in the Biological Opinion are summarized in Figure 2.

LEGEND

AF - Acre Feet

●- USGS Stream Gage Compliance Points



Upper Russian River

Water Supply Conditions	NMFS Biological Opinion Proposed Changes				D1610 Requirements	
	Temporary Changes		Permanent Changes			
	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period
Normal	125	May 1 - Oct 15	125	Jun 1 - Oct 31	185	Apr 1 - Aug 31
					150	Sep 1 - Oct 31
Normal - Dry Spring 1	125	May 1 - Oct 15	125	Jun 1 - Oct 31	185	Apr 1 - May 31
					150	Jun 1 - Mar 31

Dry Creek

Water Supply Conditions	NMFS Biological Opinion Proposed Changes				D1610 Requirements	
	Temporary Changes		Permanent Changes			
	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period
Normal	-	-	40	May 1 - Oct 31	80	May 1 - Oct 31

Lower Russian River

Water Supply Conditions	NMFS Biological Opinion Proposed Changes				D1610 Requirements	
	Temporary Changes		Permanent Changes			
	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period
Normal	70 (85 cfs w/ buffer)	May 1 - Oct 15	70 (85 cfs w/ buffer)	Jan 1 - Dec 31	125	Jan 1 - Dec 31
Dry	-	- -	70 (85 cfs w/ buffer)	Jan 1 - Dec 31	85	Jan 1 - Dec 31

SPECIAL PROJECTS\ 1323-RRIFR-D1610\2010-USGS-GAGE-STREAMFLOW.mxd April 1, 2010

SONOMA WATER

Russian River Biological Opinion
Proposed Minimum Instream Flow Changes

Per National Marine Fisheries Service's Biological Opinion Issued September 24, 2008

Figure 2

4.0 CRITERIA FOR APPROVING TEMPORARY UNGENCY CHANGE TO PERMITS 12947A, 12949, 12950, 16596

As stated in the State Water Board's Order WR 2009-0034-EXEC (§ 8.0, page 12), the Board must make the following findings before issuing a temporary change order:

1. The permittee or licensee has an urgent need to make the proposed change;
2. The proposed change may be made without injury to any other lawful user of water;
3. The proposed change may be made without unreasonable effect upon fish, wildlife, or other in-stream beneficial uses; and
4. The proposed change is in the public interest.

4.1 Urgency of the Proposed Change

Decision 1610 set the minimum in-stream flows that the State Water Board concluded, in 1986, would benefit both fishery and recreation uses, and which would "preserve the fishery and recreation in the river and in Lake Mendocino to the greatest extent possible while serving the needs of the agricultural, municipal, domestic, and industrial uses which are dependent upon the water" (D 1610, § 13.2, page 21). The State Water Board also concluded in Decision 1610 that additional fishery studies should be done (D 1610, § 14.3.1, pages 26-27).

Twenty-four years later, it appears that the flows set by Decision 1610 no longer benefit both fishery and recreation uses. To the contrary, the Biological Opinion concludes that summertime flows in the Russian River, at the levels required by Decision 1610, are higher than the optimal levels for the listed fish species. The Biological Opinion contains an extensive analysis of the impacts of these required minimum in-stream flows on listed fish species. The Biological Opinion requires Water Agency to file a petition with the State Water Board to improve conditions for listed species by seeking permanent reductions in the minimum Russian River in-stream flow requirements contained in Water Agency's existing water rights permits. The Biological Opinion also contains the following requirement:

> To help restore freshwater habitats for listed salmon and steelhead in the Russian River estuary, SCWA will pursue interim relief from D1610 minimum flow requirements by petitioning the SWRCB for changes to D1610 beginning in 2010 and for each year prior to the permanent change to D1610. These petitions will request that minimum bypass flows of 70 cfs be implemented at the USGS gage at the Hacienda Bridge between May 1 and October 15, with the understanding

> that for compliance purposes SCWA will typically maintain about 85 cfs at the Hacienda gage. For purposes of enhancing steelhead rearing habitats between the East Fork and Hopland, these petitions will request a minimum bypass flow of 125 cfs at the Healdsburg gage between May 1 and October 15. NMFS will support SCWA's petitions for these changes to D1610 in presentations before the SWRCB.
> (Biological Opinion, page 247.)

One of the species listed under the federal ESA (coho salmon) is also listed under the California Endangered Species Act (CESA), and the California Department of Fish and Game (DFG) has issued a consistency determination in which it determined that the incidental take statement issued to Water Agency by NMFS in connection with the Biological Opinion is consistent with the provisions and requirements of CESA.

In light of this background, an urgent need exists for the proposed change. As discussed in the Biological Opinion, the temporary changes that are requested in this petition will improve habitat for the listed species by reducing in-stream flows and by increasing storage for later fishery use, without unreasonably impairing other beneficial uses, thus maximizing the use of Russian River water resources. Moreover, given the listings of Chinook salmon, coho salmon, and steelhead under the federal ESA, there is a need for prompt action. As demonstrated by the Biological Opinion, there has been an extensive analysis of the needs of the fishery, and fishery experts agree that the Decision 1610 in-stream flows appear to be too high.

4.2 No Injury to Any Other Lawful User of Water

If this petition is granted, the Water Agency still will be required to maintain specified minimum flows in the Russian River from the Water Agency's most upstream point of diversion to the river's confluence with the Pacific Ocean. Because these minimum flows will be present, all other legal users of water still will be able to divert and use the amounts of water that they legally may divert and use. Accordingly, granting this petition will not result in any injury to any other lawful user of water.

4.3 No Unreasonable Effect upon Fish, Wildlife, or Other In-stream Beneficial Uses

This petition is based upon the analysis contained in the 2008 Biological Opinion, which was issued primarily to improve conditions for fish resources in the Russian River system. Two types of improved conditions will result from an order approving this petition. First, the Biological Opinion indicates that stream flows that are required by Decision 1610 are too high for optimum fish habitat in both the river and in the estuary. If this petition is granted, then lower stream flows, which will result in better fish habitat, will occur. Second, lowering the required minimum in-stream flows will result in higher fall storage levels in Lake Mendocino. The resulting conservation of water in Lake

Mendocino will allow enhanced management of Russian River flows in early fall for the benefit of fish migration.

It is possible that reduced flows in the Russian River may impair some in-stream beneficial uses, principally recreation uses. However, although some recreation uses may be affected by these reduced flows, any such impacts on recreation this summer will be reasonable in light of the impacts to fish that could occur if the petition were not approved.

4.4 The Proposed Change is in the Public Interest

As discussed above, the sole purpose of this petition is to improve conditions for listed Russian River salmonid species, as determined by NMFS and DFG. Approval of the Water Agency 's petition to reduce in-stream flows to benefit the fishery will also result in higher fall storage levels in Lake Mendocino, which will make more water available in the fall for fishery purposes. Under these circumstances, it is in the public interest to temporarily change the Decision 1610 minimum required in-stream flows.

5.0 REQUESTED TEMPORARY URGENCY CHANGE TO PERMITS 12947A, 12949, 12950, 16596

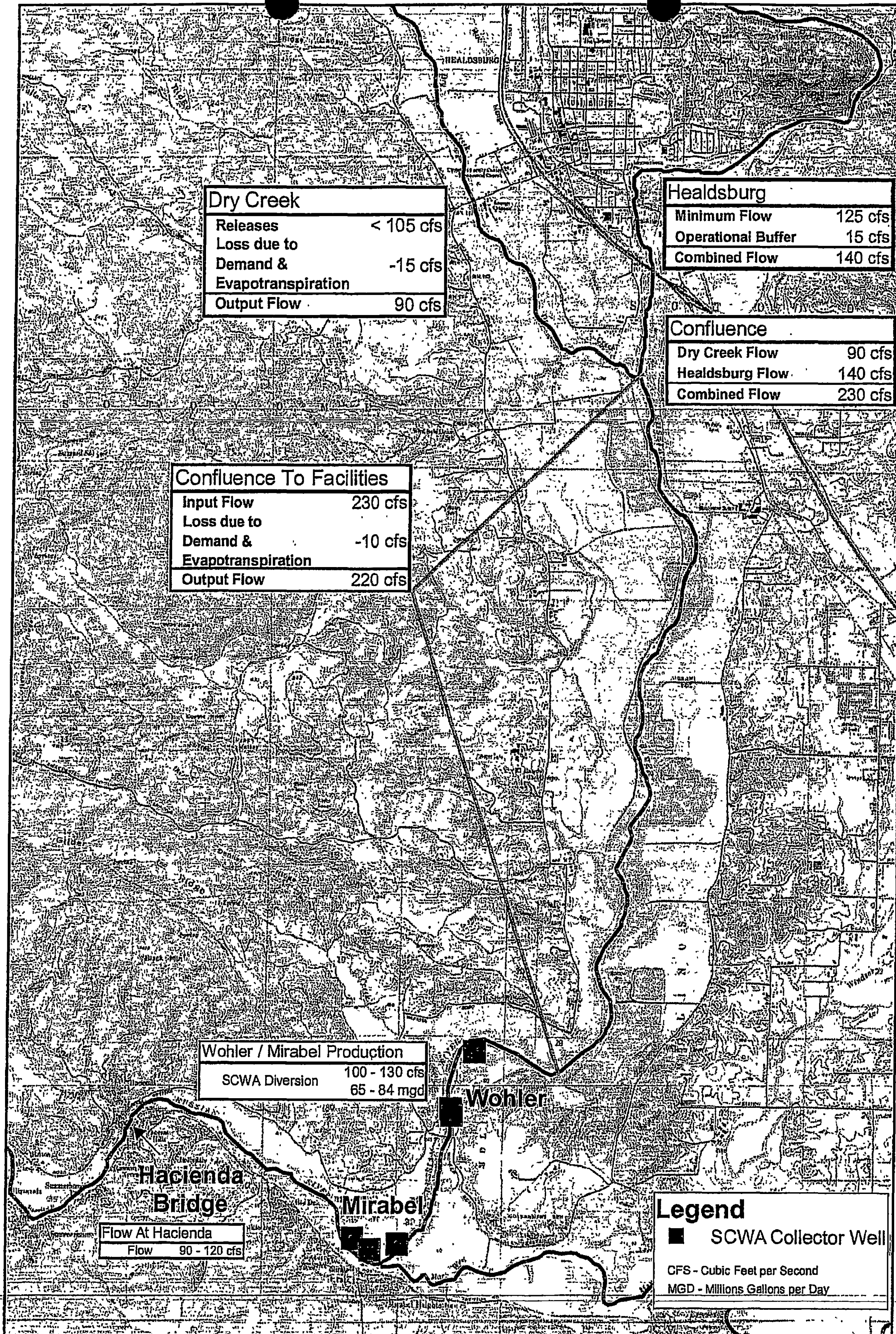
The Temporary Urgency Change Petitions that the Water Agency filed in 2004, 2007 and 2009 requested reductions in the Decision 1610 minimum in-stream flow requirements to address low storage levels in Lake Mendocino. In contrast, this petition is mandated by the Biological Opinion, to provide improved conditions for threatened and endangered fish species. Water supply storage in Lake Mendocino as of April 1, 2010 was approximately 83,000 acre-feet, which is significantly higher than the April 1 levels in 2007 (71,406 acre-feet) and 2009 (56,666 acre-feet).

