WATER FORUM
Sacramento City-County Office of Metropolitan Water Planning

December 16, 2016

Felicia Marcus, Board Chair
Members of the Board
State Water Resources Control Board
c/o Jeanine Townsend, Clerk to the Board
1001 I Street, 24th Floor
Sacramento, CA 95814

Dear Board Chair Marcus and Members of the Board,

Subject: Comment Letter – Bay-Delta Phase II Working Draft Science Report

Thank you for the opportunity to comment on the Bay-Delta Phase II Working Draft Science Report. Water Forum signatories are appreciative of your staff's efforts to share their technical approach early in this process.

As demonstrated in my presentation at your workshop on December 7th, the Water Forum has made significant progress on flow-setting to meet environmental and water supply objectives on the lower American River.

Please refer to the attached for more detailed comments on the Draft Science Report. We look forward to working further with State Water Board staff as this process progresses.

Sincerely,

Tom Gohring
Executive Director

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Comments on:

Working Draft Scientific Basis Report for New and Revised Flow Requirements on the Sacramento River and Tributaries, Eastside Tributaries to the Delta, Delta Outflow, and Interior Delta Operations

Water Forum

December 2016

Introduction

The State Water Resources Control Board (SWRCB) has requested comments on the "Working Draft Scientific Basis Report for New and Revised Flow Requirements on the Sacramento River and Tributaries, Eastside Tributaries to the Delta, Delta Outflow, and Interior Delta Operations" (Draft Scientific Basis Report). The Water Forum has reviewed this document and provides the following comments.

The approach proposed by the Report would dedicate a block of water – measured as percent of unimpaired inflow – to support improved aquatic habitat conditions in the Sacramento-San Joaquin Delta. The Draft Scientific Basis Report explained that the SWRCB would prefer that local entities use site-specific information and adaptive management to "sculpt" this block of water into a functional flow approach to best meet the needs of fish in each tributary. A functional flow approach could include carryover storage to improve water temperatures, habitat management improvements, or shifting of flows in time to meet ecological goals.

The signatories of the Water Forum, guided by the voluntary basin agreement known as the Water Forum Agreement, have been working on improving conditions in the lower American River for over two decades. While we did not use an unimpaired flow approach to guide our work, we believe that we have made significant progress on the type of functional flows described in the Report.

We have used site-specific scientific information, the best available technical tools, and adaptive management to improve surface and groundwater management, water conservation, in-stream habitat management, water temperature management, and the pattern of flows on the lower American. We look forward to working with SWRCB staff to share our data and technical tools. We are confident that you will recognize the value of the local investments by Water Forum signatories to improve conditions of the lower American River.

Background

The American River is the second largest tributary to the Sacramento River, a critical component of the Sacramento-San Joaquin Delta (Delta) system. The lower American River is a particularly valuable asset within the Sacramento region, providing important fish and wildlife habitat, a high-quality water source, a critical floodway, and a spectacular regional recreational parkway. In recognition of its attributes, the lower American River has been federally and State designated as a "Wild and Scenic River." To the best of the Water Forum's knowledge, the lower American River is the only river designated under the federal Wild and Scenic Rivers Act that flows through an urban area.

The U.S. Department of Interior, Bureau of Reclamation (Reclamation) operates Folsom and Nimbus dams to provide flood control and water for irrigation, municipal and industrial uses, hydroelectric power, recreation, water quality, and the protection of aquatic resources. Folsom Reservoir has a capacity of 977,000 acre-feet (AF). Average annual inflow into Folsom Reservoir is about 2.7 million acre-feet (MAF).

The water-right requirements for protection of the lower American River's aquatic resources were adopted in 1958 as part of the State Water Rights Board's Decision 893 (D-893). This decision established minimum flows in the lower American River at its confluence with the Sacramento River of 250 cubic feet per second (cfs) from January through mid-September, and 500 cfs for the remainder of the year under all hydrologic conditions. The SWRCB, Reclamation, Water Forum, and other stakeholders agree that the minimum flow requirements in D-893 do not sufficiently protect the aquatic resources of the lower American River. During recent years, pursuant largely to biological opinions adopted under the federal Endangered Species Act, Reclamation has operated Folsom and Nimbus dams to provide flows in the lower American River typically well in excess of those required by D-893.

Since 1993, the Water Forum has advocated an enhanced lower American River flow regime. This effort is reflected in the Water Forum Agreement adopted in 2000, and in the Water Forum Environmental Impact Report (EIR) certified by the City and County of Sacramento in 1999.

As part of the Water Forum Agreement, the Lower American River Flow Management Standard (2006 FMS) was developed by a diverse group of state and federal agencies and local stakeholders to provide protection to both environmental and water supply resources in the lower American River. Since that time, minimum flow releases in the lower American River have been based on the 2006 FMS. Recent drought conditions and modeling have shown that the 2006 FMS does not adequately protect water supplies and environmental resources (e.g., fish) that rely on the American River during drought conditions. For this reason, the Water Forum has been exploring refinements to the 2006 FMS that includes drought protection to better protect the important fisheries and water supply resources of the lower American River.

Recent history, including the 2012-15 drought, has demonstrated that the water resources of the American River are not as reliable as previously believed. Planning studies prepared by federal, State, and local agencies have indicated that Folsom Reservoir is particularly vulnerable to drought conditions which are likely to result in extremely low reservoir levels, wide-spread urban water supply outages, and stressful to potentially lethal conditions for lower American River salmonid species (i.e., fall-run Chinook salmon and Central Valley steelhead).

