

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

similar threats and stressors to the Spring-Run Chinook Salmon, Steelhead, Green Sturgeon, and Delta Smelt that would result from the Tunnels Project.

***The BDCP identifies several threats and stressors to the Central Valley Spring-Run Chinook Salmon, which include flow reductions causing increased water temperature and habitat elimination or degradation due to water conveyance systems.***<sup>123</sup> The BDCP Plan admits that adverse effects of the proposed north Delta diversions on juvenile Spring-Run Chinook Salmon include near-field (physical contact with the screens and aggregation of predators) and far-field (reduced downstream flows).<sup>124</sup> "Plan Area flows have considerable importance for downstream migrating juvenile salmonids and will be affected by the proposed north Delta diversions . . . Because of the north Delta diversions, salmonids migrating down the Sacramento River generally will experience lower migration flows compared to existing conditions. . . As with winter-run Chinook salmon, it was assumed with high certainty that Plan Area flows have critical importance for migrating juvenile spring-run Chinook salmon."<sup>125</sup> Other admitted adverse effects caused by operations of the north Delta diversions include reduced attraction flows in the Sacramento River for migrating adult spring-run Chinook salmon.<sup>126</sup> "Lower river flow downstream of the north Delta intakes under the BDCP may reduce survival of juvenile spring-run Chinook salmon during downstream migration along the Sacramento River and also could negatively affect upstream migration of adult spring-run Chinook salmon by changing attraction flows/olfactory cues."<sup>127</sup> The RDEIR/SDEIS again delivers bleak prospects for the survival of this federally-protected species: "Under Alternative 4A (including climate change effects), there are flow and storage reductions, as well as temperature increases in the Sacramento River that would lead to biologically meaningful increases in egg mortality rates and overall reduced habitat conditions for spawning spring-run and egg incubation."<sup>128</sup>

***The BDCP states that threats and stressors to the Steelhead include water storage and conveyance systems as well as flow reductions contributing to increased water temperatures.***<sup>129</sup> The Plan admits near-field (physical contact with the screens and aggregation of predators) and far-field (reduced downstream flows leading to greater probability of predation) effects of the north Delta diversions on juvenile Sacramento River Region Steelhead.<sup>130</sup> The plan also admits that "Sacramento River attraction flows for migrating adult Sacramento River region steelhead will be lower from operations of the north Delta diversions under the BDCP."<sup>131</sup> The Plan admits that respect to the Feather River, "the reduction in flows in the high-flow channel due to

<sup>123</sup> BDCP EIR-EIS Administrative Draft, p. 11A-83, 11A-76 (March 2013).

<sup>124</sup> Bay Delta Conservation Plan, Chapter 5, p. 5. 4-16; see also RDEIR/SDEIS, Section 4.3, p. 4.3.7-79, lines 15-17.

<sup>125</sup> Bay Delta Conservation Plan, Chapter 5, p. 5. 4-17; BDCP Appendix 5C, Tables C.A-41 and C.A-42; see also RDEIR/SDEIS, Section 4.3, Figures 4.3.2-7 and 4.3.2-8.

<sup>126</sup> Bay Delta Conservation Plan, Chapter 5, p. 5. 4-19.

<sup>127</sup> Bay Delta Conservation Plan, Chapter 5, p. 5. 4-20.

<sup>128</sup> RDEIR/SDEIS, Section 4.3, p. 4.3.7-98.

<sup>129</sup> BDCP EIR-EIS Administrative Draft, p. 11A-129, 11A-133 (March 2013).

<sup>130</sup> Plan, Chapter 5, 5. 6-11; see also RDEIR/SDEIS, p. 4.3.7-199, lines 1-6.

<sup>131</sup> Plan, Chapter 5, 5. 6-13; BDCP Appendix 5C, Tables C.A-41 and C.A-42; see also RDEIR/SDEIS, Section 4.3, Figures 4.3.2-7 and 4.3.2-8.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

BDCP would reduce conditions in an already unsuitable habitat.<sup>132</sup> The RDEIR/SDEIS states: "In general, Alternative 4A would degrade the quantity and quality of rearing habitat for steelhead relative to Existing Conditions."<sup>133</sup>

***The BDCP identifies increased water temperatures and habitat loss as threats and stressors to the Green Sturgeon.***<sup>134</sup> With respect to admitted adverse effects, the Plan admits that flow changes will reduce transport and migration flows in the Feather River and Plan area.<sup>135</sup> "As such [reduction in early fall releases], average in stream flows during some months of the three periods identified above (June-September, August-October, August-June) are expected to substantially decline in the Feather River at Thermalito and moderately decline in the Sacramento River at Verona under the BDCP, especially for the LOS [low-outflow scenario] (Appendix 5.C, flow, passage, salinity, and turbidity, section 5.C.5.3.3, High Outflow and Low Outflow Scenarios)."<sup>136</sup> Also, the plan admits that "there is [on the Feather River] the potential for appreciable change in the Feather River as a result of operational differences between the BDCP scenarios and future conditions without the BDCP (EBC<sub>2</sub>\_LLT)."<sup>137</sup> The RDEIR/SDEIS states: "In general, Alternative 4A would reduce the quantity and quality of rearing habitat for larval and juvenile green sturgeon relative to Existing Conditions."<sup>138</sup>

***The BDCP identifies several threats and stressors to the Delta Smelt, including water exports and increased water temperature.***<sup>139</sup> Admitted adverse effects caused by the BDCP north Delta intakes include reducing the quantity of sediment entering the Plan Area thus increasing water clarity and negatively affecting delta smelt.<sup>140</sup> Greater water residence time from changes in water operations will likely increase the toxic blue-green alga *Microcystis* having both direct and indirect effects on the smelt.<sup>141</sup> North Delta intakes' operations will introduce and increase entrainment and impingement of Delta smelt as well as introduce and increase predation hotspots in and around the new intakes.<sup>142</sup>

In 2013, NMFS reiterated its previous "Red Flag" comment that the Tunnels Project threatens the "potential extirpation of mainstem Sacramento River Populations of winter-run and spring-run Chinook salmon over the term of the permit ...."<sup>143</sup> The U.S. Environmental Protection Agency

<sup>132</sup> Plan, Chapter 5, pp. 6-16.

<sup>133</sup> RDEIR/SDEIS, Section 4.3, p. 4.3.7-22.

<sup>134</sup> BDCP EIR-EIS Administrative Draft, 11A-162-165 (March 2013).

<sup>135</sup> Plan, Chapter 5. pp. 8-17 through 8-24.

<sup>136</sup> Plan, Chapter 5. 5. p. 8-18.

<sup>137</sup> Plan, Chapter 5, 5. p. 8-24.

<sup>138</sup> RDEIR/SDEIS, Section 4.3, p. 4.3.7-296.

<sup>139</sup> BDCP EIR-EIS Administrative Draft, p. 11A-8-11 (March 2013).

<sup>140</sup> Plan, Chapter 5, p. 5. 1-30; see also RDEIR/SDEIS, Section 4.3, p. 4.3.7-26, 4.3.7-29.

<sup>141</sup> Plan, Chapter 5, p. 5. 1-32; BDCP, Appendix 5C, p. 5.4-14; RDEIR/SDEIS, Chapter 8, Table 8-60a.

<sup>142</sup> RDEIR/SDEIS, Section 4.3, p. 4.3.7-24, lines 4-7.

<sup>143</sup> NMFS Progress Assessment and Remaining Issues Regarding the Administrative Draft BDCP Document, Section 1.17, 12, April 4, 2013.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

(EPA) has called for alternatives addressing “the need for water availability and greater freshwater flow through the Delta.”<sup>144</sup> Likewise, the Army Corps of Engineers, State Water Resources Control Board, and USFWS scientists also raised concerns regarding the BDCP’s impacts on water quality and impacts to endangered and threatened species.<sup>145</sup>

However, comments from other federal agencies were ignored. In April 2015, the claimed habitat conservation elements of the BDCP have been dropped or drastically pared back in the switch from the BDCP to the “California WaterFix.” As just one example, the plan to provide “65,000 acres of tidal wetland restoration” has been eviscerated to merely “59 acres of tidal wetland restoration.”<sup>146</sup> Consequently, the current Tunnels Project is *even more of a threat* to fish species and their habitat compared to the previous version that resulted in the concerns raised then by the EPA, Army Corps of Engineers, State Water Resources Control Board, and NMFS and USFWS scientists.

“The goal of the ESA is not just to ensure survival but to ensure that the species recover to the point it can be delisted.”<sup>147</sup> Pursuant to the commands of the ESA, each Federal agency “shall... insure that any action authorized, funded, or carried out by such agency... is not likely to jeopardize the continued existence of any endangered or threatened species *or result in the destruction or adverse modification of [critical] habitat of such species . . .*”<sup>148</sup> “[T]he purpose of establishing ‘critical habitat’ is for the government to carve out territory that is not only necessary to the species’ survival but also essential for the species’ recovery.”<sup>149</sup> Also, “existing or potential conservation measures outside of the critical habitat cannot properly be a substitute for the maintenance of critical habitat that is required by Section 7 [of the ESA, 16 U.S.C § 1536].”<sup>150</sup>

Taking the fresh water flows and safe refuge away from endangered and threatened fish species would neither insure their survival nor insure their recovery and delisting. On-the-ground habitat restoration is not a lawful substitute under the ESA for maintaining existing critical habitat of and in the waters of the Sacramento River, sloughs, and Delta. The reduction of water and flows, increased residence times of water, and increased water temperature are adverse modifications of their critical habitat. Approval of the BDCP would violate the ESA. The Tunnels Project is thus not permissible under the ESA.<sup>151</sup>

<sup>144</sup> EPA Letter, August 26, 2014, p. 2.

<sup>145</sup> We briefly summarized some of these agencies comments in our July 22, 2015 letter (at pp. 8-10) to you.

<sup>146</sup> RDEIR/SDEIS, Executive Summary, p. ES-17. Emphasis added.

<sup>147</sup> *Alaska v. Lubchenko*, 723 F.3d 1043, 1054 (9th Cir. 2013), citing *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service*, 378 F.3d 1059, 1070 (9th Cir. 2004).

<sup>148</sup> 16 U.S.C. § 1536(a)(2). Emphasis added.

<sup>149</sup> *Gifford Pinchot*, 378 F.3d 1059, 1070.

<sup>150</sup> *Gifford Pinchot*, 378 F.3d 1059, 1076.

<sup>151</sup> We have brought the impermissibility of the Tunnels Project given the substantive prohibitions of the ESA and the related procedural ESA and NEPA violations to the attention of Reclamation and DWR on numerous occasions for more than two years now. These prior communications include the FOR letters of June 4, September 25 and November 18, 2013, January 14, March 6, May 21, and July 29 (including pp. 10-11), 2014, EWC letter of June 11, 2014 (including pp. 29-30) and our recent joint letters of July 16 (requesting an extension of time to comment), and July 22 (alternatives), 2015. We also addressed these issues in our meeting with federal agency representatives in Sacramento on November 7, 2013.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

**Reclamation is Presently Violating both NEPA and ESA Procedure by Failing to Issue a Draft EIR/EIS Concurrently with and Integrated with ESA Required Biological Assessments and Biological Opinions.** Fortunately, the ESA obligates federal agencies “to afford first priority to the declared national policy of saving endangered species.”<sup>152</sup> Despite that, Reclamation has failed to prepare a Biological Assessment pertaining to its action and has failed to initiate consultation with USFWS and NMFS even though Biological Assessment preparation and initiation of consultation are required by the ESA.<sup>153</sup> The RDEIR/SDEIS concedes that “formal consultation under ESA Section 7” will be necessary.<sup>154</sup>

Section 7 of the ESA (16 U.S.C. § 1536(a)(4) requires that “Should the agency find that its proposed action *may* affect a listed species or critical habitat, it must formally or informally consult with the Secretary of the Interior, or his or her delegatee [USFWS and/or NMFS].”<sup>155</sup> “Formal consultation is required when the acting agency or consulting agency determines that the proposed action is *likely* to adversely affect a listed species or critical habitat.”<sup>156</sup> Formal consultation requires the consulting agency . . . to issue a biological opinion stating whether the proposed action is likely to jeopardize such species or habitat.”<sup>157</sup>

ESA Regulations (50 C.F.R. § 402.14(a)) require that “Each Federal agency shall review its actions *at the earliest possible time* to determine whether any action may affect listed species or critical habitat. If such a determination is made, formal consultation is required. . . .”<sup>158</sup> The Ninth Circuit Court of Appeals has repeatedly held that: “Any possible effect, whether beneficial, benign, adverse or of an undetermined character, triggers the formal consultation requirement.”<sup>159</sup>

Even ardent advocates for the Tunnels Project who prepared the 48,000 pages of BDCP and Tunnels Project documents do not contend that taking large quantities of water away from the Sacramento River, sloughs, and Delta will not have “any possible effect, whether beneficial, benign, adverse or of an undetermined character” on the endangered and threatened fish species or their habitat. Not surprisingly, no preposterous claim of “no possible effect” is made in the Draft EIR/EIS or RDEIR/SDEIS. But instead of reviewing the proposed Tunnels Project at the earliest possible time, Reclamation delays ESA review until some unspecified and unacknowledged future time.

NEPA regulations require that “To the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with environmental impact

<sup>152</sup> *Tennessee Valley Authority v. Hill*, 437 U.S. 153, 185 (1978).

<sup>153</sup> See RDEIR/SDEIS, Chapter 1, p. 1-15 (under “Section 7 of the Endangered Species Act”).

<sup>154</sup> *Id.*

<sup>155</sup> *Jewell*, 747 F.3d 581, 596. Emphasis in decision.

<sup>156</sup> 50 C.F.R. §§ 402.13, 402.14.

<sup>157</sup> 16 U.S.C. § 1536(b); 50 C.F.R. § 402.14.

<sup>158</sup> *Karuk Tribe of California v. U.S. Forest Service*, 681 F.3d 1006, 1020 (9th Cir. 2012) (en banc)(emphasis added), cert. denied, 133 S.Ct. 1579 (2013).

<sup>159</sup> *Western Watersheds Project v. Kraayenbrink*, 620 F.3d 1187, 1210 (9th Cir. 2010). *Accord, Karuk Tribe*, 681 F.3d 1006, 1027; *Cal. ex rel. Lockyer v. U.S. Dep’t of Agric.*, 575 F.3d 999, 1018 (9th Cir. 2009).

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

analyses and related surveys and studies required by the... Endangered Species Act...."<sup>160</sup> "The [ESA] regulations also acknowledge that the agencies are expected to concurrently comply with both Section 7 of the ESA and NEPA.<sup>161</sup> Consequently, against this threat of extinction, conducting the draft EIS public review and comment stage without Biological Assessments or Biological Opinions leaves the public in the dark and violates both the ESA and NEPA. In the absence of the ESA required analyses, the draft EIS/EIR is "so inadequate as to preclude meaningful analysis" in violation of NEPA.<sup>162</sup>

Reclamation has violated the "at the earliest possible time" ESA mandate and the "concurrently with and integrated with" NEPA mandate by prematurely issuing the Draft EIR/EIS and now the REDIR/ SDEIS attempting to hide from the reviewing public the critical pertinent information and analyses that would be supplied by the missing Biological Assessments and Biological Opinions. New upstream diversions of large quantities of water from the Sacramento River will undeniably "affect" the listed fish species and their critical habitats.

**The public now has what it does not need:** unsupported advocacy from the consultants speculating that the adverse effects will be offset or that the effects will not really be all that adverse. **The public does not have what it does need:** the federal agency Biological Assessments and Biological Opinions required by the ESA and NEPA.<sup>163</sup>

Evasion of ESA obligations by Reclamation is both extreme and deliberate. Reclamation has on August 26, 2015, joined with DWR in submitting a change petition to the State Water Resources Control Board to add three new points of diversion and rediversion to state and federal water right permits for the Tunnels Project. The change petition recites that "The proposed project reflects the culmination of a multiyear planning process that began in 2006 .."<sup>164</sup> The passage of nine years without a biological opinion for the Tunnels Project makes a mockery of the ESA requirement to commence ESA review "at the earliest possible time." Because of the absence of the ESA-required Biological Assessments and Biological Opinions, Reclamation feels free to make the demonstrably false representation in the petition that "The California WaterFix would result in substantially improved conditions in the Delta for endangered and threatened species and afford greater water supply reliability for the state."<sup>165</sup>

<sup>160</sup> 40 C.F.R. § 1502.25(a).

<sup>161</sup> See 50 C.F.R. § 402.06 ('Consultation, conference, and biological assessment procedures under section 7 may be consolidated with interagency cooperation procedures required by other statutes, such as the National Environmental Policy Act (NEPA).'). *Jewell*, 747 F.3d 581, 648. "ESA compliance is not optional," and "an agency may not take actions that will tip a species from a state of precarious survival into a state of likely extinction." *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 524 F.3d 917, 929-30 (9th Cir. 2008).

<sup>162</sup> 40 C.F.R. § 1502.9(a). The CEQA rule is the same. Recirculation is required where feasible project alternatives were not included in the Draft EIR. CEQA Guidelines, 14 Cal. Code Regs., § 15088.5(a), or when "The draft EIR was so fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded." CEQA Guidelines, § 15088.5(a)(4).

<sup>163</sup> "The ESA requires an agency to use 'the best scientific and commercial data available' when formulating a BiOp." *Locke*, 776 F.3d 971, 995. "The purpose of the best available science standard is to prevent an agency from basing its action on speculation and surmise." *Locke*, 776 F.3d at 995.

<sup>164</sup> Petition cover letter, p. 1.

<sup>165</sup> Petition cover letter, p. 2.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

Red flag comments and the Record so far have made it clear that there is at minimum significant uncertainty about whether the Tunnels Project is even permissible under the ESA. This critical issue cannot be resolved until the Biological Assessments and Opinions have been completed.

Reclamation has not obtained the determination pursuant to ESA-required consultation whether the RDEIR/SDEIS “preferred alternative”—the Tunnels Project—is even lawful or feasible.

Against this threat of extinction from known stressors and negative effects on the critical habitat, conducting the NEPA environmental draft process prior to and in a vacuum from the ESA consultation process violates the ESA command to carry out the ESA process “at the earliest possible time” and violates the NEPA command to conduct the NEPA and ESA processes “concurrently” and in an “integrated” manner. This also constitutes unlawful piece-mealing or segmenting of the NEPA process from the ESA required analyses of the jeopardy and habitat threats posed by the proposed Tunnels Project.

***Reclamation is Proceeding in the Absence of the “Reasonable and Prudent Alternatives” that Must be Developed and Identified pursuant to the ESA.*** Reclamation and DWR have ignored repeated warnings and suggestions made to them over the years by public agencies including the EPA, U.S. Army Corps of Engineers, and State Water Resources Control Board, by the National Academy of Sciences and by the Environmental Water Caucus (EWC) of the failure of the BDCP documents including the Draft EIR/EIS and the new RDEIR/SDEIS to include a reasonable range of alternatives increasing freshwater flows through the Delta by reducing exports and not including new upstream conveyance.<sup>166</sup>

Beyond ignoring the NEPA alternatives mandate, expert government agencies, the Academy and the EWC, Reclamation is also ignoring the crystal clear prohibitions and mandates of the ESA and NEPA. The previous section set forth the procedural ESA requirements for consultation “at the earliest possible time” and the procedural NEPA requirements for the NEPA Draft EIS to be prepared “concurrently with and integrated with” the analyses required by the ESA.

There is more. Under Section 7 of the ESA, 16 U.S.C. § 1536(b)(3)(A), after consultation “If it appears that an action may affect an endangered or threatened species, the consulting agency must provide a biological opinion to the action agency explaining how the action ‘affects the species or its critical habitat.’ *Id.* § 1536(b)(3)(A). When a biological opinion concludes that the action is likely to jeopardize an endangered or threatened species, or adversely modify its habitat, then the consulting agency must suggest ‘reasonable and prudent alternatives [RPA].’ *Id.*<sup>167</sup> The consulting agency “in the course of proposing an RPA, must insure that the RPA does not jeopardize the species or its habitat.”<sup>168</sup>

EWC member groups wrote to state and federal officials that Reclamation and DWR had to drop the attempt to sell the Tunnels Project as part of a habitat conservation plan.<sup>169</sup> The USFWS and NMFS scientists were unwilling to find falsely that the Tunnels Project would not be harmful to endangered species of fish and their habitat. The RDEIR/SDEIS euphemizes this as “difficulties in

<sup>166</sup> Letter of EWC member groups to state and federal officials, July 22, 2015. Accessible at <http://restoretthedelta.org/wp-content/uploads/2015/09/7-22-15-BDCP-alts-ltr-pdf.pdf>.

<sup>167</sup> *Cottonwood Envtl. Law Ctr. v. U.S. Forest Serv.*, 789 F.3d 1075, 1085 (9th Cir. 2015). *Accord, Jewell*, 747 F.3d 581, 596; *Locke*, 776 F.3d 971, 988.

<sup>168</sup> *Jewell*, 747 F.3d 581, 636.

<sup>169</sup> *Id.*, p. 10.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

assessing species status and issuing assurances over a 50 year period ..."<sup>170</sup> In fact, for more than three years, federal scientists have issued "Red Flag" warnings that the Tunnels Project threaten the "potential extirpation of mainstem Sacramento River populations of winter-run and spring-run Chinook salmon over the term of the permit," contrary to publicity claims made for the project.

At this time, the Draft EIR/EIS and RDEIR/SDEIS alternatives and alternatives analyses are of no value whatsoever to either decision-makers or the public. This appears to be a deliberate effort on the part of Reclamation and DWR to evade the solemn legal obligation to develop in a Draft EIR/EIS for public review and comment a reasonable range of alternatives including ones that would increase freshwater flows through the Delta by reducing exports and that would not include new upstream conveyance. A central feature of this intentional violation of procedural requirements is premature issuance by Reclamation of the Draft EIR/EIS and RDEIR/SDEIS on the one hand, while with the other hand, Reclamation has deliberately failed to prepare a timely Biological Assessment and initiate formal ESA consultation with USFWS and NMFS.<sup>171</sup>

**Other Ecological Issues.** The Bay Delta Conservation Plan fails to provide adequate assurances that its biological goals and objectives will be implemented and used to hold the Applicants accountable for making progress towards recovery of listed species and minimizing incidental take, as well as compliance with the terms of the implementing agreement and incidental take permit terms.

Last year, the BDCP failed to provide adequate assurances that its Section 10-based biological goals and objectives will be implemented.<sup>172</sup> This year, the Tunnels Project alternatives of the RDEIR/SDEIS, having removed Section 10 habitat conservation plan obligations, will leave the biological ecological issues we identified completely unaddressed.

In the absence of any biological opinions for listed species for both the Bay Delta Conservation Plan and the 2015 Tunnels Project alternatives the full scope of the alternatives and their necessary mitigations are unknown, and therefore the description of alternatives is incomplete. This renders the RDEIR/SDEIS inadequate, and must be recirculated once the biological opinions as to both jeopardy of listed species and reasonable and prudent alternatives are known.

Also, California EcoRestore is supposed to take up some of the ecological and habitat restoration functions from BDCP relative to the 2015 Tunnels Project alternatives. But this too goes unaddressed in the RDEIR/SDEIS. It should be addressed in Cumulative Impacts, but is not. California EcoRestore's role in the RDEIR/SDEIS is highly ambiguous. As a cumulative project (that is, one that is reasonably foreseeable), then omission of its analysis from the RDEIR/SDEIS renders the latter document premature and inadequate to the task assigned it under CEQA and NEPA.

There is also gaping ambiguity on the relationship of California EcoRestore to the eventual content of Section 7 biological opinions for listed Delta smelt and salmonids. In BDCP, this ambiguity was at least partially addressed by the Decision Tree hypotheses last year. This year, vastly reduced restoration is expected, and limited to requirements already imposed by the existing 2008 and 2009 biological opinions, according to the RDEIR/SDEIS.

<sup>170</sup> RDEIR/SDEIS, Section 1, pp. 1-2.

<sup>171</sup> The same is true for DWR and Bureau of Reclamation filing applications for 401 certification and changes to points of diversion of state and federal water project water right permits with the State Water Resources Control Board, and for dredge and fill permit (Section 404) with the US Army Corps of Engineers.

<sup>172</sup> EWC Comment Letter, June 11, 2014, pp. 38-44.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

**Flawed Habitat Restoration Hypothesis for Increasing Food Web Productivity.** The Tunnels Project alternatives this year withdraw from any pretense of additional habitat restoration beyond that already required of the DWR and Bureau. What becomes of actions, such as increased flow and other possible management strategies, to address nonnative invasive clams (particularly *Potamocorbula*), as we discussed last year, is gapingly ambiguous. Hopefully, it will at least be addressed in the new Section 7 biological opinions, but these are as yet unavailable. The extent to which the biological opinions will address last year's "habitat for flow" hypothesis (which we characterized then as "magical thinking") remains unknown at this time, another omission rendering the RDEIR/SDEIS inadequate. Without the biological opinions, the supposed "environmental commitments" are wishes and prayers at this time, since vettings by the NMFS and USFWS and California Department of Fish and Wildlife are not completed.

