

**OCAP BIOLOGICAL OPINION REVIEW**  
**DRAFT June 2009 –September 2010**  
**FISH ACTIONS IMPLEMENTED PURSUANT TO THE NOAA BIOLOGICAL OPINION**  
**ON THE SACRAMENTO RIVER**

**Sacramento River Temperature Task Group**  
**October 11, 2010**

The purpose of this document is to describe the fish actions taken on the Sacramento River between June 4, 2009 and September 30, 2010, especially those related to the recently enacted NMFS and FWS Biological Opinions for the operation of the SWP and CVP water projects. Full accounting for WY 2010 has not been completed and this narrative only describes the actions taken in a qualitative format.

The objectives of the May 15 through October Sacramento River instream temperature criteria are to manage the cold water storage within Shasta Reservoir and make cold water releases from Shasta Reservoir to provide suitable habitat temperatures for winter-run Chinook salmon, spring-run Chinook salmon, Central Valley steelhead, and the Southern Distinct Population Segment (DPS) of green sturgeon in the Sacramento River between Keswick Dam and Bend Bridge, while retaining sufficient carryover storage to manage for the following year's cohorts. And, to the extent feasible, manage for suitable temperatures for naturally spawning fall-run Chinook salmon.

Depending on carryover storage, water year type, and fish distribution, the Sacramento River Temperature Task Group (SRTTG) advises NOAA on the best course of action to take based on fish surveys, real-time data, and temperature modeling. In many years, it is not possible to attain 56° Fahrenheit at Bend Bridge, and the SRTTG will advise that the temperature control compliance point be established further upstream. This was the case in both 2009 and 2010.

During WY 2009, Reclamation was striving to meet a temperature control compliance point of 56° F at Airport Road Bridge (approximately 18 miles below Keswick Dam). This compliance point was chosen in lieu of Bend Bridge (approximately 44 miles below Keswick Dam) because of the low storage in Lake Shasta, a minimal cold water pool, and winter-run redd surveys that indicated redds were upstream of the Airport Road Bridge. The SRTTG determined that this was the best location to target because it was anticipated that Reclamation would be able to maintain temperatures at that location through October. A report on planned temperature operations was submitted to the State Water Resources Control Board (SWRCB) as required by Board order 90-5. The SWRCB approved the temperature operations plan for WY 2009.

Instream temperature compliance is met via a combination of flow changes and the use of the temperature control device (TCD) constructed on Shasta Dam in 1997. In the early portion of the temperature control season, Reclamation increases releases from Shasta Dam and Keswick Dam as necessary to meet temperature objectives. Once a fairly high flow is achieved, then if additional cooling is needed, the TCD gates are gradually shut from the top down to access