Folsom Reservoir is operated to support many authorized project purposes including flood control, Sacramento-area water supply, and lower American River fish protection. As a facility of the federal Central Valley Project (CVP), Folsom Reservoir contributes to implementation of Delta water quality and outflow requirements, and provides water supply for out-of-basin CVP contractors.

The relatively close proximity of Folsom Reservoir to the Delta often results in Folsom Reservoir being used as a "first responder" when prompt flow augmentations are required in the Delta. As a result, the water stored in Folsom Reservoir can be released in a pattern that significantly increases the risks to the aquatic ecosystem of the lower American River and to water supply reliability in the American River Basin.

Fish Species of Concern

The lower American River is home to two anadromous salmonid species – Central Valley steelhead and fall-run Chinook salmon. Only a few hundred steelhead spawn annually in the lower American River, and in 1998, the federal government listed Central Valley steelhead as a threatened species. Fall-run Chinook salmon returns to the lower American River appear to be fairly stable during recent years, but at levels over this past decade (2006-2015) of less than 1/3 of the run sizes that occurred during the previous decade (1996-2005). Particularly during drought or dry water years, anadromous salmonids in the lower American River are exposed to stressful or even lethal conditions due to low flows and high water temperatures.

Prior to habitat elimination resulting from Folsom and Nimbus dam construction in 1955, rearing fish had access to cooler habitats throughout the summer at higher elevations. Since dam construction, juvenile steelhead may rear in the remaining 23 miles of the lower American River for relatively short periods of time after emergence, or for several months, or even up to a year before moving downstream out of the lower American River. Presently, the environmental factor believed to be most limiting to natural production of steelhead in the lower American River is high water temperatures during the summer and fall (Water Forum 2005; Reclamation 2008; NMFS 2014).

Water temperatures during the over-summer rearing period typically exceed reported suitable temperatures for juvenile steelhead rearing. Titus and Brown (2006) concluded that temperatures in excess of 65°F should be avoided, partly because juvenile steelhead become very susceptible to bacterial infection and predation above this temperature. Water temperatures in the river typically exceed 65°F during the summer, and can be substantially higher during dry or drought conditions. For example, during 2015, water temperatures at Watt Avenue exceeded 67°F for the entire period extending from July through September, and exceeded 71°F for the entire month of August.

In contrast to steelhead, fall-run Chinook salmon do not exhibit a stream-type life history strategy in the lower American River. Fall-run Chinook salmon juveniles leave the river from a few days to a few months after hatching, and do not rear over summer. Water temperatures during the fall oftentimes exceed those considered most suitable (56°F) for fall-run Chinook salmon spawning. During 2015, water temperatures at Watt Avenue exceeded 56°F over the entire period extending from October through mid-November, and exceeded lethal temperatures for spawning and egg incubation for the entire month of October.

Work to Date

In 2000, after decades of contentious battles over the lower American River, diverse regional interests came together to create the Water Forum. The Water Forum is a group of over 40 stakeholder organizations including environmental advocacy groups, citizen groups, water purveyors, local governments, agricultural interests, and business and trade organizations that have agreed to pursue a series of seven elements as a means to achieve the dual objectives of protecting the fishery, recreation, and aesthetic values of the lower American River, as well as providing a safe and reliable water supply for the region to the year 2030. The seven elements of the Water Forum Agreement are:

1. Increased surface water diversions
2. Dry-year diversion reductions
3. Lower American River flow management standard
4. Lower American River habitat management
5. Water conservation
6. Groundwater management
7. The Water Forum Successor Effort

In addition to its efforts toward developing a durable flow standard for the lower American River, the Water Forum and its member organizations have been active on the other elements of the agreement. These initiatives have included side-channel enhancement and gravel replenishment projects to improve spawning and rearing habitat for salmonids, removal of invasive plants, groundwater management, and implementation of water efficiency programs, including installation of water meters.

The 2006 Flow Management Standard

A central element of the Water Forum Agreement calls for developing and implementing a flow-management standard on the lower American River. Prior to this, there had already been many attempts to improve the flow requirements in D-893. These efforts included those undertaken by the U.S. Fish and Wildlife Service (USFWS) pursuant to the Anadromous Fish Restoration Program. These previous efforts were unsuccessful because they relied so heavily on high spring flows where inadequate water remained in summer and fall for either water supply or fishery purposes. In essence, these approaches did not create winners and losers, only losers. Therefore, the Water Forum decided to try a different approach.

Starting in 2000, the Water Forum worked with Reclamation, USFWS, the California Department of Fish and Wildlife (CDFW, formerly the California Department of Fish and Game), and NMFS for 5 years to develop a rigorous, science-based flow management standard. Key to this work was an improved understanding of what fish need. Many experts said that water temperature is equally, if not more important, than flows in improving conditions for fish.

Culminating in 2006, these efforts yielded a new approach for specifying minimum flow releases from Folsom Dam to the river and for managing water temperatures in the lower American River. The approach was given the accurate, though not particularly catchy, name of the Lower American River Flow Management Standard (2006 FMS). The 2006 FMS is a set of measures that includes:

1. Minimum release requirements;
2. Water temperature objectives;
3. Oversight by the American River Group, an interagency workgroup comprised of representatives from Reclamation, USFWS, NMFS, and CDFW; and
4. Monitoring and evaluation

Although the 2006 FMS is a prescriptive standard, it is also adaptive. In other words, flow releases are adjusted based on current conditions. For this reason, the American River Group plays a key ongoing role in reviewing information, developing recommendations, and coordinating operational requirements for the river.