Freshwater flow expands native fishes' critical habitat in and through the Delta. **And** it pushes the nonnative *Potamocorbula* westward, putting greater distance between its range and the presence of pelagic food webs and nutrients in Suisun Bay and the western Delta used by native estuarine species and juvenile and smolting salmon migrating to sea.<sup>173</sup>

***The Tunnels Project alternatives continue to fail to prevent jeopardy to listed fish species under the Endangered Species Acts. Tunnels Project incidental take permissions should be rejected by the state and federal fishery agencies.***

### **Clean Water Act Violations**

***The Tunnels Project will violate water quality standards for flow and other parameters, preventing necessary Clean Water Act Section 401 certification.*** The California Department of Water Resources and the United States Bureau of Reclamation filed an application for a CWA Section 404 dredge and fill permit with the US Army Corps of Engineers on August 24, 2015, and they filed an application for a 401 certification on September 23, 2015 with the State Water Resources Control Board (SWRCB).<sup>174</sup> The 404 permit will be needed from the Army Corps of Engineers because construction of the Tunnels Project will result in discharges of dredge or fill material into waters of the United States.<sup>175</sup> Section 401 requires that the SWRCB certify that the Corps' Section 404 permit meets CWA requirements before the permit may be legally issued.<sup>176</sup> State and federal

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<sup>173</sup> *Id.*, pp. 41-42.

<sup>174</sup> Accessed September 15, 2015, at <http://www.spk.usace.army.mil/Media/RegulatoryPublicNotices/tabid/1035/Article/616568/spk-2008-00861-california-waterfix-project.aspx>.

<sup>175</sup> "Many of the actions that will be implemented under the Tunnels Project will result in the discharge of dredged or fill materials into waters of the United States and will need to be authorized by USACE." Public Draft Plan § 1.3.7.1 (Nov. 2013), available at: <http://baydeltaconservationplan.com/Libraries/Dynamic Document Library/Public Draft BDCP Chapter 1 - Introduction.sflb.ashx>. This is no less true of intake construction of the "California WaterFix" version (Alternative 4A) of the Tunnels Project.

<sup>176</sup> "No license or permit shall be granted until the certification required by this section has been obtained or has been waived as provided in the preceding sentence. No license or permit shall be granted if certification has been denied by the State, interstate agency, or the Administrator, as the case may be." 33 U.S.C. § 1341(a)(1).

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

agencies have long recognized the importance of this requirement, meeting several times to discuss it in the context of the preparation of the Tunnels Project EIR/EIS.<sup>177</sup>

In the Administrative Draft of the Bay Delta Conservation Plan issued in March 2013, the conservation strategy announced: "*The BDCP will fundamentally alter the hydrodynamics of the Delta.*"<sup>178</sup> This sentence has since been toned down to read, "The BDCP will modify the hydrodynamics (i.e., tidal flows) in the Delta channels," but the original formulation is truer.<sup>179</sup> Overall, says BDCP, east to west flows will increase; the frequency and magnitude of reverse flows in Old and Middle River will decrease because of reduced south Delta pumping in most water year types. In the north Delta, flow patterns will "change" from increased diversions to Yolo Bypass with the proposed modifications to Fremont Weir. BDCP states:

These changes in flow patterns in the north Delta present ecosystem-level tradeoffs between habitat in the Yolo Bypass and the Sacramento River during the winter-spring migration period, resulting in both positive and negative effects on the migration and passage of fish through and within the Delta...<sup>180</sup>

This year, the Tunnels Project, freed from habitat and ecosystem restoration encumbrances, is touted to accomplish what BDCP apparently could not:

The ecological problems with the current system could be greatly reduced by the construction and use of new north Delta intake structures with state-of-the-art fish screens.<sup>181</sup>

Although Alternatives 4A, 2D, and 5A comprise only the conveyance facilities and operations that formerly constituted [Conservation Measure 1] under BDCP alternatives, and no longer include habitat restoration beyond what is needed to provide full mitigation under CEQA and NEPA, habitat restoration is still recognized as a critical component of the state's long-term plans for the Delta. Habitat restoration in the Delta beyond these alternatives' mitigation requirements will occur separately through implementation of California EcoRestore, and these activities will be further developed and evaluated independent of the water conveyance facilities.<sup>182</sup>

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<sup>177</sup> As reflected by U.S. EPA in its comments on these discussions: "[a]lthough there is no statutory requirement that the NEPA document prepared for an HCP under the Endangered Species Act be used as the basis for permits and certifications required under CWA §404 to authorize and implement the project, EPA recognizes the importance of coordination in federal review. Toward this end, EPA and the Corps have met with the project proponent on numerous occasions over the past several years in the interest of using the BDCP EIS/EIR to inform the Corps' 404 regulatory decisions. Despite these efforts, significant unresolved issues remain about the scope of analysis for the proposed project, the level of detail required to trigger the consultation process and federal permitting, and the structure of a comprehensive permitting framework for the proposed project." U.S. EPA, "EPA's Comments on BDCP ADEIS," p. 6 (July 03, 2013), available at: [www2.epa.gov/sites/production/files/documents/july3-2013-epa-comments-bdcp-adeis.pdf](http://www2.epa.gov/sites/production/files/documents/july3-2013-epa-comments-bdcp-adeis.pdf).

<sup>178</sup> Administrative Draft of the Bay Delta Conservation Plan, March 2013, Chapter 5, *Effects Analysis*, p. 5.3-2, line 23. Emphasis added.

<sup>179</sup> Bay Delta Conservation Plan, November 2013, Chapter 5, *Effects Analysis*, p. 5.3-2, line 23.

<sup>180</sup> *Ibid.*, p. 5.3-2, lines 34-37.

<sup>181</sup> RDEIR/SDEIS, Executive Summary, p. ES-2, lines 1-2.

<sup>182</sup> RDEIR/SDEIS, Executive Summary, p. ES-8.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

**These stated rationales** attributing ecological and biological benefits to fish from the Tunnels Project **are, like last year's BDCP Conservation Measure 1, still claptrap.** On one hand, the Tunnels Project will increase exports and the Delta's loss of outflow at the same time, both wet and above normal years.<sup>183</sup> (Moreover, in drought years, the Bureau and the Department typically petition the State Water Board to have Delta water quality objectives waived, and the Board grants this request. There is little reason to believe the Tunnels Project would change the outcome.)

**The project reduces Delta freshwater flow conditions in violation of CWA requirements to fully protect the most sensitive beneficial uses.** The inadequate flow proposals of the Tunnels Project EIR/EIS alternatives will ensure that its implementation trips over mandatory compliance with the CWA. Flow regimes that fully protect Delta ecosystems and aquatic species are necessary to avoid this result.

CWA regulations dictate that adopted criteria must protect the "most sensitive" beneficial use.<sup>184</sup> The SWRCB's August 2010 flow criteria report used science to identify the *minimum* amount of unimpaired flow that would protect Delta fish species and habitats. That report thus reflects flows needed to comply with CWA mandates. A new Bay-Delta Plan adopting the Tunnels Project's proposed flow regimes would fall significantly short of this benchmark, and thereby would fail to protect the most sensitive beneficial uses as required by the CWA.

Instead of improving flow conditions in the Delta, the Tunnels Project will actually *increase* average exports<sup>185</sup> and *reduce* already inadequate Delta outflow in many months. Specifically, on average for February through June, the Tunnels Project would *decrease* Delta outflow by about 1,000 cubic feet per second and also *decrease* the median Delta outflow by about 2,000 cfs.<sup>186</sup> For the period of January through June (the time period during which the August 2010 Flow Criteria from the SWRCB called for an increase of outflow to 75 percent of unimpaired Delta outflow), the BDCP *decreases* outflow. Tunnels Project modeling (Figure 1) shows that long-term monthly average Sacramento River flows below the north Delta intake diversions would *decrease* between 6 to 38 percent from current and future flows without the Tunnels project, and in wet years river flows would decrease between 7 and 42 percent (Tables 3 and 4). Overall, monthly lower Sacramento River flows are projected by "California WaterFix" to decrease between 20 and 24 percent, and flows in the Sacramento River at Rio Vista are expected to decrease significantly (Figures 2 and 3).<sup>187</sup>

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<sup>183</sup> We take up the matter of BDCP's unacknowledged purpose of expanding opportunities for cross-Delta water market transfers in Section VI of this comment letter.

<sup>184</sup> 40 CFR § 131.11 ("For waters with multiple use designations, the criteria shall support the most sensitive use"); see also 40 CFR §131.6.

<sup>185</sup> See Public Draft Plan, App. 5B, Fig. 5.B.4-4, available at: <http://baydeltaconservationplan.com/Libraries/Dynamic Document Library/Public Draft BDCP EIREIS Appendix 5B - Responses to Reduced South of Delta Water Supplies.sflb.ashx>. See also BDCP/California WaterFix, RDEIR/SDEIS, 2015, Section 4.3.1, Figures 4.3.1-15, -16, -18, -19, -20, and -21.

<sup>186</sup> See Public Draft Plan, App. 5C, Attachment 5.C.A, Table C.A-41, available at: <http://baydeltaconservationplan.com/Libraries/Dynamic Document Library/Public Draft BDCP Appendix 5C - Part 5 - Flow Passage Salinity and Turbidity.sflb.ashx>.

<sup>187</sup> Estimates derived by Restore the Delta from graphical analysis interpolating data in Figures 4.3.2-7 and 4.3.2-8 from the Recirculated Draft EIR/EIS, Section 4.3.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

**Figure 1**  
**Sacramento River Flow Downstream of North Delta Intakes for Alternative 4A, Long-Term and Wet Year Averages**

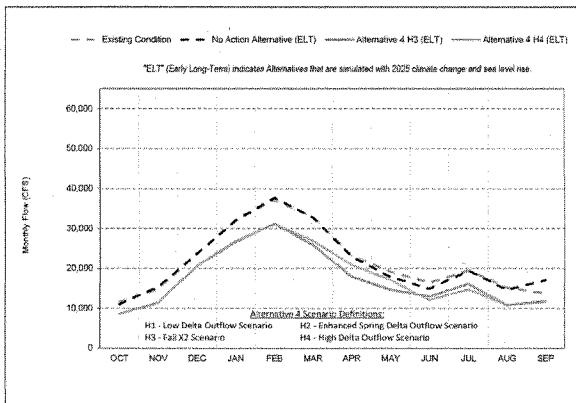


Figure 4.3.2-8

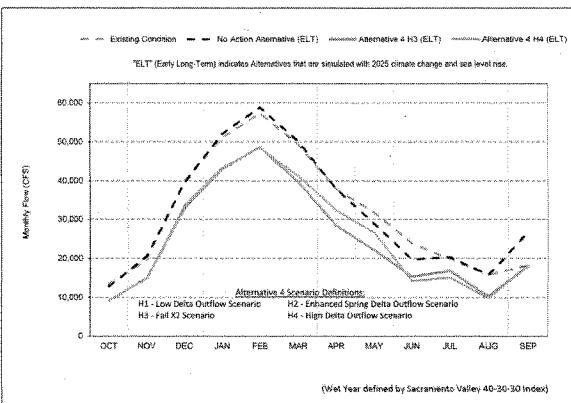


Figure 4.3.2-7

Source: RDEIR/SDEIS, Section 4.3.

**Table 3**  
**Monthly Long-Term Average Estimates of Flow for Lower Sacramento River Downstream of North Delta Intakes Interpolated from Figure 4.3.2-8**

	Existing Conditions	No Action Alternative	Alt 4A - Scenario H3	Alt 4A - Scenario H4	% Change EC to H3	% Change EC to H4	% Change from NAA to H3	% Change from NAA to H4
October	11,667	11,333	8,667	8,667	-26%	-26%	-24%	-24%
November	15,333	16,000	11,667	11,667	-24%	-24%	-27%	-27%
December	23,333	23,333	20,667	20,667	-11%	-11%	-11%	-11%
January	36,000	36,000	25,667	25,667	-29%	-29%	-29%	-29%
February	37,000	37,667	31,333	31,333	-15%	-15%	-17%	-17%
March	33,000	33,000	26,333	27,333	-20%	-17%	-20%	-17%
April	23,333	23,667	14,667	21,000	-37%	-10%	-38%	-11%
May	19,000	18,000	14,667	17,000	-23%	-11%	-19%	-6%
June	16,667	15,000	13,000	12,000	-22%	-28%	-13%	-20%
July	19,333	19,333	16,000	14,667	-17%	-24%	-17%	-24%
August	15,333	15,000	11,000	11,000	-28%	-28%	-27%	-27%
September	14,000	17,000	11,667	11,667	-17%	-17%	-31%	-31%
Average	22,000	22,111	17,111	17,722	-22%	-20%	-23%	-20%

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

**Table 3**  
**Monthly Long-Term Average Estimates of Flow for Lower Sacramento River Downstream of North Delta Intakes Interpolated from Figure 4.3.2-8**

Existing Conditions	No Action Alternative	Alt 4A - Scenario H3	Alt 4A - Scenario H4	% Change EC to H3	% Change EC to H4	% Change from NAA to H3	% Change from NAA to H4
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Source: Bay Delta Conservation Plan/California WaterFix Recirculated Draft EIR/EIS, Section 4.3, Figure 4.3.2-8; Restore the Delta.

**Table 4**  
**Monthly Wet Year Average Estimates of Flow for Lower Sacramento River Downstream of North Delta Intakes Interpolated from Figure 4.3.2-7**

	Existing Conditions	No Action Alternative	Alt 4A - Scenario H3	Alt 4A - Scenario H4	% Change from EC to H3	% Change from EC to H4	% Change from NAA to H3	% Change from NAA to H4
October	13,333	12,667	9,000	9,000	-33%	-33%	-29%	-29%
November	20,000	21,000	14,667	14,667	-27%	-27%	-30%	-30%
December	40,000	40,000	33,333	34,000	-17%	-15%	-17%	-15%
January	51,333	52,000	42,667	43,333	-17%	-16%	-18%	-17%
February	56,667	55,333	48,000	48,000	-15%	-15%	-13%	-13%
March	49,333	50,000	39,333	41,333	-20%	-16%	-21%	-17%
April	38,333	38,333	28,667	32,667	-25%	-15%	-25%	-15%
May	32,000	28,667	22,000	26,667	-31%	-17%	-23%	-7%
June	24,000	20,000	14,667	14,000	-39%	-42%	-27%	-30%
July	20,000	20,333	16,667	15,000	-17%	-25%	-18%	-26%
August	16,000	16,000	10,667	10,000	-33%	-38%	-33%	-38%
September	18,000	25,333	18,000	18,000	0%	0%	-29%	-29%
<b>Average</b>	<b>31,583</b>	<b>31,639</b>	<b>24,806</b>	<b>25,556</b>	<b>-23%</b>	<b>-21%</b>	<b>-24%</b>	<b>-22%</b>

Source: Bay Delta Conservation Plan/California WaterFix Recirculated Draft EIR/EIS, Section 4.3, Figure 4.3.2-7; Restore the Delta.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

**Figure 2**  
**Flow Differences in the Sacramento River Below the North Delta Diversion Facilities - by Water Year Type and Monthly Averages**

Supplemental Modeling Results for New Alternatives

**Table B.7-2B. Differences\* (Percent Differences) between Pairs of Model Scenarios for the Sacramento River Downstream of the North Delta Diversion Facility, Year-Round**

Alternative 4A ELT: In Delta—Sacramento River Downstream of North Delta Diversion Facility					
Month	Water Year Type	EXISTING CONDITIONS vs. H3 ELT	NAA ELT vs. H3 ELT	EXISTING CONDITIONS vs. H4 ELT	NAA ELT vs. H4 ELT
JAN	W	-0.039 (-5.8%)	-0.041 (-37.4%)	-7.770 (-32.2%)	-8.772 (-16.9%)
	AN	-7.749 (-19.4%)	-6.592 (-17.0%)	-7.426 (-16.8%)	-6.529 (-16.8%)
	BN	-5.110 (-21.5%)	-4.441 (-29.2%)	-4.881 (-29.5%)	-4.231 (-19.2%)
	D	-2.362 (-13.5%)	-2.328 (-13.4%)	-2.271 (-1.3%)	-2.347 (-12.9%)
	C	-1.693 (-1.0%)	-1.724 (-1.1%)	-1.593 (-11.1%)	-1.818 (-12.5%)
FEB	W	-0.445 (-15.1%)	-0.218 (-17.3%)	-0.784 (-15.3%)	-1.035 (-17.4%)
	AN	-6.358 (-13.9%)	-5.592 (-16.2%)	-6.931 (-15.2%)	-5.168 (-17.4%)
	BN	-6.740 (-21.1%)	-6.501 (-20.5%)	-6.273 (-19.6%)	-5.934 (-18.4%)
	D	-3.913 (-18.4%)	-3.777 (-17.7%)	-3.914 (-18.5%)	-3.730 (-17.7%)
	C	-1.457 (-0.9%)	-1.177 (-1.1%)	-1.498 (-19.2%)	-1.212 (-8.4%)
MAR	W	-0.592 (-15.9%)	-0.440 (-17.1%)	-0.912 (-15.9%)	-0.674 (-17.7%)
	AN	-7.732 (-19.7%)	-6.584 (-22.9%)	-8.204 (-15.9%)	-7.967 (-17.9%)
	BN	-7.945 (-20.9%)	-6.918 (-22.6%)	-8.091 (-19.3%)	-7.297 (-20.9%)
	D	-4.865 (-22.3%)	-4.232 (-20.9%)	-4.029 (-19.5%)	-3.946 (-18.6%)
	C	-1.288 (-1.7%)	-1.066 (-3.9%)	-1.137 (-10.8%)	-1.237 (-9.5%)
APR	W	-0.558 (-21.3%)	-0.340 (-21.1%)	-0.912 (-18.6%)	-0.595 (-18.6%)
	AN	-9.336 (-24.7%)	-6.411 (-26.8%)	-5.368 (-14.2%)	-5.643 (-14.4%)
	BN	-9.162 (-31.2%)	-7.516 (-29.6%)	-5.656 (-14.3%)	-5.078 (-13.1%)
	D	-3.048 (-22.3%)	-3.440 (-19.9%)	-2.028 (11.4%)	-2.531 (14.7%)
	C	-5.94 (-5.8%)	-3.98 (-4%)	-7.72 (-7.5%)	-5.76 (-5.7%)
MAY	W	-5.282 (-22.8%)	-5.071 (-22.1%)	-2.288 (-19.9%)	-2.078 (-19.1%)
	AN	-9.729 (-30.9%)	-6.842 (-23.5%)	-5.289 (-16.5%)	-2.372 (-12.6%)
	BN	-4.795 (-22.8%)	-3.475 (-17.4%)	-852 (-4.1%)	462 (2.3%)
	D	-2.852 (-18.6%)	-1.429 (-1.1%)	-301 (-2.1%)	923 (7.3%)
	C	-832 (-7.6%)	-476 (-4.5%)	-733 (-5.7%)	-379 (-3.6%)
JUN	W	-3.19 (-4.1%)	-7.06 (-8.7%)	-360 (-5%)	-2.771 (-9.6%)
	AN	-4.463 (-23.3%)	-1.130 (-17.5%)	-2.082 (-19.8%)	-7.24 (-4.1%)
	BN	-8.590 (-35.9%)	-4.448 (-22.5%)	-9.667 (-40.4%)	-5.225 (-28.5%)
	D	-3.331 (-20.2%)	-2.146 (-15.2%)	-4.474 (-27.4%)	-3.228 (-21%)
	C	-1.14 (-0.9%)	-4.30 (-3.4%)	-0.97 (-0.2%)	-1.137 (-10.5%)
	W	-6.098 (-7.1%)	-6.631 (-6.5%)	-901 (-0.1%)	-846 (-8.6%)
	AN	-3.431 (-20.9%)	-4.935 (-3.9%)	-4.358 (-26.5%)	-2.866 (-19.2%)
	BN				
	D				
	C				

Bay Delta Conservation Plan/California WaterFix  
RDEIR/SDEIS

B-357

2015

I&P 00139.14

Supplemental Modeling Results for New Alternatives

Alternative 4A ELT: In Delta—Sacramento River Downstream of North Delta Diversion Facility					
Month	Water Year Type	EXISTING CONDITIONS vs. H3 ELT	NAA ELT vs. H3 ELT	EXISTING CONDITIONS vs. H4 ELT	NAA ELT vs. H4 ELT
JUL	W	-3.039 (-15.3%)	-3.493 (-17.3%)	-4.796 (-24.1%)	-5.250 (-25.8%)
	AN	-2.627 (-12.2%)	-3.234 (-14.6%)	-4.724 (-23.9%)	-5.335 (-24.6%)
	BN	-2.676 (-12.8%)	-2.676 (-12.8%)	-4.181 (-20.6%)	-4.183 (-20.6%)
	D	-3.793 (-13.7%)	-3.190 (-17.1%)	-5.196 (-26.9%)	-5.583 (-24.5%)
	C	-5.214 (-34.5%)	-4.065 (-28.7%)	-5.011 (-32.7%)	-3.793 (-26.8%)
AUG	W	-3.414 (-17.5%)	-3.331 (-7.1%)	-4.802 (-24.6%)	-4.720 (-26.3%)
	AN	-5.461 (-34.9%)	-5.527 (-34.9%)	-5.913 (-37.7%)	-5.903 (-37.7%)
	BN	-3.225 (-20.3%)	-4.924 (-23.7%)	-4.522 (-31.6%)	-5.639 (-33.9%)
	D	-3.342 (-21.1%)	-2.743 (-1.8%)	-3.298 (-26.5%)	-1.809 (-18.4%)
	C	-6.227 (-40.8%)	-4.466 (-30.9%)	-5.173 (-30.5%)	-2.711 (-18.7%)
SEP	W	-1.311 (-1.3%)	-5.14 (-5.6%)	-0.96 (-9.9%)	-1.189 (-7%)
	AN	-4.453 (-29.3%)	-3.852 (-26.8%)	-4.424 (-29.1%)	-3.933 (-26.2%)
	BN	-1.22 (-0.7%)	-3.212 (-2.5%)	-1.66 (-0.3%)	-1.736 (-2.5%)
	D	-2.672 (-4.9%)	-3.672 (-4.8%)	-1.937 (-1.7%)	-1.955 (-1.7%)
	C	-4.034 (-32.6%)	-4.06 (-34.3%)	-4.553 (-37.7%)	-4.911 (-38.4%)
OCT	W	-4.445 (-36.9%)	-3.058 (-26.8%)	-4.324 (-35.0%)	-3.922 (-35.7%)
	AN	-2.003 (-13.9%)	-2.227 (-3%)	-2.15 (-3%)	83 (1.1%)
	BN	-2.116 (-26.5%)	-2.141 (-21.2%)	-3.086 (-27.6%)	-2.210 (-20.9%)
	D	-1.548 (-18.9%)	-1.896 (-18.6%)	-1.995 (-14.9%)	-1.945 (-19.9%)
	C	-1.320 (-14.3%)	-1.319 (-14%)	-1.966 (-13.5%)	-1.202 (-13.8%)
NOV	W	-1.071 (-26.4%)	-4.663 (-22.4%)	-3.061 (-26.4%)	-4.453 (-22.3%)
	AN	-4.532 (-23.4%)	-5.584 (-27.3%)	-6.621 (-23.8%)	-5.654 (-27.6%)
	BN	-3.006 (-19.6%)	-4.542 (-27.1%)	-2.041 (-18.6%)	-4.395 (-46.1%)
	D	-3.226 (-23.7%)	-3.198 (-13%)	-3.391 (-26.3%)	-2.723 (-31.5%)
	C	-3.594 (-26.4%)	-3.025 (-29.2%)	-3.607 (38%)	-3.281 (-25.9%)
DEC	W	-3.381 (-22.9%)	-3.994 (-25.9%)	-3.460 (-22.4%)	-4.073 (-26.4%)
	AN	-6.986 (-17.6%)	-6.507 (-16.9%)	-6.349 (-16%)	-5.975 (-15.2%)
	BN	-1.499 (-6.9%)	-2.533 (-11.7%)	-1.314 (-6.1%)	-2.349 (-10.3%)
	D	-1.109 (-6.7%)	-1.603 (-6.9%)	-1.324 (-6.5%)	-1.926 (-11.2%)
	C	-1.378 (-8.9%)	-1.320 (-8.6%)	-1.562 (-10.9%)	-1.604 (-10.4%)

\* Red boxes indicate that flows under the alternative are more than 5% lower than flows under the baseline; green boxes indicate that flows under the alternative are more than 5% greater than flows under the baseline.

