California Natural Resources Agency
DEPARTMENT OF FISH AND GAME
Central Region
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Fresno, California 93710
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August 19, 2009

Larry Weis
General Manager
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Post Office Box 949
Turlock, California 95381-0949

NOTED
AUG 27 2009
L. W. WEIS

Subject: Tuolumne River Water Diversion at La Grange Powerhouse

Dear Mr. Weis:

During the 2008 annual Chinook salmon escapement survey, Department of Fish and Game biologists observed an alteration of river flow resulting from the rerouting of water at the La Grange powerhouse.

Typically in dry years, water released from the La Grange reservoir travels via a Turlock Irrigation District (TID) canal until it reaches the La Grange powerhouse. A portion of that water is then run through the powerhouse and continues downstream in the Tuolumne River along the "powerhouse" channel. Water flowing into the powerhouse channel is supplied entirely from the TID canal during dry water years. (Figures 1 and 2). The powerhouse channel converges with the "west" channel approximately a quarter of a mile downstream of the La Grange Dam. The west channel originates directly below the La Grange Dam, and had minimal flow supplied predominately from water seepage through the dam prior to the alteration of river flow (Figures 1 and 2).

During the November 4, 2008 escapement survey, Department biologists observed that the TID powerhouse was shut down. As a result, flows in the powerhouse channel were significantly reduced. Water entering the Tuolumne River below the La Grange Dam was being rerouted through the Modesto Irrigation District (MID) canal and released down the hillside into the west channel. The rerouting of water isolated the powerhouse channel from the flow, potentially de-watering redds that had been observed during the previous weeks' surveys (Figure 3).

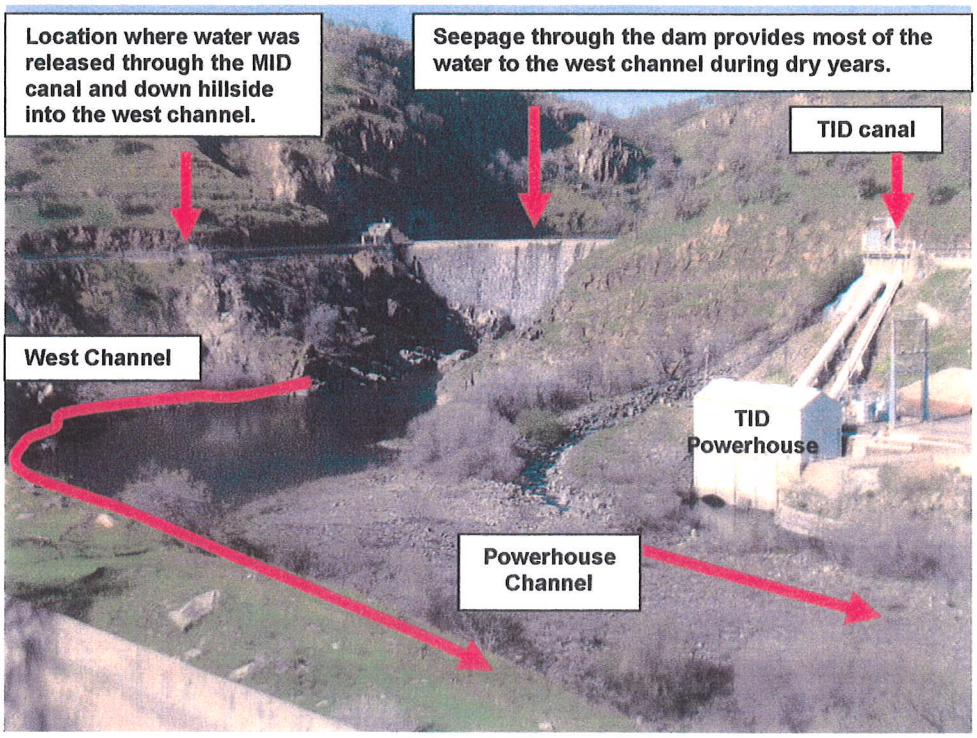

Figure 1. Upstream view of MID and TID canals showing the direction of water flow into the west channel and powerhouse channel during dry water years. March 12, 2009.