The foundation of the 2006 FMS is its adaptive Minimum Release Requirement and water temperature objectives. The Minimum Release Requirement uses a sliding scale for minimum flows and establishes water temperature targets that balance available water supplies with achievable biological objectives.

The water temperature objectives strive to provide optimal summer water temperatures of 63 degrees Fahrenheit (°F) (17 degrees Celsius [°C]) and fall temperatures of 56°F (13°C) to support salmonid spawning and rearing. The adaptive approach of the 2006 FMS allows incrementally higher water temperatures during drier years when cold-water supplies are not available to support the optimal temperatures.

As a general rule, under the 2006 FMS, the minimum flow releases must equal or exceed 800 cfs year-round, with narrowly defined exceptions when dry or critically dry conditions are forecasted to occur. Thus, in most years, flows would exceed those specified by D-893.

The exceptions fall into two categories: (1) an off-ramp; and (2) a conference year.

- An off-ramp occurs when Folsom Reservoir storage is forecasted to fall below 200,000 acre-feet (AF) at any time during the next 12-month period.
- A conference year occurs when the projected unimpaired inflow to Folsom Reservoir from March through November is computed to be less than 400,000 AF.

When either of these conditions occurs, flow requirements under the 2006 FMS revert back to those specified in D-893 and allow releases to the river to drop below 800 cfs.

Reclamation began implementing the 2006 FMS on a voluntary basis in 2006, with the intention of asking the SWRCB to modify Reclamation's permits to reflect this approach. However, due to a protracted period of regulatory uncertainty associated with the 2004 and 2009 NMFS Biological Opinions, both of which were extensively litigated, Reclamation determined that substantive work on the 2006 FMS would have to wait until completion of a final Operations Criteria and Plan (OCAP), and Reclamation's request to the SWRCB was deferred.

Refinements to the Flow Management Standard

Although the 2006 FMS was an improvement over the historical operations of Folsom Dam, that regime—together with Bay-Delta outflow and other requirements—could still allow water storage in Folsom Reservoir to drop to levels that would cause stressful to lethal temperatures for anadromous salmonids and would preclude (or limit) diversions to municipal and industrial water users. Several additional factors led the Water Forum to explore refinements to the 2006 FMS.

Storage Requirement for Improving Water Temperature: The Water Forum has determined that a more protective flow regime would include Folsom Reservoir storage requirements. The Folsom storage requirements have been shown to be instrumental in preserving cold water pool in Folsom Reservoir, which is vital to protecting juvenile steelhead in the lower American River. Our analyses have explored a range of storage requirements in varying time frames. Modeling analyses indicate that an end-of-December requirement of 300 TAF can significantly improve water temperature in the lower American River without creating out-of-basin fisheries impacts. The modeling results of a flow approach refined with end-of-December storage requirements are shown in the Comparison of Effects section, below.

Spring Pulse Flow: The Water Forum has investigated the benefits of and potential methods for providing a pulse flow in the lower American River. Although studies in other Central Valley tributaries have indicated that pulse flows have fisheries benefits, limited data exist on pulse flows in the lower American River. We have developed a flow adjustment method using the hypothesis that a lower American River pulse flow in the spring will provide a beneficial emigration cue for juvenile salmonids (fall-run Chinook salmon and steelhead).

Our work showed that we could provide a multi-day Spring pulse flow on the lower American River of up to 4,000 cfs from March 15 to April 15 by supplementing normal operational releases from Folsom Dam.

The pulse flow event would range in duration from 6 to 7.5 days, depending upon pre-pulse flows levels. The potential pulse flow would also include restriction on flow ramp down to reduce the risks of fish stranding.

Other Refinements: Other refinements to the Flow Management Standard were investigated, including a flow ramping requirement for the purpose of avoiding salmon and steelhead redd dewatering, more representative hydrologic indices for the American River Basin, and modest changes to the minimum release requirements.

Unsuccessful Refinements

Not all of the potential refinements that we explored have borne fruit. Following is a brief description of some of the flow regime approaches that were found to be unacceptable for various reasons.

Unconstrained Thermal Optimization: Our modeling has shown that we can obtain improved water temperatures in the lower American River if we alter the annual release pattern from Folsom Dam. An optimization algorithm was devised that iteratively considered hundreds of annual release patterns to determine one that would provide improved water temperature conditions in the river. However, the modeling of the resulting release changes at Folsom had serious unintended consequences. Namely, it created commensurate operational changes at Shasta Dam that, according to the models, resulted in worsening temperature conditions in the Sacramento River. Our coalition found this trade-off to be unacceptable because the temperature changes could affect winter-run Chinook salmon in the Sacramento River, which is a species listed as endangered under the federal Endangered Species Act.

