

## Summary of Proposed Updates to the Bay-Delta Water Quality Control Plan (September 15, 2016)

### Introduction

The San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta) is a critical crossroads in the state's water supply system as well as an ecosystem in crisis. The Delta, at the confluence of the Sacramento and San Joaquin Rivers, was once a vibrant tidal marsh teeming with fish and wildlife, including several iconic species, such as Chinook salmon, many of which are threatened, endangered, and some of which still support a commercial fishery. Reclamation of farmland in the Delta and diversions upstream and through the Delta led to vibrant farming and urban development within the Delta and in Central and Southern California. Those factors have played a significant role in fish and wildlife species plummeting because of the extent of water diverted out of the rivers and Delta.

Over the past 47 years, since the passage of California's Porter-Cologne Water Quality Control Act (Porter-Cologne Act), and with subsequent passage of the federal Clean Water Act and the federal and state endangered species acts, state and federal agencies have taken steps to improve conditions for fish and wildlife while protecting other water uses. Yet on balance, Californians continue to take more water out of the Delta and its tributaries than the species can withstand.

Many state and federal agencies are working on multiple fronts to protect, restore, and enhance the Bay-Delta while balancing those efforts with water supply for farmers and cities that rely on water pumped from the Bay-Delta. The State Water Resources Control Board (State Water Board) has a unique role with respect to the Bay-Delta because it establishes water right and water quality requirements to protect human, fish, and wildlife uses of the Bay-Delta's waters. Evidence amassed over the last 10 years by researchers, the Legislature, the State Water Board, and state and federal fisheries agencies shows a crucial need to update these requirements for the benefit of people and fish.

On September 15, 2016, the State Water Board staff released a draft proposal to update water quality requirements for salinity in the southern Delta and water flows in major tributaries to the San Joaquin River (the Stanislaus, Tuolumne, and Merced Rivers), which drain into the southern Delta. The refined salinity requirements reflect updated scientific information about salt levels that reasonably protect farming in the southern Delta. The new flow requirements for the San Joaquin River's major tributaries recognize the vital role upstream water flows provide for habitat and migratory signals for threatened and endangered salmon and steelhead. In sum, the draft proposes increasing flows for fish and wildlife and adjusts the salinity requirements to a slightly higher level to reflect updated scientific knowledge.

While the proposal focuses on the southern Delta and tributaries of the San Joaquin River, the effort is one of myriad actions completed and underway related to water quality, habitat restoration, and flows in the Bay-Delta. A draft science report related to the Sacramento River and the Delta will follow in a few weeks, with a draft plan to follow next year.

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### **What is the Bay-Delta?**

The Bay-Delta includes the Sacramento–San Joaquin Delta, Suisun Marsh, and San Francisco Bay. California’s two largest rivers, the Sacramento and the San Joaquin, converge in the Delta and meet incoming seawater from the Pacific Ocean in San Francisco Bay. The Delta is a critically important natural resource for California and the nation. It is both the hub of California’s water supply system and the most valuable estuary and wetlands system on the west coast, serving cities, farms, fishing communities, boaters, fish, and wildlife.

### **Why is the State Water Board Updating the Bay-Delta Water Quality Control Plan Now?**

Under the Porter-Cologne Act, the State Water Board has authority to establish water quality requirements to protect beneficial uses of water. The State Water Board is proposing changes to water quality requirements related to (1) salinity levels for the protection of farming in the southern Delta, and (2) critical flows in the San Joaquin River system to provide habitat for fish and wildlife upstream of the Delta. More than ten years ago, the State Water Board identified these water quality issues as priority updates in the 2006 Water Quality Control Plan for the Bay-Delta (Bay-Delta Plan) in an effort to develop adequate information to protect the beneficial uses of the Delta. Failure to address these priorities now could result in more draconian actions under the state or federal Endangered Species Act or federal action to establish water quality standards for the Bay-Delta. On the other hand, addressing these issues now will provide a platform for responding to future droughts, adapting to climate change, and improving water resource management.