Bay Delta Conservation Plan/California WaterFix  
RDEIR/SDEIS

B-358

2015

I&P 00139.14

Source: RDEIR/SDEIS, Appendix B.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

**Figure 3**

**Flow Differences in the Sacramento River at Rio Vista  
by Water Year Type and Monthly Averages**

Supplemental Modeling Results for New Alternatives

**Table B.7-30. Differences<sup>a</sup> (Percent Differences) between Pairs of Model Scenarios in the Sacramento River at Rio Vista, Year-Round**

		Alternative 4A.ELT: In Delta—Sacramento River at Rio Vista			
Month	Water Year Type	EXISTING CONDITIONS vs. H3.ELT	NAA.ELT vs. H3.ELT	EXISTING CONDITIONS vs. H4.ELT	NAA.ELT vs. H4.ELT
JAN	W	-1,351 (-1.9%)	-5,751 (-7.6%)	-1,083 (-1.5%)	-5,682 (-7.3%)
	AN	<b>-4,656 (-11.3%)</b>	<b>-1,099 (-9.9%)</b>	<b>-3,691 (-9.9%)</b>	<b>-5,144 (-7.6%)</b>
	BN	<b>-2,635 (-12.6%)</b>	<b>-2,000 (-10.2%)</b>	<b>-2,422 (-11.5%)</b>	<b>-1,867 (-9.2%)</b>
	D	<b>-1,359 (-8.5%)</b>	<b>-1,396 (-9.3%)</b>	<b>-1,175 (-7.3%)</b>	<b>-1,312 (-8.7%)</b>
	C	<b>-937 (-7.1%)</b>	<b>-1,098 (-9.1%)</b>	<b>-917 (-7.7%)</b>	<b>-1,179 (-9.7%)</b>
	All	<b>-1,059 (-5.3%)</b>	<b>-3,247 (-8.4%)</b>	<b>-1,682 (-4.5%)</b>	<b>-5,978 (-7.9%)</b>
FEB	W	-444 (-0.5%)	-5,718 (-7.7%)	998 (+2.2%)	2,272 (-3.3%)
	AN	-1,957 (-3.7%)	-3,029 (-5.6%)	-3,235 (-4.2%)	-1,307 (-6.6%)
	BN	<b>-3,701 (-12.3%)</b>	<b>-3,773 (-12.5%)</b>	<b>-2,628 (-12.7%)</b>	<b>-5,696 (-9.9%)</b>
	D	<b>-2,287 (-11.8%)</b>	<b>-2,286 (-11.8%)</b>	<b>-2,332 (-12.1%)</b>	<b>-2,331 (-12.1%)</b>
	C	<b>-739 (-6.8%)</b>	<b>-586 (-4.9%)</b>	<b>-786 (-6.4%)</b>	<b>-613 (-5.1%)</b>
	All	-1,672 (-3.8%)	<b>-3,895 (-8.2%)</b>	-1,865 (-4.2%)	<b>-5,598 (-8.6%)</b>
MAR	W	-4,643 (-7.3%)	-7,195 (-10.7%)	-3,278 (-3.1%)	-5,700 (-8.7%)
	AN	-1,854 (-10.4%)	-5,077 (-12.7%)	<b>-3,888 (-8.3%)</b>	5,113 (-10.7%)
	BN	<b>-5,390 (-25.7%)</b>	<b>-4,039 (-26.0%)</b>	<b>-5,695 (-16.7%)</b>	<b>-2,134 (-19.9%)</b>
	D	<b>-2,885 (-16.3%)</b>	<b>-2,570 (-14.8%)</b>	<b>-2,397 (-13.6%)</b>	<b>-2,962 (-12.6%)</b>
	C	-644 (-4.9%)	-526 (-5.1%)	-778 (-7.2%)	-662 (-4.2%)
	All	<b>-3,843 (-10.7%)</b>	<b>-4,531 (-12.3%)</b>	<b>-2,844 (-7.3%)</b>	<b>-3,504 (-9.5%)</b>
APR	W	-5,365 (-1.9%)	-5,844 (-15.3%)	-1,274 (-3.3%)	-1,753 (-4.5%)
	AN	<b>-5,540 (-34.4%)</b>	<b>-5,048 (-22.7%)</b>	-917 (-4.6%)	-425 (-1.9%)
	BN	<b>-2,808 (-19.2%)</b>	<b>-2,430 (-17.1%)</b>	<b>-3,375 (-23%)</b>	<b>-3,733 (-26.1%)</b>
	D	<b>-1,250 (-12.3%)</b>	<b>-1,134 (-12.3%)</b>	<b>-704 (-8.8%)</b>	<b>-589 (-5.8%)</b>
	C	-382 (-5.5%)	-337 (-3.2%)	-533 (-7.1%)	-398 (-5.2%)
	All	<b>-3,322 (-15.6%)</b>	<b>-3,294 (-15.5%)</b>	196 (-0.6%)	168 (-0.8%)
MAY	W	<b>-5,550 (-11.7%)</b>	<b>-5,897 (-21.1%)</b>	<b>-4,662 (-17.3%)</b>	<b>-4,255 (-3.4%)</b>
	AN	-4,682 (-4.9%)	-2,931 (-18.5%)	-655 (-3.9%)	496 (3.1%)
	BN	<b>-2,210 (-20.2%)</b>	<b>-2,148 (-18.6%)</b>	-159 (-1.5%)	963 (9.2%)
	D	-609 (-7.5%)	-314 (-4%)	-512 (-6.3%)	-217 (-2.8%)
	C	-159 (-1%)	510 (-2%)	-221 (-4.2%)	-571 (-10.9%)
	All	<b>-3,843 (-24.9%)</b>	<b>-2,619 (-18.8%)</b>	<b>-1,748 (-11.7%)</b>	<b>-524 (-3.7%)</b>
JUN	W	-7,622 (-4.6%)	-4,059 (-31.2%)	-6,393 (-50.7%)	-4,830 (-37.2%)
	AN	<b>-3,222 (-32.6%)</b>	<b>-1,969 (-22.8%)</b>	<b>-4,056 (-41%)</b>	<b>-2,803 (-32.5%)</b>
	BN	-349 (-5%)	-26 (-0.4%)	-1,279 (-16.1%)	-806 (-12.1%)
	D	-14 (-0.2%)	-244 (-3.9%)	-640 (-10.9%)	-870 (-13.9%)
	C	<b>-393 (-9.1%)</b>	<b>-365 (-8.5%)</b>	<b>-534 (-11.1%)</b>	<b>-506 (-11.7%)</b>
	All	-3,009 (-30.6%)	-1,687 (-19.8%)	-3,666 (-37.2%)	-2,344 (-27.5%)

Bay Delta Conservation Plan/California WaterFix  
RDEIR/SDEIS

B-361

2015  
ICP-00139.14

Supplemental Modeling Results for New Alternatives

		Alternative 4A.ELT: In Delta—Sacramento River at Rio Vista			
Month	Water Year Type	EXISTING CONDITIONS vs. H3.ELT	NAA.ELT vs. H3.ELT	EXISTING CONDITIONS vs. H4.ELT	NAA.ELT vs. H4.ELT
JUL	W	-2,291 (-19.8%)	-2,293 (-20.4%)	-3,633 (-32.7%)	-3,715 (-31.1%)
	AN	-1,893 (-15.6%)	-2,309 (-18.4%)	-3,337 (-27.5%)	-3,753 (-29.2%)
	BN	-1,907 (-16.3%)	-1,887 (-16.2%)	-2,952 (-23.3%)	-2,932 (-25.1%)
	D	<b>-2,368 (-22.3%)</b>	<b>-1,950 (-19.3%)</b>	<b>-3,633 (-34.5%)</b>	<b>-3,215 (-31.8%)</b>
	C	-3,633 (-47.8%)	-2,764 (-40.2%)	-3,328 (-43%)	-2,458 (-35.8%)
	All	-2,352 (-21.9%)	-2,216 (-20.9%)	-3,429 (-31.9%)	-3,293 (-31.1%)
AUG	W	-1,911 (-4.6%)	-3,932 (-41.1%)	-1,218 (-49.6%)	-1,239 (-49.7%)
	AN	<b>-3,332 (-32.6%)</b>	<b>-2,808 (-31.2%)</b>	<b>-3,504 (-41%)</b>	<b>-3,979 (-41.1%)</b>
	BN	-2,225 (-26.6%)	-1,516 (-23.8%)	-2,292 (-27.4%)	-1,083 (-24.6%)
	D	<b>-1,890 (-52.6%)</b>	<b>-3,151 (-41.9%)</b>	<b>-3,631 (-39.2%)</b>	<b>-3,892 (-25.1%)</b>
	C	-650 (-15.5%)	-113 (-1%)	-562 (-12.8%)	5 (-0.1%)
	All	<b>-3,334 (-38.0%)</b>	<b>-3,699 (-35.7%)</b>	<b>-3,121 (-30.8%)</b>	<b>-2,679 (-25.2%)</b>
SEP	W	-361 (-3.4%)	-10,311 (-49.8%)	-335 (-3.1%)	-10,855 (-49.6%)
	AN	-513 (-7.6%)	-6,696 (-31.6%)	-1,724 (-18%)	-3,398 (-57.1%)
	BN	-2,770 (-44.1%)	-3,025 (-46.3%)	-3,118 (-49.1%)	-3,711 (-51.6%)
	D	-3,102 (-50.7%)	-1,417 (-32%)	-3,008 (-49.1%)	-3,291 (-29.6%)
	C	-568 (-15.8%)	-195 (-6.1%)	-423 (-11.8%)	-51 (-1%)
	All	-1,427 (-19.4%)	-5,104 (-41.3%)	-1,529 (-20.9%)	-5,216 (-47.3%)
OCT	W	-3,775 (-4.3%)	-2,923 (-37.2%)	-3,637 (-41.7%)	-2,786 (-35.4%)
	AN	<b>-3,527 (-40.9%)</b>	<b>-1,861 (-33.7%)</b>	<b>-2,415 (-39.1%)</b>	<b>-2,749 (-31.7%)</b>
	BN	<b>-2,340 (-37.4%)</b>	<b>-1,498 (-27.7%)</b>	<b>-2,419 (-38.6%)</b>	<b>-1,577 (-29.1%)</b>
	D	<b>-1,511 (-28.5%)</b>	<b>-1,420 (-27.2%)</b>	<b>-1,465 (-27.6%)</b>	<b>-1,377 (-26.4%)</b>
	C	-1,410 (-2.7%)	-89 (-18.8%)	-1,495 (-28.7%)	-964 (-20.6%)
	All	-2,504 (-37.6%)	-1,895 (-31.3%)	-2,461 (-36.9%)	-1,852 (-30.6%)
NOV	W	-1,511 (-2.2%)	-1,866 (-26.3%)	-3,632 (-22.9%)	-4,987 (-29%)
	AN	-2,379 (-21%)	-1,143 (-31.7%)	-2,086 (-16.4%)	-1,856 (-29.4%)
	BN	-2,415 (-26.5%)	-3,628 (-30.9%)	-2,437 (-29.4%)	-5,673 (-39.5%)
	D	-2,693 (-32.1%)	-2,603 (-30.6%)	-2,944 (-33.7%)	-2,750 (-32.2%)
	C	-687 (-16.4%)	-1,020 (-18.1%)	-1,041 (-19%)	-1,184 (-20.9%)
	All	-2,620 (-24.3%)	-3,499 (-30%)	-2,669 (-24.7%)	-3,645 (-30.4%)
DEC	W	-2,786 (-4.3%)	-3,602 (-43%)	-1,506 (-3.5%)	-3,429 (-5.5%)
	AN	-156 (-0.8%)	-1,491 (-7.3%)	22 (0.1%)	-1,313 (-6.4%)
	BN	-105 (-0.7%)	-1,217 (-8.1%)	-183 (-1.3%)	-1,295 (-4.6%)
	D	-873 (-7.3%)	-742 (-6.3%)	-1,153 (-9.6%)	-1,022 (-8.6%)
	C	-760 (-5.3%)	31 (0.4%)	-1,083 (-13.2%)	-294 (-4%)
	All	-1,211 (-5.3%)	-1,745 (-7.5%)	-917 (-4%)	-1,451 (-4.2%)

\* Red boxes indicate that flows under the alternative are more than 5% lower than flows under the baseline; green boxes indicate that flows under the alternative are more than 5% greater than flows under the baseline.

Bay Delta Conservation Plan/California WaterFix  
RDEIR/SDEIS

B-362

2015  
ICP-00139.14

Source: RDEIR/SDEIS, Appendix B.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

These tables and figures show that most changes are colored in red enabling the eye to see the preponderance of *decreases* in flow of 5 percent or more compared with Existing Conditions *and* the No Action Alternative (especially along the Sacramento River downstream of the north Delta intakes).<sup>188</sup> The vast majority of differences reported in these two tables are decreases in average flows across all water year types. Most of the decreases are of 10 percent or more and many of these are of 20 to 30 percent or more. Only slight improvements occur in just a handful of months and water year types. (Most San Joaquin River flows at Vernalis between February and September in most water year types decrease greater than 5 percent relative to existing conditions as well.)

Reducing flows in the Sacramento River is not a "waterfix," certainly not for the Bay-Delta Estuary. This will increase residence time of water in the Bay-Delta Estuary relative to existing conditions and to a future without the Tunnels; salinity violations will increase with the Tunnels Project as well (Figure 4).<sup>189</sup> DWR and its partners opted not to model residence time behavior for Alternative 4A and the other RDEIR/SDEIS alternatives (2D and 5A). However, the water source "fingerprinting" analyses in interior and western Delta water ways in both last year's and this year's modeling appendices show replacement of good quality Sacramento River water with lower-flow and poorer quality San Joaquin River water, so it is reasonable, in the absence of more definitive modeling, that relative to existing conditions residence times will increase with the Tunnels Project under both Alternatives 4 and 4A (Figures 4 and 5).

The lower-flowing and more polluted San Joaquin River will make up greater fractions of water flowing into the western Delta, Franks Tract, and at Contra Costa Water District's Rock Slough intakes.<sup>190</sup> Meanwhile, better quality Sacramento River water diverted into the Tunnels will improve state and federal export water quality, making Delta water quality elsewhere the poorer.<sup>191</sup>

Decreased flows and increased residence times will cause the designated beneficial uses of migratory and rare fish species to decline, according to Tunnels Project RDEIR/SDEIS modeling results. Through-Delta survival rates of the juvenile and smolt life stages of winter-run, spring-run, fall-run and late-fall-run Chinook salmon are *all expected to decrease relative to both existing conditions and the No Action Alternative* (Figure 6). These fish species are "rare and endangered species" beneficial uses as well as "migration of aquatic organisms" beneficial uses. These reduced flows will decrease the size of critical open water estuarine habitat beneficial uses for state and federally-listed species like Delta smelt and longfin smelt, both of which count also as rare and endangered beneficial uses under the current Bay-Delta Water Quality Control Plan.<sup>192</sup> The U.S. EPA

<sup>188</sup> See also Appendix B, Tables B.7-28 (downstream of north Delta intakes), B.7-30 (Sacramento River at Rio Vista), B.7-32 (Delta outflow), and B.7-34 (San Joaquin River at Vernalis), pp. B-357 to B-370.

<sup>189</sup> RDEIR/SDEIS, Section 4.3.4, p. 4.3.4-67, lines 4-12.

<sup>190</sup> This reasoning is confirmed by source-water fingerprint modeling provided in both the 2013 Draft EIR/EIS and the 2015 RDEIR/SDEIS. The source water fingerprint modeling results are found in Bay Delta Conservation Plan, Draft EIR/EIS/ November 2013, Appendix 3D, pp. 147-168, 8D-171 to 8D-192; and in Bay Delta Conservation Plan, Recirculated Draft EIR/Supplemental Draft EIS, Appendix B, pp. B-191 to B-256.

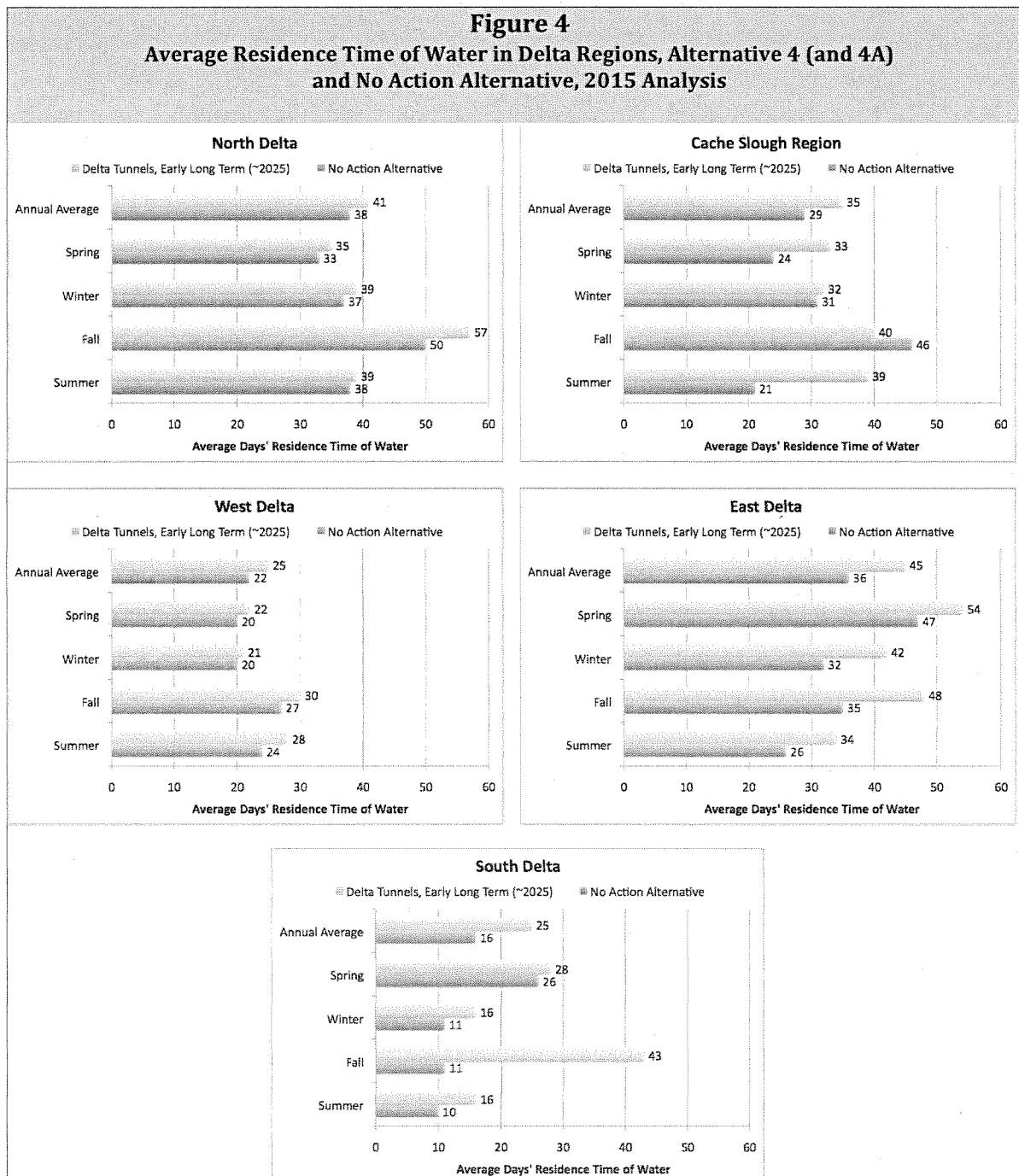
<sup>191</sup> Bay Delta Conservation Plan Draft EIR/EIS, November 2013, Appendix 8D (figures for Alternative 4, Scenarios H3 and H4), 2013; BDCP/California WaterFix, Recirculated Draft EIR/Supplemental Draft EIS, Appendix B, Section B.4.2 (figures for No Action Alternative, Alternative 4A, Scenarios H3 and H4), 2015; analyzed by Restore the Delta.

<sup>192</sup> State Water Resources Control Board, *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*, December 13, 2006, p. 9.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

expressed serious concerns about the EIR/EIS Administrative Draft's (ADEIS) proposed decrease in outflow "despite the fact that several key scientific evaluations by the federal and State agencies

**Figure 4**  
**Average Residence Time of Water in Delta Regions, Alternative 4 (and 4A)  
and No Action Alternative, 2015 Analysis**

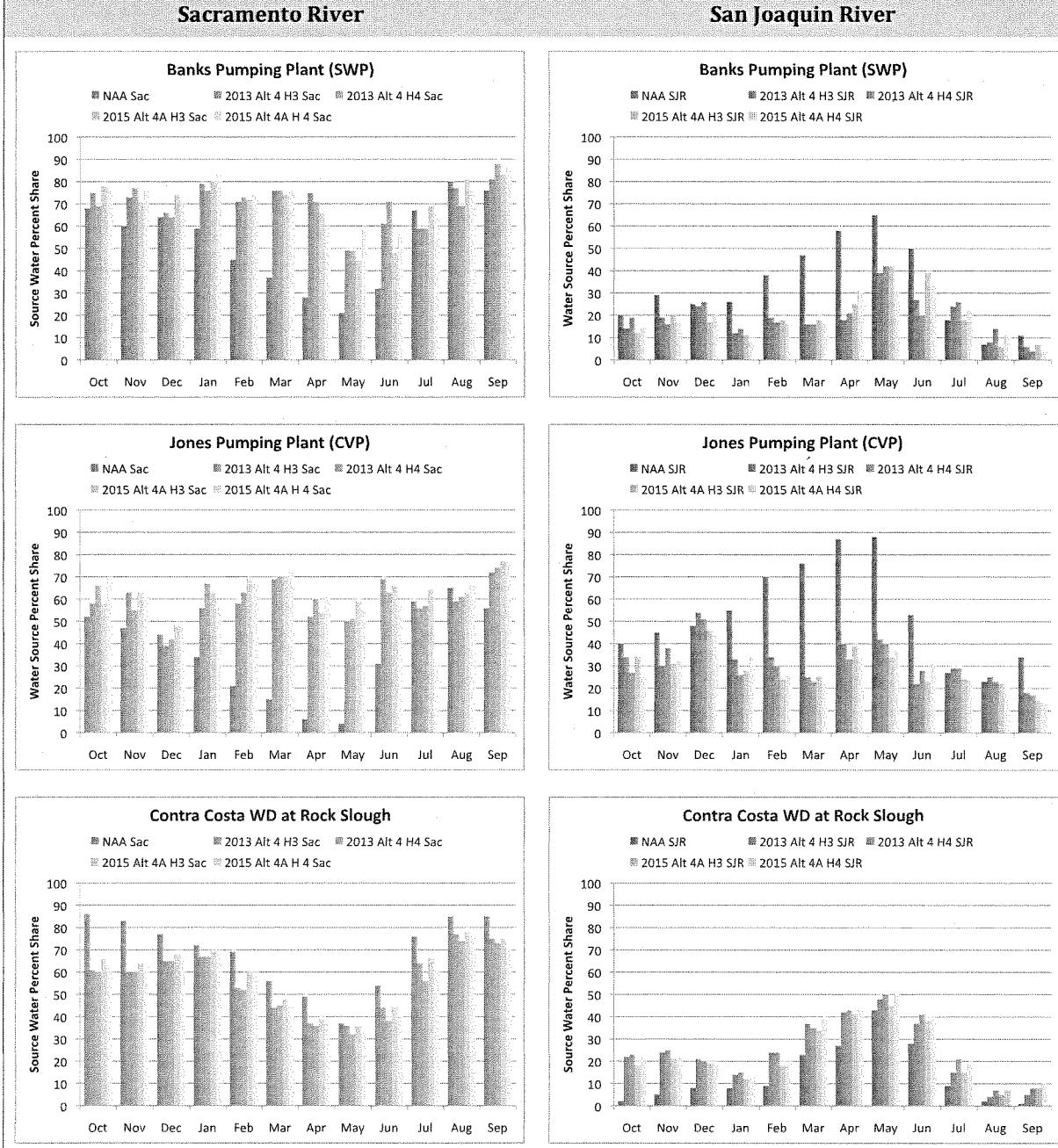


Source: Bay Delta Conservation Plan RDEIR/SDEIS, 2015, Table 8-60a, p. 8-82.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

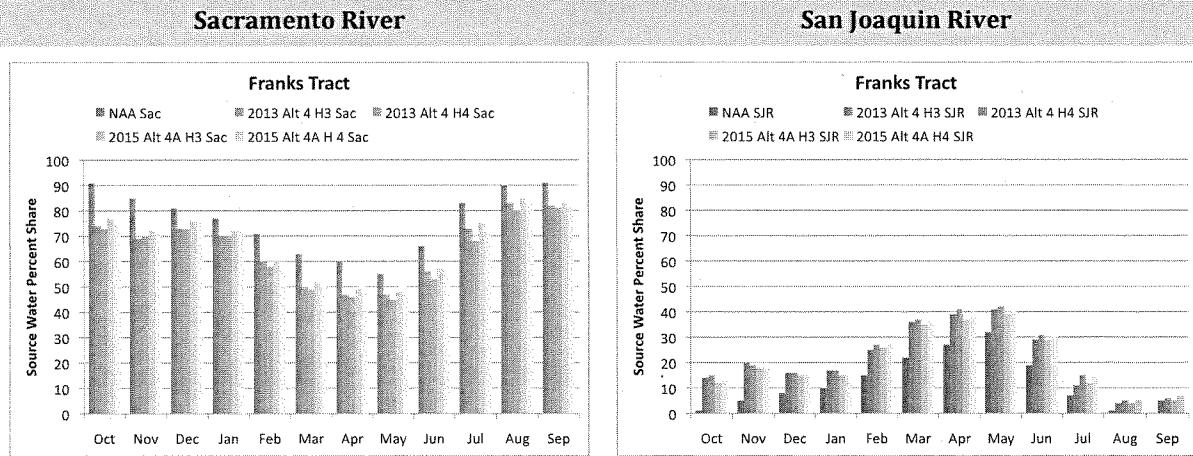
**Figure 5**

**Share of Delta Location River Sources from "Fingerprint" Modeling Results  
No Action Alternative, 2013 BDCP Conservation Measure 1  
and 2015 Tunnels Project**



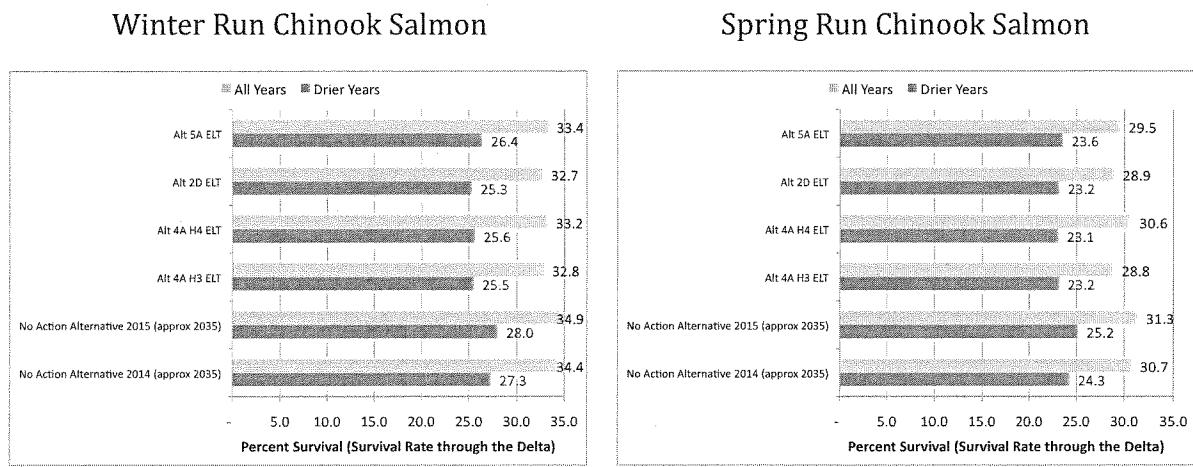
**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

**Figure 5**  
**Share of Delta Location River Sources from "Fingerprint" Modeling Results**  
**No Action Alternative, 2013 BDCP Conservation Measure 1**  
**and 2015 Tunnels Project**



Sources: BDCP Draft EIR/EIS, Appendix 8D (figures for Alternative 4, Scenarios H3 and H4); BDCP/California WaterFix, Recirculated Draft EIR/Supplemental Draft EIS, Appendix B, Section B.4.2 (figures for No Action Alternative, Alternative 4A, Scenarios H3 and H4); Restore the Delta.