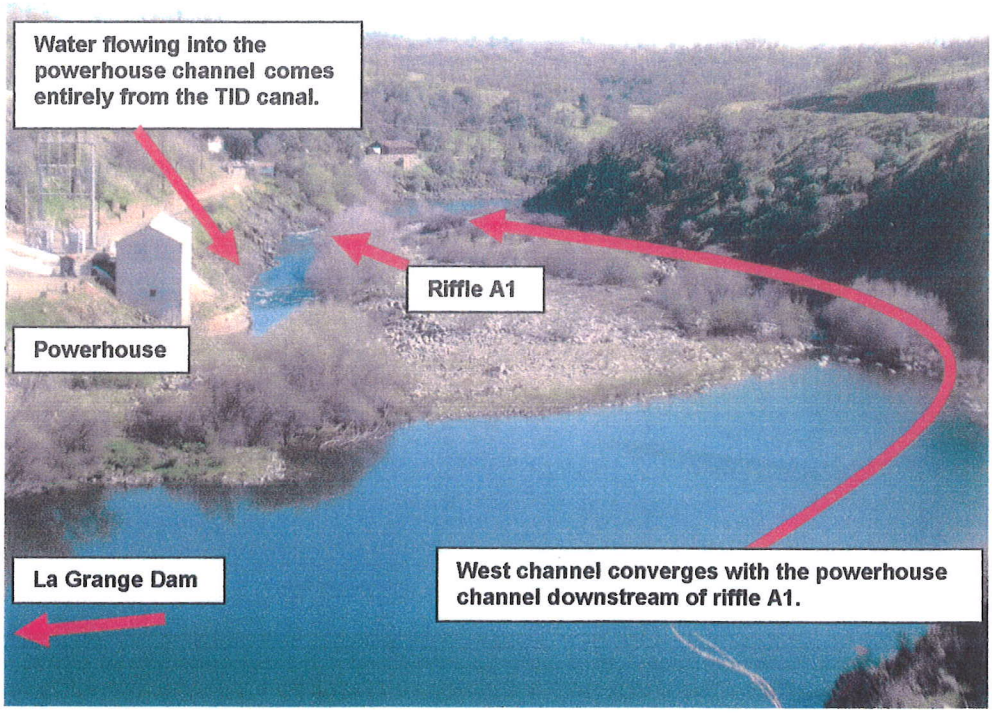

Figure 2. Downstream view taken during spawning flows showing the junction of the Powerhouse channel and west channel near riffle A1. March 12, 2009.