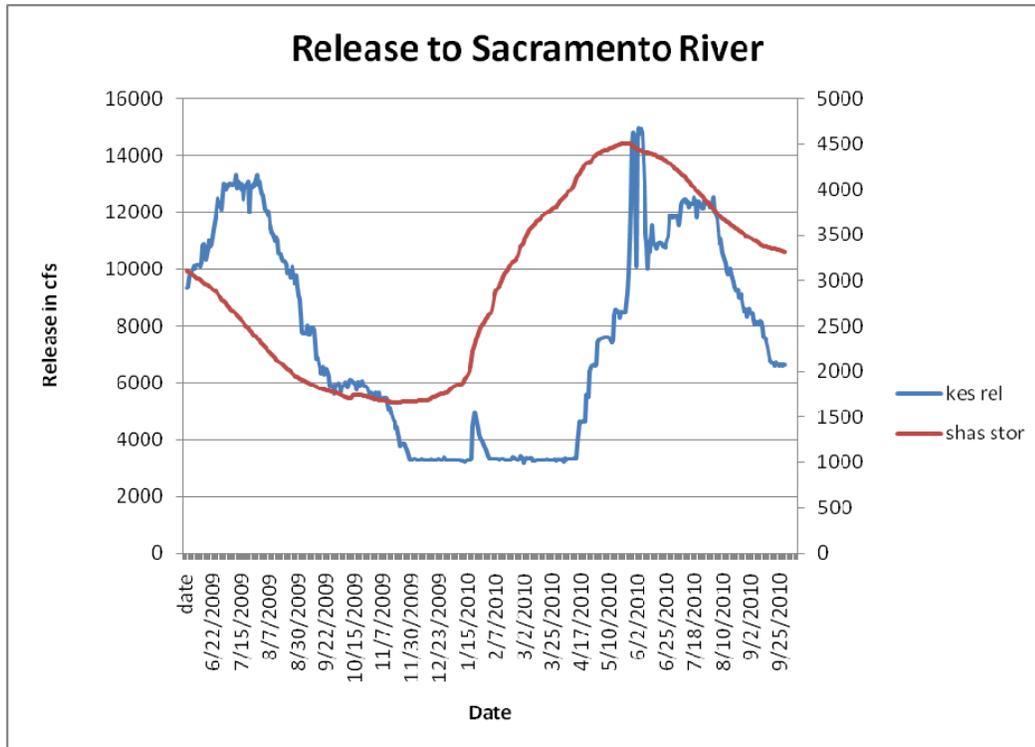
colder water. Towards the end of the temperature control season, as the cold water pool begins to be depleted, Reclamation begins to reduce Keswick releases and goes much deeper on the TCD to access the coldest remaining water and allow us to conserve storage at the same time. This allows Reclamation to stretch the cold water pool as long into the temperature control season as possible. However, in September and October of 2009, it was necessary to use the lower river outlet to help attain instream temperatures (power bypass). This was necessary due to the extremely low storage and minimal remaining cold water pool at that point in time.

The End of September carryover storage in Shasta Reservoir was 1.77 million acre-feet (MAF) for WY 2009, which triggered the implementation of Action I.2.2.C. (page 595) in the reasonable and prudent alternative of the NMFS Biological Opinion. Carcass surveys of winter-run Chinook in river escapement in 2009 estimated a return of approximately 4,500 fish (GrandTab data).

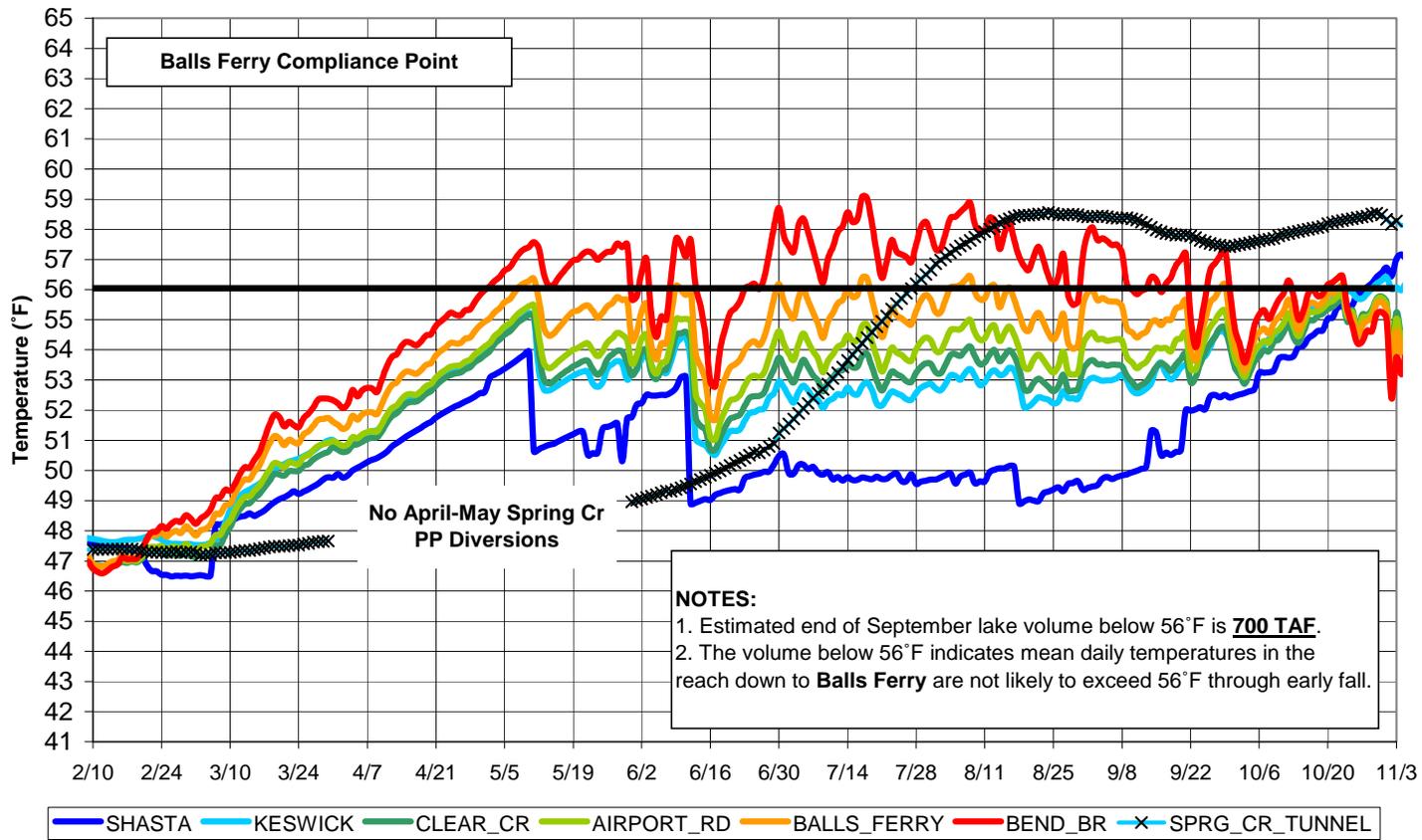
Over the winter and spring of 2010, Shasta Reservoir received above normal inflow and was able to increase storage to a point just below full. This restored our cold water pool, and allowed for more aggressive temperature control operations during WY 2010. The February 90% exceedence forecast predicted that Reclamation should be able to operate to a Balls Ferry compliance location for the duration of the temperature control season. Reclamation submitted this forecast to NMFS as required by BO Action 1.2.3.B and it was subsequently approved by NMFS.