Both changes would be incorporated into the Bay-Delta Plan, which establishes water quality requirements for the Bay-Delta. The Bay-Delta Plan lays out water quality protections to ensure the various water uses – drinking, irrigation, fisheries, and more – are protected. In establishing the water quality requirements, the State Water Board must consider all beneficial uses of water in determining how to reasonably protect particular uses. Rather than “choose” one beneficial use over others, the State Water Board must balance the needs in order to “maximize” support all of the uses.

In the last ten years, the continuing decline of the Bay-Delta ecosystem’s health has reinforced the need for action. Several species of fish have been listed as protected species under the state or federal Endangered Species Act. Water diversions from the San Joaquin River and its tributaries have surpassed the rivers’ ability to support a healthy fishery. The proposed update would address factors contributing to the decline of key fishery species, incorporate new science in the State Water Board’s planning processes, and provide a framework for accepting voluntary agreements with alternative methods for enhancing fish and wildlife in the tributaries.

As part of the 2009 Delta Reform Act, the Legislature directed the State Water Board to develop flow criteria for the Delta ecosystem necessary to protect public trust uses. In keeping with the narrow focus of the legislation, the State Water Board’s 2010 Delta Flow Criteria Report only presents a technical assessment of flow and operational requirements to provide fishery protection under existing conditions. The report does not do the analysis to inform the

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consideration of competing uses of water that is required by the California Water Code. The Delta Flow Criteria Report determined that 60 percent of the unimpaired San Joaquin River inflow from February-June was necessary to preserve the attributes of a natural, variable system to which native species are adapted. It also pointed to the need for flows on all three major San Joaquin River tributaries that reflect a more natural frequency, duration, timing and rate of change to provide adequate conditions for spawning and rearing of juvenile salmon as well as for essential migration. Looking only at inflows to the Delta is insufficient. Instead, the report recognized the need for flow contributions upstream of the Delta from each tributary, and throughout the habitat range of key species, such as salmonids.

Presently, the Bay-Delta Plan specifies a combined requirement for flow at a single point upstream of the southern Delta on the San Joaquin River below the confluence of the tributaries. There is no existing requirement for the flows in the major tributaries to sustain fish in the tributaries or to contribute to the flow at this compliance point. The draft update to the Bay-Delta Plan proposes to provide the necessary flow on all three tributaries, in dry years as well as wetter ones, to ensure suitable habitat and migratory pathways upstream of the Bay-Delta to support native fish.

The 2010 Delta Flow Criteria Report reviews the scientific basis for modifying flow regimes on the three tributaries, but it was not designed to look, nor did it look, at the effect that this increased level of unimpaired flow would have on other competing uses of water or the environment. The update of the Bay-Delta Plan includes this analysis in a comprehensive staff report, known as the Substitute Environmental Document (SED). The SED weighs recommendations for new salinity and flow standards with the costs, impacts, and benefits of the proposals.

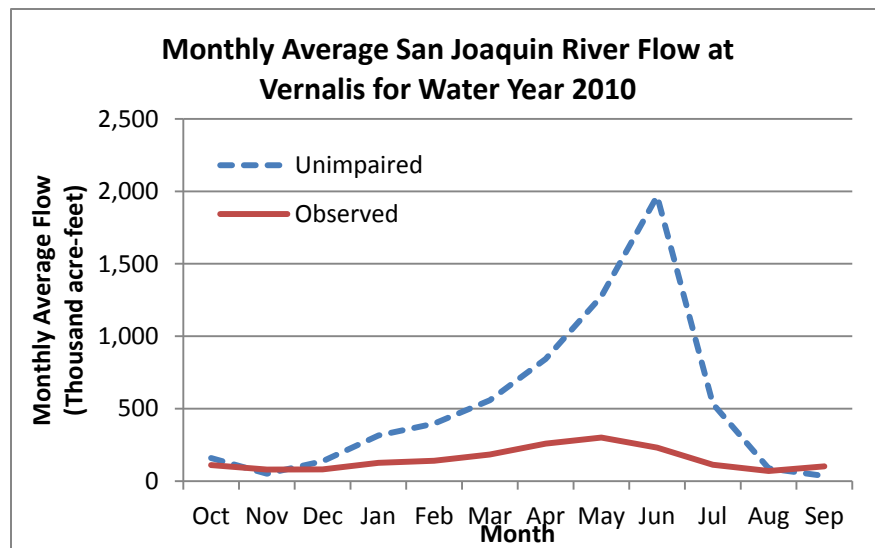
### **Proposed Change #1 – An Improved Approach to Setting Flow Objectives**

