



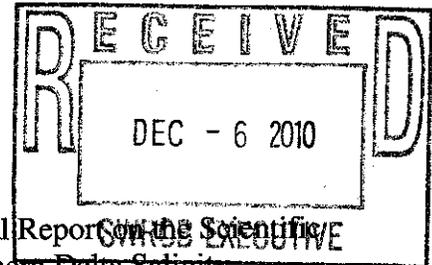
Coalition for a Sustainable Delta

1/6-7/11 Bd. Wrkshop
SJR Technical Report
Deadline: 12/6/10 by 12 noon

December 6, 2010

VIA E-MAIL (commentletters@waterboards.ca.gov) AND U.S. MAIL

Jeanine Townsend
Clerk to the Board
State Water Resources Control Board
P.O. Box 100, Sacramento, CA 95812-2000



Re: SJR Technical Report Comments on the Draft Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives (Oct. 29, 2010).

Dear Ms. Townsend,

The Coalition for a Sustainable Delta (Coalition)¹ is writing in response to the State Water Resources Control Board's (State Water Board's) request for comments on the Draft Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives dated October 29, 2010 (Draft Technical Report). The Coalition urges you to give due consideration to the comments that follow and issue a second Draft Technical Report for public comment prior to subjecting the Draft Technical Report to the announced independent peer review. The Coalition also requests that this letter be included in the administrative record for the Substitute Environmental Document (SED) that the State Water Board is preparing for the proposed amendments to the San Joaquin River flow objectives (SJR Flow Objectives) and southern Delta salinity objectives (Salinity Objectives) contained in the 2006 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan).

1. Introduction.

By law, the proposed amendments to the SJR Flow Objectives and Salinity Objectives in the Bay-Delta Plan must balance both for the ecological well being of the Delta and the health and welfare of the people of California, who depend upon a reliable water supply.

Unfortunately, as explained in detail below, the Draft Technical Report is based upon an unlawfully narrow range of alternative SJR Flow Objectives that focuses exclusively on the beneficial use for fish, specifically fall-run Central Valley Chinook Salmon and Central Valley steelhead, to the exclusion of all other designated beneficial uses, including agriculture, and municipal and industrial beneficial uses.

¹ The Coalition is a California nonprofit corporation comprised of agricultural, municipal, and industrial water users, as well as individuals in the San Joaquin Valley. The Coalition and its members depend on water from the Sacramento-San Joaquin Delta for their continued livelihood. Individual Coalition members frequently use the Delta for environmental, aesthetic and recreational purposes; thus, the economic and non-economic interests of the Coalition and its members are dependent on a healthy and sustainable Delta ecosystem.

In addition, the range of alternatives focuses on SJR Flow Objectives alone to achieve water quality objectives that should include a range of other actions to address the multiple factors that the Draft Technical Report recognizes as having contributed to the decline of fall-run Chinook and Central Valley steelhead.

While the State Water Board may intend to address those other factors when it crafts an implementation plan for the SJR Flow Objectives, or when it amends other aspects of the Bay-Delta Plan, it cannot lawfully determine which alternative SJR Flow Objectives to study in the SED in isolation from the numerous other measures that should be included in the Bay-Delta Plan to address the entire constellation of stressors on fish and wildlife in the Delta.

The Coalition is also very concerned that the Draft Technical Report does not – in its present state – properly assess, interpret, and apply the best available scientific information. In light of the fact that it is explicitly described as a report on the “scientific basis” for SJR Flow and Salinity Objectives, this shortcoming constitutes a fatal flaw that must be addressed prior to completion and independent peer review of the Draft Technical Report.

2. The Range of Alternative SJR Flow Objectives in the Draft Technical Report Is Unlawfully Narrow, and Must Be Revised to Include Alternatives That Ensure the Reasonable Protection of All Designated Beneficial Uses.