By April, 2010 Shasta Reservoir storage and the cold water pool had recovered enough that Reclamation was able to target a temperature control point of 56° F at Jelly's Ferry (approximately 35 miles below Keswick Dam) for the majority of the temperature control season. This compliance location was chosen by the SRTTG after careful consideration of the temperature forecast runs and the water operations forecast, taking into consideration protection for fisheries this year, as well as operating to a reasonable carryover storage target for the end of September. For a short period in May (5-11 through 5-24), the temperature compliance point was set at Balls Ferry (approximately 26 miles below Keswick Dam) because warm tributary inflow between Balls Ferry and Jelly's Ferry would have caused multiple exceedances of the 56° F temperature criterion if it was continued to be applied at Jelly's Ferry. The SRTTG determined that it would be extremely difficult for Reclamation to mitigate for this warm water runoff when there was no data on volume or temperature of this runoff. Consequently, the SRTTG determined that it would be a waste of cold water resources attempting to "chase" the temperatures all the way to Jelly's Ferry early in the temperature season, and although the fisheries biologists on the SRTTG could not say definitively, moving the temperature compliance point was not likely to have any substantive negative effect on the fisheries at that point in time. The temperature compliance point was established at Jelly's Ferry and winter-run aerial redd surveys in 2010 indicated redds were upstream of the Airport Road Bridge. A report on planned temperature operations was submitted to the SWRCB as required by Board order 90-5. The SWRCB approved the temperature operations plan for WY 2010.

Due to the excellent recovery of Shasta Reservoir storage over the winter and spring of 2010, Reclamation was able to operate to a temperature control target of 56° F at Jelly's Ferry for the majority of the temperature control season in WY 2010. The End of September carryover storage at Shasta Reservoir for WY 2010 was 3.32 MAF, a significant recovery from WY 2009. Carcass survey data analysis for winter-run Chinook escapement in 2010 is underway and will likely be available in early December 2010.



### Sacramento River Modeled Temperature 2010 February 90%-Exc Outlook



# Sacramento River Temperatures

