

State Water Resources Control Board
Order 5/1/2015

Provision 7 - Fisheries Monitoring Tasks



April 1, 2016

Prepared by

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Introduction

On April 22, 2015, the Sonoma County Water Agency (Water Agency) filed a Temporary Urgency Change Petition (TUCP) with the State Water Resources Control Board (SWRCB) to temporarily reduce minimum instream flows in the upper Russian River to prevent significant depletion of storage in Lake Mendocino and the potential elimination of water supplies for 2015, and in the lower Russian River to protect fishery resources in Dry Creek.

In summary, the Water Agency requested that the SWRCB make the following temporary changes to the Decision 1610 (D1610) instream flow requirements:

- (1) From May 1, 2015, through October 27, 2015, reduce instream flow requirements for the upper Russian River (from its confluence with the East Fork of the Russian River to its confluence with Dry Creek) from 185 cubic feet per second (cfs) to 75 cfs.
- (2) From May 1, 2015, through October 27, 2015, reduce instream flow requirements for the lower Russian River (downstream of its confluence with Dry Creek) from 125 cfs to 85 cfs.

The TUCP also requested that compliance with these minimum instream flow requirements be measured based on a 5-day running average of average daily stream flow measurements, provided that instantaneous flows on the upper Russian River shall be no less than 65 cfs and on the lower Russian River shall be no less than 75 cfs. These 5-day running average provisions allowed the Water Agency to reduce the operational buffers needed to manage these stream flows, thereby allowing the Water Agency to conserve more water in Lake Mendocino. The SWRCB issued an Order (Order) approving the Water Agency's TUCP on May 1, 2015.

On May 27, 2015, the Water Agency provided new information to the SWRCB regarding anticipated inflow into Lake Mendocino and requested additional changes to instream flow requirements (May 27 Request):

- (1) From June 16, 2015, through October 27, 2015, reduce instream flow requirements for the upper Russian River (from its confluence with the East Fork of the Russian River to its confluence with Dry Creek) to a minimum of 25 cfs.
- (2) From June 16, 2015, through October 27, 2015, reduce instream flow requirements for the lower Russian River (downstream of its confluence with Dry Creek) to a minimum of 50 cfs.

The May 27 Request also requested that compliance with these reduced minimum instream flow requirements be measured based on a 24-hour mean instream flow criterion. The 24-hour instream flow criterion is intended to ensure a conservative operational buffer with respect to flow management, thereby allowing the Water Agency to conserve more water in Lake Mendocino.

The May 27 Request was intended to address the significant reductions in inflow from the Potter Valley Project (PVP) resulting from a Federal Energy Regulatory Commission (FERC) order approving Pacific Gas and Electric's (PG&E's) temporary variance request. The additional flow reduction in the upper Russian

River intended to prevent significant depletion of storage in Lake Mendocino and potential elimination of water supplies for 2015. Such depletion in storage and reduction to or elimination of water supplies could cause serious impacts to human health and welfare and reduce water supplies needed for fishery protection and stable flows in the upper Russian River. The request for the lower Russian River was intended to protect fishery resources in Dry Creek.

The SWRCB issued an Order (Order) on June 17, 2015, approving the May 27 Request and modifying the May 1, 2015 Order. The State Water Board's temporary urgency order (Order) included a number of provisions, 5 of which required fisheries monitoring and reporting. Provision 2 required that the Water Agency monitor and record the daily number of adult salmonids moving upstream through the Russian River past the Dry Creek life cycle monitoring station. Provision 3 required the Water Agency to monitor the number of adult salmon and steelhead at known spawning sites and in relatively deep pools in the upper Russian River (Lake Mendocino to Healdsburg) on a weekly basis after the number of adult salmon and steelhead counted at Dry Creek exceeds 100 fish. Weekly upper river surveys were to continue until the expiration of the order or when sustained flow at Healdsburg was above 150 cfs. Provision 4 required that the Water Agency conducted snorkel surveys in the lower river to monitor adult salmonids beginning October 1 and continuing through the end of the Order. Provision 5 required that once 100 adult salmonids moved past Dry Creek or on November first, whichever is earliest, the Water Agency must consult with NMFS about the possibility of increasing stream flow for adult passage. Provision 6 required that the Water Agency consult with NMFS and CDFW if there were any necessary revisions to terms 2 through 5. Provision 7 required the Water Agency to submit an annual report on the fisheries data collected for Terms 2 and 6. This report is intended to fulfill the reporting requirement in Provision 7.