The stated purpose of the proposed amendments to the Bay-Delta Water Plan is “the reasonable protection of fish and wildlife, *agriculture, and municipal and industrial* beneficial uses, and a program of implementation.”² This purpose is imposed by law. A water quality control plan such as the Bay-Delta Plan must contain three elements: (1) the beneficial uses to be protected; (2) water quality objectives which ensure reasonable protection of the designated beneficial uses; and (3) a program of implementation.³ Once the State Water Board establishes water quality objectives which ensure reasonable protection of beneficial uses,⁴ it must prepare an implementation program to achieve the water quality objectives.⁵

The imperative to balance water supply and protection of fish and wildlife resources has long been recognized in state law. The Legislature has declared it “to be the established policy of this state that the use of water for domestic purposes is the highest use of water.”⁶ This declaration is tempered by Water Code section 1243, which provides:

The use of water for recreation and preservation and enhancement of fish and wildlife resources is a beneficial use of water. In determining the amount of water available for appropriation for

² Draft Technical Report at p. 1 (emphasis added).

³ Water Code, § 13050, subd. (j).

⁴ *Id.*, § 13241.

⁵ *Id.*, §§ 13240, 13050, subd. (j).

⁶ Water Code, § 1254. “Domestic purposes” includes “consumption for the sustenance of human beings, for household conveniences, and for the care of livestock.” *Prather v. Hoberg* (1944) 24 Cal.2d 549, 562.

other beneficial uses, the board shall take into account, whenever it is in the public interest, the amounts of water required for recreation and the preservation and enhancement of fish and wildlife resources.

Furthermore, as the California Supreme Court has recognized, “[t]he state has an affirmative duty to take the public trust into account in the planning and allocation of water resources, and to protect public trust uses whenever feasible.”⁷ But the Court also recognized that “[a]s a matter of practical necessity the state may have to approve appropriations despite foreseeable harm to public trust uses.”⁸ “[I]n determining whether it is ‘feasible’ to protect public trust values like fish and wildlife in a particular instance, the [State Water] Board must determine whether protection of those values, or what level of protection, is ‘consistent with the public interest.’”⁹

In addition, under the California Environmental Quality Act (CEQA) and the State CEQA Guidelines,¹⁰ the State Water Board is required to consider a reasonable range of feasible alternative SJR Flow Objectives that could avoid or substantially lessen the project’s significant environmental effects.¹¹ Importantly, the alternatives must be capable of implementing most of the project’s objectives.¹²

The Draft Technical Report states that the proposed amendments to the Bay-Delta Plan include “revisions to the [SJR Flow and southern Delta salinity] objectives for the reasonable protection of fish and wildlife, *agriculture, and municipal and industrial* beneficial uses, and a program of implementation.”¹³ But the Draft Technical Report purports to design SJR flow objectives that “protect fish and wildlife beneficial uses,” and “represent the likely range of alternatives that will be analyzed” in the Substitute Environmental Document (SED) that is being prepared to support any amendment to the SJR flow objectives in the existing 2006 Bay-Delta Plan.¹⁴

Thus, contrary to the requirements of the Water Code and CEQA, the range of alternatives that have been developed in the Draft Technical Report ignores the agriculture, and municipal and industrial beneficial uses.

Instead, the Draft Technical Report explains that the range of alternatives developed in the Draft Technical Report will be further refined to develop the alternatives to be evaluated in the SED,

⁷ *National Audubon Society v. Superior Court* (1983) 33 Cal.3d 419, 446.

⁸ *Ibid.*

⁹ *State Water Resources Control Bd. Cases* (2006) 136 Cal.App.4th 674, 778.

¹⁰ Pub. Resources Code, subs. §§ 21000-21777; see also State CEQA Guidelines, Cal. Code Regs., tit. 14, §§ 15000-15387.