The State Water Board is updating and re-tooling its Bay-Delta Plan to better account for ecosystem needs and to better address the balancing of instream and consumptive human uses. Most notably, new flow objectives proposed for the San Joaquin River and its tributaries would enhance water flows upstream of the Delta to support the migratory and spawning habitat of native fish.

As recommended in the Delta Flow Criteria Report, the new flow objectives would be based on percentages of unimpaired flows at locations on each tributary. Unimpaired flow is the rate and volume of water flow that would be produced by the rain and snow accumulating in a watershed absent any diversion, storage, or use of water. An unimpaired flow approach generally mimics the natural variability of California's river flows that support native fish like salmon and steelhead and for which they have evolved.

The proposal does not contemplate flow requirements equal to natural, pre-development conditions or even the 60 percent threshold identified in the Delta Flow Criteria Report. Instead, the draft proposes narrative and numeric flow objectives, expressed as a range from 30 to 50% of unimpaired flow, for February through June for the Stanislaus, Tuolumne, and Merced Rivers through to the San Joaquin River near Vernalis.

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The proposal recommends a 30 to 50 percent adaptive flow range, with a starting point of 40 percent, because the State Water Board's analysis shows that range will provide reasonable protection of fish and wildlife while moderating impacts to water supply for drinking water and agriculture. Historical median February–June flows from 1984–2009 in

the Merced, Tuolumne, and Stanislaus Rivers were, respectively, 26, 21, and 40 percent of unimpaired flow. This means that flows in the tributaries were less than this amount half the time. Observed flows are far lower than unimpaired flows even in years of above normal unimpaired flow, like 2010. The Sacramento River, in contrast, already contributes to the Delta, on average, about 50 percent of Sacramento River unimpaired flow from April through June.

### Adaptive Management

The unimpaired flow proposal does not require rigid adherence to a fixed percent of unimpaired flow, but can be thought of as a water budget. The draft proposes a block of water that can be “shaped” or shifted in time to best align instream flows with the needs of fish and wildlife throughout the year. As such, the flow proposal accommodates an adaptive implementation process that allows the magnitude and timing of flows to be adjusted, within a prescribed range, provided that such changes protect the fishery. Moreover, a key element of successful adaptive management is the implementation of non-flow measures that could reduce the flows needed, within the adaptive range, to achieve reasonable fish and wildlife protection goals, such as restoration of gravel spawning beds, suppression of habitat beneficial to predatory fish, and enhancement of habitat beneficial to native species.