High Spring Outflow: As part of recent investigations into flow refinements on the lower American River, the Water Forum has evaluated a "High Spring Flows" approach. The High Spring Flows approach

was developed to be consistent with the approach described by SWRCB and staff in the following documents:

- Public Workshop, Method to Develop Flow Criteria for Priority Tributaries to the Bay-Delta, SWRCB, March 2014
- Recommendations for Determining Regional Instream Flow Criteria for Priority Tributaries to the Sacramento-San Joaquin Delta, Delta Science Panel, 2014

The High Spring Flows approach was developed to represent some components of the natural hydrograph, specifically elevated flows during the spring to emulate snowmelt runoff. Such a flow pattern is understood to potentially activate a variety ecological processes including, but not limited to:

- Inundate off channel areas (e.g., high flow secondary channels, channel margins, and bar features) to provide habitat for rearing salmonids and to flush allocthonous material (i.e., organic matter not derived from the main channel) into the main channel.
- Provide a cue and additional habitat availability for spring spawning native fishes.
- Assist outmigration and/or redistribution of juvenile native fishes, both by assisting downstream travel due to higher downstream velocities, but also by increased turbidity and habitat availability along the channel margins.

The values of the minimum flows were developed to create a reasonable increase in spring flows. If the spring flows were too high, they would have unreasonable consequences to Folsom Reservoir cold-water pool and fall flows.

The analysis of the High Spring Flows approach showed that, while it does provide some potential advantages during the Spring, the consequential depletion of cold water in Folsom Reservoir is considered unacceptable. The modeling results of the High Spring Flow approach are shown in the Comparison of Effects section, below.

Comparison of Effects

Following are a series of tables and graphs that show the effects of altering the Flow Management Standard to include an end-of-December storage requirement and the High Spring Flow Approach. These two modeling scenarios are also compared to the existing flow regime, the 2006 Flow Management Standard.

Figure 5 is an exceedance plot of the simulated January through June volume at the mouth of American River.

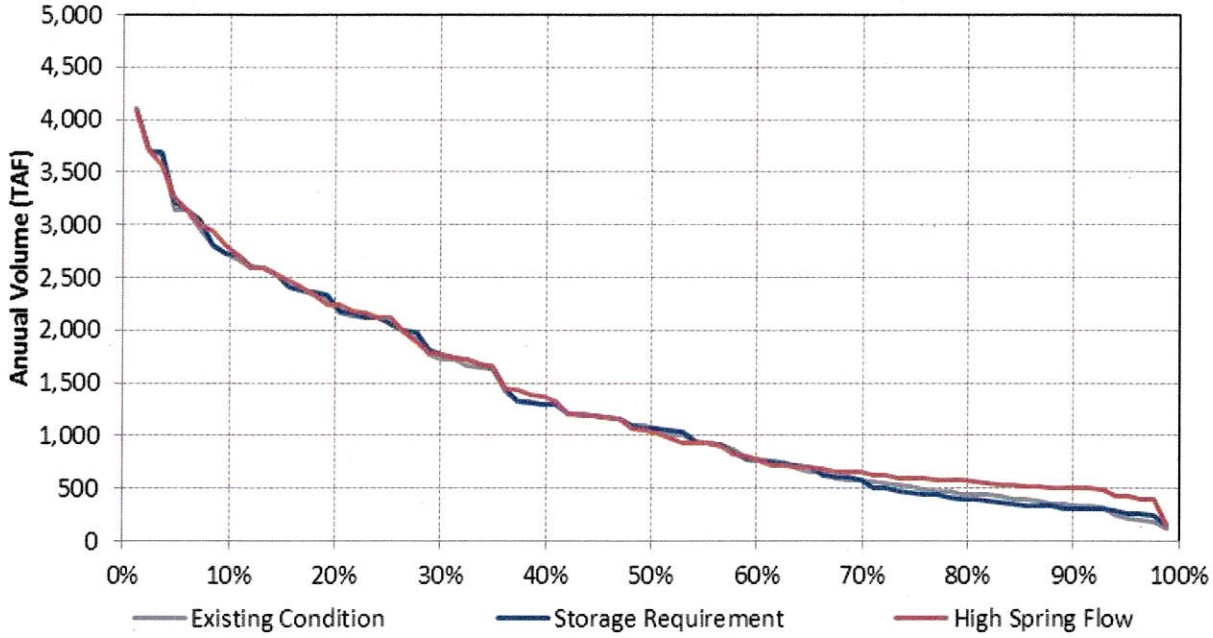

Figure 5. Comparison of Simulated Annual January-June American River Flow Volume at its Mouth (1922-2003)

As expected, the figure shows that simulated flows under the High Spring Flow alternative would be notably higher in the driest 30% of years, relative to the Existing Condition and Functional Flow alternatives. This increased release in the spring time would reduce available water for summer release in many years, as shown in Figure 6.

