



March 30, 2015

Transmitted via email: william.h.guthrie@usace.army.mil

William Guthrie, Project Manager
US Army Corps of Engineers, Sacramento District
1325 J Street, Room 1350
Sacramento, CA 95814-2922

Subject: SPK-2014-00187 “Emergency” Drought Barriers

Dear Mr. Guthrie:

With this letter, Restore the Delta provides the US Army Corps of Engineers its comments on the above referenced application to your office from the California Department of Water Resources (DWR) concerning emergency drought barriers in the Delta. We understand this application requests a 10-year program permit to allow temporary installation of barriers at specific locations in Sutter and Steamboat sloughs, and along False River, up to three times over the next ten years.

Restore the Delta is a grassroots campaign by residents and organizations committed to restoring the Sacramento-San Joaquin Delta so that fisheries and farming can thrive there together again. We work through public education and outreach so that all Californians recognize the Sacramento-San Joaquin Bay Delta as part of California’s natural heritage, deserving of restoration. We fight for a Delta with waters that are fishable, swimmable, drinkable, and farmable, able to support the health of the estuary, San Francisco Bay, and the ocean beyond. Our coalition envisions the Sacramento-San Joaquin Delta as a place where a vibrant local economy, tourism, recreation, farming, wildlife, and fisheries thrive as a result of resident efforts to protect our waterway commons.

The Corps’ notice, posted January 30, 2015, states that “the Corps is particularly interested in receiving comments related to the proposals probable impacts on the affected aquatic environment and the secondary and cumulative effects.” The notice also indicates that if the Corps determines “that the information received in response to this notice is inadequate for thorough evaluation, a public hearing may be warranted.” This letter incorporates the comments we have already provided to DWR on March 16, and supplements that letter with additional comments, some of which reflect the rapidly changing circumstances California, the Central Valley, and the Delta face as the drought continues to worsen.

DWR's request to allow installation of the proposed barriers in three consecutive years out of ten could be enough to cause extinction of some runs of Chinook salmon. Granting this request would amount to a license to commit extinction. There are better alternatives. We urge the Corps to look closely at this proposed project's relationship to other cumulative projects and plans in order to fully assess the project's impacts, and condition any program permit it issues to DWR to that it mitigates or avoids these impacts altogether, including ones that increase the likelihood of extinction.

Additional Comments

1. The need for the drought barriers is still neither demonstrated nor justified.

In Restore the Delta's letter to DWR of March 16 (attached), we stated that the need for the proposed drought barriers is neither demonstrated nor justified. We continue to believe this. For the time being, it appears that even DWR and the Bureau agree. They filed their second Temporary Urgency Change Petition (TUCP) with the State Water Resources and it does not request permission from the Board to install the drought barriers at this time.¹ The Corps' role in evaluating and permitting installation, operation, and removal of such barriers over a ten-year period is critical, should dry years continue after 2015, in protecting the long-term fate of Delta smelt, the various surviving races of Chinook salmon, steelhead, sturgeon, and overall water quality in the Delta. The conditions the Corps imposes on the barriers for the next years will tell us much about the official future of the Delta and its ecology.

As California approaches the end of its winter rainy season, key state and federal reservoir levels appear to have already peaked. Table 1 below updates Table 1 from our March 16 letter to DWR, and shows that overall storage this year has already peaked. As of March 15th, California Data Exchange Center information showed storage in these reservoirs at 8,359,000 acre-feet (see Table 1, attached letter, page 5). Since that time, reservoir storage has shown a small decrease of about 2,000 acre-feet as of March 29th. The change in storage from March 15th to the 29th decreased by about 165,000 acre-feet (from 996,000 to 831,000 acre-feet). The storage picture has evidently worsened. Yet DWR and the Bureau are still not inclined to install the barriers, to our nervous relief.

¹ Letter of March 24, 2015, from David Murrillo, Regional Director, Bureau of Reclamation, and Mark W. Cowin, Director, Department of Water Resources, to Thomas Howard, Executive Director, State Water Resources Control Board, p. 4. "These proposed modifications reflect the elements included in the [Drought Contingency Plan] 99% hydrology (without installation of Emergency Drought Barriers) as well as additional concepts for potential water operations. Currently DWR and Reclamation are closely monitoring and analyzing the need to install rock barriers in the Delta to protect water quality and minimize impacts on stored water supplies. If it is decided that Emergency Drought Barriers must be installed this water year, the Projects will submit a subsequent TUCP, based on most recent hydrology, to request additional modifications to D-1641 requirements."

Table 1 Change in Storage Conditions Major CVP and SWP Upstream Reservoirs, 2014-2015				
Reservoir	Storage, March 29, 2015 (TAF)	Storage, March 29, 2014 (TAF)	Change in Storage (TAF)	Percent of Average
Trinity	1,187	1,295	-108	62%
Shasta	2,679	2,114	565	79%
Oroville	1,791	1,638	153	70%
Folsom	573	417	156	104%
New Melones	561	1,041	-480	41%
San Luis	1,362	853	509	74%
Millerton	204	168	36	57%
Totals	8,357	7,526	831	NA

Source: California Data Exchange Center, March 29, 2015; accessible online at <http://cdec.water.ca.gov/cgi-progs/reservoirs/RES>.