Methods

Adult fish counts

The Water Agency used a dual-frequency identification sonar (DIDSON) and underwater video to count adult salmonids at 2 different sites. At Dry Creek, DIDSON was used to monitor adult salmonids which allowed us to count adult salmonids as they returned to Dry Creek. The Water Agency also installed an underwater video camera at the Healdsburg fish ladder in order to count adult salmon migrating up the mainstem Russian River. Since this site is located on the main stem Russian River, upstream of Dry Creek we assume that fish counted at this station are different individuals for those counted at the Dry Creek station.

Spawner surveys

In previous years the water agency has conducted walk-in and boat based salmon redd surveys on the mainstem Russian River and in Dry Creek. When salmonid redds are encountered on these surveys their location is recorded with a hand held GPS unit, and the number of redds and fish located at that point are recorded.

Snorkel surveys

NMFS requested that the Water Agency conduct snorkel surveys on a weekly basis in the lower Russian River to detect adult salmonids. In 2014 NMFS provided the Water Agency with 6 snorkel survey sites located at Duncans Mills, Vacation Beach, and Guerneville (Figure 1). However, it was noted, and agreed

upon that it may not be possible to visit all 6 sites each week. The Water Agency continued to visit these sites in 2015.

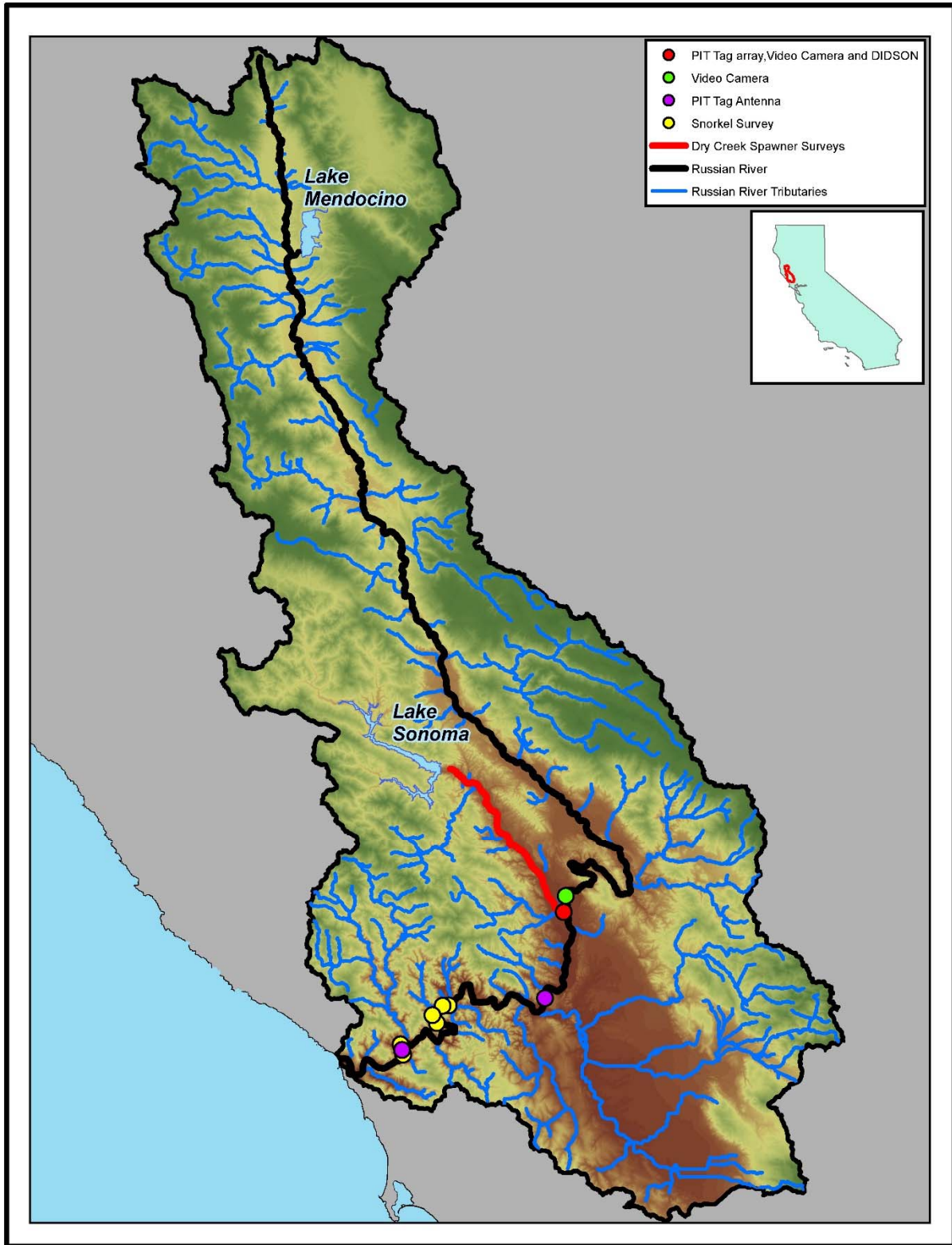


Figure 1. Russian River fisheries monitoring sites for the August, 2015 Temporary Urgency Change Order.

Results

Flow

Flow in the Russian River in early May was slightly elevated due to tributary inflow, but was generally controlled by reservoir releases from early summer until the end of the Order on October 28, 2015. From May 1, 2015 to October 28, 2015 flow in the Russian River at Hacienda ranged from a low of approximately 60 cfs in July to approximately 305 cfs in May (Figure 2).

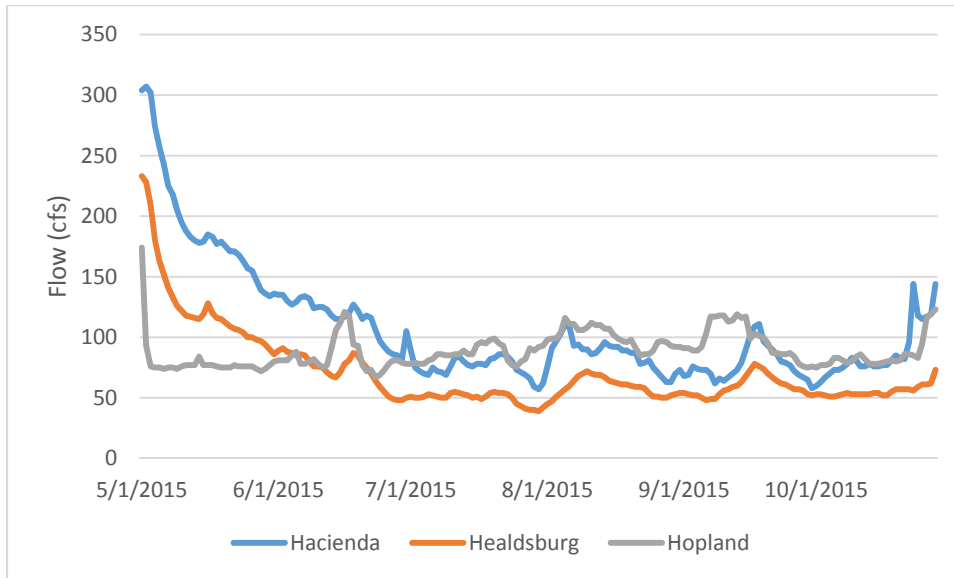


Figure 2. Flow at the USGS stream gages at Hacienda, Healdsburg, and Hopland during the period of the Order.