The proposed changes in the Decision 1610 Russian River minimum in-stream flows that are requested by this petition will not result in unusual circumstances. The proposed changes to minimum in-stream flows are within the range of those that already occur during the *Dry* and *Critical* water supply conditions specified by Decision 1610. Due to low rainfall and other hydrologic factors, flows in the Russian River from June through October for the last three years have been similar to or lower than the minimum flows that will be authorized by the proposed changes.

Because the requested changes are not driven by low Lake Mendocino storage levels, reductions in summertime diversions by the Water Agency would not be beneficial. In fact, flows in the Lower Russian River resulting from the combined required minimum flows in Dry Creek and the Upper Russian River (with the changes requested by this petition) and normal levels of Water Agency diversions (100 cfs to 135 cfs) at its Wohler-

Mirabel facilities will likely be 20 cfs to 50 cfs greater than the 70 cfs goal described in the Biological Opinion. Projected flows on the Lower Russian River under the minimum in-stream flows required by the Biological Opinion are shown in Figure 3. Under these conditions, reducing the Water Agency's summertime diversions at Wohler-Mirabel would increase flows in the lower Russian River downstream of Wohler-Mirabel, which would have adverse impacts on the estuary management strategy described in the Biological Opinion. Specifically, reducing Water Agency diversions at Wohler-Mirabel would result in higher lower Russian River flows into the estuary, which would make it more difficult to maintain the estuary as a closed system, as contemplated by the Biological Opinion.

The potential need to make changes after 1986 to the minimum in-stream flow requirements specified in Decision 1610 was contemplated by Decision 1610. Decision 1610 states: "Our decision will be subject to a reservation of jurisdiction to amend the minimum flow requirements if future studies show that amendments might benefit the fisheries or if operating the project under the terms and conditions herein causes unforeseen adverse impacts to the fisheries." As discussed in this petition, fisheries studies conducted during the last decade, which ultimately led to NMFS' Biological Opinion, now indicate the need to amend the Decision 1610 minimum flow requirements. The Water Agency therefore requests that the State Water Board approve this petition.



SONOMA COUNTY WATER

Lower Russian River
Projected Flows Under Biological Opinion

Figure 3

THIS CHECK IS VOID WITHOUT A GREEN & BLUE BORDER AND BACKGROUND PLUS A KNIGHT & FINGERPRINT WATERMARK ON THE BACK - HOLD AT ANGLE TO VIEW

TO THE TREASURER OF THE
COUNTY OF SONOMA
SANTA ROSA, CALIFORNIA
OR ANY BANK OR BANKER

CLAIMS WARRANT
REVOLVING FUND 10-052-000

WARRANT NO
1112267
11-35
1210

DATE 03/26/2010
VOID AFTER SIX MONTHS

PAY THIS AMOUNT
$22,485.80

PAY *Twenty two thousand four hundred eighty five and 80/100 Dollars*

To The Order Of
STATE WATER RESOURCES CONTROL BOARD
ATTN: ACCOUNTING DEPT
P O BOX 100
SACRAMENTO CA 95812-0100

RODNEY A. DOLE
AUDITOR-CONTROLLER

SIGNATURE AREA CONTAINS A KNIGHT & FINGERPRINT CHECK WORDING

⑈0001112267⑈ ⑆121000358⑆ 00439⑈80050⑈

ABSENCE OF PINK U.S. PATENT NUMBERS UNDER SIGNATURE INDICATES CHECK IS FRAUDULENT. PATENT NUMBERS ARE PRINTED WITH HEAT SENSITIVE INK & WILL DISAPPEAR WHEN BLOWING OR RUBBING

THIS CHECK IS VOID WITHOUT A GREEN & BLUE BORDER AND BACKGROUND PLUS A KNIGHT & FINGERPRINT WATERMARK ON THE BACK - HOLD AT ANGLE TO VIEW

TO THE TREASURER OF THE
COUNTY OF SONOMA
SANTA ROSA, CALIFORNIA
OR ANY BANK OR BANKER

CLAIMS WARRANT
REVOLVING FUND 10-052-000

WARRANT NO
1112658
11-35
1210

DATE 03/29/2010
VOID AFTER SIX MONTHS

PAY THIS AMOUNT
$850.00

PAY *Eight hundred fifty and 00/100 Dollars*

To The Order Of
DEPT OF FISH & GAME
ATTN CASHIER
12TH FLR
1416 NINTH ST
SACRAMENTO CA 94814

RODNEY A. DOLE
AUDITOR-CONTROLLER

SIGNATURE AREA CONTAINS A KNIGHT & FINGERPRINT CHECK WORDING

⑈0001112658⑈ ⑆121000358⑆ 00439⑈80050⑈

ABSENCE OF PINK U.S. PATENT NUMBERS UNDER SIGNATURE INDICATES CHECK IS FRAUDULENT. PATENT NUMBERS ARE PRINTED WITH HEAT SENSITIVE INK & WILL DISAPPEAR WHEN BLOWING OR RUBBING

SONOMA COUNTY WATER AGENCY

April 4, 2010

CF/42-0 19-9 SWRCB Order Approving Temporary Urgency Change in Permits 12947A, 12949, 12950 & 16596 for 2010

Victoria Whitney, Deputy Director of Water Rights
State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

RE: Petition for Temporary Urgency Change—Permits 12947A, 12949, 12950, and 16596

Dear Ms. Whitney:

Enclosed is a Petition for Temporary Urgency Change to modify the minimum in-stream flow requirements for the Russian River as established by Decision 1610 for Permits 12947A, 12949, 12950 and 16596. Accompanying the petition are the following:

1) A supporting analysis document: *In-Stream Flow Analysis for 2010 Temporary Urgency Change Petition*
2) Notice of Exemption
3) California Department of Fish and Game (DFG) Review Fee Payment
4) State Water Resources Control Board (SWRCB) Petition Fee Payment

The petition is being submitted as required by the Russian River Biological Opinion issued by NOAA National Marine Fisheries Services in September of 2008. The Sonoma County Water Agency requests that the Division of Water Rights act expeditiously to approve the requested changes to minimum in-stream flows as identified in the Russian River Biological Opinion.

I look forward to working with the State Water Resources Control Board and Division of Water Rights staff on this important conservation effort.

Sincerely,

Grant Davis
General Manager

C Dick Butler – NMFS
William Hearn – NMFS

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EP

State of California
State Water Resources Control Board
DIVISION OF WATER RIGHTS
P.O. Box 2000, Sacramento, CA 95812-2000
Info: (916) 341-5300, FAX: (916) 341-5400, Web: http://www.waterrights.ca.gov

PETITION FOR TEMPORARY URGENCY CHANGE

(Water Code 1435)

__X__ Change in Instream Flow Requirements

Applications # 12919A, 15736, 15737, 19351 Permits # 12947A, 12949, 12950, 16596

I (we) Sonoma County Water Agency hereby petition for a temporary urgency change(s) noted above
(Water Right Holders Name)
and described as follows:

The Sonoma County Water Agency requests that the State Water Resources Control Board make the following temporary changes to the Decision 1610 (D-1610) instream flow requirements for the period from May 1 through October 15: (a) reduce the D-1610 requirements in the Upper Russian River (from its confluence with the East Fork to its confluence with Dry Creek) to 125 cfs for Normal and Normal—Dry Spring 1 water supply conditions; (b) reduce the D-1610 requirements in the Lower Russian River (downstream of its confluence with Dry Creek) to 70 cfs for Normal and Dry water supply conditions.

These temporary changes are requested to comply with the National Marine Fisheries Service's *Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed* (September 24, 2008).