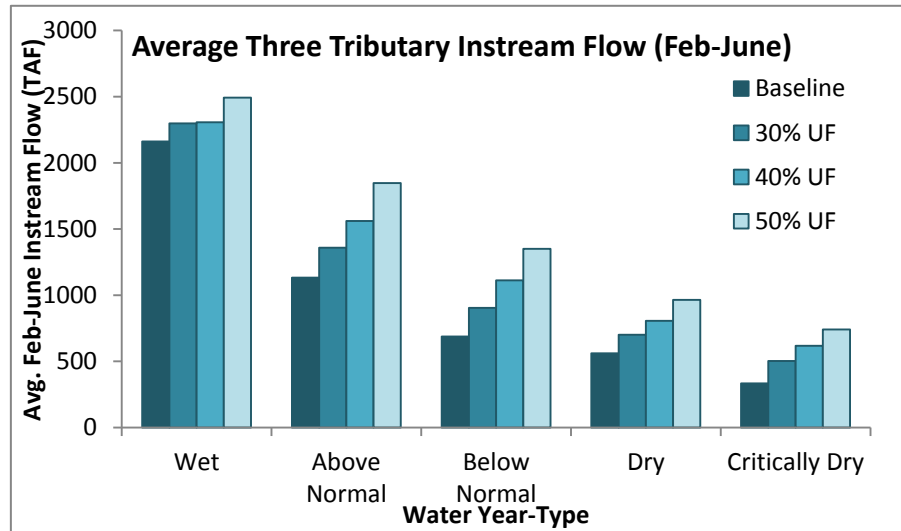
The proposal contemplates that biological goals (to assess improvements to fish resulting from flow and other actions) will be among the tools that inform future State Water Board decisions on whether to adjust the unimpaired flow percentage within the 30 to 50 percent range. Put another way, adaptive management will optimize the balance between fishery and human uses, while rewarding actual improvements in biological conditions that support native fish. Adaptive implementation of flows will also allow a nimble response to changing information and changing conditions while minimizing unintended impacts.

### What are the Ecosystem Benefits of the Flow Proposal?

In most instances the proposed flow objectives will provide more instream flow than existing baseline conditions, restoring the pattern and some limited magnitude of flow to levels that are

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more closely aligned to the flow conditions to which native species adapted. Average annual instream flow between February and June would increase by 288 thousand acre feet (TAF), or 26 percent, under the 40 percent unimpaired flow. The effects would be more pronounced at the 50 percent unimpaired flow level (485 TAF) and more attenuated at the 30 percent unimpaired flow level (174 TAF), with the biggest benefits in dry years.



Nearly every feature of habitat that affects fish and other aquatic life is influenced by flow, including temperature, water chemistry, and physical habitat availability. These habitat features, in turn, affect the risk of disease and predation, reproductive success, growth, migration, feeding behavior, and

other ecological factors that determine the viability of native fish. As discussed earlier, adding compliance locations on the tributaries helps ensure all these benefits for native fish extend further into the watersheds and along migratory routes.

The State Water Board has quantified the effect of the flow proposal on key components of habitat to assess the ecosystem benefits of providing additional instream flow. The State Water Board’s analysis demonstrates that implementation of the flow proposal would significantly improve water temperature conditions conducive for salmonids, with the largest benefits occurring in dry years, particularly in the Tuolumne and Merced Rivers. With 40 percent of unimpaired flow, May salmon rearing temperature thresholds are met twice as frequently in critically dry years. Overall, temperature targets that are protective of salmonids are attained more frequently than under baseline for all life stages from February through June under 30, 40 and 50 percent of unimpaired flow.

Higher instream flows will also result in increased floodplain inundation. Floodplain inundation is important because it enhances the spawning and rearing success of salmonids. This is so because floodplain habitat provides abundant food and a safer environment for growing fish. The State Water Board’s analysis shows an overall 35 percent increase in floodplain inundation at 40 percent of unimpaired flow.