Adult counts

Video and DIDSON counts

The Water Agency installed a DIDSON and underwater video camera near the mouth of Dry Creek on September 1, 2015. During the Order there were three periods when DIDSON was not collecting images due to technical problems (September 4, through September 7; September 12 through September 13; and October 9 through October 11, 2015 Figure 3). In addition to the DIDSON at Dry Creek, the Water Agency operated an underwater video camera in the Healdsburg Fish ladder from September 15 to December 9, 2015 (Figure 4).

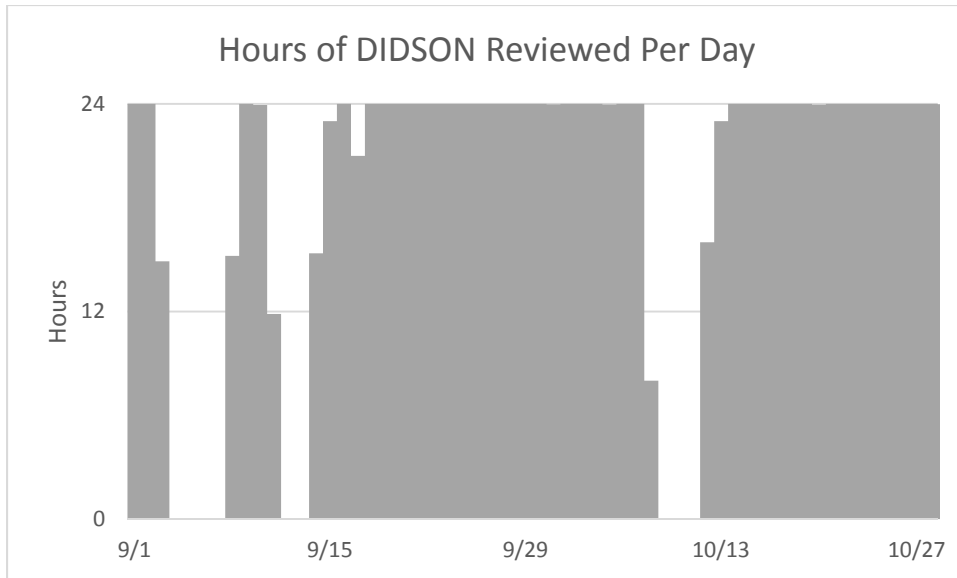


Figure 3. The number of hours of DIDSON that has been reviewed at the Dry Creek sampling site. Missing hours are due to technical difficulties.

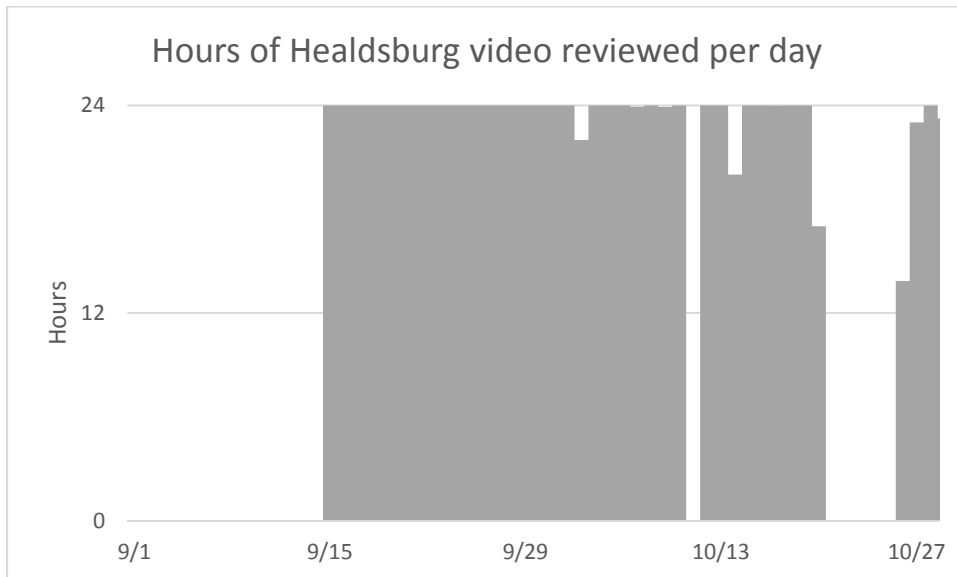


Figure 4. The number of hours of underwater video that has been reviewed per day at the Healdsburg Fish ladder on the mainstem Russian River. Missing hours are due to corrupt data and technical difficulties.