Point of Diversion or Rediversion (Give coordinate distances from section corner or California Coordinates, and the 40-acre subdivision in which the present and proposed points lie.)
Present see permits Proposed no change

Place of Use (If irrigation, then state number of acres to be irrigated within each 40-acre tract.)
Present see permits Proposed no change

Purpose of Use
Present see permits Proposed no change

Does the proposed use serve to preserve or enhance wetlands habitat, fish and wildlife resources, or recreation in or on the water (See WC 1707)? No (yes/no)

****This question was answered 'No' because this petition is not being filed under Water Code section 1707. However, the requested temporary changes will benefit fish resources, for the reasons stated in NMFS's Biological Opinion.*

The temporary urgency change(s) is to be effective from May 1, 2010 to October 15, 2010
(Cannot exceed 180 days)
Will this temporary urgency change be made without injury to any lawful user of water? Yes (yes/no)

Will this temporary urgency change be made without unreasonable effect upon fish, wildlife, and other instream beneficial uses? Yes (yes/no)

State the "Urgent Need" (Water Code 1435(c)) that is the basis of this temporary urgency change petition (attach additional information as necessary):
see attachment *In-Stream Flow Analysis for 2010 Temporary Urgency Change Petition*

If the point of diversion or rediversion is being changed, is any person(s) taking water from the stream between the old point of diversion or rediversion and the proposed point?
Not Applicable (yes/no)

Are there any persons taking water from the stream between the old point of return flow and the new point of return flow? Not Applicable (yes/no)
If yes, give name and address, as well as any other person(s) known to you who may be affected by the proposed change.

I (we) consulted the California Department of Fish and Game concerning this proposed temporary change. Yes (yes/no)
If yes, state the name and phone number of the person contacted and the opinion concerning the potential effects of your proposed temporary urgency change on fish and wildlife and state the measures required for mitigation.

The Agency has been coordinating activities related to the Biological Opinion and DFG's Consistency Determination with Richard Fitzgerald (707-944-5568) and Eric Larson (707-944-5528) from California Department of Fish and Game (DFG).

Contacts at NOAA National Marine Fisheries Service for the Biological Opinion are Dr. William Hearn (707-575-6062) and Dick Butler (707-575-6058).

THIS TEMPORARY URGENCY CHANGE DOES NOT INVOLVE AN INCREASE IN THE AMOUNT OF THE APPROPRIATION OR SEASON OF USE. THIS TEMPORARY URGENCY CHANGE IS REQUESTED FOR A PERIOD OF ONE HUNDRED EIGHTY DAYS OR LESS.

I (we) declare under penalty of perjury that the above is true and correct to the best of my (our) knowledge and belief.

Dated April 4, 2010 at Santa Rosa, California

Signature(s)

(707) 521-6210
Telephone No.

404 Aviation Boulevard, Santa Rosa, CA 95403-9019
(Address)

NOTE: All petitions must be accompanied by the **filing fee, (see fee schedule at www.waterrights.ca.gov)** made payable to the State Water Resources Control Board and an **$850 fee** made payable to the Department of Fish and Game must accompany this petition. Separate petitions are required for each water right.

April 2010

Sonoma County Water Agency

In-Stream Flow Analysis for 2010 Temporary Urgency Change Petition

1.0 BACKGROUND

The Sonoma County Water Agency (Water Agency) controls and coordinates water supply releases from the Coyote Valley Dam and Warm Springs Dam projects in accordance with the provisions of Decision 1610, which the State Water Board adopted on April 17, 1986. Decision 1610 specifies the minimum flow requirements for the Russian River and Dry Creek. These minimum flow requirements vary based on water supply conditions, which are also specified by Decision 1610.

1.1 Minimum Flow Requirements

Decision 1610 requires a minimum flow of 25 cubic feet per second (cfs) in the East Fork Russian River from Coyote Valley Dam to the confluence with the West Fork of the Russian River under all water supply conditions. From this point to Dry Creek, the required minimum Russian River flows are 185 cfs from April through August and 150 cfs from September through March during *Normal* water supply conditions, 75 cfs during *Dry* water supply conditions and 25 cfs during *Critical* water supply conditions. Decision 1610 further specifies two variations of the *Normal* water supply condition, commonly known as *Dry Spring 1* and *Dry Spring 2*. These conditions provide for lower required minimum flows in the Upper Russian River during times when the combined storage in Lake Pillsbury and Lake Mendocino on May 31 is unusually low. *Dry Spring 1* exists if the combined storage in Lake Pillsbury and Lake Mendocino is less than 150,000 acre-feet on May 31. Under *Dry Spring 1*, the required minimum flow in the Upper Russian River between the confluence of the East Fork and West Fork and Healdsburg is 150 cfs from June through March, with a reduction to 75 cfs during October through December if Lake Mendocino storage is less than 30,000 AF during those months. *Dry Spring 2* exists if the combined storage in Lake Pillsbury and Lake Mendocino is less than 130,000 acre-feet on May 31. Under *Dry Spring 2*, the Upper Russian River required minimum flows are 75 cfs from June through December and 150 cfs from January through March.

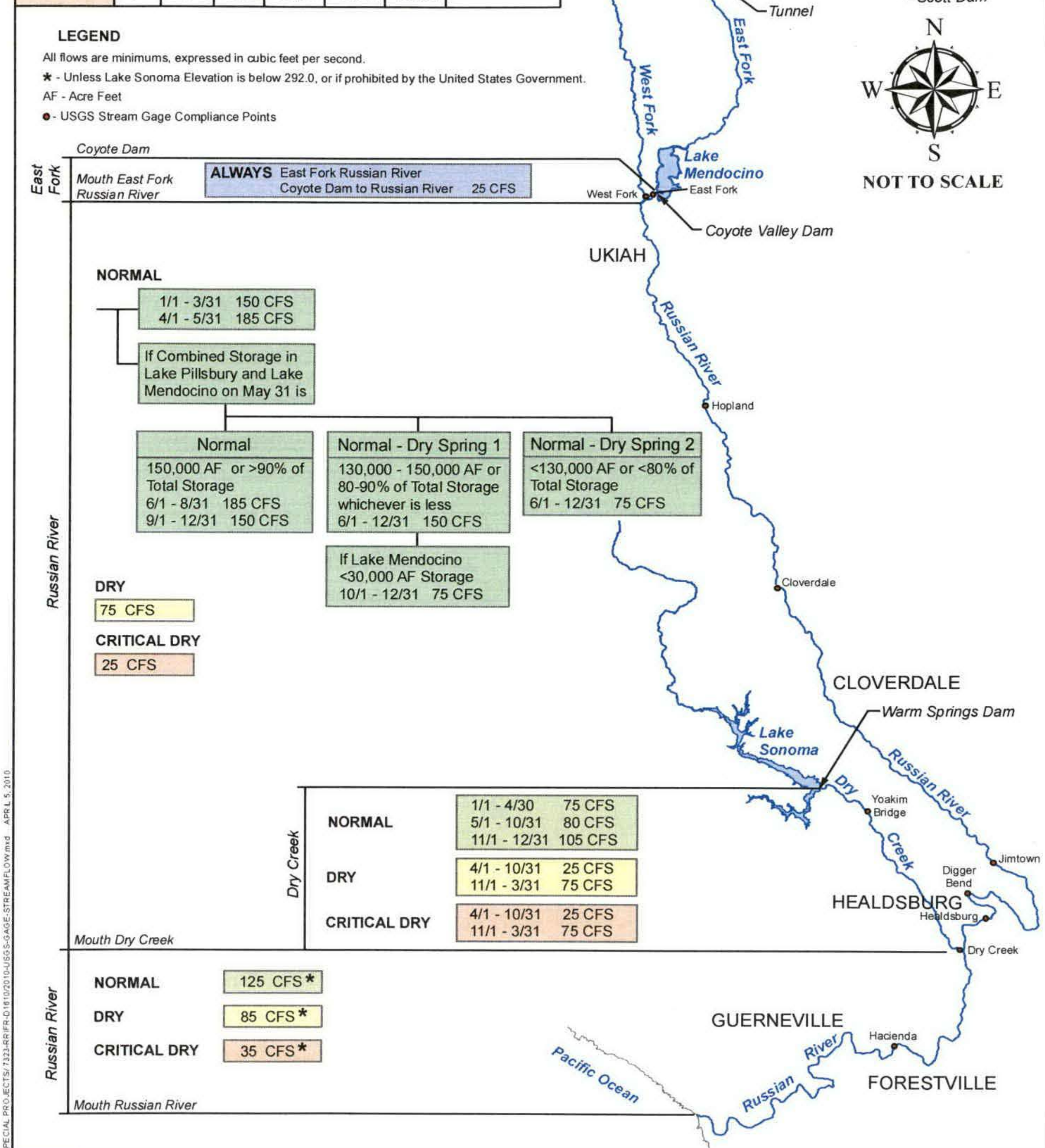
From Dry Creek to the Pacific Ocean, the required minimum flows are 125 cfs during *Normal* conditions, 85 cfs during *Dry* water supply conditions and 35 cfs during *Critical* conditions.

In Dry Creek, the required minimum flows are 75 cfs from January through April, 80 cfs from May through October, and 105 cfs in November and December during *Normal* conditions. During *Dry* and *Critical* conditions, these required minimum flows are 25 cfs from April through October, and 75 cfs from November through March.

Figure 1 shows all of the required minimum in-stream flows specified in Decision 1610 by river reach, the gaging stations used to monitor compliance, and the definitions of the various water supply conditions.

Cumulative inflow to Lake Pillsbury (Acre Feet) as of

	1/1	2/1	3/1	4/1	5/1	6/1	
NORMAL	≥8,000	≥39,200	≥65,700	≥114,500	≥145,600	≥160,000	Water Supply Conditions Prevailing on 6/1 Apply Through 12/31
DRY	<8,000	<39,200	<65,700	<114,500	<145,600	<160,000	
CRITICAL DRY	<4,000	<20,000	<45,000	<50,000	<70,000	<75,000	



SONOMA COUNTY WATER AGENCY

Russian River Basin
Streamflow Requirements

Per State Water Resources Control Board Decision 1610, April 1986

Figure 1

1.2 Water Supply Conditions

There are three main water supply conditions that are defined in Decision 1610 to provide for adjustments in minimum instream flow requirements based on the hydrologic conditions in the Russian River system. These water supply conditions are determined based on criteria for the calculated cumulative inflow into Lake Pillsbury from October 1 to the first day of each month from January to June. Decision 1610 defines cumulative inflow as the algebraic sum of releases from Lake Pillsbury, increases in storage in Lake Pillsbury and evaporation from Lake Pillsbury.