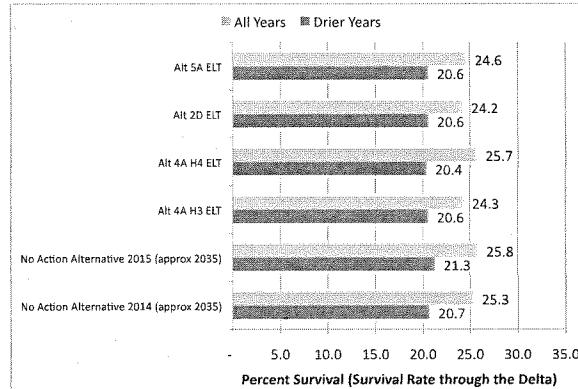
**Figure 6**  
**Through-Delta Survival Rates of Emigrating Juvenile Salmon Races Under Alternative 4A (California WaterFix)**



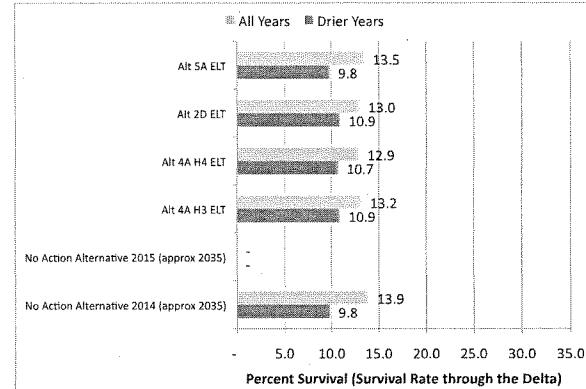
**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

**Figure 6**  
**Through-Delta Survival Rates of Emigrating Juvenile Salmon Races Under Alternative 4A (California WaterFix)**

Fall Run Chinook Salmon - Sacramento River



Fall Run Chinook Salmon - San Joaquin River



Source: Bay Delta Conservation Plan/California WaterFix RDEIR/SDEIS, 2015, Section 4.3, Tables 11-4A-23, -51, and -74; Section 4.4, Tables 11-2D-16, -31, and -45; and Section 4.5, Tables 11-5A-14, -31, and -45; and Environmental Water Caucus.

indicate that *more* outflow is necessary to protect aquatic resources and fish populations.<sup>193</sup> The Tunnels Project's flow regime will violate the beneficial uses of affected waterways and therefore violate water quality objectives. In order to receive the Section 404 permit, DWR and the Bureau of Reclamation must revise the Tunnels Project to ensure that it fully protects all designated beneficial uses.

**The project increases Delta several pollutant concentrations, resulting in violations of pollutant criteria.** Reduced through-Delta flows will stagnate water conditions and cause Delta water quality to deteriorate badly. RDEIR/SDEIS modeling results reveal that the project will degrade water quality for boron, bromide, chloride, electrical conductivity, dissolved organic carbon, nitrate, mercury, pesticides, and selenium.<sup>194</sup> (See details below.) Harmful algal blooms are expected to worsen under Tunnels Project operational regimes relative to the No Action Alternative as well as existing conditions. While these constituents' concentrations will *increase* in western and central Delta locations, as well as Contract Costa Water District's Pumping Plant No. 1, their concentrations are expected to *decrease* in export waters of the North Bay Aqueduct in Barker Slough, and Jones Pumping Plant and Banks Pumping Plant in the south Delta. These results hold for both changes compared with existing conditions as well as the No Action Alternative, the latter of which factors out most sea level rise and climate change impacts.

<sup>193</sup> U.S. EPA, "EPA Comments on Administrative Draft EIR/EIS, III Aquatic Species and Scientific Uncertainty, Federal Agency Release," p. 4 (July 18, 2013) (emphasis added), available at: <http://www2.epa.gov/sites/production/files/documents/july3-2013-epa-comments-bdcp-adeis.pdf>.

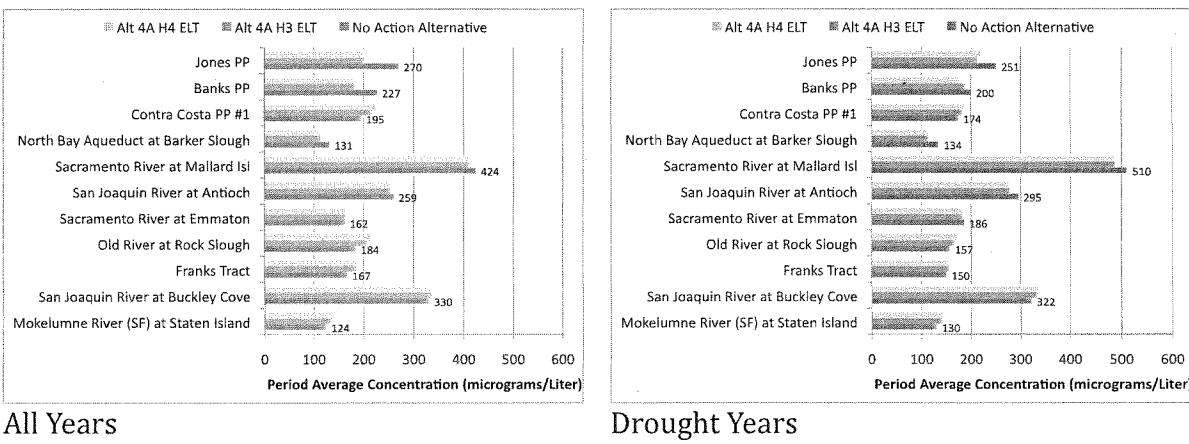
<sup>194</sup> RDEIR/SDEIS, Appendix B.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

### Boron

Although period average concentrations decrease with Tunnels operations (except for Sacramento River at Emmaton and Contra Costa Water District's Pumping Plant No. 1), agricultural (that is, crop sensitivity) threshold of 500 micrograms per liter ( $\mu\text{g}/\text{L}$ ) would see exceedances a substantial percentage of the time at San Joaquin River at Antioch and Sacramento River at Mallard Island.<sup>195</sup> The Tunnels Project will increase boron concentrations throughout the year at the south fork of the Mokelumne River, as well as at Franks Tract and Old River at Rock Slough, relative to both existing conditions and No Action Alternative.<sup>196</sup> In the western Delta, boron concentrations increase with Tunnels operation relative to existing conditions and No Action Alternative between February and September, most months of the year. Finally, boron concentrations increase at the Contra Costa Water District's Pumping Plant No. 1, while boron concentrations decrease the North Bay Aqueduct intakes at Barker Slough and at Banks and Jones pumping plants of the state and federal water projects.

**Figure 7**  
**Period Average Boron Concentrations of Various Delta Locations**



All Years

Drought Years

Source: RDEIR/SDEIS, Appendix B, Table Bo-3, p. B-71. Data values shown are for the No Action Alternative for comparison purposes.

### Bromide

For both human health and aquatic life criteria, the Tunnels Project would increase the frequency of criteria violations in the interior and western Delta, but would decrease bromide violations 25 to 30 percent of the time at Banks and Jones pumping plants. Western Delta bromide concentrations are a problem for Antioch diversions as well. One method of evaluating the Tunnels Project's bromide concentrations suggests that wet years may see increases rather than decreases.<sup>197</sup> (Figures 8, 9, and 10.)

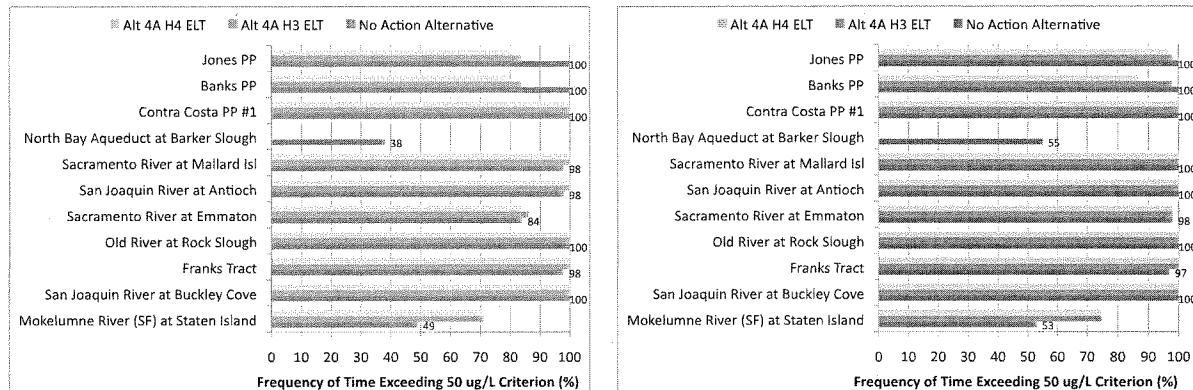
<sup>195</sup> RDEIR/SDEIS, Appendix B, Table Bo-3, p. B-71.

<sup>196</sup> RDEIR/SDEIS, Appendix B, Table Bo-4 and Bo-5, pp. B-73 and B-74.

<sup>197</sup> RDEIR/SDEIS, Appendix B, Table Br-1 and Table Br-2, pp. B-84, and Tables Br-5 and Br-6, p. B-87.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

**Figure 8**  
**Frequency Percentage of Exceedances  
of Bromide Human Health Criterion**

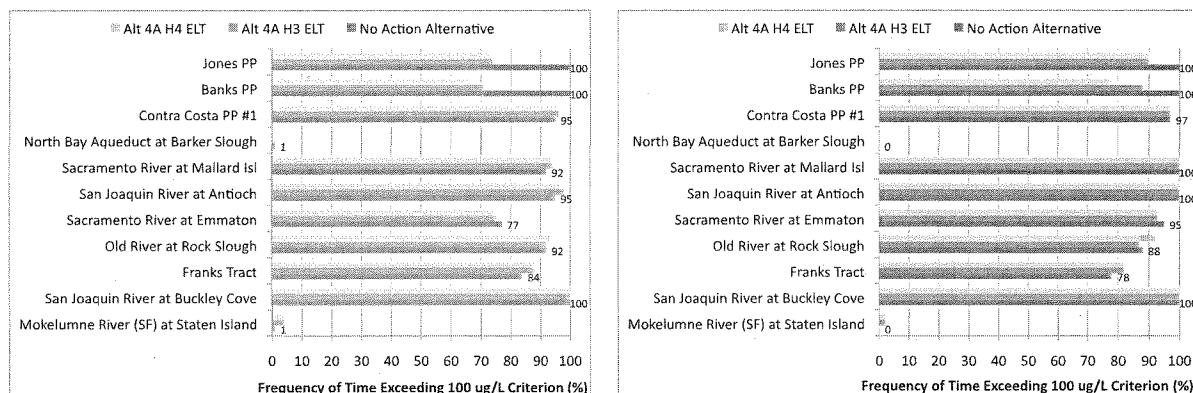


All Years

Drought Years

Source: RDEIR/SDEIS, Appendix B, Table Br-1, p. B-83. Data values shown are for the No Action Alternative for comparison purposes.

**Figure 9**  
**Frequency Percentage of Exceedances  
of Bromide Aquatic Life Criterion**



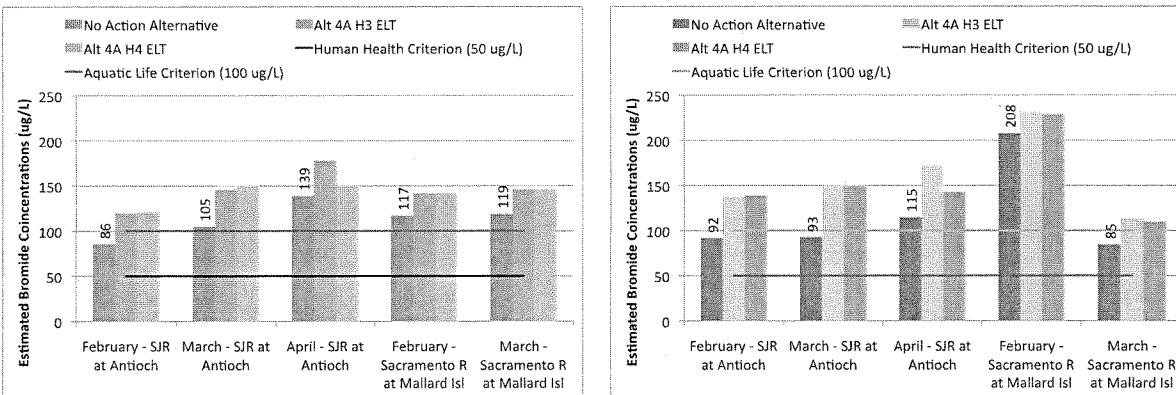
All Years

Drought Years

Source: RDEIR/SDEIS, Appendix B, Table Br-1, p. B-83. Data values shown are for the No Action Alternative for comparison purposes.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

**Figure 10  
Estimated Concentrations of Bromide  
in Wet and Above Normal Water Year Types  
(Periods of Normally Acceptable Water Quality for Withdrawal)**



**Wet Years**

**Above Normal Years**

Source: RDEIR/SDEIS, Appendix B, Table Br-5, p. B-87. Data values shown are for the No Action Alternative for comparison purposes.

### Chloride

The Mokelumne River south fork at Staten Island sees significant increases in chloride concentrations all year, every year. This is closely influenced by reduced flow through Georgiana Slough downstream of the north Delta intakes. Other interior and western Delta areas will see increased chloride concentrations relative to both existing conditions and No Action Alternative by the Tunnels during March through June (for interior locations) and March through August for Sacramento River at Emmaton, San Joaquin River at Antioch and Sacramento River at Mallard Island.<sup>198</sup>

### Salinity

The Tunnels Project will more than triple the number of spikes in excess of salinity objectives along the Sacramento River downstream of the Tunnels, and along the San Joaquin River at Prisoners Point. Outright violations of salinity objectives are expected to more than double with the Tunnels in place.<sup>199</sup> These violations will degrade water quality for Delta agriculture and for fish and wildlife beneficial uses. This means that the State Water Resources Control Board cannot issue a 401 certification regardless of whether it has adequately assessed the project's propensity to degrade water quality.

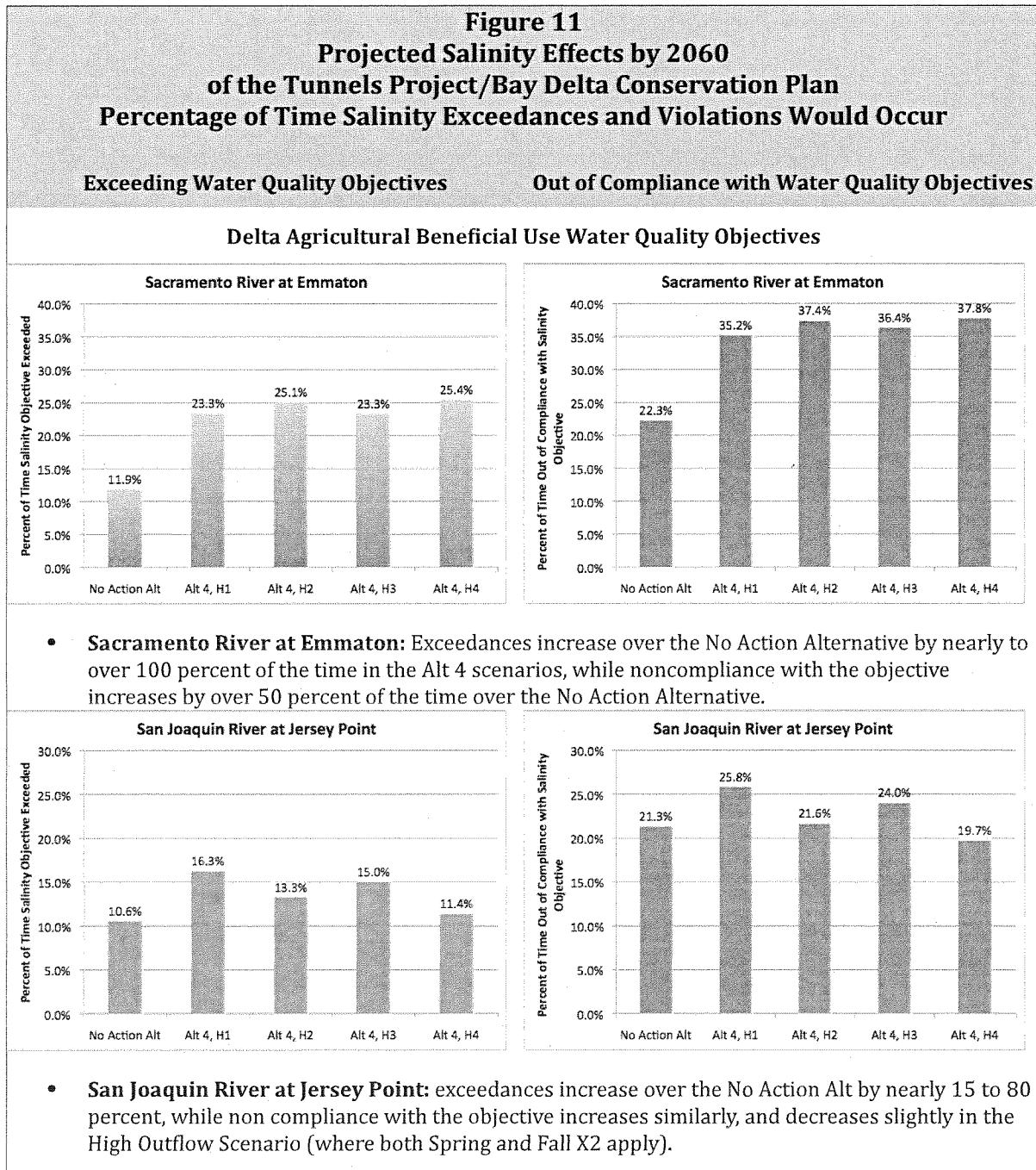
Along the lower Sacramento River, salinity violations will more than double, and will occur about a quarter of the time that salinity objectives are in effect, up from about 11 percent of the time now and with the Tunnels Project in place. These conditions will worsen relative to current and future

<sup>198</sup> RDEIR/SDEIS, Appendix B, Tables Cl-6 through Cl-9 for two estimation methods and the two operational scenarios (H3 and H4), pp. B-93 and B-96.

<sup>199</sup> RDEIR/SDEIS, Appendix B, Table EC-1, p. B-129. "Spikes" here means daily exceedances of a salinity objective, while compliance with objectives is determined by comparing multi-day running averages with an objective. When the running average is exceeded, a violation is then deemed to occur by regulators.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

conditions between May and September, especially in drought years (which are expected to increase in frequency). Interior Delta salinity will also worsen between March and September (such as along the South Mokelumne River and at San Andreas Landing on the San Joaquin), as well as between February and June at Prisoners Point along the San Joaquin.<sup>200</sup> (Figure 11)

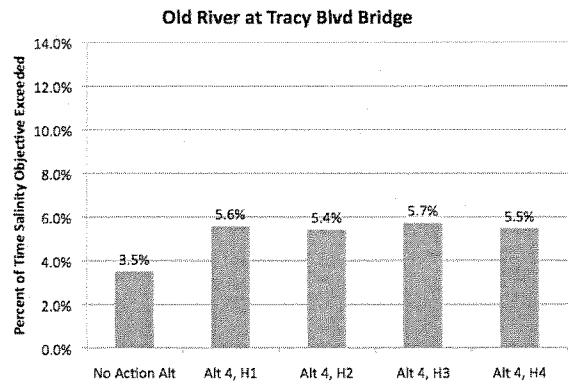


<sup>200</sup> RDEIR/SDEIS, Appendix B, Tables EC-8A and EC-8B, pp. B-134 to B-135.

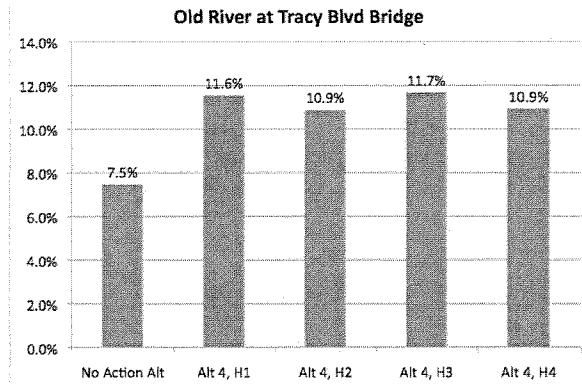
**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

**Figure 11  
Projected Salinity Effects by 2060  
of the Tunnels Project/Bay Delta Conservation Plan  
Percentage of Time Salinity Exceedances and Violations Would Occur**

**Exceeding Water Quality Objectives**

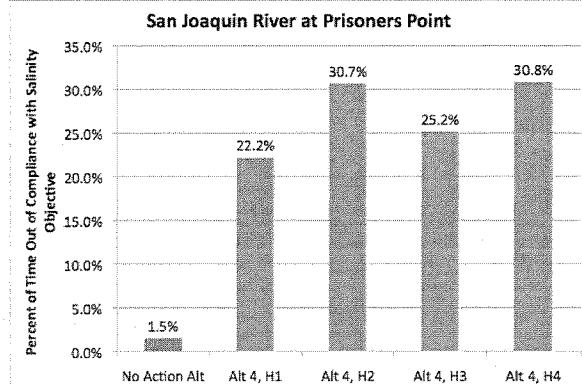
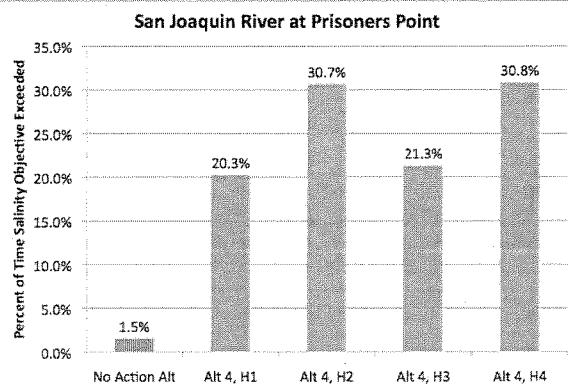


**Out of Compliance with Water Quality Objectives**



- **Old River at Tracy Blvd Bridge:** Exceedances increase by about two-thirds typically over the No Action Alternative. Noncompliance with the objective would increase by one-third to 40 percent. These percents are lower because as shown above (Table 2) the existing rate of violations is already high.