¹¹ Pub. Resources Code, §§ 21002, 21002.1, subd. (a), 21100, subd. (b)(4), 21150; CEQA Guidelines, § 15126, subd. (a). Although the State Water Board is preparing an SED instead of an Environmental Impact Report pursuant to a certified regulatory program, the SED remains subject to all other CEQA requirements, including the requirement that it avoid or lessen the project’s significant environmental impacts. *Envil. Protection Info. Ctr. v. Johnson* (1985) 170 Cal.App.3d 604; CEQA Guidelines, § 15250.

¹² CEQA Guidelines, § 15126.6, subd. (a).

¹³ Draft Technical Report at p. 1 (emphasis added).

¹⁴ Draft Technical Report at p. 35; see also *id.* at p. 2 (defining the range of SJR flow objective alternatives as 20%, 40%, and 60% of unimpaired flow at Vernalis during the months of February through June).

and “[t]he potential environmental, economic, *water supply*, and related impacts of the various alternatives will then be analyzed and disclosed prior to any changes in the existing flow objectives.”¹⁵ Thus, in the Draft Technical Report, agriculture, and municipal and industrial beneficial uses are subsumed under “water supply” *as an environmental impact of the alternatives*, not as project *goals* that must be reasonably protected.¹⁶

As demonstrated above, by law, the project (i.e., the proposed amendments to the SJR Flow Objectives and Salinity Objectives) must include the water quality objectives which ensure reasonable protection of all designated beneficial uses.¹⁷ Those uses include agriculture, as well as municipal and industrial water supply. But the range of alternatives developed in the Draft Technical Report focuses exclusively on the reasonable protection of fish and wildlife resources. In addition to excluding consideration of all beneficial uses but fish and wildlife resources in designing a range of alternative SJR Flow Objectives and Salinity Objectives to be studied in the SED, the Draft Technical Report further limits consideration of the fish and wildlife beneficial uses to two fish: fall-run Chinook salmon and Central Valley steelhead.¹⁸

Thus, the range of alternatives studied in the Draft Technical Report is unlawfully narrow, and should be revised to include a range of alternatives designed to balance the entire range of beneficial uses that are to be served by the SJR flow and southern Delta salinity objectives.¹⁹

3. The Range of Alternatives Focuses on SJR Flow Objectives to Achieve Water Quality Objectives that Should Include a Range of Other Actions to Address the Multiple Factors Known to Contribute to the Decline of Fall-Run Chinook and Central Valley Steelhead.

Published evidence strongly suggests that the decline of the Delta’s pelagic and anadromous fishes – and the Delta ecosystem that supports those fishes – is attributable to multiple factors including changes to the food web in the Delta, agriculture in the Delta itself that both diverts

¹⁵ Draft Technical Report at p. 35 (emphasis added).

¹⁶ This singular focus on setting flow objectives to protect fish and wildlife resources was adopted by the State Water Board in its *Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem Prepared Pursuant to the Sacramento-San Joaquin Delta Reform Act of 2009* 2 (Aug. 3, 2010) (“Given the accelerated time frame in which to develop the criteria, the State Water Board’s approach to developing criteria was limited to review of instream needs in the Delta ecosystem, specifically fish species and Delta outflows, while also receiving information on hydrodynamics and major tributary inflows. The State Water Board’s flow criteria determinations are accordingly limited to protection of aquatic resources in the Delta.” (emphasis added)). There, the State Water Board acknowledged that it cannot establish regulations aimed exclusively at the protection of aquatic resources: “When setting flow objectives with regulatory effect, the State Water Board reviews and considers all the effects of the flow objectives through a broad inquiry into all public trust and public interest concerns. . . . [including] a broad range of public interest matters, including economics, power production, human health and welfare requirements, and the effects of flow measures on non-aquatic resources (such as habitat for terrestrial species).” *Ibid.* As demonstrated above, the Draft Technical Report fails to develop and study a range of alternatives that aims at the reasonable protection of “all public trust and public interest concerns.”

¹⁷ Water Code, § 13050, subd. (j).

¹⁸ Draft Technical Report at pp. 1; 34-35; 48-60; 65-67.