Dry water supply conditions exist when cumulative inflow to Lake Pillsbury from October 1 to the date specified below is less than:

- 8,000 acre-feet as of January 1;
- 39,200 acre-feet as of February 1;
- 65,700 acre-feet as of March 1;
- 114,500 acre-feet as of April 1;
- 145,600 acre-feet as of May 1; and
- 160,000 acre-feet as of June 1.

Critical water supply conditions exist when cumulative inflow to Lake Pillsbury from October 1 to the date specified below is less than:

- 4,000 acre-feet as of January 1:
- 20,000 acre-feet as of February 1;
- 45,000 acre-feet as of March 1;
- 50,000 acre-feet as of April 1;
- 70,000 acre-feet as of May 1; and
- 75,000 acre-feet as of June 1.

Normal water supply conditions exist whenever a *Dry* or *Critical* water supply condition is not present. As indicated above, Decision 1610 further specifies three variations of the *Normal* water supply condition based on the combined storage in Lake Pillsbury and Lake Mendocino on May 31. These three variations of the *Normal* water supply condition determine the required minimum in-stream flows for the Upper Russian River from the confluence of the East Fork and the West Fork to the Russian River's confluence with Dry Creek. This provision of Decision 1610 does not modify the required minimum in-stream flows in Dry Creek or the Lower Russian River (the Russian River between its confluence with Dry Creek and the Pacific Ocean). A summary of the required minimum flows in the Russian River for *Normal*, *Normal— Dry Spring 1* and *Normal— Dry Spring 2* water supply conditions is provided below:

1. Normal: When the combined water in storage in Lake Pillsbury and Lake Mendocino on May 31 of any year exceeds 150,000 acre-feet or 90 percent of the estimated water supply storage capacity of the reservoirs, whichever is less:

From June 1 through August 31	185 cfs
From September 1 through March 31	150 cfs
From April 1 through May 31	185 cfs

2. Normal—Dry Spring 1: When the combined water in storage in Lake Pillsbury and Lake Mendocino on May 31 of any year is between 150,000 acre-feet or 90 percent of the estimated water supply storage capacity of the reservoirs, which ever is less, and 130,00 acre-feet or 80 percent or the estimated water supply storage capacity of the reservoirs, whichever is less:

From June 1 through March 31	150 cfs
From April 1 through May 31	185 cfs
If from October 1 through December 31, storage in Lake Mendocino is less than 30,000 acre-feet	75 cfs

3. Normal—Dry Spring 2: When the combined water in storage in Lake Pillsbury and Lake Mendocino on May 31 of any year is less than 130,000 acre-feet or 80 percent of the estimated water supply storage capacity of the reservoirs, which ever is less:

From June 1 through December 31	75 cfs
From January 1 through March 31	150 cfs
From April 1 through May 31	185 cfs

2.0 PROJECTED WATER SUPPLY CONDITIONS

From October 1, 2009 to April 1, 2010, the cumulative inflow into Lake Pillsbury was 266,956 acre-feet. Consequently, the water supply condition is categorized as *Normal*. Based on this designation, the Decision 1610 required minimum in-stream flows in the Upper Russian River (from the East Fork Russian River to the Russian River's confluence of Dry Creek) will be 150 cfs until March 31 and 185 cfs between April 1 and May 31. The required minimum in-stream flows starting June 1 will be determined based on the combined storage of Lake Pillsbury and Lake Mendocino on May 31. Based on the current combined storage in Lake Pillsbury and Lake Mendocino and the observed water supply conditions to date, the Water Agency anticipates the water supply conditions as of June 1 will likely be *Normal* or *Normal — Dry Spring 1*. Consequently, the Decision 1610 required minimum in-stream flows in the Upper Russian River will likely be either 185 cfs or 150 cfs.

3.0 RUSSIAN RIVER BIOLOGICAL OPINION

Under the federal Endangered Species Act (ESA), steelhead, coho salmon and Chinook salmon in the Russian River watershed are listed as threatened or endangered species. Coho salmon is also listed as endangered under the California Endangered Species Act (CESA). In September 2008, the National Marine Fisheries Service (NMFS) issued the Russian River Biological Opinion (Biological Opinion). This Biological Opinion was the culmination of more than a decade of consultation under Section 7 of the ESA by the Water Agency and U.S. Army Corps of Engineers (Corps) with NMFS regarding the impacts of the Water Agency's and Corps' water supply and flood control operations in the Russian River watershed on the survival of these listed fish species.

Studies conducted during the consultation period that ultimately led to this Biological Opinion indicate that summer flows in the Upper Russian River and Dry Creek required by Decision 1610 are too high for optimal juvenile salmonid habitat. NMFS also concluded in the Biological Opinion that the historical practice of breaching the sandbar that builds up and frequently closes the mouth of the Russian River during the summer and fall may also adversely affect the listed species. NMFS concluded in the Biological Opinion that it might be better for juvenile steelhead and salmon if the sandbar is kept closed during these times, to allow for the formation of a seasonal freshwater lagoon in the estuary. However, the minimum in-stream flows required by Decision 1610 result in flows into the estuary that are so high that it is difficult to maintain a freshwater lagoon while preventing flooding of adjacent properties.

To address these issues, the Biological Opinion requires the Water Agency and Corps to implement a series of actions to modify existing water supply and flood control activities that, in concert with habitat enhancement, are intended to minimize impacts to listed salmon species and enhance their habitats within the Russian River and its tributaries. The Water Agency is responsible for the following actions under the Biological Opinion:

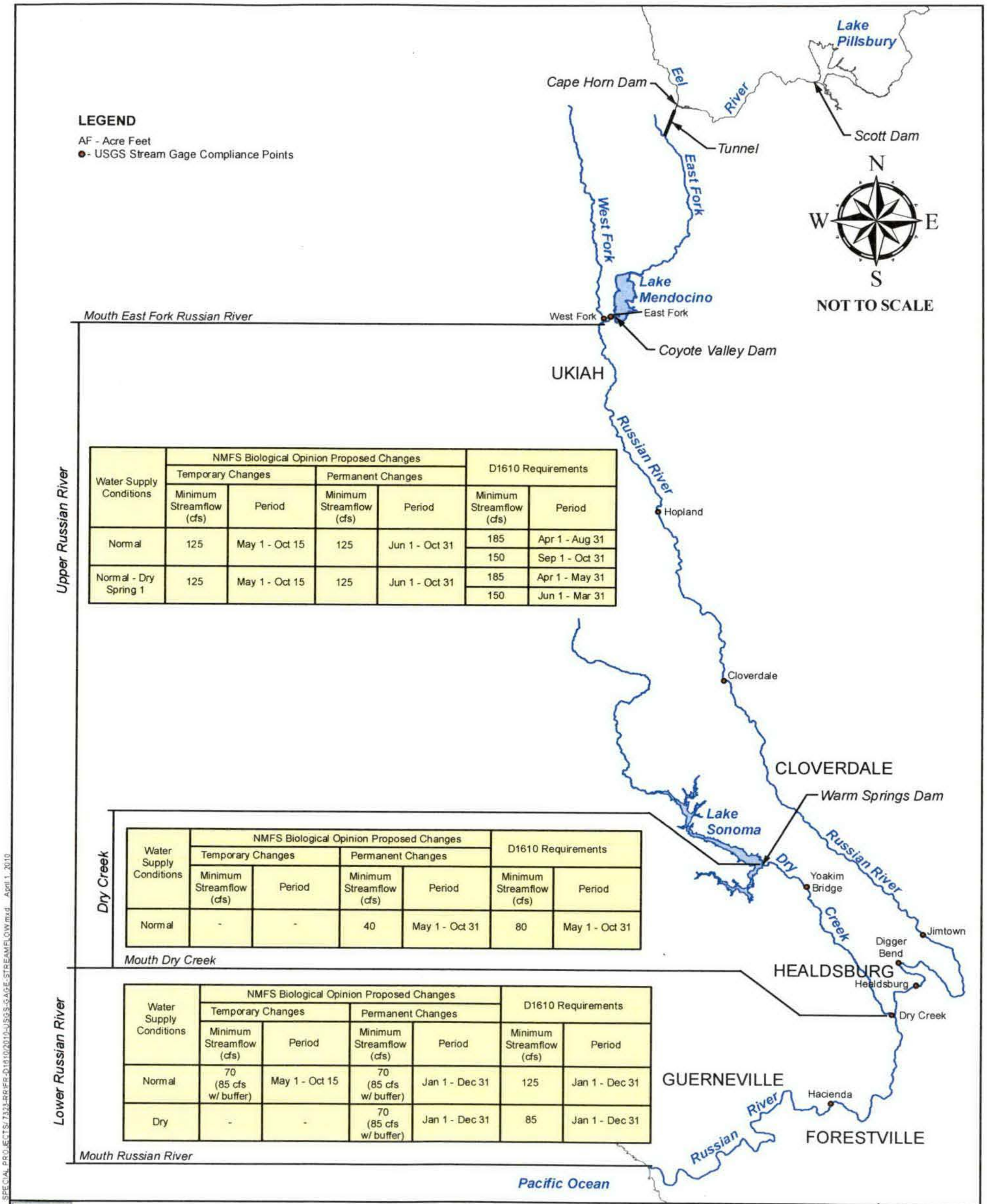
- Petitioning the State Water Board to modify permanently the requirements for minimum in-stream flows in the Russian River and Dry Creek;
- Enhancing salmonid habitat in Dry Creek and its tributaries;
- Developing a bypass pipeline around Dry Creek, if habitat enhancement is unsuccessful;
- Changing Russian River estuary management;
- Improving water diversion infrastructure at the Agency's Wohler and Mirabel facilities;
- Modifying flood control maintenance activities on the mainstem Russian River and its tributaries; and
- Continuing to participate in the Coho Broodstock program.