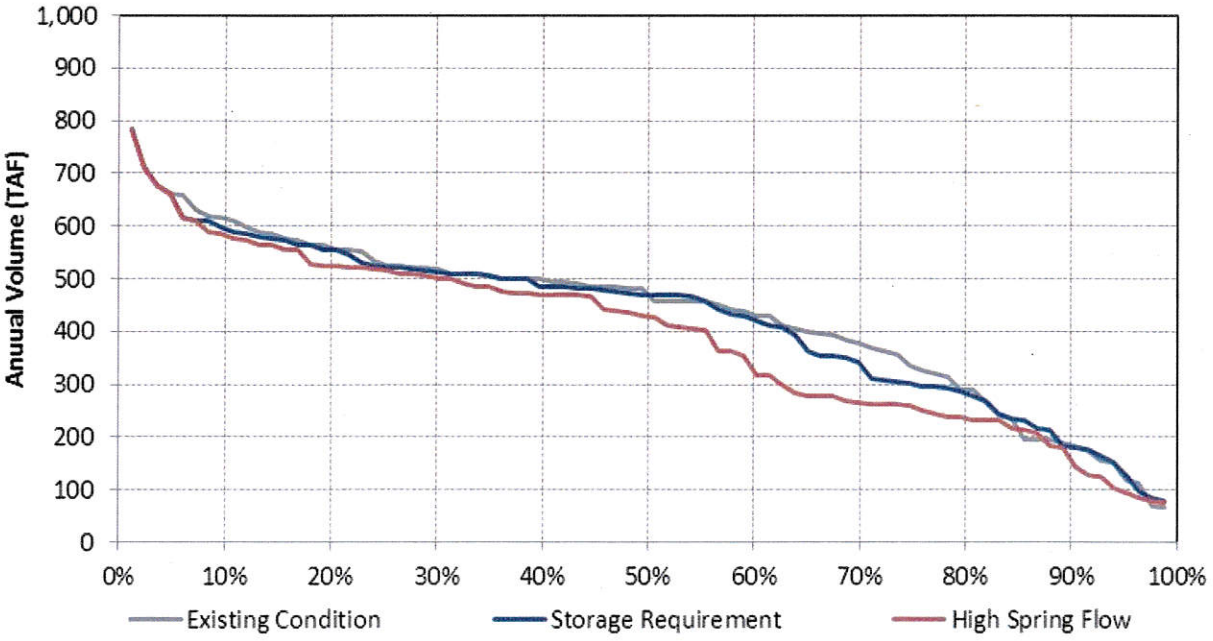

Figure 6. Comparison of Simulated Annual July-September American River Flow Volume at its Mouth (1922-2003)

As a result of the increased February through June flows under the High Spring Flow alternative, end-of-June Folsom Reservoir storage would be depleted. Figure 7 shows a comparison of the end-of-June Folsom Reservoir storage for the three alternatives.

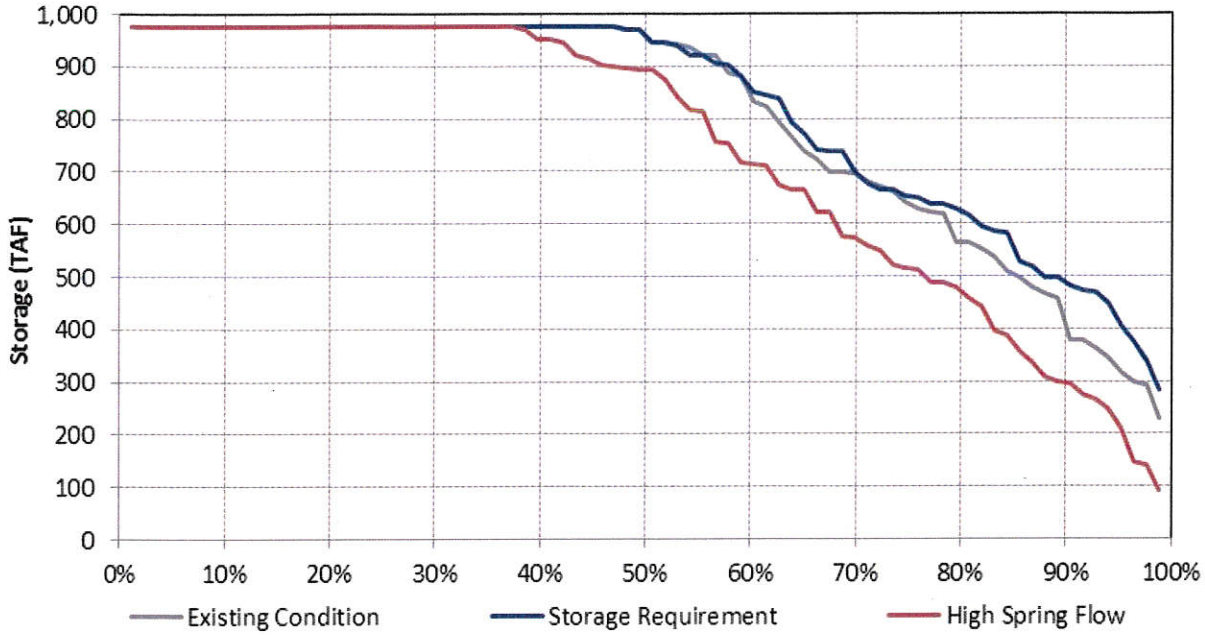

Figure 7. Comparison of Simulated Annual End-of-June Folsom Reservoir Storage (1922-2003)

As shown in Figure 6, decreased end-of-June storage would result in lower summer flows due to less water availability. Minimum storage in Folsom Reservoir is 90 TAF; the High Spring Flow alternative would result in Folsom Reservoir dropping to its lowest storage in one year in the period of record. Furthermore, there would be an approximately 10% decrease in years in which Folsom Reservoir was full heading into the summer months.

The combination of lower storage heading into the summer, and lower flows during the summer would generally result in increased water temperatures in the lower American River in the summer months. Figure 8 shows a generalized relationship, developed from modeled data, showing the relationship between end-of-June storage and the maximum weekly average water temperature (MWAT) in July through September. The figure and supporting modeling show that decreases in end-of-June Folsom Reservoir storage directly result in warmer water temperatures in subsequent months.