¹⁹ The Draft Technical Report makes the converse mistake with respect to the southern Delta salinity objectives. In the Draft Technical Report, they are designed to protect agriculture, and municipal and domestic water supply beneficial uses to the exclusion of fish and wildlife beneficial uses. Draft Technical Report at pp. 2; 68-69; 76-77.

water and returns agricultural flows containing pesticides and other pollutants, urban development within the Delta that destroys fish habitats and results in stormwater runoff, leaching of contaminants into the Delta and into waterways that run into the Delta, predation of the delta smelt and other native fishes by non-native species, diversions of water to power plants, climate change, and water exports from the Delta. In combination over a period of decades, these factors precipitated the current crisis, as is well documented in *The State of Bay-Delta Science 2008* (Michael Healey, ed. 2008) and *Envisioning Futures for the Sacramento-San Joaquin Delta* (Jay Lund et al. 2007).

The Draft Technical Report pays lip service to the ample body of evidence in the literature that indicates that adjusting flow alone will not result in protection of fish and wildlife beneficial uses.²⁰ Instead of attempting to estimate the relative contribution that flows have on fish and wildlife beneficial uses, the Draft Technical Report simply dismisses them, stating that “flow remains a key factor [impacting aquatic resources] and is the focus of the State Water Board’s current review. Many other factors affect aquatic resources in the SJR basin and need to be evaluated in protective fish and wildlife beneficial uses, but are not the focus of this review.”²¹ Instead, the Draft Technical Report states that “[f]actors other than flow will be discussed in the environmental document supporting any changes to the [2006] Bay-Delta Plan and will also be addressed in the program of implementation section of the Bay-Delta Plan.”²²

There is ample evidence, for example, that predation has a more profound adverse impact on fall-run Chinook salmon and Central Valley steelhead in the Bay Delta than SJR flows. For instance, in the *Vernalis Adaptive Management Program (VAMP): Report of the 2010 Review Panel (VAMP Report of the 2010 Review Panel)*,²³ the independent scientific review panel concluded that:

simply meeting certain flow objectives at Vernalis is unlikely to achieve consistent rates of smolt survival through the Delta over time. The complexities of Delta hydraulics in a strongly tidal environment, and **high and likely highly variable impacts of predation**, appear to affect survival rates more than the river flow by itself, and greatly complicate the assessment of effects of flow on survival rates of smolts.²⁴

The panel further concluded that:

Although some positive statistical associations between San Joaquin River flow and salmon survival have been identified, there is also very large variation in the estimated survival rates at specific

²⁰ Draft Technical Report at p. 34.

²¹ *Ibid.*

²² *Ibid.*

²³ Hankin, D. et al. 2010. The Vernalis Adaptive Management Program (VAMP): Report of the 2010 Review Panel (May 13, 2010).

²⁴ *VAMP Report of the 2010 Review Panel* at p. 3.

flow levels and there is a disturbing temporal trend to reduced survival rates at all flows. This large variability and associated temporal decline in survival rates strongly supports a conclusion that survival is a function of a complex set of factors, of which San Joaquin River flow at Vernalis is just one.²⁵

The Draft Technical Report acknowledges these conclusions of the VAMP independent review panel, but it continues to ignore their implications for the Draft Technical Report's singular focus on developing alternative SJR Flow Objectives in isolation from the other factors that it acknowledges adversely affect fall-run Chinook escapement and adult return.