A total of 47 adult salmonids were observed on the DIDSON from September 1, 2015 through the end of the order on October 28, 2015. The video camera at Dry Creek did not allow us to prorate DIDSON counts based on the species ratio. Instead we relied on the historic species ratio from video recorded at Mirabel from 2009-2014. Using species ratios from the same dates in the historic data set, we determined that all of the observed 47 fish were likely Chinook salmon. A barrier beach that formed at the river mouth prevented adult salmonids from entering the Russian River for 81 % of the days where

the Order overlapped with the adult salmon migration period (September 1 through October 28, 2015). After the Order expired many more salmonids were observed on the Dry Creek DIDSON. The preliminary adult salmonid count for fish that have been observed on the Dry Creek DIDSON from when the Order expired to January 1, 2016 is 8,706 fish. Of these 8,706 adult salmonids we estimate that based on run timing 3,253 are likely Chinook salmon and the remainder are mainly steelhead. From when the Order expired to January 1, 2016 the river mouth was closed for 33% of the days (Table 2). The state of the river mouth which is largely controlled by ocean swell, has a strong influence on adult salmonid counts in the Russian River. For detailed salmonid counts for the entire 2015 salmonid return year see the Russian River Biological Opinion Status and Data Report Year 2015-2016.

Table 1. Weekly prorated counts for Dry Creek Chinook for the period of the 2015-16 return year that occurred during the Order (September 1, 2015 through October 28, 2015). Estimates are based on the weekly ratio of Chinook, coho, and steelhead counts at Mirabel from 2009-2013 video counts. The number of steelhead trapped at Warm Springs hatchery are also shown. We have higher certainty for standard weeks containing 4 or more years of data. *These numbers are estimates.

Week start	Number of years in week Mirabel video (2009-2013)	Proportion of Chinook from Mirabel video (2009-2013)	Fish observed on Dry Creek DIDSON (2015)	*Estimated Chinook (2015)	Steelhead trapped at WSD (2015)
8/29	5	0.50	0	0	0
9/5	5	0.67	0	0	0
9/12	5	0.57	0	0	0
9/19	5	0.71	0	0	0
9/26	5	0.98	0	0	0
10/3	5	0.99	0	0	0
10/10	5	0.98	2	2	0
10/17	5	0.98	17	17	0
10/24	5	0.98	28	28	0

Table 2. The number of days of the adult salmonid run that occurred in each time period, the percentage of those days the river mouth was closed and blocked adult salmonids from entering the Russian River, the number of adult salmonids that could not be identified to species, the estimated number of unidentified salmonids that are adult Chinook, and the number of Chinook observed on the underwater video cameras. The time periods are separated into the period of the Order that overlaps with the adult salmonid run (September 1, 2015 through October 28, 2015) and the period of time from when the order expired (October 29, 2015) to January 31, 2016. Additional adult salmonids were observed after January 31, 2016, and are not included in this table.

Time period	# of days	% of time river mouth closed	Unidentified salmonids	Estimated Chinook	Observed Chinook
During order	58	81 %	61	47	45
After order expired	95	33 %	8,706	3,253	384

At Healdsburg, an underwater video camera allowed us to capture images of adult salmonids and they migrated upstream through the Russian River. In total, 44 Chinook, 1 steelhead, no coho, and 14 unidentified salmonids were observed on the underwater video camera at the Healdsburg fish ladder during the Order. The preliminary adult salmonid counts for the Healdsburg fish ladder which includes fish up to December 9, 2015 are 428 Chinook, 3 steelhead, 20 fish with coho characteristics, and 88

unidentified salmonids. For the final count of salmon and steelhead observed on the Healdsburg video camera for the entire 2015 adult salmonid return year see the Russian River Biological Opinion Status and Data Report year 2015-2016.