The Biological Opinion acknowledges that implementing permanent changes to the minimum in-stream flow requirements for the Russian River and Dry Creek will take several years, including the time needed for review under the California Environmental Quality Act (CEQA) and the National Environmental Polity Act (NEPA) and compliance with state and federal regulations. Consequently, the Biological Opinion mandates that the Water Agency file annual petitions with the State Water Board for temporary changes to the Decision 1610 minimum in-stream flow requirements, starting in 2010 and for each year thereafter until the State Water Board has issued an order on the Agency's petition for permanent changes to the Decision 1610 minimum in-stream flow requirements. The Biological Opinion requires the Water Agency to request that the minimum in-stream flow requirements be temporarily changed to the following values:

- 70 cfs at the U.S. Geological Survey (USGS) gage located at Hacienda Bridge, between May 1 and October 15, with the understanding that, because of the need for an operational buffer above this minimum requirement, the Water Agency will typically maintain approximately 85 cfs at this gage; and

- 125 cfs at the USGS gage located at Healdsburg between May 1 and October 15.

The temporary changes to Decision 1610 minimum in-stream flows specified in the Biological Opinion are summarized in Figure 2.



Upper Russian River

Water Supply Conditions	NMFS Biological Opinion Proposed Changes – Temporary Changes: Minimum Streamflow (cfs)	Temporary Changes: Period	Permanent Changes: Minimum Streamflow (cfs)	Permanent Changes: Period	D1610 Requirements: Minimum Streamflow (cfs)	D1610 Requirements: Period
Normal	125	May 1 - Oct 15	125	Jun 1 - Oct 31	185	Apr 1 - Aug 31
					150	Sep 1 - Oct 31
Normal - Dry Spring 1	125	May 1 - Oct 15	125	Jun 1 - Oct 31	185	Apr 1 - May 31
					150	Jun 1 - Mar 31

Dry Creek

Water Supply Conditions	NMFS Biological Opinion Proposed Changes – Temporary Changes: Minimum Streamflow (cfs)	Temporary Changes: Period	Permanent Changes: Minimum Streamflow (cfs)	Permanent Changes: Period	D1610 Requirements: Minimum Streamflow (cfs)	D1610 Requirements: Period
Normal	-	-	40	May 1 - Oct 31	80	May 1 - Oct 31

Lower Russian River

Water Supply Conditions	NMFS Biological Opinion Proposed Changes – Temporary Changes: Minimum Streamflow (cfs)	Temporary Changes: Period	Permanent Changes: Minimum Streamflow (cfs)	Permanent Changes: Period	D1610 Requirements: Minimum Streamflow (cfs)	D1610 Requirements: Period
Normal	70 (85 cfs w/ buffer)	May 1 - Oct 15	70 (85 cfs w/ buffer)	Jan 1 - Dec 31	125	Jan 1 - Dec 31
Dry	-	-	70 (85 cfs w/ buffer)	Jan 1 - Dec 31	85	Jan 1 - Dec 31

SPECIAL PROJECTS\7323-RRIFR-D1610\2010\USGS-GAGE-STREAMFLOW.mxd April 1, 2010

SONOMA COUNTY WATER AGENCY

Russian River Biological Opinion
Proposed Minimum Instream Flow Changes

Per National Marine Fisheries Service's Biological Opinion Issued September 24, 2008

Figure 2

4.0 CRITERIA FOR APPROVING TEMPORARY UNGENCY CHANGE TO PERMITS 12947A, 12949, 12950, 16596

As stated in the State Water Board's Order WR 2009-0034-EXEC (§ 8.0, page 12), the Board must make the following findings before issuing a temporary change order:

1. The permittee or licensee has an urgent need to make the proposed change;
2. The proposed change may be made without injury to any other lawful user of water;
3. The proposed change may be made without unreasonable effect upon fish, wildlife, or other in-stream beneficial uses; and
4. The proposed change is in the public interest.

4.1 Urgency of the Proposed Change

Decision 1610 set the minimum in-stream flows that the State Water Board concluded, in 1986, would benefit both fishery and recreation uses, and which would "preserve the fishery and recreation in the river and in Lake Mendocino to the greatest extent possible while serving the needs of the agricultural, municipal, domestic, and industrial uses which are dependent upon the water" (D 1610, § 13.2, page 21). The State Water Board also concluded in Decision 1610 that additional fishery studies should be done (D 1610, § 14.3.1, pages 26-27).

Twenty-four years later, it appears that the flows set by Decision 1610 no longer benefit both fishery and recreation uses. To the contrary, the Biological Opinion concludes that summertime flows in the Russian River, at the levels required by Decision 1610, are higher than the optimal levels for the listed fish species. The Biological Opinion contains an extensive analysis of the impacts of these required minimum in-stream flows on listed fish species. The Biological Opinion requires Water Agency to file a petition with the State Water Board to improve conditions for listed species by seeking permanent reductions in the minimum Russian River in-stream flow requirements contained in Water Agency's existing water rights permits. The Biological Opinion also contains the following requirement:

> To help restore freshwater habitats for listed salmon and steelhead in the Russian River estuary, SCWA will pursue interim relief from D1610 minimum flow requirements by petitioning the SWRCB for changes to D1610 beginning in 2010 and for each year prior to the permanent change to D1610. These petitions will request that minimum bypass flows of 70 cfs be implemented at the USGS gage at the Hacienda Bridge between May 1 and October 15, with the understanding

> that for compliance purposes SCWA will typically maintain about 85 cfs at the Hacienda gage. For purposes of enhancing steelhead rearing habitats between the East Fork and Hopland, these petitions will request a minimum bypass flow of 125 cfs at the Healdsburg gage between May 1 and October 15. NMFS will support SCWA's petitions for these changes to D1610 in presentations before the SWRCB.
> (Biological Opinion, page 247.)

One of the species listed under the federal ESA (coho salmon) is also listed under the California Endangered Species Act (CESA), and the California Department of Fish and Game (DFG) has issued a consistency determination in which it determined that the incidental take statement issued to Water Agency by NMFS in connection with the Biological Opinion is consistent with the provisions and requirements of CESA.

In light of this background, an urgent need exists for the proposed change. As discussed in the Biological Opinion, the temporary changes that are requested in this petition will improve habitat for the listed species by reducing in-stream flows and by increasing storage for later fishery use, without unreasonably impairing other beneficial uses, thus maximizing the use of Russian River water resources. Moreover, given the listings of Chinook salmon, coho salmon, and steelhead under the federal ESA, there is a need for prompt action. As demonstrated by the Biological Opinion, there has been an extensive analysis of the needs of the fishery, and fishery experts agree that the Decision 1610 in-stream flows appear to be too high.

4.2 No Injury to Any Other Lawful User of Water

If this petition is granted, the Water Agency still will be required to maintain specified minimum flows in the Russian River from the Water Agency's most upstream point of diversion to the river's confluence with the Pacific Ocean. Because these minimum flows will be present, all other legal users of water still will be able to divert and use the amounts of water that they legally may divert and use. Accordingly, granting this petition will not result in any injury to any other lawful user of water.

4.3 No Unreasonable Effect upon Fish, Wildlife, or Other In-stream Beneficial Uses

This petition is based upon the analysis contained in the 2008 Biological Opinion, which was issued primarily to improve conditions for fish resources in the Russian River system. Two types of improved conditions will result from an order approving this petition. First, the Biological Opinion indicates that stream flows that are required by Decision 1610 are too high for optimum fish habitat in both the river and in the estuary. If this petition is granted, then lower stream flows, which will result in better fish habitat, will occur. Second, lowering the required minimum in-stream flows will result in higher fall storage levels in Lake Mendocino. The resulting conservation of water in Lake

Mendocino will allow enhanced management of Russian River flows in early fall for the benefit of fish migration.

It is possible that reduced flows in the Russian River may impair some in-stream beneficial uses, principally recreation uses. However, although some recreation uses may be affected by these reduced flows, any such impacts on recreation this summer will be reasonable in light of the impacts to fish that could occur if the petition were not approved.

4.4 The Proposed Change is in the Public Interest

As discussed above, the sole purpose of this petition is to improve conditions for listed Russian River salmonid species, as determined by NMFS and DFG. Approval of the Water Agency 's petition to reduce in-stream flows to benefit the fishery will also result in higher fall storage levels in Lake Mendocino, which will make more water available in the fall for fishery purposes. Under these circumstances, it is in the public interest to temporarily change the Decision 1610 minimum required in-stream flows.