Indeed, the Draft Technical Report itself identifies poor ocean conditions, construction of impassable rim dams on the San Joaquin River tributaries, subsequent altered flow and temperature regimes "along with other human influences," and overproduction of hatchery-raised fish following low escapement numbers of wild fish in the late 1980s to early 1990s as significant factors contributing to the observed short- and long-term decline in fall-run Chinook adults returning to the SJR basin.²⁶ Moreover, the Draft Technical Report itself acknowledges that in a 2001 article, Baker and Morhardt found that "fall-run Chinook salmon smolt survival through the Delta may be influenced to some extent by the magnitude of flows from the SJR, but that the relationship was not well quantified at that time, especially in the range of flows for which such quantification would be most useful."²⁷ "[A]t flows below 10,000 cfs there was very little correlation between flows at Vernalis and escapement, and flows at Vernalis and smolt survival."²⁸ NMFS confirmed that "inflows below approximately 5,000 cfs have a high level of variability in the adult escapement returning two and a half years later, indicating that factors other than flow may be responsible for the variable escapement returns."²⁹

The State Water Board states that it will address the other factors that are known to contribute to the decline of fall-run Chinook salmon and Central Valley steelhead when it crafts an implementation plan for the SJR Flow Objectives, or when it amends other aspects of the Bay-Delta Plan.³⁰ However, as demonstrated in the previous section, the State Water Board is required by law to study a reasonable range of alternatives that achieve most of the project's goals (i.e., the reasonable protection of *all* designated beneficial uses), and that can avoid or substantially lessen significant environmental impacts. Thus, the State Water Board cannot lawfully determine the appropriate range of alternative SJR Flow Objectives to study in the SED in isolation from the numerous other measures that should be included in the Bay-Delta Plan to address the entire constellation of stressors on fish and wildlife in the Delta.

²⁵ VAMP Report of the 2010 Review Panel at p. 8.

²⁶ Draft Technical Report at p. 42.

²⁷ Draft Technical Report at p. 52.

²⁸ *Ibid.*

²⁹ *Ibid.* (citing "NMFS 2009b," National Marine Fisheries Service, *Endangered Species Act Section 7 Consultation, Biological Opinion and Conference Opinion on the Long-Term Operations of the Central Valley Project and State Water Project*, App. 5 (June 2009)).

³⁰ Draft Technical Report at p. 34.

4. Use of the Best Available Scientific Information.

Any agency charged with development of policy based in part upon extant scientific information must necessarily be guided by criteria regarding the assessment, interpretation, and application of the best available scientific information. This is a prerequisite for sound public policy.

A stepwise process must be used to ensure proper assessment, interpretation, and application of the best available scientific information. At a minimum, the process should include the following steps:

- collecting pertinent reliable scientific information, which can include data, analyses, and findings from research and monitoring
- cataloging and selecting from among models that can be used to integrate existing data and analyses to describe the baseline conditions and the effects of management actions and alternatives on relevant species and their respective habitats
- assessing critically the quality and applicability of existing data and analyses (both by assessing discrete data sets, analyses, and findings themselves, and by assessing synthetic data and analyses pertaining, for example, to the effects of river flows, predation, or contaminants on the abundance of a targeted species), as well as associated findings from pertinent studies
- acknowledging the uncertainties and incorporating them into findings made
- linking scientific data and model results to resource management options in an analysis of the ecological costs and benefits of management actions under consideration

This final step is where the best available science is actually “used” to substantiate defensibly the conclusions made by State Water Board staff in identifying the effects of alternative flow regimes on at-risk, native species and proposing changes to the existing flow regime that have a high probability of benefitting those species.³¹

Unfortunately, the Draft Technical Report does not reflect use of the above-described process, or a similarly rigorous process, to provide a scientific basis for SJR Flow and Salinity Objectives. Instead, the Draft Technical Report fails at a number of the steps described above. First, it fails to gather and vet all readily available relevant scientific information. Second, it fails to critical assess available information. And, third, it fails to use that information to evaluate the relationship between alternative flow regimes and the status of targeted at-risk species.