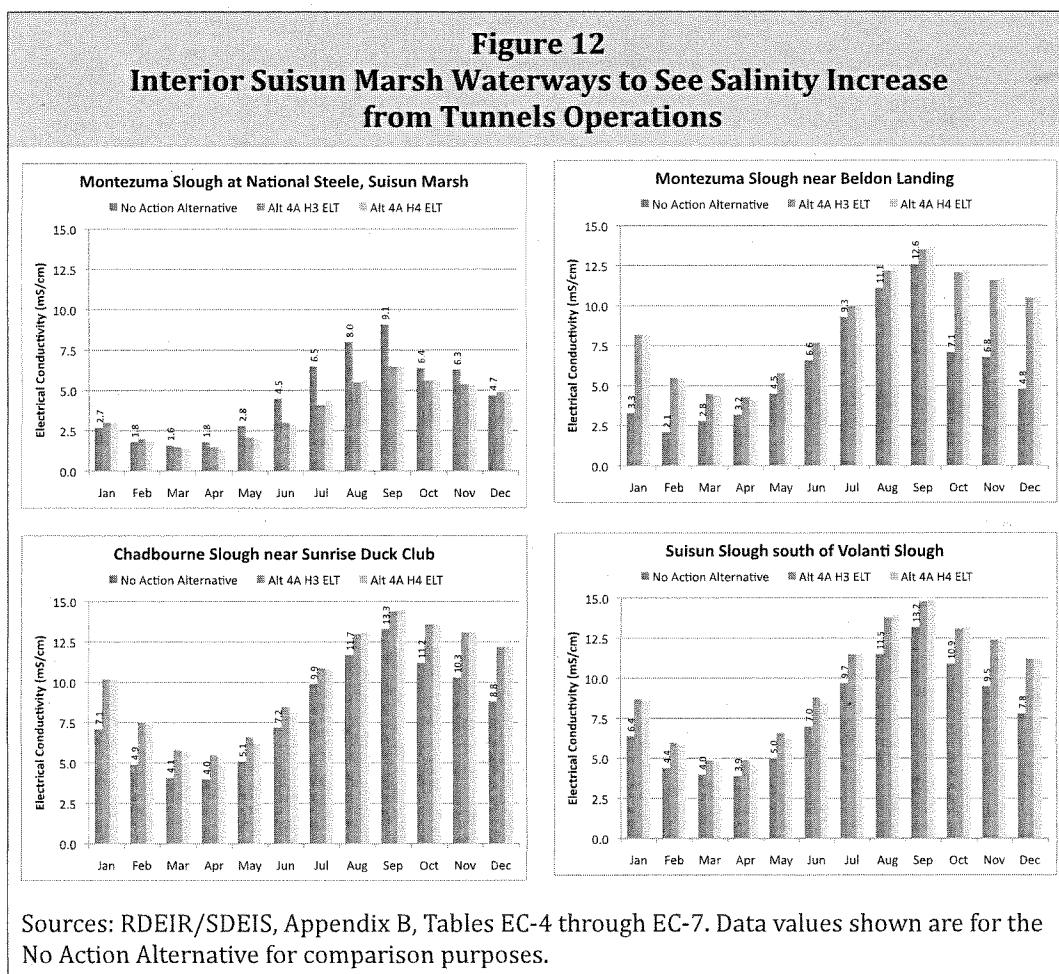
**Delta Fish and Wildlife Water Quality Objective**



- **San Joaquin River at Prisoners Point:** The percent of time exceedances would occur increases sharply—1200 to 1900 percent increase in exceedances and a similar similar range for noncompliance. This is a fish and wildlife-related salinity objective, while the other three are agricultural beneficial use salinity objectives.

Source: Bay Delta Conservation Plan EIR/EIS, Appendix 8H, *Electrical Conductivity*, Table EC-4, p. 8H-5. Note: Percentage of time is based on a 16-year hydrology modeled using DSM2 in Appendix 8H. Being “out of compliance” is the number of days that the 30-day running average at the monitoring site registers violations of the salinity objective. “Exceeding Water Quality Objective” refers to the number of days that the monitoring equipment actually registers salinity exceeding the threshold level the objective.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**



The Tunnels will be the opposite of a “WaterFix” for Suisun Marsh. “California WaterFix” modeling results show that every month’s average salinity will increase about 56 percent over present conditions and about 60 percent over future conditions in the Beldon Landing area, 28 percent over present conditions and 27 percent over future conditions near Sunrise Duck Club, and 27 percent over present conditions and 26 percent over future conditions along Suisun Slough near Volanti Slough.<sup>201</sup> This altered salinity regime will result in less habitat for fish and other aquatic species native to the Bay-Delta Estuary, as well as affect agricultural soils and vegetation in Suisun Marsh.

### Pesticides

The San Joaquin River is an impaired water body for chlorpyrifos, diazinon, diuron, DDT, and Group A pesticides (human carcinogens) under the Clean Water Act.<sup>202</sup> Increasing that river’s fraction of water contributed to the Delta will result in more concentrated pesticides reaching central and western Delta water ways from the San Joaquin, and with longer residence times, its pesticide burdens stay longer. The Bay-Delta Estuary will be left with a worsening pesticide “cocktail” supplied by the San Joaquin River’s agricultural effluent.

<sup>201</sup> RDEIR/SDEIS, Appendix B, Tables EC-5, EC-6, and EC-7, pp. B-131 to B-132.

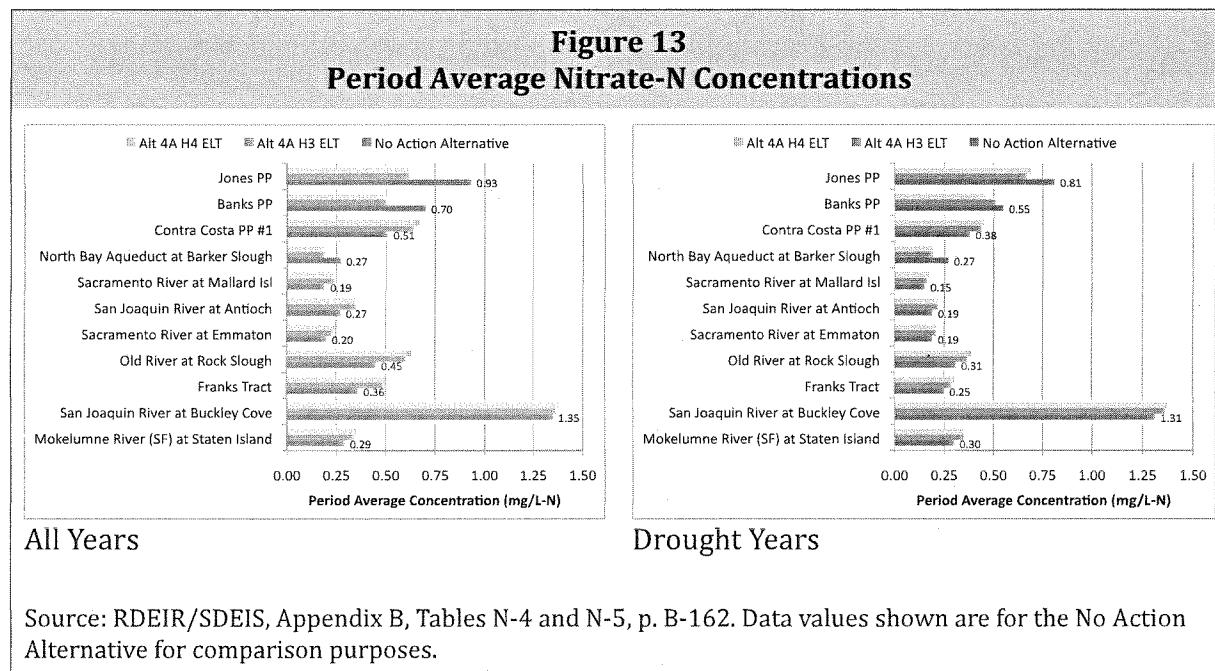
<sup>202</sup> US EPA, 2010 California California 303(d) List of Water Quality Limited Segments. Accessible online at [http://gispublic.waterboards.ca.gov/pub/303d/2010 USEPA\\_approv\\_303d\\_List\\_Final\\_122311wsrcc.xls](http://gispublic.waterboards.ca.gov/pub/303d/2010 USEPA_approv_303d_List_Final_122311wsrcc.xls).

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

### Nitrates

Tunnels Project modeling results indicate increases of nitrates relative to the No Action Alternative of 19 to 34 percent for interior Delta locations in all years (except for San Joaquin River at Buckley Cove near Stockton). Similar modeling results are shown for the western Delta as well, 16 to 30 percent increases in salinity (Figure 13). And Contra Costa Water District's Pumping Plant No. 1 is projected to see a 25 percent increase in nitrates. This would likely result in significant increases in water treatment costs for the District. In all of these locations the monthly period average changes were almost all increases in the range of 10 to 30 percent. As with other pollutants, nitrate concentrations are expected in Tunnels modeling results to decrease significantly at Barker Slough, Jones and Banks.<sup>203</sup>

**Figure 13  
Period Average Nitrate-N Concentrations**



All Years

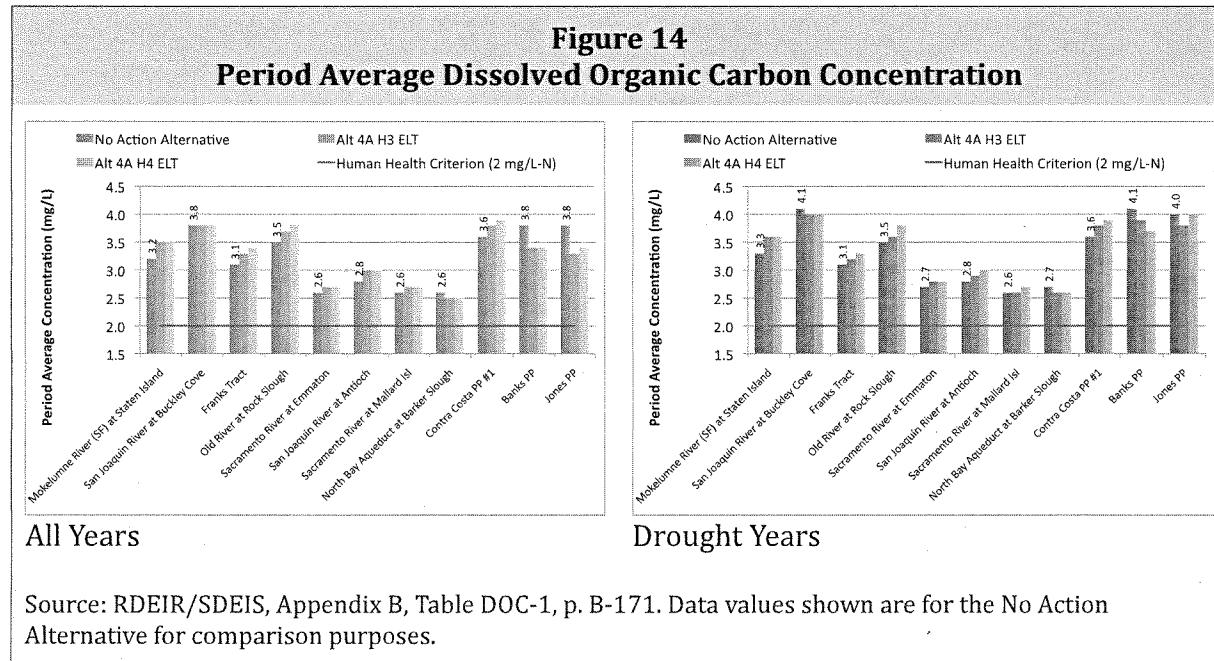
Drought Years

Source: RDEIR/SDEIS, Appendix B, Tables N-4 and N-5, p. B-162. Data values shown are for the No Action Alternative for comparison purposes.

<sup>203</sup> RDEIR/SDEIS, Appendix B, Tables N-4 and N-5, pp. B-162 and B-163.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

**Dissolved Organic Carbon (Figure 14)**



**Methyl Mercury**

As shown in Figure 15, the ratio of mercury concentrations in largemouth bass tissue was for Alternative 4 Tunnels scenarios well over 1.5 to *twice or more* the toxicity threshold.<sup>204</sup> (DWR and its partners try to divert attention from the toxicity threshold by comparing these levels to continuation of the status quo No Action Alternative<sup>205</sup>, but the important comparison is to the toxicity threshold for ecological and public health protection.) Alternative 4A modeling in 2015 shows that the Tunnels project despite having less habitat restoration and no Yolo Bypass improvements would have only slightly less effect on fish tissue concentrations of mercury. Moreover, fish tissue concentrations at several Estuary locations would still be more than 1.5 to 2 times the USEPA's mercury guidance concentration. This analysis, however does not reflect "California EcoRestore's" habitat restoration efforts, which cumulatively can be expected to have impacts similar to the Tunnels and the Bay Conservation Plan last year.<sup>206</sup> The Bay Delta Conservation Plan states that "at this time... there is no proven method to mitigate methylation and mobilization of mercury into the aquatic system resulting from inundation of restoration areas. *The*

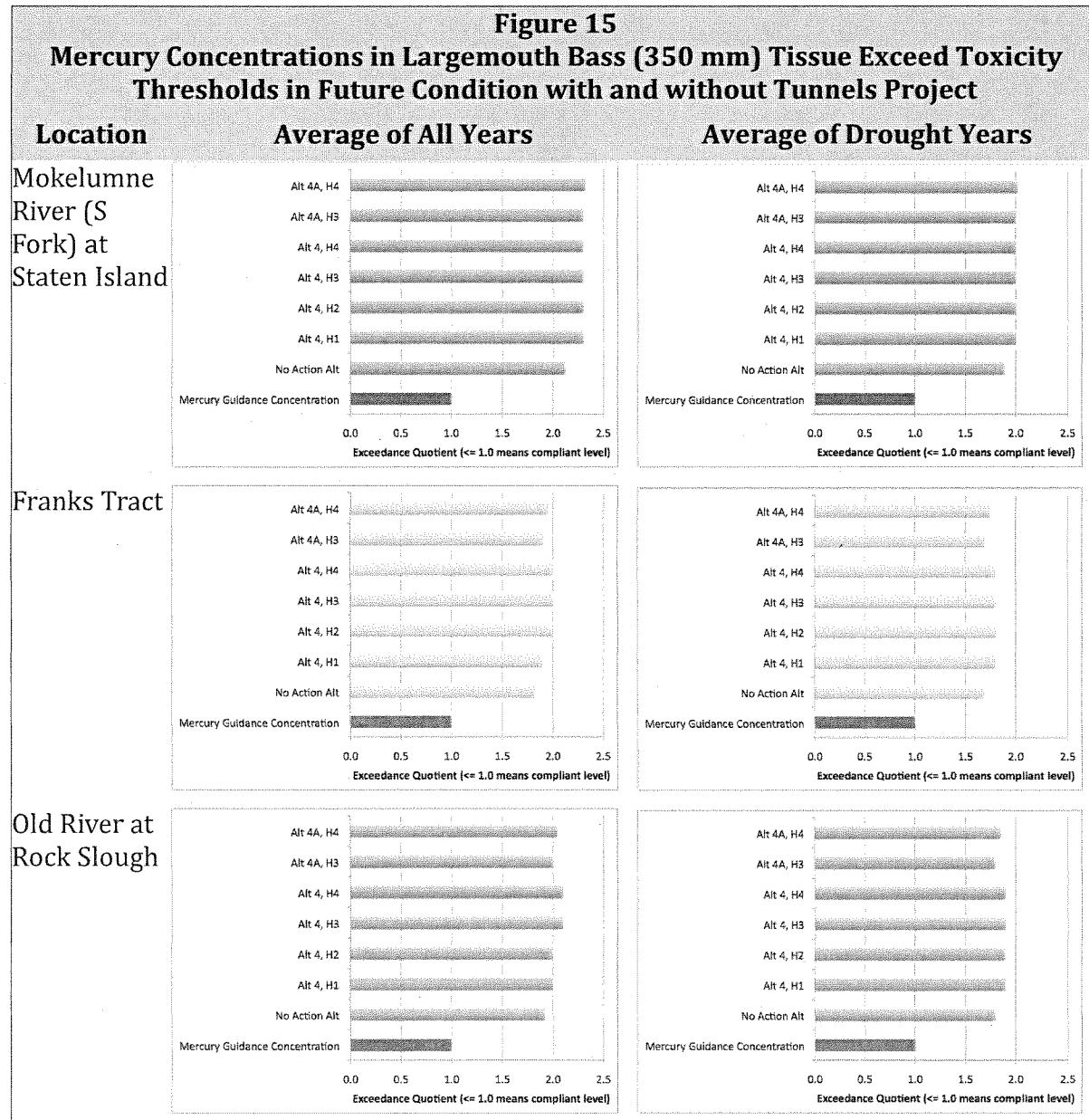
<sup>204</sup> Environmental Water Caucus, *Comment Letter on Bay Delta Conservation Plan and Draft Environmental Impact Report/Statement*, June 11, 2014, Figure 9, pp. 85-86. Accessible online at <http://ewccalifornia.org/reports/bdcpcomments6-11-2014-3.pdf>.

<sup>205</sup> Bay Delta Conservation Plan/California WaterFix, Recirculated Draft EIR/Supplemental EIS, 2015, Section 4.3.4, p. 4.3.4-33, lines 15-45.

<sup>206</sup> Based on Equation 1 calculations according to Appendix 8I of the Bay Delta Conservation Plan Draft EIR/EIS in 2013-2014 and Appendix B (Tables Hg-5 and Hg-7) and Appendix 8I of the Recirculated Draft EIR/Supplemental EIS in 2015. See also Environmental Water Caucus, *Comment Letter*, June 11, 2014, above.

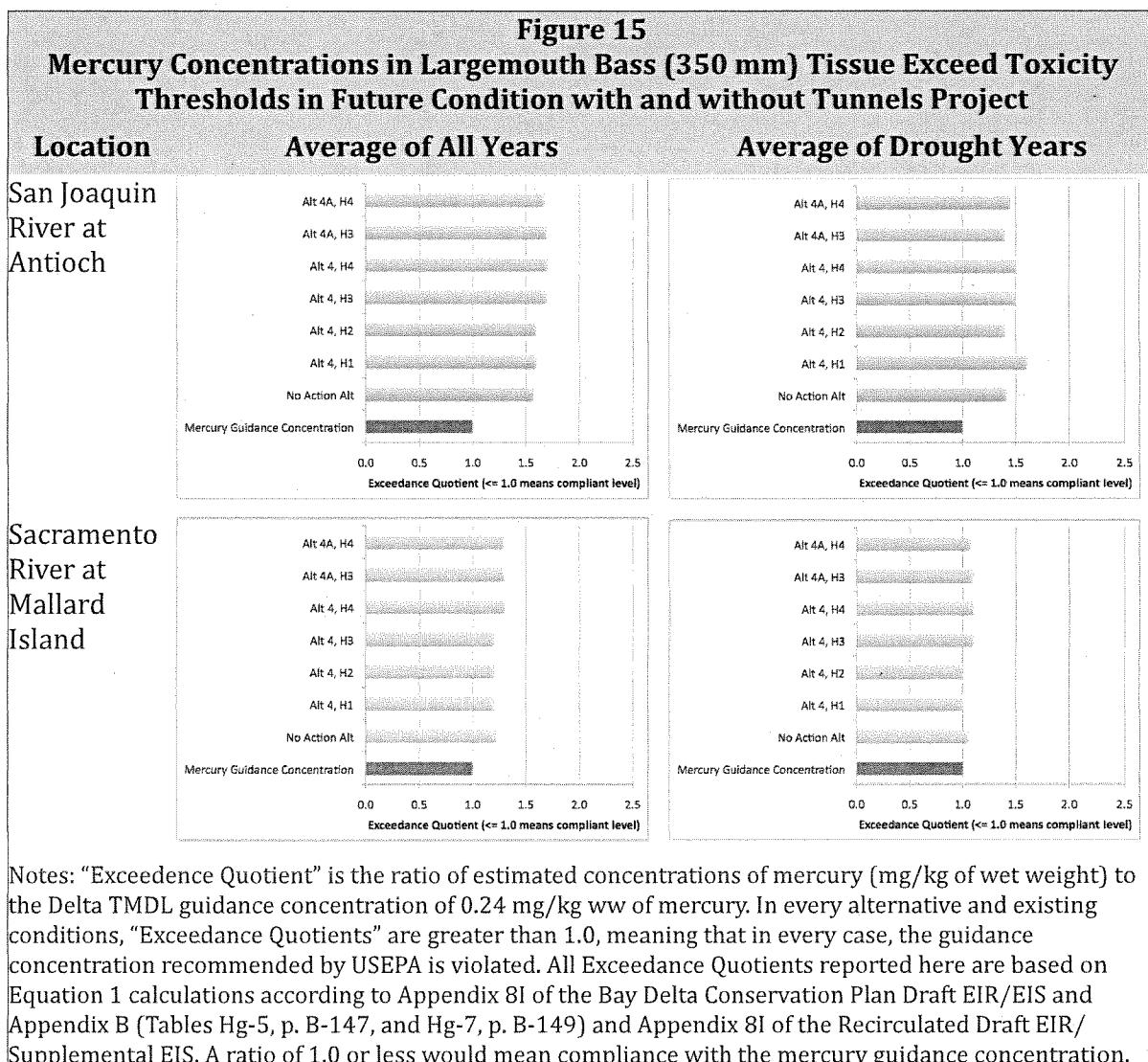
**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

*mitigation measures...are meant to provide a list of current research that has indicated potential to mitigate mercury methylation."*<sup>207</sup>



<sup>207</sup> Charles N. Alpers, et al, *Sacramento-San Joaquin Delta Regional Ecosystem Restoration Implementation Plan, Ecosystem Conceptual Model: Mercury*, prepared January 24, 2008, pp. 12-13. Accessible online at <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=6413>.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**



## Selenium

**The RDEIR/SDEIS errs in assuming decreasing selenium tissue loads.** Selenium concentrations in water are expected to change only slightly under the Tunnels Project's flow regimes, annual average selenium concentrations in whole-body sturgeon are expected to increase substantially, according to Tunnels Project modeling results in the RDEIR/SDEIS. These results are summarized in Figures 16, 17, and 18. In addition, the RDEIR/SDEIS reports that protective toxicity thresholds recommended by Presser and Luoma will be exceeded under Tunnels Project flow regimes relative to No Action Alternative conditions. In particular, their "low" threshold of 5 mg/kg, dry weight would see an exceedance quotient of 1.1 for both operational scenarios of the Tunnel Project, relative to the No Action Alternative condition of 0.95 for the San Joaquin River at Antioch. Under the higher protective threshold they recommend, the exceedance quotient would not rise above 1.0, but would nonetheless increase from 0.59 to about 0.7. For Sacramento River at Mallard Island, average annual exceedance quotients under Tunnels Project flow conditions would increase over the No Action Alternative from 0.88 to 0.99, very close to exceedance. Modeling results do not

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

report the error rate for the modeling here performed, so these results could represent exceedance, since they are so close to 1.0.<sup>208</sup>

The Tunnels Project provides no mitigation method at all, just a list of "adaptive management" research issues to be handled later.<sup>209</sup> *Calling the Tunnels project "California WaterFix" plus DWR's premature application to the Corps of Engineers are not real adaptive management, but political prejudging of scientific outcomes.* For both tunnels construction and habitat restoration work in and around the Bay-Delta Estuary, DWR and its partners would have to handle MeHg on a case by case basis.<sup>210</sup>

Retirement of the drainage impaired lands of the western San Joaquin Valley has been found time and again to be the most cost-effective solution to the problem of selenium-tainted irrigation drainage.<sup>211</sup> Land retirement is the best and cheapest option for slowing the rate at which selenium loads and concentrations reach the Delta, and for sequestering selenium in its source rock and soils longer into the future. The natural reservoir of selenium has been documented to hold up to at least another 300 years' worth of tainted drainage at current rates.<sup>212</sup> The National Research Council's 2012 report on Bay-Delta sustainable water management cited this selenium reservoir as well, stating in part:

Irrigation drainage, contaminated by selenium from those soils, is also accumulating in western San Joaquin Valley groundwaters. The problem is exacerbated by the recycling of the San Joaquin River when water is exported from the delta. While control of selenium releases has improved, how long those controls will be effective is not clear because of the selenium reservoir in groundwater.

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<sup>208</sup> RDEIR/SDEIS, Appendix B, Table Se-7, p. B-186.