5.0 REQUESTED TEMPORARY URGENCY CHANGE TO PERMITS 12947A, 12949, 12950, 16596

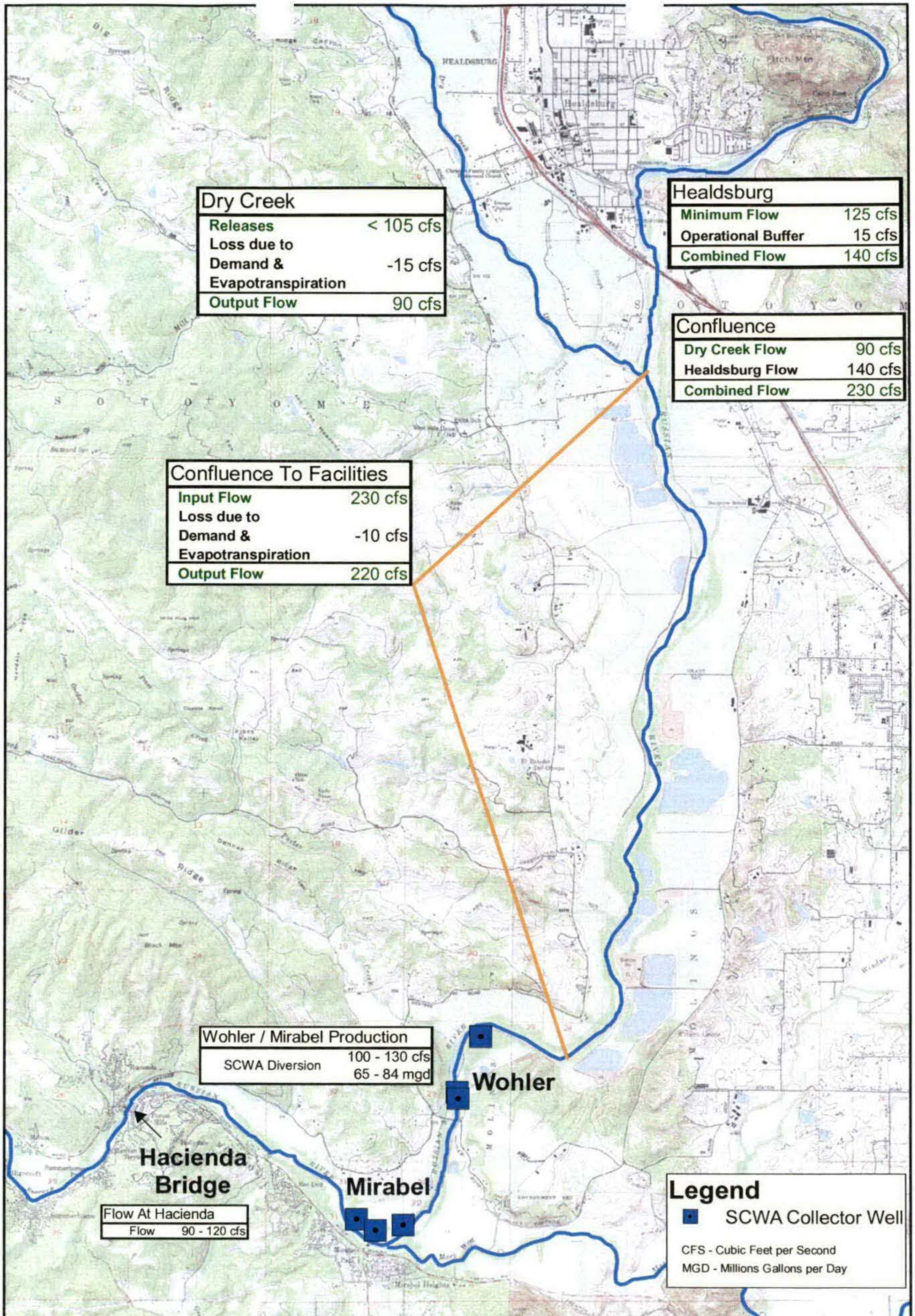
The Temporary Urgency Change Petitions that the Water Agency filed in 2004, 2007 and 2009 requested reductions in the Decision 1610 minimum in-stream flow requirements to address low storage levels in Lake Mendocino. In contrast, this petition is mandated by the Biological Opinion, to provide improved conditions for threatened and endangered fish species. Water supply storage in Lake Mendocino as of April 1, 2010 was approximately 83,000 acre-feet, which is significantly higher than the April 1 levels in 2007 (71,406 acre-feet) and 2009 (56,666 acre-feet).

The proposed changes in the Decision 1610 Russian River minimum in-stream flows that are requested by this petition will not result in unusual circumstances. The proposed changes to minimum in-stream flows are within the range of those that already occur during the *Dry* and *Critical* water supply conditions specified by Decision 1610. Due to low rainfall and other hydrologic factors, flows in the Russian River from June through October for the last three years have been similar to or lower than the minimum flows that will be authorized by the proposed changes.

Because the requested changes are not driven by low Lake Mendocino storage levels, reductions in summertime diversions by the Water Agency would not be beneficial. In fact, flows in the Lower Russian River resulting from the combined required minimum flows in Dry Creek and the Upper Russian River (with the changes requested by this petition) and normal levels of Water Agency diversions (100 cfs to 135 cfs) at its Wohler-

Mirabel facilities will likely be 20 cfs to 50 cfs greater than the 70 cfs goal described in the Biological Opinion. Projected flows on the Lower Russian River under the minimum in-stream flows required by the Biological Opinion are shown in Figure 3. Under these conditions, reducing the Water Agency's summertime diversions at Wohler-Mirabel would increase flows in the lower Russian River downstream of Wohler-Mirabel, which would have adverse impacts on the estuary management strategy described in the Biological Opinion. Specifically, reducing Water Agency diversions at Wohler-Mirabel would result in higher lower Russian River flows into the estuary, which would make it more difficult to maintain the estuary as a closed system, as contemplated by the Biological Opinion.

The potential need to make changes after 1986 to the minimum in-stream flow requirements specified in Decision 1610 was contemplated by Decision 1610. Decision 1610 states: "Our decision will be subject to a reservation of jurisdiction to amend the minimum flow requirements if future studies show that amendments might benefit the fisheries or if operating the project under the terms and conditions herein causes unforeseen adverse impacts to the fisheries." As discussed in this petition, fisheries studies conducted during the last decade, which ultimately led to NMFS' Biological Opinion, now indicate the need to amend the Decision 1610 minimum flow requirements. The Water Agency therefore requests that the State Water Board approve this petition.



SONOMA COUNTY WATER AGENCY

Lower Russian River
Projected Flows Under Biological Opinion

Figure 3

NOTICE OF EXEMPTION

To: X	Office of Planning & Research 1400 Tenth Street, Room 121 Sacramento, CA 95814	From:	Sonoma County Water Agency 404 Aviation Boulevard Santa Rosa, CA 95403
X	County Clerk County of Sonoma Santa Rosa, CA 95401		
X	County Clerk County of Mendocino Ukiah, CA 95482		

Project Title: Petition by Sonoma County Water Agency Requesting Approval of a Temporary Urgency Change in Permits 12947A, 12949, 12950, and 16596 in Mendocino and Sonoma Counties (Applications 12919A, 15736, 15737, and 19351): 2010 Temporary Changes to Minimum Instream Flow Requirements of Decision 1610

Project Location: The proposed action is to temporarily change the required minimum instream flows in the Russian River in Mendocino and Sonoma Counties. Figure 1 shows the minimum instream-flow requirements in the water-right permits of the Sonoma County Water Agency (SCWA) for its Russian River Project that are in effect now and that will remain in effect if the proposed action is not approved. The proposed action is to temporarily change some of these requirements, to the "Temporary Changes" shown in Figure 2, for the period from May 1, 2010 through October 15, 2010. Communities and cities along the Russian River include Ukiah, Hopland, Cloverdale, Geyserville, Healdsburg, Forestville, Mirabel Park, Rio Nido, Guerneville, Monte Rio, Duncans Mills, and Jenner.

Project Background: The National Marine Fisheries Service (NMFS) issued its *Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed* (Russian River BO) on September 24, 2008.[1] NMFS concluded in the Russian River BO that the continued operations of Coyote Valley Dam and Warm Springs Dam by the U.S. Army Corps of Engineers and SCWA in a manner similar to recent historic practices, together with SCWA's stream channel maintenance activities and estuary management, are likely to jeopardize and adversely modify critical habitat for endangered Central California Coast coho salmon and threatened Central California Coast steelhead.

SCWA controls and coordinates water supply releases from the Coyote Valley Dam and Warm Springs Dam projects in accordance with the requirements of Decision 1610, adopted by the State Water Resources Control Board (SWRCB) in 1986. NMFS' Russian River BO states that changes to Decision 1610 minimum instream flow requirements will enable alternative flow management scenarios that will increase available rearing habitat in Dry Creek and the upper Russian River, and provide a lower, closer to natural inflow to the estuary between late spring and early fall, thereby enhancing the potential for

[1] NMFS' Russian River BO may be accessed online at www.sonomacountywater.org and may be reviewed at SCWA's office at 404 Aviation Boulevard, Santa Rosa, CA.

maintaining a seasonal freshwater lagoon that will likely support increased production of juvenile steelhead and salmon.[2]

As required by NMFS' Russian River BO, in September 2009 SCWA filed a petition with the SWRCB to make permanent changes to the Decision 1610 minimum instream flow requirements. This petition presently is pending before the SWRCB. The SWRCB will not act on this petition until the necessary environmental impact report is prepared and the water-rights issues associated with this petition are resolved. This process is expected to take several years.

Until the SWRCB issues an order on this petition, SCWA must maintain the minimum instream flows specified in Decision 1610, with resulting impacts to listed salmonids, unless temporary changes to these requirements are authorized by the SWRCB. To help restore freshwater habitats for listed salmon and steelhead in the Russian River estuary NMFS' Russian River BO requires that SCWA petition the SWRCB for temporary changes to minimum instream flow requirements beginning in 2010 and for each year thereafter until the SWRCB issues an order on SCWA's petition for the permanent changes to the Decision 1610 minimum instream flow requirements. The temporary changes include a reduction in the minimum instream flow to 70 cubic feet per second (cfs) in the lower Russian River between May 1 and October 15, with the understanding that, because of the need to maintain an operational buffer above this minimum requirement, SCWA will typically maintain a flow of about 85 cfs at this point. Additionally, for the purposes of enhancing steelhead rearing habitat between the East Fork and Hopland, the temporary changes include a reduction in the minimum instream flow to 125 cfs in the upper Russian River between May 1 and October 15.[3] NMFS' Russian River BO only requires petitions for temporary changes to minimum streamflows on the mainstem Russian River, and not on Dry Creek. This petition therefore does not seek changes in required Dry Creek flows, which will be maintained at the levels currently required by Decision 1610.