Much of what is implied to be science in this Draft Technical Report is not. The preponderance of the citations is not drawn from peer-reviewed literature from scientific journals, but is drawn from previous reports to agencies, written testimony, and comment letters. These materials are relied upon as sources for nearly all of the conclusions drawn in the Draft Technical Report

³¹ Murphy and Weiland (2010).

regarding flow effects on fishes. Few, if any, of these materials have been subjected to the independent scientific or peer review required of published science. Few, if any, use the scientific method to establish relationships between river flows and ecological phenomena. Nearly all of the cited studies, like this Draft Technical Report itself, present time-series data sets on river and tributary flows, document the decline of targeted species over similar assessment periods, then default to concluding that correlated declines in flows and fish numbers imply causation. In doing so, many of the cited materials miss the opportunity to integrate into an ecologically defensible, multifactorial assessment of fish declines the salient facts recognized in the Draft Technical Report, that “downstream migrations” of Chinook salmon “occur in response to many factors, including inherited behavior, habitat availability, flows, competition for space and food, water temperature, increasing turbidity from runoff”³² All of these environmental factors must be accounted for in any modeled projections of the potential benefits of increased flows and hydrographic regime change.

The cascade of information in the Draft Technical Report creates an unfocused narrative, much of which is not well connected to the problem statement. Assertions about the relationship between flows and fish population dynamics are credited to previous studies, but review of that source material shows a similar pattern of data presentation and asserted conclusions about ecological causation, without requisite sampling design or multifactor analysis. Moreover, much of the material referenced in the Draft Technical Report simply does not support the representations made. In a number of cases, the presentation of findings is incomplete, and, therefore, is applied without appropriate context to the technical report’s seemingly preformed conclusions. In other cases, findings from previous work are misinterpreted or misrepresented, often subtly, often by not clarifying that those findings are limited by variability in the data available and by attendant uncertainties. In the next section, the Coalition provides some specific examples of the shortcomings just described. These are by no means exhaustive, but they demonstrate the need to overhaul the Draft Technical Report before its completion and submission for independent peer review.

5. Examples of Failure to Use the Best Available Scientific Information.

A. Effects of Alternative Flow Regimes.

The statement that “[s]cientific information indicates that reductions in flows and changes in the natural flow regime of the SJR basin resulting from water development over the past several decades are impairing fish and wildlife beneficial uses” may be true, in the most general terms.³³ But that observation does not particularly well inform the most important question that is essential to setting flow criteria in the San Joaquin River system – will increased flows and a flow regime that better mimics the historical flow regime before the system was highly altered with tributary dams serve to contribute directly to the recovery of desired fishes? The Coalition could not identify any data, analyses, or studies cited in the Draft Technical Report that provide an affirmative answer to that critical question.

³² Draft Technical Report at p. 39.

³³ Draft Technical Report at p. 34.

It is improper to suggest that restoring any specific flow regime on the San Joaquin River could make a difference to population dynamics of Chinook salmon, given that during passage from spawning habitat to and through the Delta outmigrating juveniles are subject to mortality rates in excess of 80 percent and perhaps as high as 95 percent. All else being equal, management of San Joaquin River flows to mimic the natural hydrograph should contribute positively to “fish and wildlife beneficial uses.” But, all else is not equal in the San Joaquin River system. For example, for steelhead, recent “declines are likely due to a combination of declining habitat quality, increased water exports, and land use practices that have reduced the relative capacity of existing winter-run steelhead rearing areas.”³⁴ Accordingly, any decision respecting San Joaquin River flows must be informed by analyses of the benefits to anadromous (and other relevant) fishes that considers the full breadth of contemporary environmental stressors (i.e., mortality factors) that act on those species under the current “impaired” flows regime, as compared to stressor contributions that will accompany any new flows regime that might better match historical conditions.

The failure to provide such a comparison constitutes a major shortcoming of the Draft Technical Report, given the references throughout the document to the multiple and severe environmental threats that contributed to the present depressed status of the fall-run Chinook and other at-risk species such as steelhead – physical barriers that have reduced spawning habitat to a small fraction of that a century ago, disappearance of floodplains and other nursery and feeding areas, invasive predators, harvest rates that may not be sustainable, and contaminant effects acting on the food web in the lower river system. A number of those threats to at-risk fishes will not be ameliorated in any way by adjustments in San Joaquin River flows, hence will continue to act unabated, and limit or obviate any positive effects on the target fishes associated with enhanced flows.