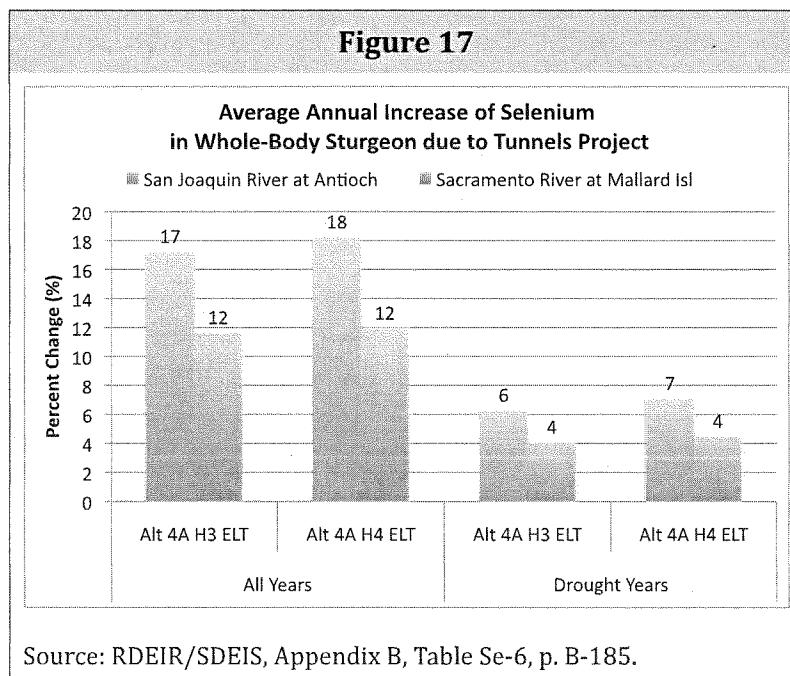
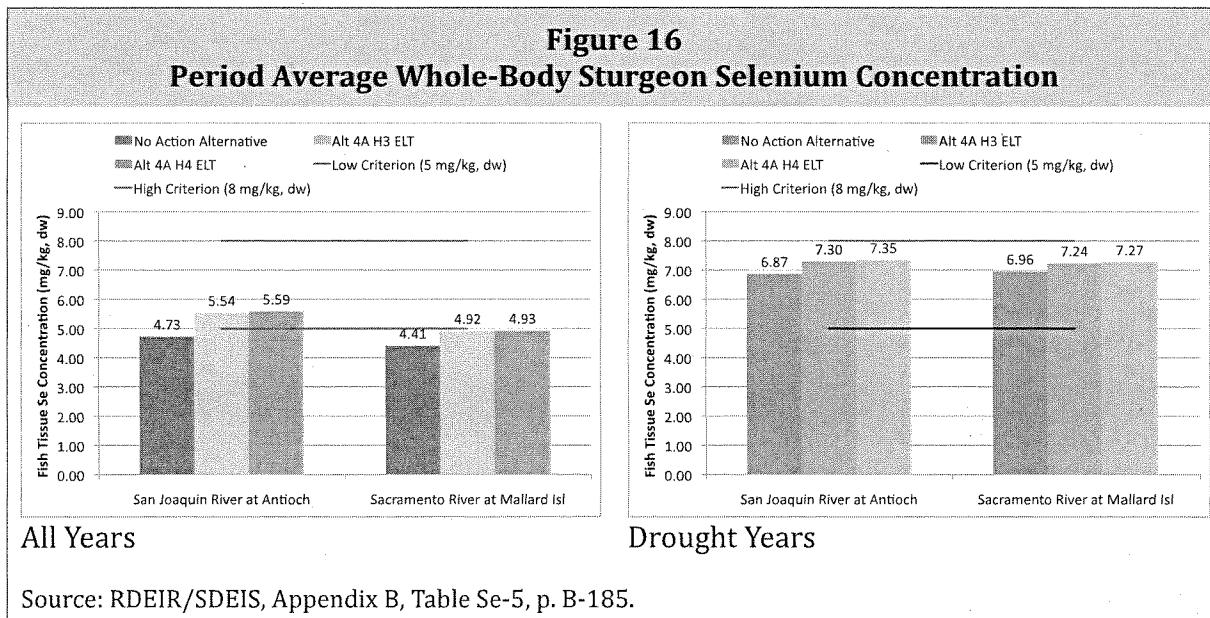
<sup>209</sup> These research approaches include: Characterize soil mercury concentrations and loads on a project-by-project basis; sequester MeHg using low-intensity chemical dosing techniques using metal-based coagulants like ferric sulfide or poly-aluminum chloride. These flocculants bind with dissolved organic carbon and MeHg to flocculate and deposit mercury out of solution; minimize microbial methylation activity in restored wetlands; design restored wetland habitat to enhance photodegradation of MeHg; remediate sulfur-rich sediments with iron to prevent the biogeochemical reactions that methylate mercury; cap mercury-laden sediments (essentially entomb and bury them permanently to keep from mobilizing and methylating mercury). The research "measures" that BDCP proposes do not include basic toxicological research into mercury's effects on these and other fish and aquatic species found in the Delta.

<sup>210</sup> Bay Delta Conservation Plan Environmental Impact Report/Environmental Impact Statement, Chapter 8, *Water Quality*, p. 8-260, lines 30-35; p. 8-446, lines 39-42, and p. 8-447, lines 1-2. "Because of the uncertainties associated with site-specific estimates of methylmercury concentrations and the uncertainties in source modeling and tissue modeling, the effectiveness of methylmercury management...would need to be evaluated separately for each restoration effort, as part of design and implementation. Because of this uncertainty and the known potential for methylmercury creation in the Delta this potential effect...is considered adverse."

<sup>211</sup> Presser, T.S. and S.E. Schwarzbach. 2008. *Technical Analysis of In-Valley Drainage Management Strategies for the Western San Joaquin Valley*, US Geological Survey Open File Report 2008-1210. Accessible online at <http://pubs.usgs.gov/of/2008/1210/>.

<sup>212</sup> T.S. Presser and S.N. Luoma, 2006. *Forecasting Selenium Discharges to the San Francisco Bay-Delta Estuary: Ecological Effects of a Proposed San Luis Drain Extension*, United States Geological Survey Professional Paper 1646, cited in: T. Stroshane, *Testimony on Recent Salinity and Selenium Science and Modeling for the Bay-Delta Estuary*, plus appendices, prepared for the California Water Impact Network, August 17, 2012, for Workshop #1, Ecosystem Changes and the Low Salinity Zone, before the State Water Resources Control Board.

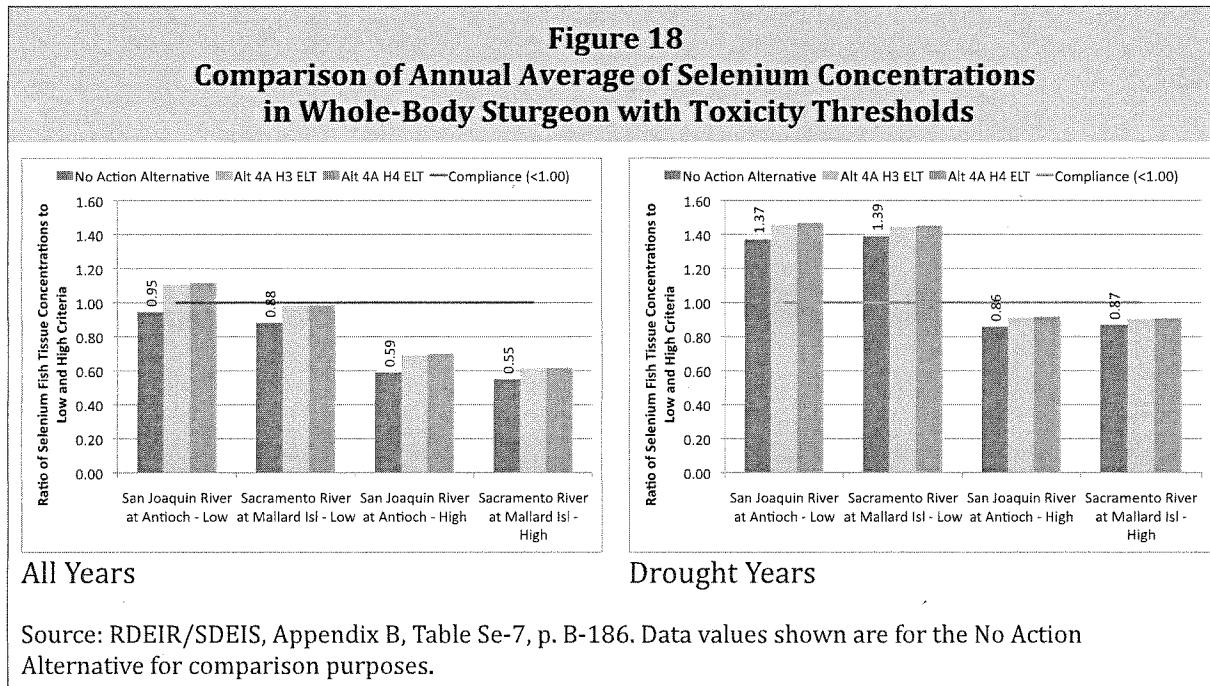
**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**



...Other aspects of water management also could affect selenium contamination. For example, infrastructure changes in the delta such as construction of an isolated facility could result in the export of more Sacramento River water to the south, which would allow more selenium-rich San Joaquin River water to enter the bay. The solutions to selenium contamination must be found within the Central Valley

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

and the risks from selenium to the bay are an important consideration in any infrastructure changes that affect how San Joaquin River water gets to the bay.<sup>213</sup>



Of course, ending application of Delta waters to irrigate western San Joaquin Valley drainage impaired lands could reduce the need for deliveries to the San Luis Unit of the Central Valley Project by up to a million acre-feet per year. *This reduction could provide by itself dramatically improved reliability for all other CVP contractors' allocations, without the investment of billions for the Tunnels project.*

## Harmful Algal Blooms

Algae occur naturally in all fresh and marine water environments. Most species are harmless under normal circumstances, but some "cyanobacteria" (also known as "blue-green algae") which use photosynthesis can "bloom" or undergo a rapid population boom during periods of slack flow, nutrient pollution conditions (such as from nitrates, nitrogen and phosphorus), and rising temperatures. Their sheer biomass can cause, according to the USEPA, a dramatic reduction or complete consumption of all dissolved oxygen in the water, suffocating oxygen-respiring organisms like fish, and can produce "cyanotoxins" that pose a significant potential threat to human and ecological health and affect taste, odor and safety of drinking water. They can degrade water ways used for recreation and as drinking water supplies.<sup>214</sup>

<sup>213</sup> National Research Council, Committee on Sustainable Water and Environmental management in the California Bay-Delta, *Sustainable Water and Environmental Management in the California Bay-Delta*, Washington, DC: The National Academies Press, 2012, p. 94. Accessible online 8 May 2014, at [http://www.nap.edu/catalog.php?record\\_id=13394](http://www.nap.edu/catalog.php?record_id=13394).

<sup>214</sup> USEPA Region 9, *Frequently Asked Question and Resources for Harmful Algal Blooms and Cyanobacterial Toxins*, Version 1, July 2015. Accessible at [http://www2.epa.gov/sites/production/files/2015-07/documents/habs\\_faqs-and-resources\\_v1-july2015.pdf](http://www2.epa.gov/sites/production/files/2015-07/documents/habs_faqs-and-resources_v1-july2015.pdf).

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

When these conditions combine, harmful algal blooms can result. These conditions are ripest in August and September in the Estuary, but drought can increase harmful algal bloom activity. The most common blue-green algae species in the Bay-Delta Estuary is called *Microcystis*. In 2014, *Microcystis* algal blooms lasted beyond October into December due to low flows and warm temperatures—water residence time was that long.<sup>215</sup> Its toxin is deadly to wildlife, dogs, and human beings, and exposure can cause liver cancer in humans. It is a dangerous ecological and public health threat.

The Tunnels are likely to increase residence times and slow flows in the western and central Delta. The recirculated Draft EIR/S this year acknowledges that “it is possible that increases in the frequency, magnitude, and geographic extent of *Microcystis* blooms in the Delta would occur relative to Existing Conditions”<sup>216</sup> as well as compared with the “no action alternative” (or the future condition of the Delta without “California WaterFix” Tunnels).

***Because it cannot meet water quality standards, the Tunnels Project cannot obtain the required Clean Water Act 401 Certification it needs for a 404 permit to build the project.*** To obtain CWA Section 401 certification, the project at issue must meet several CWA requirements, including the requirement to meet water quality standards under CWA Section 303.<sup>217</sup> If these requirements are met, then either the Regional Water Quality Control Boards (RWQCB) or the SWRCB may grant Section 401 certification.<sup>218</sup>

As implementing U.S. EPA regulations assert<sup>219</sup>, Section 401 certification “shall” include “a statement that there is a reasonable assurance that the activity will be conducted in a manner which will not violate applicable water quality standards.”<sup>220</sup> In other words, the state *cannot* grant Section 401 certification to a project if there is no reasonable assurance that it will meet water quality standards. The examination of whether a project violates water quality standards does not include “balancing” factors such as economic considerations – a project either meets water quality

<sup>215</sup> Peggy Lehman, Staff Environmental Scientist, California Department of Water Resources, presentation to IEP 2015 Workshop, Folsom, California, “Response of *Microcystis* to Drought,” March 20, 2015.

<sup>216</sup> RDEIR/SDEIS, Section 4.3, p. 4.3.4-67.

<sup>217</sup> 33 U.S.C. § 1341(a)(1), (d). A state agency may also condition, deny or waive certification under certain circumstances. See also 33 U.S.C. § 1341(a)(1)-(2), and 33 U.S.C. § 1341(d). According to § 401(d), certification “shall set forth any effluent limitations and other limitations ... necessary to assure that any applicant” complies with certain provisions of the CWA. The Supreme Court in *PUD No. 1 of Jefferson County v. Washington Department of Ecology* held that this includes CWA §303, since § 301 incorporates it by reference. *PUD No. 1 of Jefferson County v. Washington Department of Ecology*, 511 U.S. 700, at 713-715 (1994) (PUD No. 1).

<sup>218</sup> In California, the Regional Water Quality Control Boards are responsible for granting water quality certification, unless the project occurs in two or more regions, in which case the SWRCB is responsible. See SWRCB, “Instructions for Completing the Clean Water Act Section 401 Water Quality Certification Application” (Jan. 2005), available at: [www.swrcb.ca.gov/centralcoast/water\\_issues/programs/401wqcert/docs/instruct\\_401\\_wq\\_cert\\_app.pdf](http://www.swrcb.ca.gov/centralcoast/water_issues/programs/401wqcert/docs/instruct_401_wq_cert_app.pdf).

<sup>219</sup> The Supreme Court held that the EPA’s interpretation is consistent with the CWA in *PUD No. 1*.

<sup>220</sup> 40 CFR § 121.2(a)(3); *PUD No. 1* at 712.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

standards, or it does not.<sup>221</sup> Furthermore, as confirmed by the 1994 U.S. Supreme Court decision in *PUD No. 1 of Jefferson County v. Washington Department of Ecology* (*PUD No. 1*), CWA Section 401 certification considers the impacts of the *entire* activity – not just impacts of any particular discharge that triggers Section 401.<sup>222</sup> For the Tunnels Project to receive Section 401 certification, the *entire project* must show it can be built and operated so as to meet all water quality standards. This it will not do, as we show in this letter and its attachments, because water quality standards cannot be met under the currently-proposed Tunnels Project flow regimes and related effects on estuarine water quality and beneficial uses.

The CWA states that water quality standards “shall consist of the designated uses of the navigable waters involved *and* the water quality criteria for such waters based upon such uses.”<sup>223</sup> In other words, “a project that does not comply with a designated [*i.e.*, beneficial] use of the water does not comply with the applicable water quality standards.”<sup>224</sup> This fundamental CWA mandate does not change when the impact on beneficial uses arises from altered flow. The CWA was established specifically to “restore and maintain the chemical, *physical*, and biological integrity of the Nation’s waters”—not solely to regulate “pollutants.”<sup>225</sup> The U.S. Supreme Court addressed this issue directly in *PUD No. 1*, stating that:

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<sup>221</sup> 40 CFR § 131.11 (“For waters with multiple use designations, the criteria shall support the most sensitive use”); see also 40 CFR §131.6. As noted by the state Supreme Court, Porter-Cologne “cannot authorize what federal law forbids”; that is, California cannot allow for the “balancing away” of the most sensitive beneficial uses in a reliance on Porter-Cologne rather than the Clean Water Act. *City of Burbank v. State Water Resources Control Bd.*, 35 Cal.4th 613, 626, 108 P.3d 862 (2005).

<sup>222</sup> *PUD No. 1*, 511 U.S. 700 (1994). *PUD No. 1* established that so long as there is a discharge, the state can regulate an activity as a whole under §401. *PUD No. 1* at 711-712.

<sup>223</sup> 33 U.S.C. 1313(c)(2)(A) (emphasis added); *PUD No. 1* at 704. In addition to the uses to be protected and the criteria to protect those uses, water quality standards include an antidegradation policy to ensure that the standards are “sufficient to maintain existing beneficial uses of navigable waters, preventing their further degradation.” *PUD No. 1* at 705; 33 U.S.C. 1313(d)(4)(B); 40 CFR § 131.6. EPA regulations add that “[e]xisting instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.” 40 CFR §131.12.

<sup>224</sup> *PUD No. 1*, 511 U.S. at 715. See also 40 CFR § 131.3(b) (U.S. EPA stating that “[w]hen criteria are met, water quality will *generally* protect the designated use,” [emphasis added] indicating that numerical criteria do not always by themselves protect a designated use). Recognized beneficial uses in the Bay-Delta Estuary include, but are not limited to, agricultural supply (AGR), groundwater recharge (GWR), Water Contact Recreation (REC-1), Non-Contact Water Recreation (REC-2), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), Estuarine Habitat (EST), and Rare, Threatened, or Endangered Species (RARE).

<sup>225</sup> 33 U.S.C. § 1251(a). Emphasis added.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

Petitioners also assert more generally that the Clean Water Act is only concerned with water 'quality,' and does not allow the regulation of water 'quantity.' This is an artificial distinction.<sup>226</sup>

The Court specifically took note of CWA Sections 101(g) and 510(2), which address state authority over the allocation of water as between users. The Court found that these provisions "do not limit the scope of water pollution controls that may be imposed on users who have obtained, pursuant to state law, a water allocation."<sup>227</sup> This conclusion is supported by the "except as expressly provided in this Act" language of Section 510(2), which conditions state water authority; and by the legislative history of Section 101(g), which allows for impacts to individual water rights as a result of state action under the CWA when "prompted by legitimate and necessary water quality considerations."<sup>228</sup> Accordingly, these CWA provisions are not impediments to California's implementation of its CWA mandate to ensure compliance with water quality standards, *including* within the context of flows.

As noted above, in its August 2010 flow criteria report, the Water Board found that "[t]he best available science suggests that current flows are insufficient to protect public trust resources," and that "[r]ecent Delta flows are insufficient to support native Delta fishes for today's habitats."<sup>229</sup> However, flow regimes proposed by the current Tunnels Project rely on water quality (including flow) objectives that have been failing to protect Delta ecosystem and aquatic species beneficial uses for the last 15 years or more. These include: Water Right Decision 1641 (D-1641)<sup>230</sup>; the 2006 San Francisco Bay/Sacramento-San Joaquin Delta Estuary Water Quality Control Plan; the 2009 NMFS Biological Opinion (BiOp); and the 2008 USFWS BiOp.

Further, the Tunnels Project notably incorporates "bypass flows" that ostensibly establish the minimum amount of water that must flow downstream of the planned north Delta intake. Rather

<sup>226</sup> *PUD No. 1*, 511 U.S. at 719. In *PUD No. 1*, the U.S. Supreme Court took up the question of whether Washington state had properly issued a CWA Section 401 certification imposing a minimum stream flow requirement to protect fish populations. The Supreme Court held that conditioning the certification on minimum stream flows was proper, as the condition was needed to enforce a designated use contained in a state water quality standard. *Id.* at 723. In reaching this decision, the court noted that the project as proposed did not comply with the designated use of "[s]almonid [and other fish] migration, rearing, spawning, and harvesting," and so did not comply with the applicable water quality standards. *Id.* at 714.

<sup>227</sup> *Id.* at 720.

<sup>228</sup> *Id.* "See 3 Legislative History of the Clean Water Act of 1977 (Committee Print compiled for the Committee on Environment and Public Works by the Library of Congress), Ser. No. 95-14, p. 532 (1978) ('The requirements [of the Act] may incidentally affect individual water rights....It is not the purpose of this amendment to prohibit those incidental effects. It is the purpose of this amendment to insure that State allocation systems are not subverted and that effects on individual rights, if any, are prompted by legitimate and necessary water quality considerations')." See also Memorandum from U.S. EPA Water and Waste Management and General Counsel to U.S. EPA Regional Administrators, "State Authority to Allocate Water Quantities – Section 101(g) of the Clean Water Act" (Nov. 7, 1978), available at: [http://water.epa.gov/scitech/swguidance/standards/upload/1999\\_11\\_03\\_standards\\_waterquantities.pdf](http://water.epa.gov/scitech/swguidance/standards/upload/1999_11_03_standards_waterquantities.pdf).

<sup>229</sup> SWRCB, 2010 Delta Flow Criteria Report, pp. 2, 5. Accessible at [http://www.swrcb.ca.gov/waterrights/water\\_issues/programs/bay\\_delta/deltaflow/docs/final\\_rpt080310.pdf](http://www.swrcb.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/final_rpt080310.pdf).

<sup>230</sup> D-1641 requires the SWP and CVP to meet flow and water quality objectives, including specific outflow requirements, an export/import ratio, spring export reductions, salinity requirements, and, in the absence of other controlling restrictions, a limit to Delta exports of 35 percent total inflow from February through June and 65 percent inflow from July through January.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

than protecting Delta flow, the Tunnels Project reduces average annual Sacramento River flow downstream of the North Delta intakes.<sup>231</sup> Reduced flows downstream of the north Delta intakes extend all the way past Rio Vista as well.<sup>232</sup> Because it fails to put needed flows back into failing waterways, the Tunnels Project will violate water quality standards by failing to protect sensitive beneficial uses. These include “rare, threatened or endangered species habitat,” “estuarine habitat,” “spawning, reproduction, and/or early development,” and other sensitive beneficial uses.<sup>233</sup> Chinook salmon, Central Valley steelhead, sturgeon and lamprey all migrate and spawn in this area, with Delta smelt and longfin smelt likely spawning in the lower Sacramento River, or in hydraulically connected adjacent channels. Factoring out climate change effects, juvenile and salmon smolt survival rates through the Delta to Chipps Island decrease for each run of salmon under the flow regimes put forward by proponents of the Tunnels Project.<sup>234</sup> The Tunnels Project will thus fail as a set of flow regimes that could support Section 401 certification for necessary Section 404 permits.

Actions that “reasonably protect”,<sup>235</sup> rather than “protect” the beneficial use are insufficient. If multiple beneficial uses are at stake, adopted flow criteria must protect the *most sensitive* beneficial use (*i.e.*, they cannot “balance” away uses) and must be based on science.<sup>236</sup> As the state Supreme Court found, Porter-Cologne balancing provisions<sup>237</sup> that provide only “reasonable” protection “cannot authorize what federal law forbids.”<sup>238</sup> The more protective CWA water quality standard requirements take precedence over weaker Porter-Cologne language; ecosystem and species needs cannot—and must not—be balanced away.

<sup>231</sup> See Attachment 1 in this letter, above, and Public Draft Plan § 5.3.1.1, available at: <http://baydeltaconservationplan.com/Libraries/Dynamic Document Library/Public Draft BDCP Chapter 5 - Effects Analysis.sflb.ashx>. See Also BDCP Draft EIR/EIS Chapter 3, *Description of Alternatives*, Table 3-17, p. 3-186.

<sup>232</sup> See RDEIR/SDEIS, 2015, Appendix B, Table B.7-30, pp. B-361 to B-362.

<sup>233</sup> State Water Resources Control Board, *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta*, December 13, 2006, p. 9.

<sup>234</sup> By “factoring out climate change effects,” we refer to the Tunnels Project proponents’ preference for environmental impact comparisons between the No Action Alternative and Alternative 4A (either Scenarios H3 or H4). This comparison reflects the future migration prospects of these fish with and without the proposed Tunnels Project. Even by their preferred comparison of the Tunnels Project with the No Action Alternative, juveniles and smolts have lower survival rates through the Delta to Chipps Island.

<sup>235</sup> SWRCB, “Comments on the Second Administrative Draft Environmental Impact Report/Environmental Impact Statement for the Bay Delta ConservationPlan,” p. 1 (July 05, 2013), available at: [baydeltaconservationplan.com/Libraries/Dynamic Document Library/State Water Resouces Control Board Comments on BDCP EIR-EIS 7-5-2013.sflb.ashx](http://baydeltaconservationplan.com/Libraries/Dynamic Document Library/State Water Resouces Control Board Comments on BDCP EIR-EIS 7-5-2013.sflb.ashx). Emphasis added.

<sup>236</sup> EPA regulations state that “criteria must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use. For waters with multiple use designations, the criteria shall support the most sensitive use.” *See* 40 CFR §131.11; *see also* 40 CFR §131.6.

<sup>237</sup> Calif. Water Code § 13000.

<sup>238</sup> *City of Burbank v. State Water Resources Control Bd.*, 35 Cal.4th 613, 626, 108 P.3d 862 (2005) (citing the Supremacy Clause).

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

USEPA commented last year on the Bay Delta Conservation Plan and its draft EIR/EIS that "[b]ecause the location of X2 [the estuarine habitat water quality objective] is closely tied to freshwater flow through the Delta, the proposed project would have a strong influence on this parameter, yet the Draft EIS does not analyze each alternative's impacts on aquatic life in the context of this relationship."<sup>239</sup> The Bay-Delta Water Quality Control Plan's estuarine habitat water quality objective will likely be violated by the Tunnels Project as well. In the RDEIR/SDEIS nor the Draft EIR/EIS there is no modeling of how changes in X2, the Delta's estuarine habitat water quality objective may affect a variety of estuarine species. X2, which measures the approximate center of the estuary's low salinity zone relative to the Golden Gate, was shown last year in BDCP modeling to migrate upstream under the Tunnels' influence relative to existing conditions and the No Action Alternative.<sup>240</sup> The modeled upstream migration of X2 means that critical habitat for estuarine species will shrink, especially relative to the No Action Alternative (Figure 19). Species abundance and X2 are negatively correlated: when X2 moves further from the Golden Gate, species abundances typically decrease as the size of the Low Salinity Zone decrease (with lower flows), with few exceptions.<sup>241</sup> This apparently remains true of the RDEIR/SDEIS, in which no new modeling is conducted.

The State Water Board has indicated tentative interest in designating subsistence fishing as a beneficial use statewide, including in the Delta.<sup>242</sup> Our organizations and others would certainly welcome such a beneficial use designation in the Delta as elsewhere because protection of the most sensitive ecological and estuarine beneficial uses will also protect subsistence fishing as a beneficial use. Humans are connected to these other beneficial uses, no less so in the Bay-Delta Estuary.