The permanent and temporary changes to Decision 1610 minimum instream flows specified by NMFS in the Russian River BO are summarized in Figure 2. NMFS' Russian River BO states that, in addition to providing the expected fishery benefits, the revised minimum instream flow requirements should promote water conservation and seek to limit effects on in-stream river recreation.[4]

Description of Project: To comply with the requirements of NMFS' Russian River BO, SCWA is filing a temporary urgency change petition with the SWRCB that asks the SWRCB to make the following changes in the instream flow requirements for the Russian River mainstem that are specified in Decision 1610 and SCWA's water right permits between May 1 through October 15, 2010: (a) a minimum instream flow requirement of 125 cfs in the upper Russian River (upstream of the confluence with Dry Creek and downstream of the confluence of the East and West Forks) and (b) 70 cfs in the lower Russian River (downstream of its confluence with Dry Creek), with the understanding that for compliance purposes SCWA will typically maintain a flow of about 85 cfs at this point.

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[2] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p. 243. September 2008.

[3] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p 247. September 2008.

[4] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p. 244. September 2008.

Decision 1610 specifies the minimum flow requirements for Dry Creek and the Russian River (see Figure 1). These requirements vary based on defined hydrologic conditions. If approved, the requested reductions in Russian River instream flow requirements will be in effect May 1 through October 15, 2010. Under Normal water supply conditions, minimum flows during this time period could be as high as 185 cfs in the upper Russian River, 125 cfs in the lower Russian River, and 80 cfs in Dry Creek. Under the proposed change, minimum flows could be as low as 125 cfs in the upper Russian River and 70 cfs in the lower Russian River. No change in the Dry Creek requirements is proposed and the minimum flow requirement in Dry Creek will remain at 80 cfs. The proposed changes in Russian River instream flow requirements will not result in any unusual circumstances, because the proposed minimum instream flow requirements are within the range of those that already occur during Dry and Critical water supply conditions under Decision 1610. In addition, due to low rainfall and other factors, flows in the river during the last three years have been similar to or lower than the proposed changes. For example, compared to summer 2009, the requested minimum flows are slightly higher for the lower Russian River and substantially higher for the upper Russian River.

During the period that the proposed temporary flow changes are in effect, SCWA will also monitor water quality and fish, and collect and report information and data related to monitoring activities, as required by NMFS' Russian River BO. This information will assist with the study and development of required future permanent flow changes.

Name of Public Agency Approving Project: State Water Resources Control Board- Division of Water Rights

Name of Person or Agency Carrying Out Project: Sonoma County Water Agency

Exempt Status: (Check one)

___	Ministerial (Sec. 21080(b)(1); 15268)	
___	Declared Emergency (Sec. 21080(b)(3); 15269(a));	
___	Emergency Project (Sec.21080 (b)(4); 15269(b)(c));	
X	Categorical Exemption. State type and section number:	State CEQA Guidelines 15307: Actions by Regulatory Agencies for Protection of Natural Resources State CEQA Guidelines 15308: Actions by Regulatory Agencies for Protection of the Environment State CEQA Guidelines 15301(i): Existing Facilities State CEQA Guidelines 15306: Information Collection
___	Statutory Exemptions. State Code number:	

Reasons why project is exempt: The proposed action is categorically exempt from the California Environmental Quality Act (CEQA) under the State CEQA Guidelines Sections 15307, 15308, 15301(i), and 15306.

A. Actions by Regulatory Agencies for Protection of Natural Resources and the Environment
Guidelines Sections 15307 and 15308 provide that actions taken by regulatory agencies to assure the maintenance, restoration or enhancement of a natural resource and the environment are categorically exempt from CEQA. If approved, the proposed changes in Russian River instream flow requirements will increase available rearing habitat in the upper Russian River and provide a lower, closer to natural inflow

to the estuary between late spring and early fall, thereby enhancing the potential for maintaining a seasonal freshwater lagoon that could support increased production of juvenile steelhead. NMFS' Russian River BO states that these changes are necessary to avoid jeopardizing the continued existence of the listed species.[5] The proposed changes also will conserve water in Lake Mendocino to benefit adult Chinook salmon migrating upstream in the fall.

B. Existing Facilities
Guidelines Section 15301(i) provides, generally, that the operation of existing facilities involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination is categorically exempt from CEQA. Subdivision (i) of Section 15301 specifically includes maintenance of streamflows to protect fish and wildlife resources. SCWA's petition to the SWRCB to change to the instream flow requirements specified in NMFS' Russian River BO does not request and will not expand SCWA use or increase the water supply available to SCWA for consumptive purposes. The proposed change in Russian River instream flow requirements still will be within the existing operational parameters established by Decision 1610.

C. *Information Collection*
Guidelines Section 15306 provides that basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource are categorically exempt from CEQA. These activities may be part of a study leading to an action which a public agency has not yet approved, adopted or funded. The water quality and fishery information and data collected during the period that the proposed temporary flow changes are in effect will assist with the study and development of the required future permanent flow changes.

Lead Agency Contact Person: ~~Erica Phelps~~ Area Code/Telephone: 707-547-1934

Signature: ______________ Date: 4-5-10 Title: General Manager

X Lead Agency ___ Applicant
Date Received for filing at OPR:

[5] National Marine Fisheries Service. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed. p. 247. September 2008.

Cumulative inflow to Lake Pillsbury (Acre Feet) as of

	1/1	2/1	3/1	4/1	5/1	6/1	
NORMAL	≧8,000	≧39,200	≧65,700	≧114,500	≧145,600	≧160,000	Water Supply Conditions Prevailing on 6/1 Apply Through 12/31
DRY	<8,000	<39,200	<65,700	<114,500	<145,600	<160,000	
CRITICAL DRY	<4,000	<20,000	<45,000	<50,000	<70,000	<75,000	

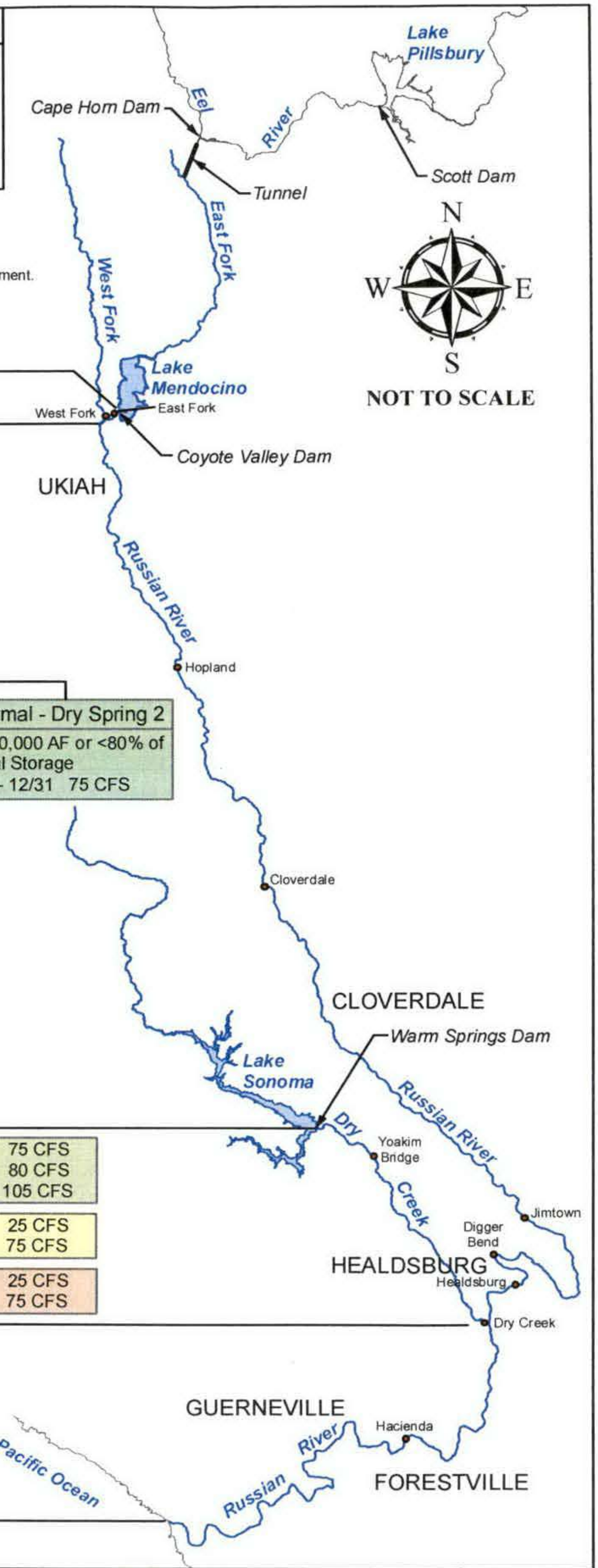
LEGEND

All flows are minimums, expressed in cubic feet per second.

★ - Unless Lake Sonoma Elevation is below 292.0, or if prohibited by the United States Government.