There are many other benefits of a more natural flow regime during the springtime, including the reduced abundance of nonnative fishes and nonnative aquatic vegetation. Additionally, it is expected that large flow pulses during the spring will help juvenile salmonids migrate

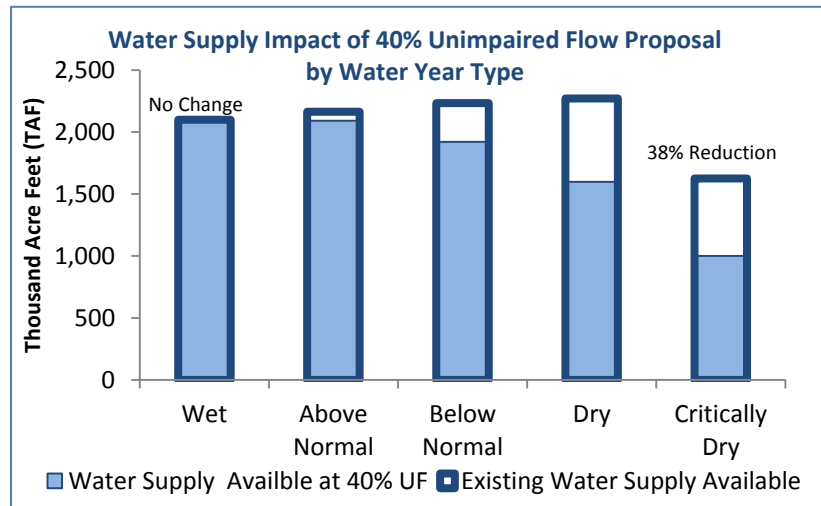
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successfully to the Delta as a result of increased velocities, increased turbidity pulses, and increased volumes of water, all of which can reduce predation vulnerability.

### What are the Impacts of the Flow Proposal?

The San Joaquin River Watershed does not produce enough water to both meet existing human demands and support a healthy ecosystem. Requiring more water to remain instream for the reasonable protection of fish and wildlife will reduce the quantity of surface water available for consumptive human uses, and will make water conservation and other tools like groundwater banking even more important than they already are, especially during drier years. The reduced water supply would primarily affect agriculture, but would also affect drinking water supplies and hydropower generation.

Implementing the flow proposal is expected to result in a 7 to 23 percent reduction in water available for human consumptive use, depending on the flow within the 30-50 percent adaptive flow range. During wet years, there will be almost no impacts on diversions for human use because of the abundance of flow to share. The most significant impact on diversions for human use will occur in the driest years.



As surface water availability declines, dependence on groundwater will grow, which in turn could cause or exacerbate groundwater overdraft. The State Water Board's analysis indicates that implementing the 40 percent flow proposal could result in an average increase in groundwater pumping of 105 thousand acre feet per year (TAF/yr). Given that there is an existing 45 TAF/yr deficit in current groundwater supplies, the unmet agricultural water demand has the potential to increase by 137 TAF/yr to 182 TAF/yr in the plan area. Overall agricultural water supply deficits have the potential to increase over time as pumpers must come into compliance with the Sustainable Groundwater Management Act. Water users can take many actions such as improved irrigation efficiency and enhanced groundwater recharge to reduce these water supply effects. While the SED does not require such mitigation at a programmatic level, it nonetheless identifies the actions that stakeholders can take that to address and lessen effects on groundwater supplies

The potential negative effects on agricultural economic output increase with the volume of flow retained instream. A 40 percent of unimpaired flow requirement is projected to result in an average annual decrease in economic output of \$64 million. This represents a 2.5 percent reduction from baseline annual average agricultural economic sector output of \$2.6 billion. The

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impact would be lower at 30 percent of unimpaired flow and higher at 50 percent. Again, these impacts do not assume implementation of mitigation that water users would likely employ.

Unless water users agree to voluntary reductions to implement an updated Bay-Delta Plan, the State Water Board would determine in subsequent regulatory proceedings the reductions necessary by specific water users to implement the updated Bay-Delta Plan. The effect of the flow proposal on specific individual water rights is unknown. In general, flow objectives that would be implemented through water right actions would follow the water right priority system and other legal requirements.