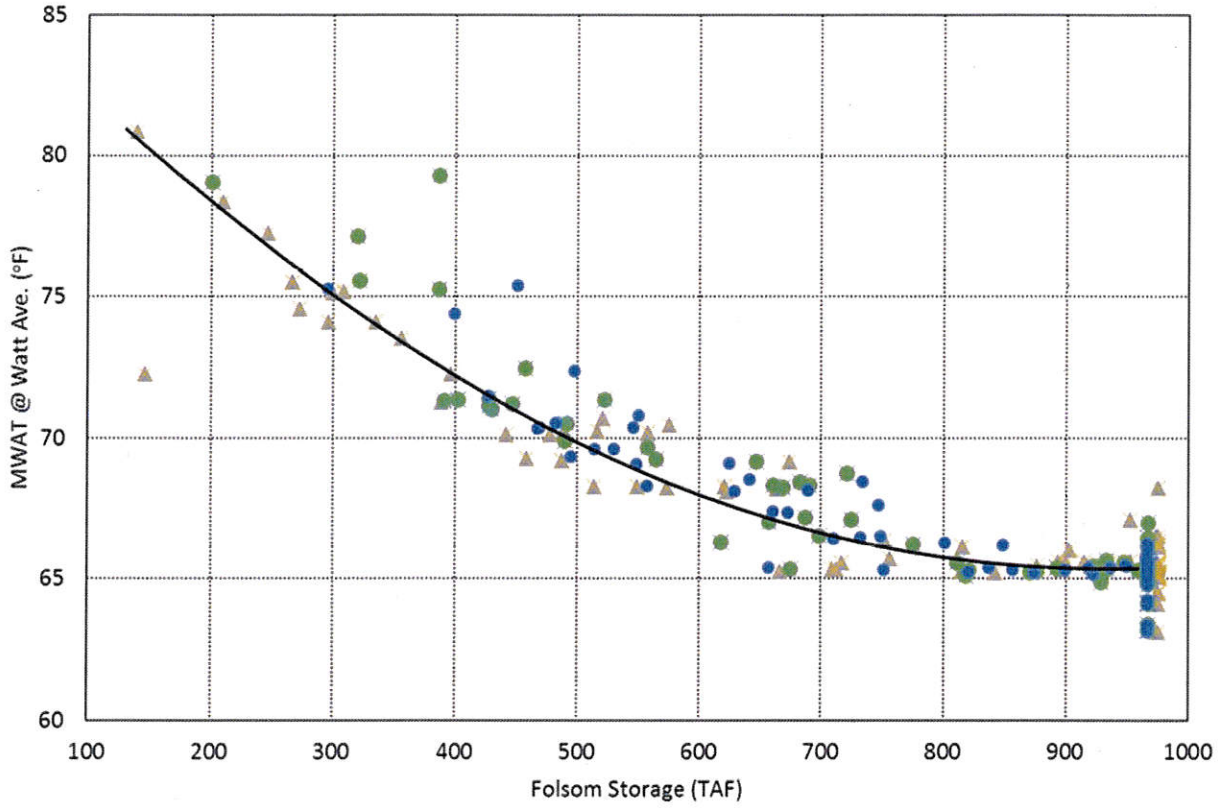

Figure 8. Relationship between End-of-June Folsom Reservoir Storage and MWAT

Accordingly, the simulation of July through September American River water temperatures at Watt Avenue indicates that water temperatures in the warmest years are increased under the High Spring Flow alternative, relative to the other two alternatives. Figure 9 shows a comparison of the simulated water temperatures.

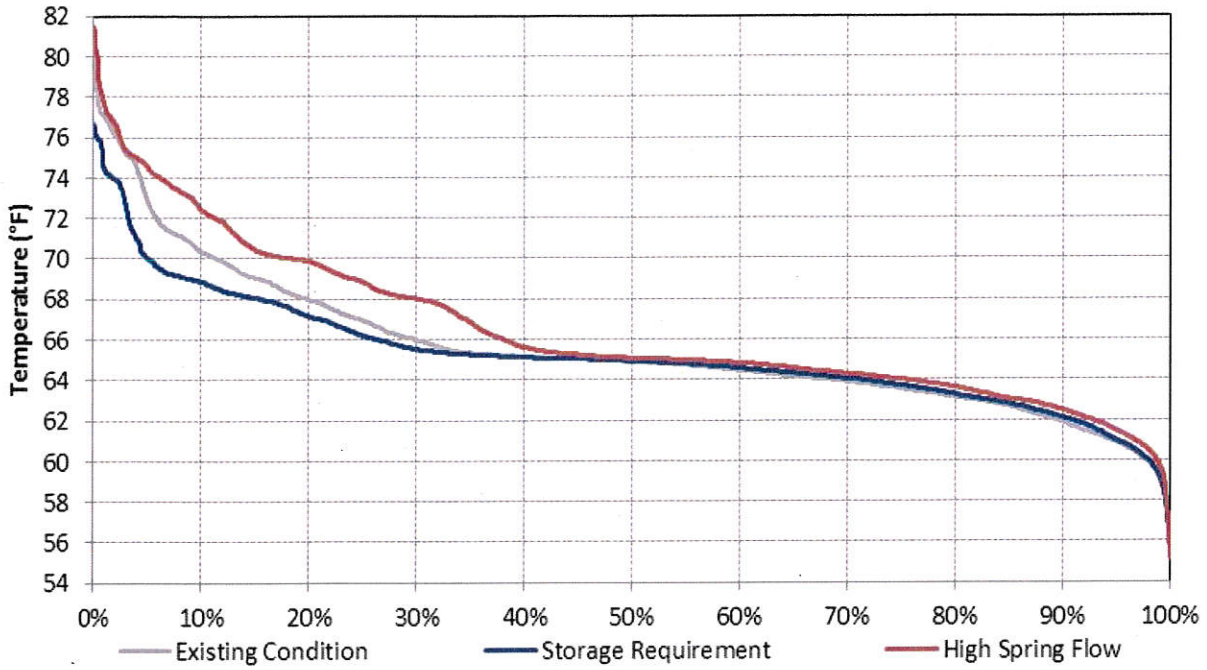

Figure 9. Comparison of Simulated Daily American River at Watt Avenue Bridge Water Temperatures for July through September (1922-2003