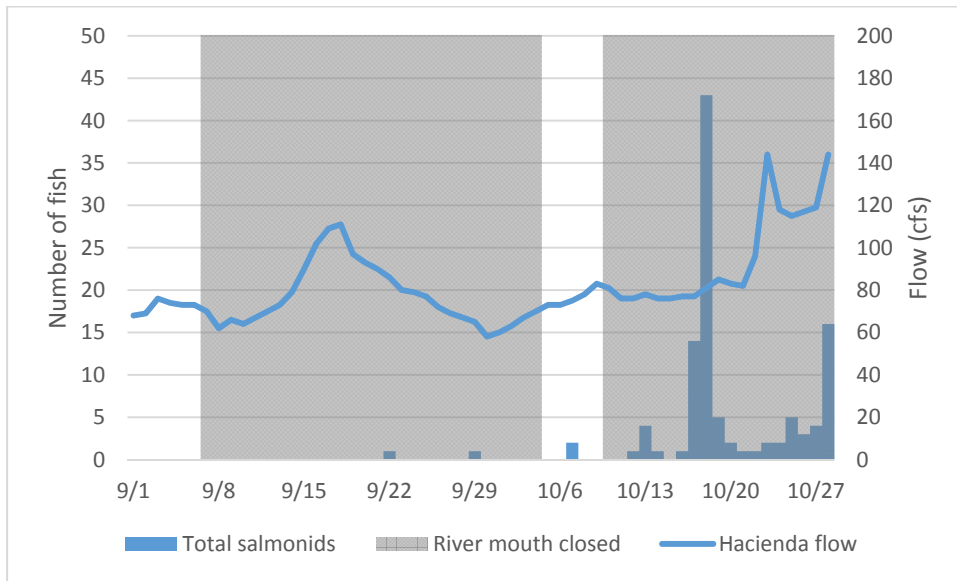


Figure 5. The period of time that the mouth of the Russian River was closed, the flow in the Russian River from the USGS Hacienda gage, and the number of adult salmonids observed at the Dry Creek DIDSON and Healdsburg underwater video during the period of the Order.

Spawner Surveys

The Order required spawner surveys to be conducted in the upper river once 100 adult salmonids were observed on the Dry Creek DIDSON. This threshold was not met during the period of the Order, therefore, spawner surveys were not conducted. For the total number of salmonid redds observed in Dry Creek during the 2015 adult salmonid return year see the California Coastal Salmonids Population Monitoring in the Russian River Watershed Progress Report January 1, 2016 Through March 31, 2016.

Snorkel Surveys

As in previous years few adult salmonids were observed during snorkel surveys conducted by the Water Agency. The mouth of the Russian River remained closed for much of the fall and limited salmonids from entering the river from the ocean. The river mouth closed on September 7, 2015 and opened on October 4, 2015. The river mouth closed again on October 10, 2015 and remained closed for the duration of the Order. The Water Agency conducted the first snorkel survey on October 7, 2015 following a breach of the Russian River on October 4, 2015. Snorkel surveys were conducted on a weekly basis until October 28, 2015 when the Order expired. Snorkel survey sites were located at: Moscow Road Bridge and Browns Pool near Duncans Mills; upstream and downstream of Vacation Beach near Monte Rio; the Hacienda Hole near Forestville; the pool immediately downstream of the Healdsburg fish ladder; and the PG&E Hole near Healdsburg. Visibility ranged from over 3 meters in Healdsburg to less than 1 meter in Duncans Mills. The total counts when combining all surveys and survey sites was 4 Chinook, 0 coho, and 2 small (less than 300 mm) steelhead (Table 3). The steelhead observed were likely half-pounders or small adults.