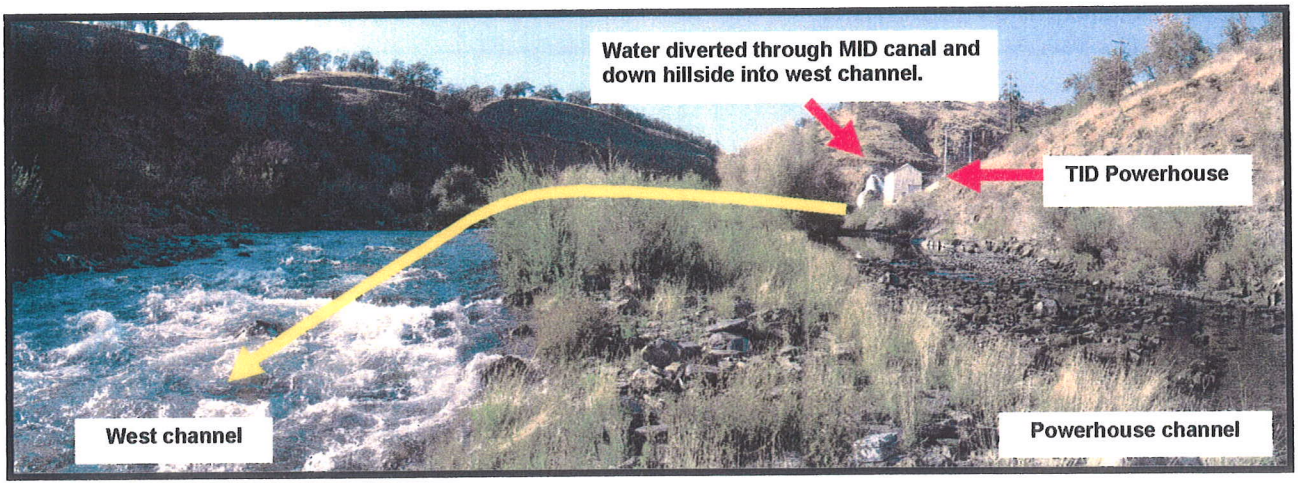

Figure 3. November 6, 2008. Water diverted through MID canal and down hillside into the west channel. The shutdown of the powerhouse resulted in the alteration of river flow to the powerhouse channel. The yellow arrow indicates the direction of water flowing from the MID canal and down the hillside into the west channel.

Surveys conducted on riffle A1, which is located in the powerhouse channel immediately downstream of the La Grange powerhouse (Figure 4), documented redds and spawning activity beginning on October 22 for the 2008 escapement survey season. Prior to the rerouting of water, ten live fish and three visible redds were observed in riffle A1 (October 22) while the number of redds increased to seven the following week when the section was surveyed on October 28. Following the rerouting of water during the November 4 survey, the number of redds decreased to five, and three live fish were observed in the powerhouse channel with minimal flow. A female carcass that appeared to have spawned was recovered, tagged, and released back into the river (Figures 5 and 6).

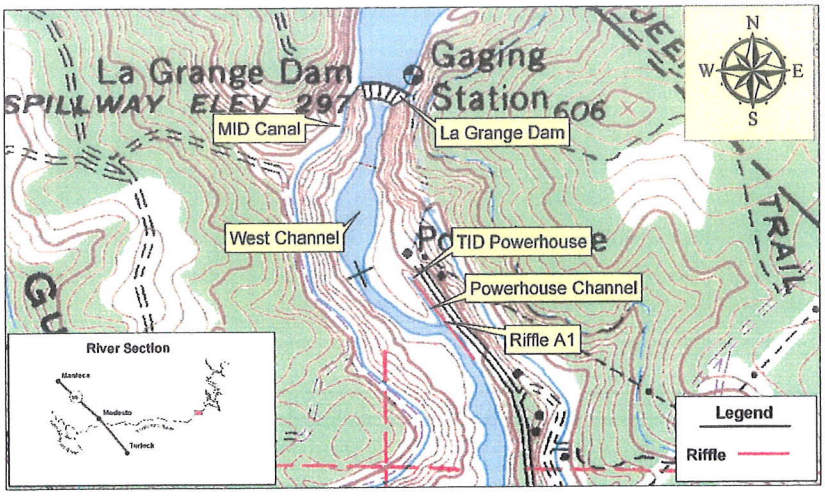

Figure 4. Location of riffle A1 within the Powerhouse channel.

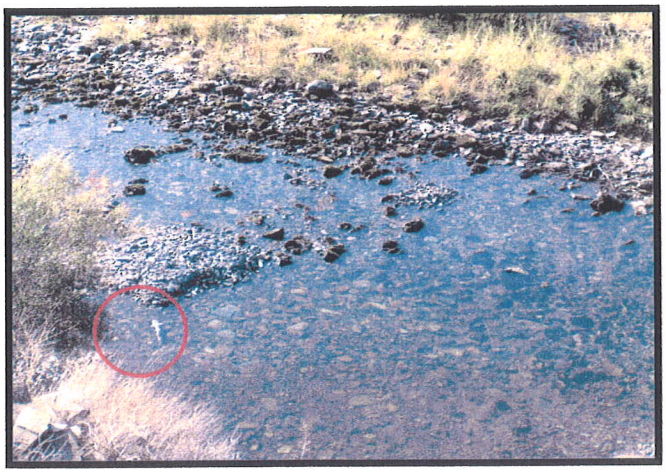

Figure 5. Redd location and a female carcass in the powerhouse channel with minimal flow following the re-routing of water during the November 4, 2008 survey.