The analysis of the High Spring Flows approach shows that while it may provide some potential advantages during the spring, the decreased storage in Folsom Reservoir, and the associated reduction in cold water volume, would result in an unacceptable increase in downstream water temperatures during the summer and fall. As a result, implementation of the High Spring Flows approach probably would cause significant impacts to listed oversummering steehead, and spawning fall-run Chinook salmon, in the lower American River. To the extent an unimpaired flow-based approach such as that suggested in the SWRCB Draft Scientific Basis Report would implement flows similar to the High Spring Flows approach analyzed by the Water Forum, it probably would cause similar impacts on steelhead and spawning fall-run Chinook salmon.

American River Contribution to the Delta

Table 2.1-7 of the Draft Scientific Basis Report shows the simulated impaired flows as a percentage of unimpaired flows for major Delta tributaries. Upon evaluation of the values in Table 2.1-7, the Water Forum adjusted the values to reflect both depletions and returns for American River water users below the mouth of the American River to be more representative of the contribution of the American River watershed to the Delta. The adjusted values include the following components that were not accounted for in the Draft Scientific Basis Report:

- Diversion from the Sacramento River Plant (City of Sacramento)
- Diversion from the Freeport Water Treatment Plant (Freeport Regional Water Authority)
- Discharge from the Sacramento Regional Sanitation District Wastewater Treatment Plant

The adjusted flow volumes were calculated using CalSim II output, and were compared to output from the Sacramento Valley Unimpaired Flows Model for unimpaired American River flow at its mouth. **Table 6** shows a comparison of the corrected values with the values from Table 2.1-7 in the SWRCB Draft Scientific Basis Report.

Table 6. American River January-June Contribution to the Delta as Percent of Unimpaired Flow

SVI	Year	From SWRCB Report (%)	Corrected Existing Condition (%)	Corrected Storage Requirement (%)	Corrected High Spring Flow (%)
3.11	1977	35%	94%	102%	102%
3.66	1931	46%	77%	83%	113%
3.87	1924	40%	100%	117%	145%
4.06	1992	48%	78%	62%	85%
4.07	1934	65%	81%	72%	93%
4.21	1991	35%	33%	41%	50%
4.63	1933	47%	72%	58%	68%
4.65	1988	23%	38%	44%	60%
4.81	1990	35%	64%	59%	74%
5.02	1994	49%	68%	66%	89%
5.22	1929	40%	66%	62%	78%
5.29	1976	60%	96%	85%	116%
5.48	1932	41%	51%	51%	44%
5.58	1939	46%	76%	70%	92%
5.61	1947	46%	58%	59%	66%
5.68	1961	33%	59%	56%	78%
5.75	1926	52%	69%	67%	67%
5.76	2001	39%	65%	64%	86%
5.86	1987	29%	58%	45%	59%
5.90	1930	49%	57%	60%	61%
6.09	1949	44%	50%	54%	54%
6.13	1989	45%	45%	46%	37%
6.14	1955	33%	47%	47%	61%
6.20	1960	30%	45%	41%	47%
6.21	1981	34%	57%	56%	75%
6.35	1944	42%	57%	52%	63%
6.35	1944	42%	57%	52%	63%
6.39	1925	48%	57%	56%	51%
6.41	1964	48%	59%	51%	65%
6.47	1985	42%	69%	66%	69%
6.62	1950	50%	55%	56%	56%
6.65	1962	32%	35%	39%	44%
6.67	1979	50%	60%	60%	60%
6.75	1959	31%	52%	58%	73%
6.80	1945	50%	58%	61%	57%
6.87	1937	49%	60%	59%	60%
6.98	1935	42%	55%	54%	47%
7.06	1923	55%	69%	69%	69%
7.12	1948	37%	45%	47%	45%
7.16	1966	33%	58%	58%	75%
7.24	1968	51%	64%	64%	76%
7.29	1972	49%	65%	65%	70%
7.70	1946	53%	67%	67%	70%
7.75	1936	69%	74%	74%	74%
7.83	1957	39%	51%	51%	53%

Table 6 (continued)