AF - Acre Feet

● - USGS Stream Gage Compliance Points



East Fork

Coyote Dam

Mouth East Fork Russian River

ALWAYS East Fork Russian River
Coyote Dam to Russian River 25 CFS

Russian River

NORMAL

1/1 - 3/31 150 CFS
4/1 - 5/31 185 CFS

If Combined Storage in Lake Pillsbury and Lake Mendocino on May 31 is

Normal
150,000 AF or >90% of Total Storage
6/1 - 8/31 185 CFS
9/1 - 12/31 150 CFS

Normal - Dry Spring 1
130,000 - 150,000 AF or 80-90% of Total Storage whichever is less
6/1 - 12/31 150 CFS

If Lake Mendocino <30,000 AF Storage
10/1 - 12/31 75 CFS

Normal - Dry Spring 2
<130,000 AF or <80% of Total Storage
6/1 - 12/31 75 CFS

DRY

75 CFS

CRITICAL DRY

25 CFS

Dry Creek

NORMAL
1/1 - 4/30 75 CFS
5/1 - 10/31 80 CFS
11/1 - 12/31 105 CFS

DRY
4/1 - 10/31 25 CFS
11/1 - 3/31 75 CFS

CRITICAL DRY
4/1 - 10/31 25 CFS
11/1 - 3/31 75 CFS

Mouth Dry Creek

Russian River

NORMAL 125 CFS★

DRY 85 CFS★

CRITICAL DRY 35 CFS★

Mouth Russian River

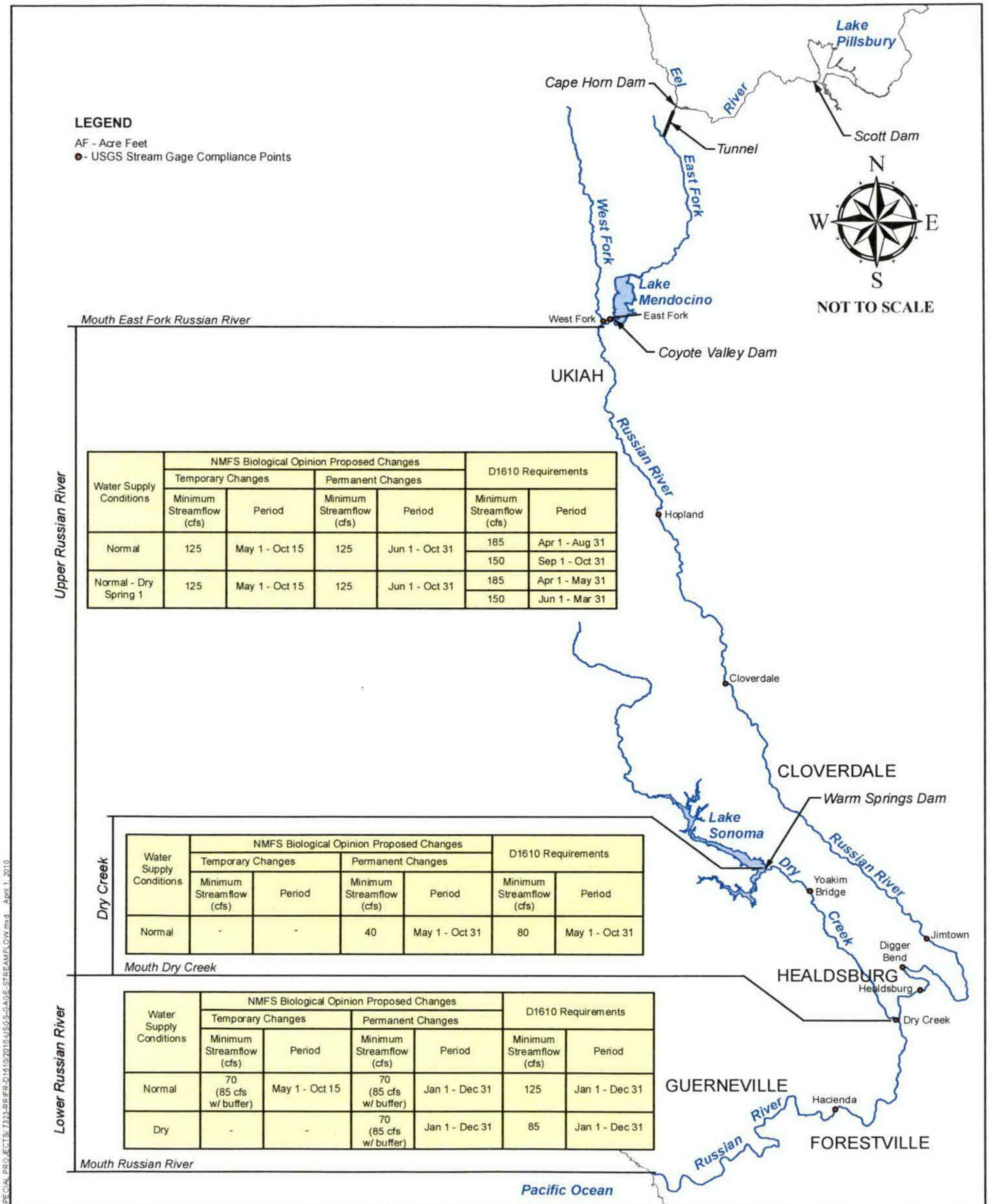
SPECIAL PROJECTS/ 7323-RRIFR-D1610/2010-USGS-GAGE-STREAMFLOW.mxd APRIL 5, 2010

SONOMA COUNTY WATER AGENCY

Russian River Basin
Streamflow Requirements

Per State Water Resources Control Board Decision 1610, April 1986

Figure 1



Upper Russian River

Water Supply Conditions	NMFS Biological Opinion Proposed Changes				D1610 Requirements	
	Temporary Changes		Permanent Changes			
	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period
Normal	125	May 1 - Oct 15	125	Jun 1 - Oct 31	185	Apr 1 - Aug 31
					150	Sep 1 - Oct 31
Normal - Dry Spring 1	125	May 1 - Oct 15	125	Jun 1 - Oct 31	185	Apr 1 - May 31
					150	Jun 1 - Mar 31

Dry Creek

Water Supply Conditions	NMFS Biological Opinion Proposed Changes				D1610 Requirements	
	Temporary Changes		Permanent Changes			
	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period
Normal	-	-	40	May 1 - Oct 31	80	May 1 - Oct 31

Lower Russian River

Water Supply Conditions	NMFS Biological Opinion Proposed Changes				D1610 Requirements	
	Temporary Changes		Permanent Changes			
	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period
Normal	70 (85 cfs w/ buffer)	May 1 - Oct 15	70 (85 cfs w/ buffer)	Jan 1 - Dec 31	125	Jan 1 - Dec 31
Dry	-	-	70 (85 cfs w/ buffer)	Jan 1 - Dec 31	85	Jan 1 - Dec 31

SPECIAL PROJECTS/7323-RRFR-D1610/2010-USGS-GAGE-STREAMFLOW.mxd April 1, 2010

SONOMA COUNTY WATER AGENCY

Russian River Biological Opinion
Proposed Minimum Instream Flow Changes

Per National Marine Fisheries Service's Biological Opinion Issued September 24, 2008

Figure 2

THIS CHECK IS VOID WITHOUT A GREEN & BLUE BORDER AND BACKGROUND PLUS A KNIGHT & FINGERPRINT WATERMARK ON THE BACK - HOLD AT ANGLE TO VIEW

TO THE TREASURER OF THE
COUNTY OF SONOMA
SANTA ROSA, CALIFORNIA
OR ANY BANK OR BANKER

CLAIMS WARRANT
REVOLVING FUND 10-052-000

WARRANT NO.
1112267

11-35
1210

DATE 03/26/2010
VOID AFTER SIX MONTHS

PAY THIS AMOUNT
$22,485.80

PAY *Twenty two thousand four hundred eighty five and 80/100 Dollars*

To The Order Of
STATE WATER RESOURCES CONTROL BOARD
ATTN: ACCOUNTING DEPT
P O BOX 100
SACRAMENTO CA 95812-0100

RODNEY A. DOLE
AUDITOR-CONTROLLER

SIGNATURE AREA CONTAINS A KNIGHT & FINGERPRINT CHECK WORDING

⑈0001112267⑈ ⑆121000358⑆ 00439⑉80050⑈

ABSENCE OF PINK U.S. PATENT NUMBERS UNDER SIGNATURE INDICATES CHECK IS FRAUDULENT. PATENT NUMBERS ARE PRINTED WITH HEAT SENSITIVE INK & WILL DISAPPEAR WHEN BLOWING OR RUBBING

THIS CHECK IS VOID WITHOUT A GREEN & BLUE BORDER AND BACKGROUND PLUS A KNIGHT & FINGERPRINT WATERMARK ON THE BACK - HOLD AT ANGLE TO VIEW

TO THE TREASURER OF THE
COUNTY OF SONOMA
SANTA ROSA, CALIFORNIA
OR ANY BANK OR BANKER

CLAIMS WARRANT
REVOLVING FUND 10-052-000

WARRANT NO.
1112658

11-35
1210

DATE 03/29/2010
VOID AFTER SIX MONTHS

PAY THIS AMOUNT
******$850.00

PAY *Eight hundred fifty and 00/100 Dollars*

To the Order Of
DEPT OF FISH & GAME
ATTN CASHIER
12TH FLR
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SIGNATURE AREA CONTAINS A KNIGHT & FINGERPRINT CHECK WORDING

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ABSENCE OF PINK U.S. PATENT NUMBERS UNDER SIGNATURE INDICATES CHECK IS FRAUDULENT. PATENT NUMBERS ARE PRINTED WITH HEAT SENSITIVE INK & WILL DISAPPEAR WHEN BLOWING OR RUBBING