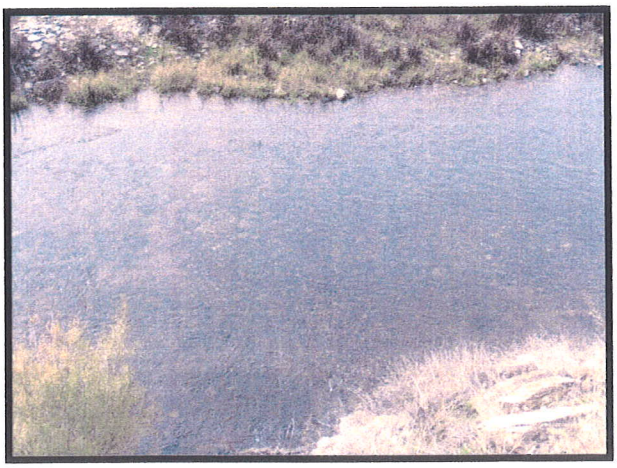

Figure 6. Comparison of redd location in the powerhouse channel while the powerhouse is operational and water enters the channel via the TID canal. (169 cfs based on USGS La Grange flow gage data). December 12, 2008.

On November 6, 2008 Department biologists returned to the site to assess potential impacts on Chinook salmon and the previously identified redds. After TID rerouted the water, the flow was predominately in the west channel. The powerhouse channel had little flow and was mostly stagnant consisting of intermittent pools separated by dry sections (Figures 7 and 8). One redd was easily distinguishable; however, it was difficult to clearly identify any additional redds due to overgrown algae and exposed gravel. It is unclear whether some of the previously identified redds had been left dry and exposed to air when the flow was rerouted. Measurements were taken to compare variations in temperature between the powerhouse channel and the west channel. Powerhouse channel temperatures were taken in the general location where redds had been observed, approximately 75 feet upstream of where it converges with the west channel. The powerhouse channel temperature was recorded at 15°C, as compared to the west channel temperature of 11.5°C. (The thermal limit for successful egg incubation is 13.3°C.) A flowmeter was used to measure the flow rate of water passing through the powerhouse channel. Measurements were taken in one foot increments across the width of the powerhouse channel in the location where redds had been documented. The flow rate averaged 0.35 cubic feet per second (cfs) in the powerhouse channel. Obtaining precise measurements from flows of such low velocity is difficult; therefore, it was estimated that the flow rate in the powerhouse channel was less than 1 cfs. The USGS La Grange flow gage is located downstream of where the powerhouse and west channels converge. The November 6, 2008 flow rate recorded at the La Grange flow gage was 163 cfs. No live fish were observed utilizing the powerhouse channel on November 6.

Figure 7. Powerhouse channel after the re-routing of water. Partially dry with intermittent pools. November 4, 2008.

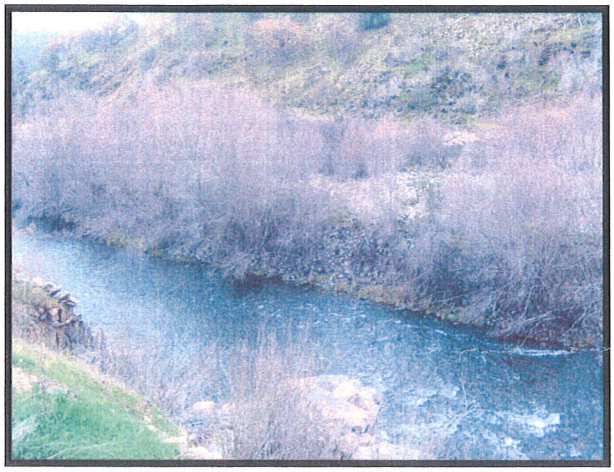

Figure 8. Comparison of powerhouse channel during normal flow. (169 cfs based on USGS La Grange flow gage data). January 15, 2009.