SVI	Year	From SWRCB Report (%)	Corrected Existing Condition (%)	Corrected Storage Requirement (%)	Corrected High Spring Flow (%)
8.21	2003	50%	58%	60%	59%
8.27	1928	57%	71%	70%	73%
8.51	1954	49%	63%	62%	67%
8.54	1993	56%	60%	63%	58%
8.58	1973	67%	75%	78%	78%
8.65	1978	49%	54%	56%	54%
8.88	1940	61%	66%	68%	65%
8.94	2000	50%	57%	57%	62%
8.97	1922	58%	66%	66%	66%
9.04	1980	74%	81%	81%	81%
9.18	1951	68%	73%	73%	79%
9.35	1975	52%	59%	59%	59%
9.52	1927	68%	73%	75%	75%
9.55	1953	52%	62%	62%	62%
9.63	1963	68%	77%	77%	77%
9.77	1943	71%	81%	81%	83%
9.80	1999	66%	78%	78%	78%
9.96	1986	70%	74%	76%	76%
10.00	1984	51%	62%	62%	68%
10.15	1965	70%	75%	75%	75%
10.20	1967	70%	76%	78%	74%
10.26	1996	71%	79%	79%	79%
10.37	1971	56%	68%	68%	68%
10.40	1970	77%	81%	81%	88%
10.82	1997	83%	87%	87%	95%
11.05	1969	75%	78%	81%	78%
11.27	1942	69%	78%	78%	78%
11.38	1956	72%	76%	76%	76%
11.47	1941	61%	69%	71%	71%
12.16	1958	70%	75%	75%	75%
12.38	1952	73%	80%	80%	80%
12.62	1938	72%	81%	81%	81%
12.76	1982	82%	86%	86%	86%
12.89	1995	75%	79%	79%	77%
12.99	1974	73%	81%	81%	81%
13.31	1998	71%	75%	77%	77%
15.29	1983	78%	84%	84%	84%

Table 6 shows that correcting the percentages for unimpaired flow to reflect the American River watershed's contribution to the Delta results in substantially increased values. Figure 10 shows a comparison of the percentages of American River unimpaired flow at its mouth for January through June, when corrected to reflect the American River watershed's contribution to the Delta.

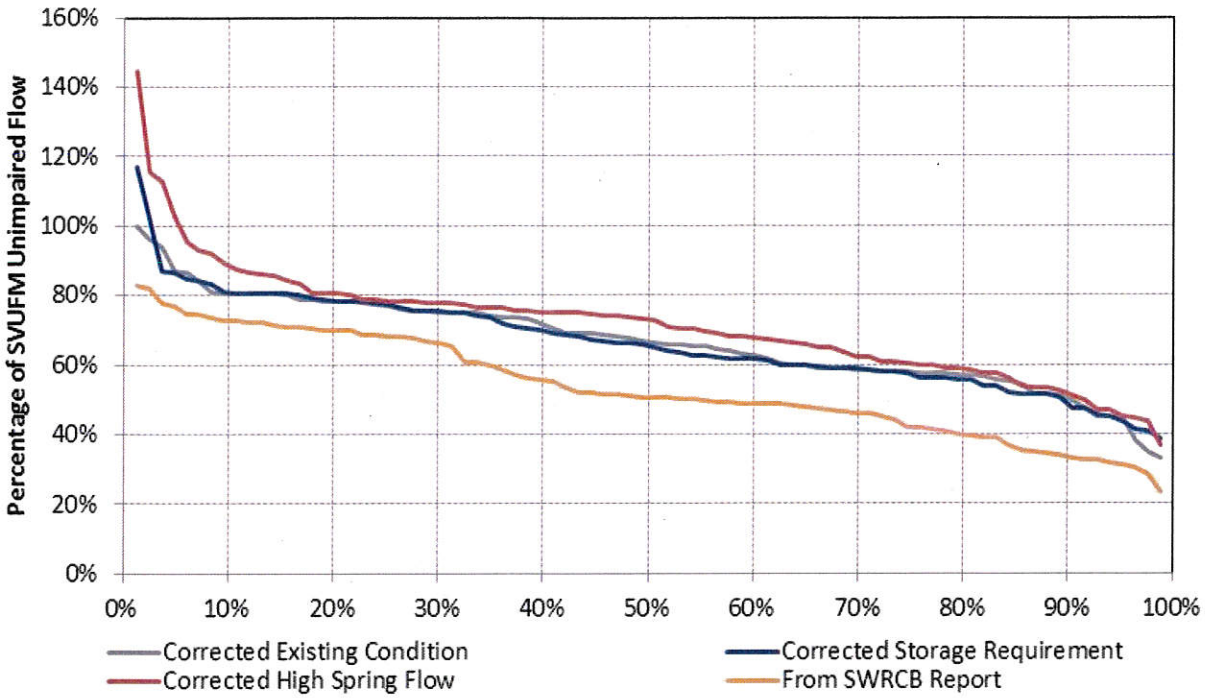

Figure 10. Comparison of Simulated Percentage of January-June Unimpaired American River Flow at its Mouth (1922-2003)

Figure 10 shows that the contribution of the American River watershed to the Delta is within the range suggested as beneficial in the SWRCB Scientific Basis Report (35-75%).

Conclusion

The Water Forum has developed a flow standard for the lower American River based on the best available science and site-specific information that is consistent with the functional flow concept in the SWRCB Draft Scientific Basis Report. Our analyses show that our potential approaches to functional flows on the lower American River could significantly improve fisheries conditions. In particular, modest storage requirement at Folsom Reservoir has the potential to significantly improve water temperature conditions in the river. In contrast, the Water Forum's analyses show that implementing a High Spring Flows approach, similar to an unimpaired flow-based approach like that discussed in the SWRCB Draft Scientific Basis Report, would adversely impact steelhead and fall-run Chinook salmon in the lower American River.

The data and technical tools that have been developed by the Water Forum may be of use to SWRCB staff as they continue their work on Delta and Tributary flow requirements. Our staff and consultants are available to share these resources at your request.