### **Reducing Water Supply Impacts while Maintaining or Increasing Environmental Benefits**

Enhanced flows are the principal means proposed to implement the updated objectives. However, the proposal recognizes that throughout the watershed a number of other factors degrade conditions for native fish, such as non-native species, predation, high water temperatures, barriers to fish passage, and habitat loss. As a result, the proposal allows for and encourages the development of non-flow measures to complement the objectives. Implementation of additional non-flow measures that meet certain criteria can reduce the need for flows within the prescribed 30-50 percent range.

The State Water Board recognizes that voluntary agreements can help inform and expedite implementation of water quality objectives and can provide durable solutions in the Delta watershed. In addition, the State Water Board believes that suitable voluntary agreements can provide reasonable protections for fish and wildlife and provide a faster and more durable implementation route if done correctly. As a result, the Board encourages stakeholders to work together to reach voluntary agreements incorporating a mix of flow and non-flow measures that meet or exceed the proposed objectives and protect fish and wildlife uses.

The State Water Board will consider a voluntary agreement as part of its proceedings to implement the plan. In evaluating any proposal, the Board will consider whether the agreement will help achieve the water quality objectives, help protect the beneficial use, and be enforceable through Board action. The Board will also need to make any independent findings required by law in connection with the proceedings to implement the plan.

Depending upon the strength of the voluntary agreement components and success in meeting the specified goals, the State Water Board could reduce the unimpaired flow requirement to as low as 30 percent.

### **Proposed Change #2 – Updated Salinity Water Quality Objectives**

The proposal also includes a new salinity water quality objective for the southern Delta. The existing salinity objective was established at four southern Delta locations to protect agriculture.

Analysis of southern Delta water quality and crop salinity requirements shows that existing salinity conditions in the southern Delta are suitable for all crops and that the existing April through August salinity objective is actually lower than what is needed to reasonably protect

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agriculture. Accordingly, the State Water Board staff proposes to increase the southern Delta salinity objective to better reflect the current condition, which is sufficient to protect agriculture. The current salinity objectives are 0.7 deciSiemens per meter (dS/m) April through August and 1.0 dS/m September through March. The update proposes a year round objective of 1.0 dS/m.

While the proposal will update southern Delta salinity objectives, the Bureau of Reclamation's water right permits would maintain existing salinity requirements at Vernalis in order to implement the proposed salinity objectives in the southern Delta, and maintain the current condition. Within the southern Delta, the proposal would specify channel segments as compliance points so that compliance with the salinity objectives can be monitored in a manner that better reflects the overall salinity levels and protection of the agricultural beneficial use.

The SJR flow element of the proposal complements the southern Delta salinity element by augmenting flow in the southern delta, particularly in February through June. Increased flows under the flow alternatives would have the incidental benefit of flushing of salts early in the irrigation season, and providing better salinity conditions during Spring germination of crops, which is generally the most salt sensitive time.

### **Next Steps**

To finish this part of the Bay-Delta update for San Joaquin River flows and salinity, the State Water Board must complete two key components – the finalization of the environmental documentation (SED) and the Bay-Delta Plan's amendments. Comments on both the plan amendments and the SED are due on November 15, 2016, and a public hearing will be held on November 2 and November 10, 2016 in Sacramento, and November 4, 2016 in the Modesto area, to receive additional oral comments.

Staff will prepare written responses to issues raised in the comments received during the written comment period and will respond in writing or orally to comments made during the public hearing. Staff will prepare a draft final SED for consideration by the State Water Board's members. The Board members will consider the draft final SED before approving the project, and the SED will become final upon project approval. The Board will consider approving the proposed Bay-Delta Plan amendments at a public meeting that will be held in early 2017.

Simultaneously, the State Water Board is moving forward with updating other elements of the Bay-Delta Plan. These other elements include update of flows on the Sacramento River and outflow from the Delta. A draft science report will be issued in a few weeks, followed by proposed updates in a process similar to what is being proposed for the San Joaquin. As noted elsewhere, the Board will allocate responsibility for meeting flow standards through water right proceedings separately.