When Department biologists returned to the site on November 7, it appeared that work on the powerhouse had been completed. Water that had been rerouted through the MID canal was once again traveling downstream along the pathway through the TID canal into the powerhouse channel. Salmon were observed spawning again in riffle A1 after the flows were returned to the powerhouse channel. The November 12 carcass survey documented the presence of six live fish and seven redds in riffle A1. The number of live fish increased to nine the following week when the section was surveyed on November 17. Figures 9 and 10 show a comparison of typical and altered flows in the west and powerhouse channels.

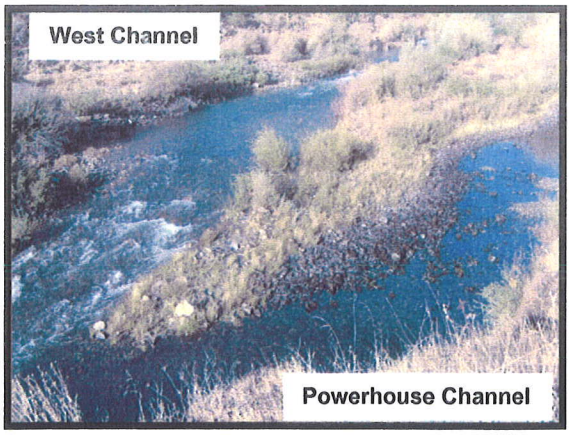

Figure 9. Comparison between the west and powerhouse channels during the re-routing of river flow. November 6, 2008.

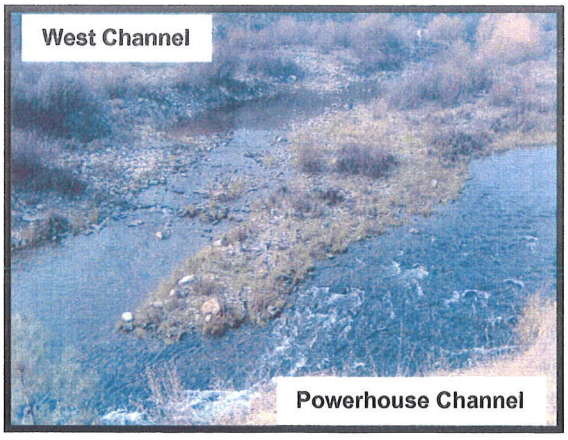

Figure 10. Comparison of flow between the west and powerhouse channels during normal flow. December 12, 2008.

Annual carcass surveys document that Chinook routinely utilize riffle A1 in the powerhouse channel for spawning year after year. Fish and Game has observed the irrigation districts performing maintenance near the powerhouse during past years' spawning seasons, resulting in the alteration of channel flow and occasionally stranding Chinook. Department personnel have conducted fish rescues in the past when Chinook have become stranded in the bypass channel during powerhouse maintenance activities.

Changes to spawning habitat within riffle A1 potentially impact the survivability of eggs. With the current trend of severely declining population numbers, any impact to redds could have a significant effect on the overall number of juveniles outmigrating in the spring and thereby reducing future adult escapements. Partial or total dewatering of the wetted channel could constitute a violation of the State of California Fish and Game Code (e.g., Sections 1600 and 5937). To avoid future occurrences of this dewatering issue, and to avoid adverse impacts to sensitive fish species, the Department would appreciate prior notification well in advance of the need to conduct maintenance activities. The Department can provide recommendations to the Districts concerning the scheduling of maintenance activities so that work is conducted at times of the year that prevent, or preclude, substantive biological impacts from occurring.

The Department appreciates TID efforts to review our concerns. If you have any questions or need additional information regarding this issue please contact Ms. Jennifer O'Brien, Fisheries Biologist or Mr. Tim Heyne, Senior Biologist Supervisor, at Post Office Box 10, La Grange, California 95329 or at (209) 853-2533.

Sincerely,

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