The Tunnels Project will also violate numerous pollutant criteria mentioned above with drastic consequences for public health and vitality of the region's ecosystems and water-dependent economic sectors like tourism, recreation, agriculture, and subsistence fishing. On this score, the Tunnels Project will further violate water quality standards, precluding the State Water Resources Control Board from certifying the project under Clean Water Act Section 401.

In summary: implementation of the Tunnels Project will require a CWA Section 404 permit from the Army Corps of Engineers, which it cannot receive unless the state issues a CWA Section 401 certification. The certification in turn cannot be legally issued unless the project as a whole (*i.e.*, rather than the individual discharge mandating the 404 permit) meets water quality standards, which includes meeting beneficial uses designed to protect Delta species and ecosystems. The Tunnels Project fails across the board; we provide more details of this failure in Attachment 5 to this letter.

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<sup>239</sup> USEPA, "Draft Environmental Impact Statement for the Bay Delta Conservation Plan, San Francisco Bay Delta, California (CEQ# 20130365), August 26, 2014, p. 5. Accessible at [http://www.friendsoftheriver.org/site/DocServer/8-26-14\\_EPA\\_Cmmnt\\_on\\_BDCP.pdf?docID=9539](http://www.friendsoftheriver.org/site/DocServer/8-26-14_EPA_Cmmnt_on_BDCP.pdf?docID=9539).

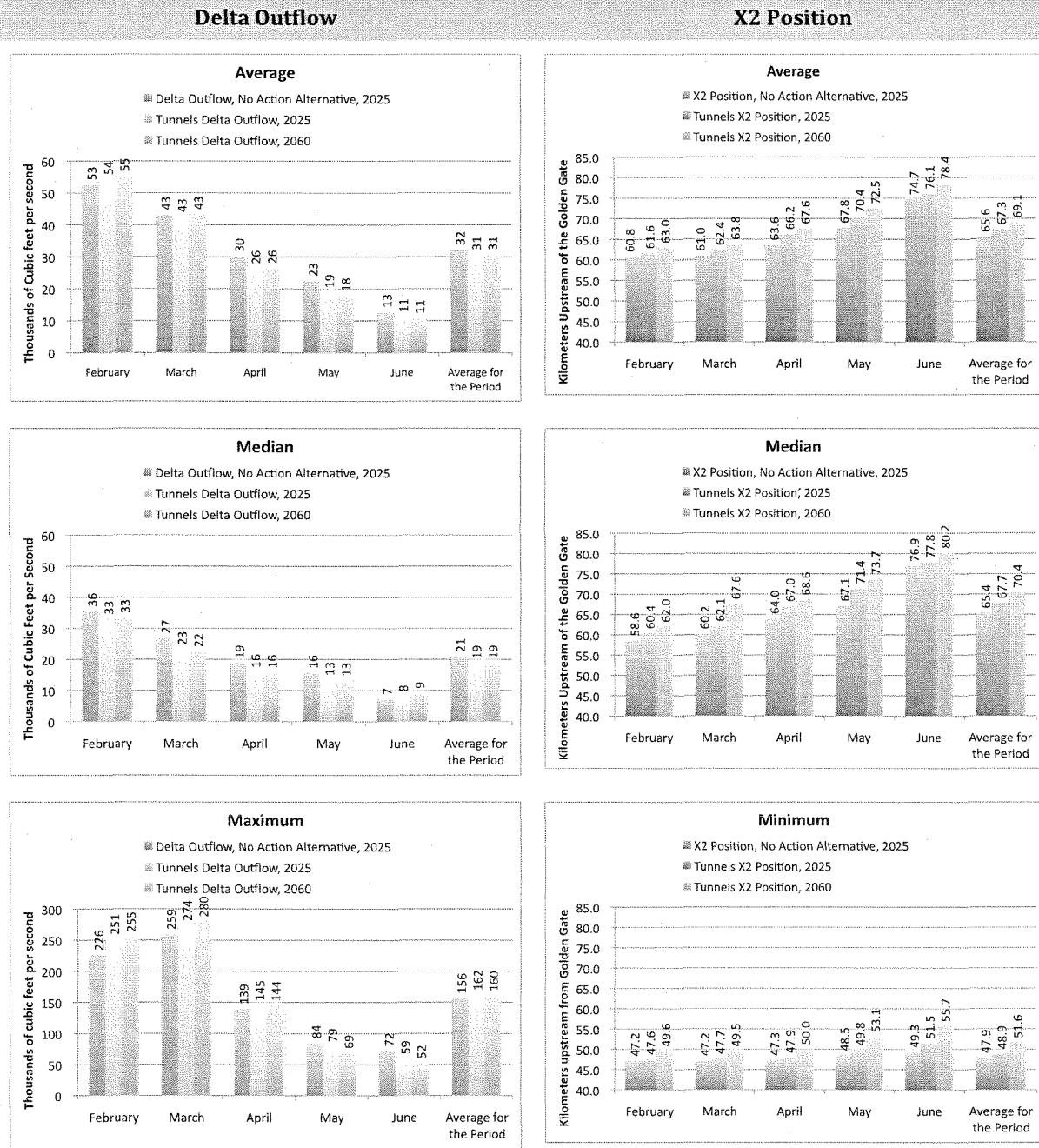
<sup>240</sup> See Figure 7, p., 66 of Environmental Water Caucus comments on Bay Delta Conservation Plan, June 11, 2014; accessible online at <http://ewccalifornia.org/reports/bdcpcComments6-11-2014-3.pdf>.

<sup>241</sup> Panel Summary Report on Workshop on Delta Outflows and Related Stressors, May 5, 2014. Accessible online at <http://deltacouncil.ca.gov/sites/default/files/documents/files/Delta-Outflows-Report-Final-2014-05-05.pdf>. This report identifies "key papers" in which the relationships of X2, Delta outflow, and species abundances are anchored.

<sup>242</sup> Email from Esther Tracy of State Water Resources Control Board, Office of Public Participation, to Andria Ventura, Clean Water Action, "State Water Resources Control Board Beneficial Uses," May 6, 2014, forwarded to Colin Bailey of Environmental Justice Coalition for Water, thence to Tim Stroshane, Environmental Water Caucus consultant. Tracy's message primarily concerns subsistence fishing by California Indian Tribes.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

**Figure 19**  
**Delta Outflow to Decrease in Future Scenarios with Tunnels Project,  
Average X2 Position to Move Eastward with Tunnels Project**



Sources: Bay Delta Conservation Plan, Appendix 5.C., Attachment 5C.A, Table C.A-41, p. 5C.A-174; and Table C.A-42, p. 5C.A-176. NOTE: The average value is skewed somewhat by presence in the data of high outflow and low X2 years. The median is the value where half of all other values in the dataset are greater than the median value, and half are less. Delta outflow and X2 are inversely related. Greater outflow means less distance of X2 from the Golden Gate.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

***There is no defensible anti-degradation analysis.*** A cornerstone of the State Water Board and Regional Water Board's regulatory authority is the Antidegradation Policy (Resolution 68-16), which is included in the Basin Plans as an appendix. However, the Tunnels Project Draft EIR/EIS and RDEIR/SDEIS fail to discuss or analyze constituents which will "degrade" water quality. These documents do not evaluate whether the designated beneficial use is degraded and what it means for Clean Water Act compliance.

Section 101(a) of the Clean Water Act (CWA), the basis for the antidegradation policy, states that the objective of the Act is to "restore and maintain the chemical, biological and physical integrity of the nation's waters." Section 303(d)(4) of the CWA carries this further, referring explicitly to the need for states to satisfy the antidegradation regulations at 40 CFR § 131.12 before taking action to lower water quality. These regulations (40 CFR § 131.12(a)) describe the federal antidegradation policy and dictate that states must adopt both a policy at least as stringent as the federal policy and implementing procedures.

The CWA requires the *full* protection of identified beneficial uses. The Federal Antidegradation Policy, as required in 40 CFR 131.12 states, "The antidegradation policy and implementation methods shall, at a minimum, be consistent with the following: (1) Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected." The Delta is classified as a Tier II, "high quality," waterbody by US EPA and the SWRCB. EPA Region 9's guidance on implementing antidegradation policy states, "All actions that could lower water quality in Tier II waters require a determination that existing uses will be fully maintained and protected."<sup>243</sup>

California's antidegradation policy is described in the State Antidegradation Guidance, SWRCB Administrative Procedures Update 90-004, 2 July 1990 ("APU 90-004") and USEPA Region IX, ("Region IX Guidance"), as well as Water Quality Order 86-17.<sup>244</sup>

California's Antidegradation Policy (Resolution 68-16) requires that:

- Existing high quality water will be maintained until it has been demonstrated that any change will be with the maximum benefit to the people of the State.
- The change will not unreasonably affect present and anticipated beneficial uses.
- The change will not result in water quality less than prescribed in the policies.
- Any activity which produces a waste or increased volume or concentration will be required to meet waste discharge requirements using the best practicable treatment or control of the discharge necessary to assure that neither pollution nor nuisance will occur and the highest water quality with maximum benefit to the people of the state will be maintained.

While California's Antidegradation Policy requires that, "[t]he change will not unreasonably affect present and anticipated beneficial uses and the change will not result in water quality less than prescribed in the policies," the Federal Antidegradation Policy requires a "determination that existing uses will be fully maintained and protected."<sup>245</sup>

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<sup>243</sup> EPA, Region 9, Guidance on Implementing the Antidegradation Provisions of 40 CFR 131.12, page 7.

<sup>244</sup> "Guidance on Implementing the Antidegradation Provisions of 40 CFR 131.12" (3 June 1987).

<sup>245</sup> Draft BDCP EIR/EIS, 2013, page 8-408.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

The Tunnels Project will reduce flows and result in poorer water quality for a number of constituents, including boron, bromide, chloride, electrical conductivity, nitrate, organic carbon, some pesticides, mercury and selenium. The Delta is currently impaired for many of the constituents that will increase under the proposed alternative. Several water quality constituents are detailed in Attachment 5 where degradation is expected should the Tunnels Project be constructed and operated.

Even if DWR and the Bureau of Reclamation provide an adequate antidegradation analysis of the Tunnels Project, the point remains that they cannot move forward on a 401 certification from the State Water Resources Control Board if any water quality standards are not met. The antidegradation analysis is supposed to ensure they comply with any and all water quality standards, but there is clear evidence that cannot and will not.

### **Water Quality, Real-Time Operations, and Adaptive Management**

***Tunnels Project operational modeling criteria scenarios could prejudice water quality objectives for the Bay-Delta Estuary from the State Water Resources Control Board.*** A large but wholly implicit assumption through the RDEIR/SDEIS is that any one of these alternatives would require wholesale revision to how water quality is regulated in the Bay Delta estuary, in order for the Tunnels Project to move forward. The setting sections of Chapter 5, 6, 7, and 8 (comprising water supply, surface water, groundwater, and water quality) contain no descriptions of the existing water quality objectives as they apply to flow and operational actions by the state and federal water facilities in the Delta. The Draft EIR/EIS Executive Summary last year only hints at this matter, titling one section "New Rules for North Delta Diversions," but does not address this matter, making no mention of the regulatory regime change that would apparently be required of the State Water Board.<sup>246</sup> This year, the RDEIR/SDEIS announces "proposed new flow criteria" for north and south Delta SWP and CVP export facilities, and the proposed new head of Old River operable barrier.<sup>247</sup>

Such changes to Delta flows and hydrodynamics must be evaluated through public review before the State Water Resources Control Board, the only state body authorized to change water quality standards. ***We are concerned that the Tunnels Project proponents hope to circumvent the process by making Tunnels operational criteria seem inevitable and necessary; they are neither, and must be the subject of careful and critical review in the Board's Bay-Delta Plan update process, before the Tunnels Project receives permit approvals for new diversions. Put simply: water quality policy must come before plumbing decisions are made. What is best for the Bay-Delta Estuary, and the Delta's economy and communities comes first.***<sup>248</sup>

Further complicating this picture is the role and regulation by SWRCB of Real-Time Operations [RTOs]. Real-time operational decisions:

are expected to be needed during at least some part of the year at the Head of Old River gate and the north and south Delta diversion facilities.<sup>249</sup>

<sup>246</sup> Bay Delta Conservation Plan, Draft EIR/EIS, November 2013, *Executive Summary*, Section ES.9.1.4, "New Rules for North Delta Diversions," pp. ES-52 to ES-53.

<sup>247</sup> RDEIR/SDEIS, Section 4.1, pp. 4.1-11 through 4.1-13.

<sup>248</sup> This stance is also consistent with the Delta Protection Act of 1959.

<sup>249</sup> RDEIR/SDEIS, p. 4.1-13, lines 17-18.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

Indicator	Alternative 4A Criteria	Alternative 4 Criteria
<b>New Criteria Included in Alternative 4A</b>		
North Delta Bypass Flows	<p>Initial Pulse Operations plus Initial Pulse Protection:</p> <p>Low-level pumping of up to 6% of total Sacramento River flow such that bypass flow never falls below 5,000 cfs. No more than 300 cfs can be diverted at any one intake.</p> <p>If the initial pulse begins and ends before Dec 1, post-pulse criteria for May go into effect after the pulse until Dec 1. On Dec 1, the Level 1 rules defined in Table 3-16 in the Draft EIR/EIS apply unless a second pulse occurs. If a second pulse occurs, the second pulse will have the same protective operation as the first pulse.</p> <p>Post-pulse Criteria (specifies bypass flow required to remain downstream of the North Delta intakes):</p> <p>October, November: bypass flows of 7,000 cfs before diverting at the North Delta intakes.</p> <p>July, August, September: bypass flows of 5,000 cfs before diverting at the North Delta intakes.</p> <p>December through June: post-pulse bypass flow operations will not exceed Level 1 pumping unless specific criteria have been met to increase to Level 2 or Level 3 as defined in the Section 3.6.4 of the Draft EIR/EIS. If those criteria are met, operations can proceed as defined in Table 3.4.1-2 in the BDCP Public draft. The specific criteria for transitioning between and among pulse protection, Level 1, Level 2, and/or Level 3 operations, will be developed and based on real-time fish monitoring and hydrologic/behavioral cues upstream of and in the Delta. During operations, adjustments are expected to be made to improve water supply and/or migratory conditions for fish by making real-time adjustments to the pumping levels at the north Delta diversions. These adjustments would be managed under Real Time Operations (RTO).</p>	<p>Initial Pulse Operations: see Table 3.4.1-2 of Bay Delta Conservation Plan.</p> <p>October, November: Flows will exceed 7,000 cfs.</p> <p>July through September: Flows will exceed 5,000 cfs</p> <p>December through June: Variable, as shown in Table 3.4.1-2.</p>

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

**Table 5: Comparison of Alternatives' Operational Criteria**

Indicator	Alternative 4A Criteria	Alternative 4 Criteria
South Delta operations	<p>1 October, November: No south Delta exports during the D-1641 San Joaquin River 2-week pulse, no Old and Middle River (OMR) flow restriction during 2 weeks prior to pulse, and a monthly average of -5,000 cfs in November after pulse.</p> <p>December: OMR flows will not be more negative than an average of -5,000 cfs when the Sacramento River at Wilkins Slough pulse triggers, and no more negative than an average of -2,000 cfs when the delta smelt action 1 triggers. No OMR flow restriction prior to the Sacramento River pulse, or delta smelt action 1 triggers.</p> <p>January, February<sup>15</sup>: OMR flows will not be more negative than an average of 0 cfs during wet years, -3,500 cfs during above-normal years, or -4,000 cfs during below-normal to critical years, except -5,000 in January of dry and critical years.</p> <p>March<sup>16</sup>: OMR flows will not be more negative than an average of 0 cfs during wet or above-normal years or -3,500 cfs during below-normal and dry year and -3,000 cfs during critical years.</p> <p>April, May: Allowable OMR flows depend on gaged flow measured at Vernalis, and will be determined by a linear relationship. If Vernalis flow is below 5,000 cfs, OMR flows will not be more negative than -2,000 cfs. If Vernalis is 6,000 cfs, OMR flows will not be less than +1,000 cfs. If Vernalis is 10,000 cfs, OMR flows will be at least 1,000 cfs. If Vernalis exceeds 10,000 cfs, OMR flows will be at least +2,000 cfs. If Vernalis is 15,000 cfs, OMR flows will be at least +3,000 cfs. If Vernalis is at or exceeds 30,000 cfs, OMR flows will be at least 6,000 cfs.</p> <p>June: Similar to April, allowable flows depend on gaged flow measured at Vernalis. However, if Vernalis is less than 3,500 cfs, OMR flows will not be more negative than -3,500 cfs. If Vernalis exceeds 3,500 cfs and up to 10,000 cfs, OMR flows will be at least 0 cfs. If Vernalis exceeds 10,000 cfs and up to 15,000 cfs, OMR flows will be at least +1,000 cfs. If Vernalis exceeds 15,000 cfs, OMR flows will be at least +2,000 cfs.</p> <p>July, August, September: No OMR flow constraints.</p>	None specified.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

**Table 5: Comparison of Alternatives' Operational Criteria**

<b>Indicator</b>	<b>Alternative 4A Criteria</b>	<b>Alternative 4 Criteria</b>
Head of Old River Gate operations	<p>October 1–November 30<sup>th</sup>: RTO management in order to protect the D-1641 pulse flow designed to attract upstream migrating adult Fall-Run Chinook Salmon. HORB will be closed approximately 50% during the time immediately before and after the SJR pulse and that it will be fully closed during the pulse unless new information suggests alternative operations are better for fish.</p> <p>January: When salmon fry are migrating, (determined based on real time monitoring), initial operating criterion will be to close the gate subject to RTO for purposes of water quality, stage, and flood control considerations.</p> <p>February–June 15th: Initial operating criterion will be to close the gate subject to RTO for purposes of water quality, stage, and flood control considerations. The agencies will actively explore the implementation of reliable juvenile salmonid tracking technology which may enable shifting to a more flexible real time operating criterion based on the presence/absence of covered fishes.</p> <p>June 16 to September 30, December: Operable gates will be open.</p>	<p>December, June 16 to September 30, and during the days in November 2 weeks after the D-1641 pulse: Operable gate will be open. All other months: Operable gate will be partially or completely closed via real-time operations, to minimize entrainment risk for outmigrant juvenile salmonids and/or manage San Joaquin River water quality. In determining the criteria for opening and closure of the Head of Old River gate, the fish and wildlife agencies goal is to have the Head of Old River gate closed as much as possible from February 1 through June 15; however, the Head of Old River gate may be open subject to real-time operations for purposes of water quality, stage, and flood management considerations.</p> <p><b>Note to Reader:</b> Prior to issuance of the final BDCP document, operational guidance will be developed for use by project operators in implementing these operational criteria.</p>
Rio Vista minimum flow standard	<p>January through August: flows will exceed 3,000 cfs</p> <p>September through December: flows per D-1641.</p>	None specified.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

**Table 5: Comparison of Alternatives' Operational Criteria**

<b>Indicator</b>	<b>Alternative 4A Criteria</b>	<b>Alternative 4 Criteria</b>
Spring outflow	<p>March, April, May: To ensure maintenance of longfin smelt abundance, initial operations will provide a March–May average Delta outflow bounded by the requirements of Scenario H3, which are consistent with D-1641 standards, and Scenario H4, which would be scaled to Table 3-24 in Chapter 3, Section 3.6.4.2 of the Draft EIR/EIS. Over the course of the 2081(b) permit term the longfin smelt indices of annual recruitment based upon the 1980–2011 trend in recruitment relative to winter-spring flow conditions will be used to evaluate the effect of operations on longfin smelt (i.e., evaluate positive cohort over cohort population growth). Adjustments to the criteria above and these outflow targets may be made using the Adaptive Management Process and the best available scientific information available regarding all factors affecting longfin smelt abundance.</p>	<p>March through May: As described in Section 3.4.1.4.4, <i>Decision Trees</i>, initial operations will be determined through the use of a decision tree. If at the initiation of dual conveyance, the Permit Oversight Group determines that the best available science resulting from structured hypothesis testing developed through a collaborative science program indicates that spring outflow is needed to achieve the longfin smelt abundance objective the following water operations would be implemented within the decision tree. The high outflow scenario would be to provide a March–May average outflow scaled to the 90% forecast of eight-river index for the water year, with scaling as summarized in the separate table below.</p> <p>March–May outflow targets are achieved using flow supplementation provided through an approved water transfer, by limiting CVP and SWP Delta exports to a total of 1,500 cfs and finally, if these two water sources have been utilized, through releases from Oroville, with subsequent appropriate accounting adjustments between the SWP and the CVP.</p> <p>Alternatively, if best available science resulting from structured hypothesis testing...shows that Delta foodweb has improved, and evidence from the collaborative science program shows that longfin smelt abundance is not strictly tied to spring outflow, the alternative operation under the decision tree for spring outflow would be to follow flow constraints established under D-1641.</p> <p>February, June: Flow constraints established under D-1641 will be followed. All other months: no constraints.</p>
Winter and summer outflow	<p>Flow constraints established under D-1641 will be followed.</p>	<p>Flow constraints established under D-1641 will be followed if not superseded by criteria listed above.</p>

**Key Existing Criteria Included in Modeling**

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

**Table 5: Comparison of Alternatives' Operational Criteria**

<b>Indicator</b>	<b>Alternative 4A Criteria</b>	<b>Alternative 4 Criteria</b>
Fall outflow	September, October, November implement the USFWS (2008) BiOp Fall X2 requirements. However, similar to spring Delta outflow and consistent with the existing RPA adaptive management process, adjustments to these outflow targets may be made using the Adaptive Management and Monitoring Program described below and the best available scientific information available regarding all factors affecting delta smelt abundance.	September, October, November: As described in Section 3.4.1.4.4, <i>Decision Trees</i> , initial operations will be determined through use of a decision tree. Within that tree, the evaluated starting operations would be to implement the USFWS (2008) BiOp requirements, and the alternative operation would be to operate to D-1641 requirements. The alternative operation would be allowed, if the research and monitoring conducted through the collaborative science program show that the position of the low-salinity zone does not need to be located in Suisun Bay and the lower Delta, as required in the biOp, to achieve the BDCP objectives for Delta smelt habitat and abundance. All other months: No constraints.
Delta Cross Channel gates	Operations as required by NMFS (2009) BiOp Action 4.1 and D-1641.	None specified.
Suisun Marsh Salinity Control Gates	<input checked="" type="checkbox"/> Gates would continue to be closed up to 20 days per year from October through May.	None specified.
Export to inflow ratio	<input checked="" type="checkbox"/> Operation criteria are the same as defined under D-1641. <input checked="" type="checkbox"/> The D-1641 export/inflow (E/I) ratio calculation was designed to protect fish from south Delta entrainment. For Alternative 4A, Reclamation and DWR propose that the North Delta Diversion (NDD) does not affect either Delta inflows or exports as they relate to the E/I ratio calculation.	Combined export rate is defined as the diversion rate of the Banks Pumping Plant and Jones Pumping Plant from the south Delta channels. <sup>b</sup> Delta inflow is defined as the sum of the Sacramento River flow downstream of the proposed north Delta diversion intakes, Yolo Bypass flow, Mokelumne River flow, Cosumnes River flow, Calaveras River flow, San Joaquin River flow at Vernalis, and other miscellaneous in-Delta flows. Operation criteria are the same as defined under D-1641, subject to BDCP adaptive management.
Notes		<sup>b</sup> = It has not yet been determined whether the combined export rate will include the diversion rate of the new north Delta diversions.

Sources: Bay Delta Conservation Plan, Section 3.4, *Conservation Measure 1*, Table 3.4.1-1, pp. 3.4-18 to 3.4-20; Bay Delta Conservation Plan/California WaterFix, RDEIR/SDEIS, Section 4.1, Table 4.1-2, pp. 4.1-2, pp. 4.1-7 to 4.1-10.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

Table 5 provides a comparison of operational criteria used in the modeling of both the tunnels project of Conservation Measure 1 last year and the Tunnels Project of the RDEIR/SDEIS. This table shows the complex range and number of operational criteria that must be taken into account as indicators or parameters that would govern real-time operations of the Tunnels Project. As indicated in Table 5, there are a number of changes made to Alternative 4A (the Tunnels Project, 2015, the RDEIR/SDEIS) relative to the parameters and operational criteria anticipated for the Conservation Measure 1 tunnels project. For every change and increase to the number and array of criteria that must be tracked for operating tunnels there is a corresponding increase of complex interactions that must be accurately accounted for in real-time in order to make adjustments that provide accurate and appropriate feedback within the system of water project and ecosystem interactions. The efficacy of real-time operations depends entirely on the belief or assumption that real-time operators have an accurate and complete grasp of the systems they work with and the interactions among the varied components of that system. This accurate and complete grasp extends not only to the conceptual and mathematical models with which they work but to basic needs for accurate and timely data from reliable instrumentation in appropriate locations.