Table 3. Dates when Snorkel surveys were conducted by the Water Agency, locations of survey sites, and the number of salmonids observed.

Date	Site	Chinook	steelhead	coho	unidentified salmonids
7-Oct	Healdsburg fish ladder				
	Steelhead Beach				
	Vacation Beach U.S.				
	Casini Ranch				
	Duncans Mills				
15-Oct	Vacation Beach U.S.				
	Casini Ranch				
	Duncans Mills				
22-Oct	Vacation Beach U.S.				
	Casini Ranch				
	Duncans Mills				
	Hacienda	1			
28-Oct	Vacation Beach D.S.		1		
	Vacation Beach U.S.		1		
	Hacienda	3			
	PG&E hole (Healdsburg)				

Discussion

Flow

Flow in the Russian River was influenced by natural run off and tributary inflow during the beginning of the Order and mainly by reservoir releases for the remainder of the Order. Storm events in December of 2014, and February of 2015 likely influenced stream flow into June. A sand bar formed at the mouth of the Russian River in early September. The river mouth breached the sand bar on October 4, 2015 and closed again on October 10, 2015. These closure events limited adult salmonids from entering the Russian River from the ocean.

Adult Counts

Video and DIDSON counts

The bulk of the adult Chinook migration occurred after the end of the Order. The mouth of the Russian River was closed for much of the period of the Order that overlaps with the adult migration period. During these closures, salmon were not able to enter the Russian River from the Ocean. During brief periods when the river mouth was open adult salmon entered the Russian River and were later observed at our counting stations. Many adult salmonids were observed at the counting stations after the Order expired. The number of salmonids observed after the Order expired was similar to previous years. From when the Order expired to January 31, 2016 a total of 8,706 unidentified salmonids were observed on the Dry Creek DIDSON alone. Using the species ratio from 2009-2013 Mirabel video counts

our preliminary estimate is that 3,253 of these unidentified salmonids were Chinook and the remainder are mainly steelhead.

The Healdsburg Memorial Dam and fish ladder used as a monitoring site in 2015 allowed us to count salmonids returning to the upper Russian River.

Spawner Surveys

Spawner surveys were not conducted in 2015. The Order required spawner surveys to be conducted in the upper river once 100 adult salmonids were observed on the Dry Creek DIDSON. This threshold was not met during the period of the Order, therefore, spawner surveys were not conducted.

Snorkel Surveys

Due to generally poor water visibility in the lower river during the term of the Order, snorkel surveys failed to account for many fish likely present during the surveys. Water visibility was typically less than 2 meters at the lower river sample sites and only adequate at sites near Healdsburg. The sample sites were often at least 3-5 meters deep and over 30 meters wide. These conditions allow for adult salmonids to easily avoid divers. When combining all sites and surveys only 6 salmonids were observed during snorkel surveys. During the same time period (October 7, 2015 through October 28, 2015) a total of 94 salmonids were observed on the DIDSON at Dry Creek and underwater video at Healdsburg. Snorkel surveys in the mainstem Russian River may detect the presence of fish but limited visibility restricts the use of these data.

Consultations with NMFS and CDFW

Adjustments of flow

The Order required that the Water Agency consult with the NMFS and CDFW about possibility of increasing flow for adult passage once 100 adult salmonids were observed on the Dry Creek DIDSON or on November 1, 2015 whichever is earliest. This threshold was not met during the period of the Order therefore this consultation did not take place.

Revisions to terms 2 through 5

In the event that there were necessary revisions to terms 2 through 5 the Order required the Water Agency to meet with NMFS and CDFW to revise these terms. A report of this meeting was to be sent to the Deputy Director of the Water Board. No revisions were necessary therefore this consultation did not take place.

References

State Water Board, Order approving Sonoma County Water Agency's petition for temporary urgency change permits 12947A, 12949, 12950, and 16596 (applications 12919A, 15736, 15737, 19351). August 25, 2014. State Water Resources Control Board. Sacramento CA.