In the unique case where the Draft Technical Report actually quotes qualifications that were made with findings from a cited document – for example, the *VAMP Report of the 2010 Review Panel* (Hankin et al. (2010)) – the Draft Technical Report states that “that higher flows through the SDWSC [Stockton Deep Water Ship Channel] could benefit migrating salmon.”³⁵ But, the Draft Technical Report includes the subsequent acknowledgement that Hankin and his colleagues offer that the “complexities of Delta hydrodynamics in a strongly tidal environment, and high and likely highly variable impacts of predation, appear to affect survival rates more than the river flow by itself, and greatly complicate the assessment of effects of flow on survival of [salmon] smolts. And, overlaying these complexities is an apparent strong trend toward reduced survival rates at all flows over the past ten years in the Delta.”³⁶ In other words, contrary to the Draft Technical Report’s interpretation of a previous review document, that document directly states that management actions intended to enhance San Joaquin River flows may not benefit salmon.

³⁴ Draft Technical Report at p. 47.

³⁵ Draft Technical Report at p. 55.

³⁶ Draft Technical Report at p. 56.

B. Fish Mortality in the Delta.

The Draft Technical Report includes the statement that “[a]ny fish that enters the central or southern Delta has a high probability of being entrained and lost at the pumps (Kimmerer and Nobriga, 2008).”³⁷ This is but one example of misapplication of reliable scientific information contained in the Draft Technical Report. The Kimmerer and Nobriga article cited reports on use of a particle tracking model (PTM) to examine entrainment losses at the Central Valley Project and State Water Project export facilities under a variety of conditions. Nowhere in the article do the authors establish or even assert that *any fish* that enters that central or southern Delta has a high probability of being entrained.

Kimmerer and Nobriga note in the abstract of the cited article that “to the extent that fish behave passively, this model is probably suitable for describing Delta-wide movement.”³⁸ Of course, most life stages of most fish do not behave passively, therefore, the model is not suitable to describe their movement in the Delta. The authors acknowledge as much stating, for example, that the PTM results have predictive value with respect to larval delta smelt that exhibit limited or no motility, but that they lack such value with respect to other stages of delta smelt.³⁹ For other fish species that are larger at the time they enter the Delta, such as Chinook and steelhead, there is no indication that the PTM results accurately predict the likelihood of entrainment.

Not only does the Draft Technical Report misrepresent the findings of Kimmerer and Nobriga, it also conveys a misleading level of certainty. In the conclusion of their article, these study authors begin by noting that limitations of the PTM should be borne in mind.⁴⁰ This warning cannot be overlooked due to the explicit limitations of the model that the authors describe in their methods section, including the fact that the authors did not evaluate the extent to which the PTM reliably records the movement of particles, and that the basic formulation of the PTM has not been subjected to peer review.⁴¹ The problem of misrepresentation of scientific findings is particularly vexing because policymakers and the public lack the time, resources, and expertise to gather and review the reference materials cited by staff in support of the Draft Technical Report. For this reason, where, as here, such misrepresentation occurs, staff must be given clear guidance to be both rigorous and objective in presenting any scientific findings that are identified as pertinent to inform the action under consideration.

C. Use of Surrogates.

In the Draft Technical Report, the State Water Board utilizes fall-run Chinook salmon as a surrogate, a substitute species, for steelhead and other undefined native fishes, and uses hatchery Chinook as a surrogate for wild Chinook. It does so without first validating its use of data regarding the surrogate species to predict behavior of other distinct targeted species in response to environmental conditions that act to affect survival and reproduction of those species. By

³⁷ Draft Technical Report at p. 51.

³⁸ Kimmerer and Nobriga (2008) at p. 1.

³⁹ *Id.* at pp. 19-20.

⁴⁰ *Id.* at p. 20.