Real-time operations are defined in Conservation Measure 1 of the Bay Delta Conservation Plan:

[R]eal-time operational decision-making process (real-time operations [RTOs]) allows for short-term adjustments in operations within the range of CM1 [that is, Tunnels Project operating] criteria..., in order to maximize water supply for SWP and CVP relative to the [BDCP] Annual Operating Plan and its quarterly updates subject to providing the necessary protections for covered species.<sup>250</sup>

The Tunnels Project's documents expect retention of BDCP's use of RTO teams focused on each Delta facility and coordinating with each other. We note that the RDEIR/SDEIS does not specify that post hoc descriptions of RTOs would be made public through such an Annual Operating Plan. Our organizations are not opposed to RTOs in principle. Tunnels Project proponents acknowledge that RTOs cannot be modeled.<sup>251</sup> Not only can they not be modeled, RTOs themselves will be difficult (if not impossible) to regulate and monitor by state authorities when the most sensitive beneficial uses have admittedly uncertain threshold conditions that should not be exceeded.

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<sup>250</sup> BDCP, November 2013, Section 3.4.1.4.5, *Real-Time Operational Decision-Making Process*, p. 3.4-26, lines 14-18.

<sup>251</sup> This is most explicitly noted in BDCP Appendix 5.C, Attachment 5C.A, *CALSIM II and DSM2 Modeling Results for the Evaluated Starting Operations Scenarios*, pp. 5C.A-157 to 162. Old and Middle River flow real-time operations are an example, p. 5C.A-157, lines 31-44. "The magnitude of the export restrictions [relating to Old and Middle River flows] cannot be simulated accurately with CALSIM because the limits will be adaptively specified by the USFWS smelt working group, based on real-time monitoring of fish and turbidity and temperature conditions. The assumed restrictions provide a representative simulation compared to D-1641 conditions without any OMR restrictions." Moreover, real-time operations pose dramatic uncertainties for South Delta export operations with real-time adaptive operations in place. "If the least restrictive OMR flow of -5,000 cfs were allowed for 6 months (January-June), a maximum of 1,800 taf per year could be pumped (assuming the San Joaquin River diversion to Old River satisfied the 35% of the net Delta depletion that is south of the OMR flow stations. But because of the 1,500 cfs limit on exports in April and May (2009 NMFS BiOp), the maximum exports would be 1,400 taf per year. If the OMR restriction was reduced to -2,500 cfs for the 6 months (with 1,500 cfs in April and May), a total of 780 taf could be pumped from the South Delta. This is a very dramatic reduction for the CVP and SWP exports which historically have exported about half (45%) of the total exports during these months. This uncertainty in the potential south Delta exports is a consequence of the adaptive management framework for the 2008 USFWS BiOp and 2009 NMFS BiOp actions regarding OMR flow." Since BDCP contemplates real-time operations in several other Delta and Yolo Bypass locations, uncertainties will compound for planning operations, exports, and outflows.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

Tunnels Project proponents push use of RTOs as "silver bullets" for gaps in mitigation that ought to protect listed fish species but which come up short. This implies that individual experts will be given broad discretion over project operations to make "short-term adjustments"—possibly to the usurpation of established laws and regulations in the name of optimizing or maximizing Delta exports relative to Delta inflows, water quality objectives, and Delta outflow, and potentially contrary to the SWRCB's role as the sole body with authority to change and enforce water quality objectives.

Given that the adaptive management research agenda of Appendix D to the RDEIR/SDEIS is replete with large numbers of studies to increase understanding of the water project and ecosystem interrelationships, EWC lacks confidence that RTO's silver bullet role would succeed. Moreover, this is not the kind of "experiment" that is called for in the literature of adaptive management of natural resources. Even more important it is unlawful as a basis for mitigating significant, unavoidable impacts under CEQA and NEPA. For example, real-time operations and modeling were employed in 2014 and 2015 along the upper Sacramento River by the Bureau of Reclamation to manage and control temperature conditions, but failed to prevent large scale losses of winter-run and spring-run Chinook salmon while SWRCB staff and officials could only stand by helplessly. Real-time operations can create situations in which project operators can behave as they see fit, and apologize later. That is unacceptable now that listed fish species are so close to extinction. We doubt that real-time operations can be permitted sufficient margins of error to prevent catastrophe. This is why we advocate application of the precautionary principle for enforcing and complying with water quality objectives.

Adjustments to water quality flow objectives and beneficial uses should err on the side of precaution. Designated beneficial uses should be protected as required under the CWA and its implementing regulations. The most sensitive of them will be endangered further by Tunnels Project operating criteria that reduce and reverse Sacramento River flows, and bring more polluted San Joaquin River water to Delta channels. The precautionary principle must come to the fore in state and federal fisheries and water project operations management.<sup>252</sup> ***Sound policy preventing extinction and restoring and enhancing the integrity of Bay-Delta Estuary waters must come before new plumbing and south of Delta export deliveries.***

This is not a call to end south of Delta exports, but an appeal to state and federal officials that they realistically assess how to protect fully all beneficial uses by protecting the most sensitive among them fully under the CWA before reasonable quantities of Delta exports can be determined and permitted. ***The Tunnels Project as proposed would put plumbing and exports first, which is neither an acceptable, lawful nor reasonable prioritization.***

Last year, we noted that the essential purpose of real-time operations (or "RTOs"), as described in BDCP, is to

maximize water supply for SWP and CVP relative to the Annual Operating Plan and its quarterly updates subject to providing the necessary protections for covered species. RTOs would be implemented on a timescale practicable for each affected facility and are part of the water operating criteria for CM1, which will be periodically evaluated and possibly modified through the adaptive management program [citation]. The RTOs will satisfy Water Code Section 85321: "The BDCP shall include a transparent, real-time operational decision-making process in which fishery agencies ensure that applicable biological performance measures are achieved in a timely manner with respect to water system operations."

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<sup>252</sup> Peter Montague, accessed online 11 September 2015 at [http://www.precaution.org/lib/pp\\_def.htm](http://www.precaution.org/lib/pp_def.htm).

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

When developing adjustments to Tunnels Project operations in real-time, the RTO team<sup>253</sup> would consider covered species risks, actions needed to avoid adverse effects on covered fish species, water allocations currently or in future years, "end of year [reservoir] storage," the San Luis Reservoir low point<sup>254</sup>, delivery schedules for any SWP or CVP contractor, and "actions that could be implemented throughout the year to recover any water supplies reduced by actions taken by the RTO team."<sup>255</sup> These criteria for consideration place a great deal of pressure on the RTO team to minimize water costs to North Delta Intake diversions, lest they be compensated later. It would be wise to assume for CEQA and NEPA purposes that some fraction of the time RTO team personnel will make errors.

RTO team activities would be needed under BDCP not only at the North Delta Intakes, but at the Delta Cross Channel gates, Head of Old River gate, the Fremont Weir operable gate, and the "nonphysical barriers" intended to shoo fish away from certain channels without actually blocking river flows.

The RTO team would attempt to plan RTOs as part of BDCP's "Annual Delta Water Operations Plan," by anticipating periods when RTOs may be employed, alternative responses to be considered, the intended benefits to covered species, any expected effects on water supply, and the monitoring and analysis procedures used to track adjustments. RTOs would necessitate an elaborate range of accounting procedures since the state and federal water projects will not tolerate net losses of water exports just because covered fish show up unannounced and uninvited at the North Delta Intakes or the South Delta pumping plants.

This section of Chapter 3 in BDCP states some "salvage density triggers" for Old and Middle River flow adjustments between January 1 and June 15 affecting the South Delta export facilities.<sup>256</sup> At the North Delta Intakes, RTO monitoring will manage bypass flow operations from December through June, but the "exact triggers and responses for RTO at the north Delta diversions are still under development." Generally they are intended to manage north Delta diversion bypass flows:

- within a preset range when juvenile salmonids are emigrating downstream past the intakes.
- within a preset range when adult sturgeon are migrating upstream.
- within a preset range to avoid an increase in frequency and magnitude of reverse flows (and entrainment) at Georgiana Slough compared to baseline (Real-time adjustments to avoid reverse flows are primarily the responsibility of DWR operators with occasional input from RTO team as appropriate.)
- and to manage the distribution of pumping activities among the three north Delta and two south Delta intake facilities to maximize survival of covered fish species in the Delta and water supply.<sup>257</sup>

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<sup>253</sup> The Real-Time Operations Team would comprise one representative each from the three state and federal fishery agencies and from DWR and the Bureau of Reclamation.

<sup>254</sup> San Luis Reservoir has a "low point" of about 300,000 acre-feet of storage below which the intakes for San Felipe Project contractors (Santa Clara Valley Water District and San Benito County Water District) are unable to withdraw water due to the potential for algal bloom contamination and other water quality concerns, due to the fact that when San Luis Reservoir gets that low, temperature and water quality conditions make it economically infeasible for San Felipe Project contractors to treat the water to an acceptable level for beneficial use.

<sup>255</sup> Bay Delta Conservation Plan, Chapter 3, p. 3.4-26, lines 34-39, and p. 3.4-27, lines 1-4.

<sup>256</sup> *Ibid.*, p. 3.4-28 to 3.4-29, Table 3.4.1-3.

<sup>257</sup> *Ibid.*, lines 13-22.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

***But the fact these ranges and pumping activities are undisclosed means the project descriptions are incomplete in both the Draft EIR/EIS and the RDEIR/SDEIS.***

***Undue, Improper and Excessive Reliance on Adaptive Management.*** Table 6 identifies threats and stressors for Delta smelt, winter-run and spring-run Chinook salmon, and Central Valley steelhead, and identifies sections of the RDEIR/SDEIS and Draft EIR/EIS sections where effects of the Tunnels Project exacerbate the threats and stressors, and cites to passages, data tables and charts that document the impact and the reliance on real-time operations and adaptive management as supposed mitigations. Such alleged mitigations are metaphorical birds in the bush, not mitigations in the hand. CEQA requires that mitigations actually reduce or avoid significant impacts. RTOs and adaptive management research tasks are not recognized as CEQA or NEPA mitigation "wild cards." You either mitigate to a level less than significant or adverse, or you have not. RTOs and adaptive management are not "enforceable," and cannot be modeled. Mitigations must be measurable and enforceable. Deteriorating through-Delta survival rates of the various runs of Chinook salmon disclosed in the RDEIR/SDEIS belie the RDEIR/SDEIS's claims for the Tunnels Project that supposed mitigations will be effective. ***Thus, the RDEIR/SDEIS is inadequate for proposing mitigations based on real-time operations and adaptive management, and then claiming that significant, adverse impacts are reduced to levels that are less than significant or not adverse.***

The National Research Council's committee on Sustainable Water and Environmental Management of the Bay Delta Estuary suggested using a technique to determine whether adaptive management is an appropriate strategy before it is undertaken. The technique probes three direct criteria:

- the existence of information gaps
- good prospects for learning at an appropriate time scale compared to management decisions, and
- the presence of opportunities for adjustment.<sup>258</sup>

In the case of BDCP, the NRC committee concluded that adaptive management is appropriate for use in BDCP, but further concluded that "BDCP needs to address...difficult problems and integrate conservation measures into the adaptive management strategy ***before there can be confidence in the adaptive management program.***" The NRC committee also stressed that it is critical that the results of adaptive management efforts management decision making.

We are more circumspect than the National Research Council about the applicability of adaptive management to the politics of the Tunnels Project and the Delta's future. For one thing, state regulatory and operational agencies fail repeatedly to apply existing statewide water policy goals to their actions, plans, and programs. The Tunnels Project's (and BDCP's) adaptive management program is co-opted by the narrow engineering objectives we described earlier that same statewide policy goals, focused as they are on better export water quality and more reliable, larger export deliveries.

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<sup>258</sup> National Research Council, Panel to Review California's Bay Delta Conservation Plan, *A Review of the Use of Science and Adaptive Management in California's Draft Bay Delta Conservation Plan*, Washington, DC: National Academies Press, 2011 p. 39. Accessible online 7 April 2014 at [http://www.nap.edu/catalog.php?record\\_id=13148](http://www.nap.edu/catalog.php?record_id=13148). Emphasis added.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

**Table 6**  
**Sources of Threat and Stressor Acknowledgements for Listed Species**  
**Bay Delta Conservation Plan/Alternatives 4 and 4A**

Listed Species	Threats and Stressors	Tunnels Project' Sources
Delta Smelt	<ul style="list-style-type: none"> <li>• Increased water clarity</li> <li>• Potential North Delta intakes entrainment and impingement, predation</li> <li>• Exposure to contaminants and harmful algal blooms due to increased water residence time</li> <li>• Reduced flows and upstream migration of X2 habitat</li> </ul>	<p><b>Water clarity:</b> RDEIR/SDEIS, p. 4.3.7-26, 4.3.7-29</p> <p><b>North Delta Intakes: entrainment and predation loss:</b> p. 4.3.7-24, lines 4-7.</p> <p><b>X2 moves upstream:</b> Alternative 4 modeling applies to Alternative 4A (Section 4.1.6, p. 4.1-43, lines 10-30), shows upstream X2 migration, BDCP Appendix 5C Tables C.A-41 and -42. See also Figures 4.3.2-7 and -8, Section 4.3.2 Water Supply.</p> <p><b>Increased residence time:</b> Appendix 5C, Table 5C.5.4-14 of BDCP; Table 8-60a of RDEIR/SDEIS.</p>
Winter-run Chinook Salmon	<ul style="list-style-type: none"> <li>• North Delta intakes contact at fish screens and predator concentration (hotspots)</li> <li>• North Delta intakes reduce downstream flows, leading to greater probability of predation effects</li> <li>• Reduced attraction flows for migrating adults from North Delta intakes operation</li> <li>• Exposure to contaminants in late long term period (2060)</li> </ul>	<p><b>Fish screens operation with adaptive management plan and real-time operations:</b> p. 4.3.7-48, lines 11-17. Claims to eliminate entrainment and impingement risk, but does not make same claim for delta smelt.</p> <p><b>Reduced downstream and attraction flows:</b> BDCP Appendix 5C Tables C.A-41 and -42. See also Figures 4.3.2-7 and -8, Section 4.3.2 Water Supply.</p> <p><b>Increased residence time:</b> Appendix 5C, Table 5C.5.4-14 of BDCP; Table 8-60a of RDEIR/SDEIS.</p>
Spring-run Chinook Salmon	<ul style="list-style-type: none"> <li>• North Delta intakes contact at fish screens and predator concentration (hotspots)</li> <li>• North Delta intakes reduce downstream flows, leading to greater probability of predation effects</li> <li>• Reduced attraction flows for migrating adults from North Delta intakes operation</li> <li>• Exposure to contaminants in late long term period (2060)</li> </ul>	<p><b>Fish screens operation with adaptive management plan and real-time operations:</b> p. 4.3.7-79, lines 15-17. Claims to eliminate entrainment risk.</p> <p><b>Reduced downstream and attraction flows:</b> BDCP Appendix 5C Tables C.A-41 and -42. See also Figures 4.3.2-7 and -8, Section 4.3.2 Water Supply.</p> <p><b>Increased residence time:</b> Appendix 5C, Table 5C.5.4-14 of BDCP; Table 8-60a of RDEIR/SDEIS.</p>
Central Valley Steel-head	<ul style="list-style-type: none"> <li>• North Delta intakes contact at fish screens and predator concentration (hotspots)</li> <li>• North Delta intakes reduce downstream flows, leading to greater probability of predation effects</li> <li>• Reduced attraction flows for migrating adults from North Delta intakes operation</li> <li>• Exposure to contaminants in late long term period (2060)</li> </ul>	<p><b>Fish screens operation with adaptive management plan and real-time operations:</b> p. 4.3.7-199, lines 1-6.</p> <p><b>Reduced downstream and attraction flows:</b> BDCP Appendix 5C Tables C.A-41 and -42. See also Figures 4.3.2-7 and -8, Section 4.3.2 Water Supply.</p> <p><b>Increased residence time:</b> Appendix 5C, Table 5C.5.4-14 of BDCP; Table 8-60a of RDEIR/SDEIS.</p>

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

Researchers Craig R. Allen and Lance H. Gunderson have identified more circumscribed conditions under which adaptive management may be applied with success. They argue that adaptive management is probably most appropriate when the degree of scientific uncertainty over environmental systems is high and the governance capacity of the system is also high. Among the "pathologies" or challenges they identify about political and organizational situations that readily undermine the efficacy of adaptive management are: lack of stakeholder engagement, surprises getting suppressed rather than learned from, procrastination on protective action toward the resource of concern (e.g., "paralysis by analysis" or a focus on planning, not action), and "learning not used to justify changing policy and management."<sup>259</sup> "Controllability" of outcomes for the Delta is indeed low at this time: Many, many governmental, private, and non-profit entities compete to govern some or another aspect of the region's natural resources and economic development, immediately creating adaptive management challenges to social learning and effective resource management. It is often remarked that Delta governance is fragmented, given the sheer number of state, local and federal governmental jurisdictions that exist. Is adaptive management really possible when the state of California through its Department of Water Resources tends to regard the Delta as an internal colony to be plundered for its water wealth, and regulatory agencies frequently defer to the Department's activities there? The Tunnels Project is the pinnacle moment for state government's and export service area contractors' colonial impulses toward the Delta.

There are no guarantees that scientific findings can successfully and meaningfully inform intensely political water decisions by mostly bureaucratic water managers. We are concerned that Tunnels Project proponents place too much faith in the water and environmental managers who will govern the Tunnels Project and/or implement BDCP.

There is no reason, after 48,000 pages of BDCP and "California WaterFix", to think that the Tunnels Project will be operated with any more environmental sensitivity or patience for social learning from scientific adaptive management experiments on Delta endangered species and other beneficial uses over the last six decades.

An alternative is to regulate the Delta on the basis of ***the precautionary principle***: First, do no harm. If you aren't sure what you're doing, you should proceed slowly and carefully, or perhaps not at all. Better safe than sorry.<sup>260</sup> If you must, export water from the Delta responsibly, not at the expense of the Delta's ecological and economic needs, and not profligately.<sup>261</sup>

***The Proposed Project is not the Least Environmentally Damaging Practicable Alternative (LEDPA).*** Finally, the Tunnels Project also fails to meet another Section 404 requirement, "[t]he requirement [under CWA § 404(b)(1)...that the project proponent must demonstrate that the project is the [Least Environmentally Damaging Practicable Alternative] LEDPA."<sup>262</sup> "A proposed action is not the LEDPA simply because a federal agency is a partner and chooses that proposed

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<sup>259</sup> Craig R. Allen and Lance H. Gunderson, "Pathology and Failure in the design and implementation of adaptive management," *Nebraska Cooperative Fish & Wildlife Research Unit--Staff Publications*. Paper 79. <http://digitalcommons.unl.edu/ncfwrustaff/79>. Also published in *Journal of Environmental Management* 92 (2011): 13279-1384.

<sup>260</sup> Peter Montague, "The Uses of Scientific Uncertainty," *Rachel's Environment and Health Weekly* #657, July 1, 1999.

<sup>261</sup> See Environmental Water Caucus, *A Sustainable Water Plan For California*, 2015. Accessible online 20 October 2015 at <http://ewccalifornia.org/reports/ewcwaterplan9-1-2015.pdf>.

<sup>262</sup> USEPA, Preliminary Administrative Draft Comments for the Bay Delta Conservation Plan DEIR/S p. 2, April 26, 2012.

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

action as its preferred alternative.<sup>263</sup> The Tunnels Project appears to be the *most* environmentally damaging alternative possible. It most definitely is not the least damaging, and therefore, it is not the LEDPA.

Over two years ago, EPA pointed out that "Chapter 8 of the [Administrative Draft EIS] ADEIS indicates that, as proposed, all project alternatives of the BDCP would result in adverse effects to one or more beneficial uses within the affected water bodies."<sup>264</sup> EPA also explained that "The DEIS should sharply distinguish between alternatives and evaluate their comparative merits, consistent with 40 CFR 1502.14(b)."<sup>265</sup> Over one year ago, EPA explained to state agencies that:

Other reasonable alternatives could be developed by incorporating a suite of measures, including water conservation, levee maintenance, and decreased reliance on the Delta. Such alternatives would be consistent with the purpose and need for the project, as well as with the California Bay-Delta Memorandum of Understanding among Federal Agencies and the Delta Reform Act of 2009.<sup>266</sup>

The "alternatives" of the Tunnels Project presented in the Draft EIR/EIS and the RDEIR/SDEIS are nothing more than peas out of the same pod.<sup>267</sup> There has also been a complete failure on the part of Tunnels Project proponents to obtain and present the Reasonable and Prudent Alternatives (RPA) required under the Endangered Species Act in the RDEIR/SDEIS.<sup>268</sup>

Under the NEPA Regulations, "This [alternatives] section is the heart of the environmental impact statement." The alternatives section should "sharply" define issues and provide a clear basis for choice among options by the decision-maker and the public. 40 C.F.R. § 1502.14. Moreover, if "a draft statement is so inadequate as to preclude meaningful analysis, the agency shall prepare and circulate a revised draft of the appropriate portion."<sup>269</sup>

Operation of the Tunnels Project would have enormous adverse environmental impacts causing and worsening violations of water quality standards. We understand that the exporters and their supporters wish to take enormous quantities of water away from the lower Sacramento River. But we have a government of laws, not of men and women. It is time either to drop this horrendously damaging and expensive project or follow the law whether certain interests want to do so or not. If the project is not dropped, it will be necessary to recirculate another Draft EIR/EIS for public and decision-maker review that presents a reasonable range of alternatives that would not include the Tunnels Project and that would finally begin to increase flows through the Delta. The range of reasonable alternatives required by NEPA must include the Reasonable and Prudent Alternatives (RPA) produced pursuant to the Endangered Species Act and the Least Environmentally Damaging Practicable Alternative (LEDPA) pursuant to the Clean Water Act.

<sup>263</sup> EPA, BDCP DEIS Corrections and Additional Editorial Recommendations, p. 1, August 27, 2014.

<sup>264</sup> EPA's Comments on BDCP ADEIS, p. 3, July 3, 2013.

<sup>265</sup> *Id.* p. 2.

<sup>266</sup> EPA Detailed Comments on the Draft Environmental Impact Statement for the Bay Delta Conservation Plan; August 26, 2014, p. 13.

<sup>267</sup> <http://restoredelta.org/wp-content/uploads/2015/09/7-22-15-BDCP-alts-ltr-pdf.pdf>.

<sup>268</sup> <http://restoredelta.org/wp-content/uploads/2015/09/9-9-15-BDCP-final-ltr-pdf.pdf>.

<sup>269</sup> 40 C.F.R. § 1502.9(a).

**Environmental Water Caucus Comments on  
Recirculated Draft EIR/Supplemental Draft EIS  
for Bay Delta Conservation Plan and Tunnels Project**

### **III. Continuing Failure to Provide Adequate Funding Assurances**

Because there is no new financial and economic analysis of the Tunnels Project alternatives in the RDEIR/SDEIS, our comments last year about the Tunnels Project apply equally this year:

There is great instability and uncertainty in the future of water exports from the Delta. Taking account of the range of reasonably foreseeable future of Delta exports shows dramatic effects on the Twin Tunnels' incremental water cost and financial performance. This instability fatally undermines BDCP's capacity to provide credible funding assurances.

Compared to other sources of potential new water supply in California, the Twin Tunnels project ranges from the high end of these alternative sources to being infeasible altogether, depending on financing assumptions used in the BDCP analysis.

The BDCP analysis of water affordability from the Twin Tunnels project is deeply flawed and fails to support the demand-side basis of financial assurances needed to make statutory findings for issuance of incidental take permits. The fishery agencies should reject BDCP incidental take application for lack of adequate funding assurances.

The Twin Tunnels financing plan remains highly uncertain and fails to meet the requirements of funding assurances needed to make statutory findings for issuance of incidental take permits.

Lack of a financing plan means the Tunnels Project and its RDEIR/SDEIS are incomplete, and cannot fulfill disclosure requirements of the California Environmental Quality Act and National Environmental Policy Act.

Economist Jeffrey Michael, director of the Center for Business and Policy Research at the University of the Pacific in Stockton, revisited his analysis of benefits and costs of the Tunnels Project, and found that the Tunnel Project's economics were worsened by three key modifications made to it:

- ***The new plan drops the 50-year permit, and any notion of regulatory assurances about future water deliveries.*** This change has already been revealed and discussed, but its importance to the economics can not be understated. According to the State's BDCP consultants, the regulatory assurance was the basis for ***over half*** of the economic value of the Tunnels to the water exporters' who would finance them. The already flimsy economic case for the Tunnels completely falls apart without the regulatory assurance. It drops the estimated benefits by nearly \$10 billion.<sup>270</sup>
- ***The average annual incremental water yield with the tunnels compared to "No Action" has dropped by 135,000 acre feet(af).*** The 2013 EIR (table 5-9) had four scenarios with an incremental yield that ranged from a loss of 27,000 af to a gain of 821,000 af, and an average gain of 392,000 af across all four scenarios. The new EIR has 2 scenarios with an incremental yield ranging between a loss of 23,000 af to a gain of 537,000 af which is an

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<sup>270</sup> Jeffrey Michael, *Valley Economy Blog*, "Is BDCP a good deal for water agencies? Jason Peltier and David Sunding disagree," June 23, 2012, accessible at <http://valleyecon.blogspot.com/2012/06/is-bdcp-good-deal-for-water-agencies.html>; see also "Comparing Benefit Cost Estimates of the Tunnels," September 3, 2013, <http://valleyecon.blogspot.com/2013/09/comparing-benefit-cost-estimates-of.html>; and "Quick Take on LA Times' Report on Restructuring the Delta Tunnel Plan," <http://valleyecon.blogspot.com/2015/04/quick-take-on-la-times-report-on.html>.