⁴¹ *Id.* at p. 5.

doing so, the Draft Technical Report fails to assess, interpret, and apply the best available scientific information.

The use of surrogates in conservation planning should be extraordinary, because species are, by definition, biologically distinct. Professor Tim Caro and his colleagues have characterized use of surrogates as a tool of last resort.⁴² Use of surrogates absent validation has drawn unequivocal criticism from biologists.⁴³ And, there is widespread agreement that it is necessary to validate the use of ecological or behavioral data from one species to predict responses of another distinct species to specific environmental conditions.⁴⁴

The use of Chinook salmon as a surrogate for steelhead absent prior validation is facially inappropriate, since these two species have significantly different life histories, biological requirements, and susceptibility to stressors. The Draft Technical Report, itself, identifies numerous differences. The Draft Technical Report, for example, states that juvenile fall-run Chinook rear in freshwater for three to seven months before entering the Pacific Ocean, while juvenile steelhead rear in freshwater for one to three years before emigrating to the Pacific Ocean.⁴⁵ Differences in age, size, and strength during emigration influence the prey base for the species, susceptibility to predation and other causes of mortality, and the duration of emigration. For this reason, the authors of the *VAMP Report of the 2010 Review Panel* made the following statement:

Life history differences between Chinook salmon and steelhead are striking, and we therefore do not believe that performance of acoustic tagged juvenile Chinook salmon provides a reliable basis for inference concerning the potential relations between San Joaquin flow and downstream migration survival of steelhead.⁴⁶

The Independent Panel Review's expert views are relied upon in the Draft Technical Report; therefore, it is unclear why this point – emphatically stated – escaped the attention of the authors of the Draft Technical Report. In any event, it confirms the fact that the State Water Board's use of surrogates in the Draft Technical Report is both conceptually inappropriate and empirically unsupported.

D. Disturbance and Success of Invasive Species.

The Draft Technical Report also states that “[l]ong-term success (i.e. integration) of an invading species is much more likely in an aquatic system, like the SJR, that has been permanently altered by human activity than in a less disturbed system.”⁴⁷ Staff make no attempt to explain how they arrived at this conclusion, and fail to cite to any material scientific findings in support of the conclusion. Throughout the Draft Technical Report, similar declarative

⁴² Caro et al. (2005).

⁴³ Landres (1992); Andelman & Fagan (2000).

⁴⁴ Landres (1992); Wenger (2008).

⁴⁵ Draft Technical Report at pp. 39, 45.

⁴⁶ *VAMP Report of the 2010 Review Panel* at p. 11.

⁴⁷ Draft Technical Report at p. 61.

statements are made without reference to any supporting material.

A priori there is no reason to presume that the claim that invasive species are more likely to persist in a more disturbed system than a less disturbed system is accurate. There is evidence that certain factors, such as salinity and temperature, may influence the success of invasive species.⁴⁸ But the Draft Technical Report does not cite to – and the Coalition are not aware of – any scientific information that supports the declarative statement quoted above. Unless staff is careful to differentiate those declarative statements supported by scientific information from those that are not, policymakers and the public are unlikely to be able to differentiate those conclusions that are actually supported by science from those that are merely speculative.

6. Conclusion.

The Coalition urges the State Water Board to revise the Draft Technical Report to critically analyze and incorporate the best available scientific information, and to comply with the requirements of the Water Code and CEQA, i.e., in a manner that defines a range of alternative SJR Flow and Salinity Objectives that will both provide for the reasonable protection of all designated beneficial uses, and that will avoid or substantially lessen any significant impacts of the proposed amendments to the Bay-Delta Plan. At that point, the Draft Technical Report should be recirculated for public comment and interagency review, and any further amendments should be made in light of the comments received before the Draft Technical Report is subjected to independent scientific peer review.

Thank you for considering the Coalition's comments.

Sincerely,



William D. Phillimore
Board Member

⁴⁸ Gido and Brown (1999) at p. 393 (citing others).

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