As we commented two weeks ago to DWR², we now also urge the Corps to insist upon DWR providing analysis prior to issuance of any program permit by the Corps that reveals the trigger point at which the Department believes it necessary to install drought barriers. We apparently are not there yet.

We reiterate our position that in the absence of reorienting water project, approval of DWR’s drought barriers project as submitted to the Corps would send the wrong message to DWR about the role of drought barriers in overall water management during an extended drought period, as we could be in. Restore the Delta is concerned that the drought barriers program permit would become a new water management crutch. DWR and the Bureau would lean on this crutch to continue their practice of managing upstream storage on the assumption that the cost of losing their wager would be borne by Delta residents and ecosystems, and not by Delta exports.

In the last 28 water years (since the beginning of the 1987-92 drought) wet and above normal years have occurred just 11 times in both the San Joaquin and Sacramento River basins, a rate of 39 percent. This tells us that the projects must operate more conservatively with regard to all competing beneficial uses in the Delta watershed. This means, in turn, that the premise of

² Letter of March 16, 2015, from Tim Stroshane and Barbara Barrigan-Parrilla, Restore the Delta, to Jacob McQuirk, Department of Water Resources, pp. 4-8, attached.

“emergency” drought barriers must be rejected. “Emergency” connotes an event that is perhaps short-lived and infrequent, if it occurs at all. But if below normal to critical water years will occur more than half the time (as they have for almost the last three decades), then the “emergency” modifier becomes meaningless. Drought period water management in the Delta watershed will become more frequent in the future. It also appears to us that the future starts now with consideration of a 10-year program permit on “drought barriers.”

If we’re going to have barriers considered part of the landscape for at least the next 10 years, the people of the Delta and of California deserve a thorough treatment and review of DWR’s application to the Corps for the drought barriers. And that means, as we commented to DWR on March 16th, the Corps should insist on DWR preparing an environmental impact report/ statement. That document should fully disclose the significant impacts and vital mitigation measures that have so far gone unaddressed for a project that DWR wants to be part of its drought water management toolkit for the next decade.

2. Use the recent Delta smelt Management Analysis and Synthesis Team model to inform the Corps’ program permit conditions for the drought barriers project.

As the Corps’ states for the drought barriers permit, this application is being evaluated under Section 10 of the Rivers and Harbors Act of 1899 for structures or work in or affecting navigable waters of the United States, Section 14 of the Rivers and Harbors Act of 1899 (as codified in 33 USC 408 commonly referred to as Section 408) for the alteration or occupation or use of a U.S. Army Corps of Engineers civil works project and Section 404 of the Clean Water Act for the discharge of dredged or fill material in waters of the United States.

The recently released Delta smelt Management Analysis and Synthesis Team model can help provide the Corps with a useful framework for evaluating the drought barriers project for its 10-year program, and formulating permit conditions that mitigate the project’s significant impacts.³ The model is already in use by Interagency Ecological Program scientists assessing drought impacts to Delta smelt, as well as developing other conceptual models associated with Chinook salmon use of tidal wetlands and restoration of tidal wetlands.⁴ These researchers used the model to identify drought impact predictive hypotheses with regard to how Delta smelt may respond in terms of abundance, distribution, growth, and fecundity, given the variety of habitat attributes and environmental drivers that affect Delta smelt.

³ Interagency Ecological Program, *An updated conceptual model of Delta Smelt biology: Our evolving understanding of an estuarine fish*, Technical Report 90, prepared by the Management, Analysis, and Synthesis Team (MAST), January 2015, 206 pages. Accessible online at http://www.water.ca.gov/iep/docs/Delta_Smelt_MAST_Synthesis_Report_January%202015.pdf.

⁴ Presentations by Louise Conrad of DWR, “Applying the Delta Smelt Conceptual Model to Understand Drought Effects: A Synthesis”; and James Hobbs of UC Davis, “Delta Smelt in Drought: Growth and Life History” at Interagency Ecological Program 2015 Annual Workshop, March 20.

There are several relevant habitat attributes that would be directly affected by installation, operation, and eventual removal of the drought barriers, as we discussed in our March 16th letter to DWR.

- Low salinity zone habitat moves landward as inflows and Delta outflow fall, resulting in less area and water volume to support Delta smelt life stages from March through as late as December. As the zone moves upstream, it also gets smaller. As it shrinks, it would force more Delta smelt into a smaller habitat, making them more vulnerable to debilitating food competition and predation by larger piscivores.
- Water temperatures during summer and fall are expected to increase, again as inflows and Delta outflow fall and overall residence time of water in many Delta channels increases, leading to greater warming from warming air temperatures during the summer and fall; and
- Harmful *Microcystis* algal blooms would increase due to rising temperatures, increased residence times of water, and increased access to sunlight in the water column because much less sediment is transported through Delta channels due to falling inflow and outflows.⁵

The MAST conceptual model for Delta smelt can be used by the Corps to identify major environmental drivers and habitat attributes that would be affected by the drought barriers. By identifying these drivers and attributes, the Corps can use them to evaluate the significance of impacts and the character, size and scale of mitigation measures needed to avoid or reduce barriers' impacts.

3. Installation and operation of the drought barriers is likely to be a step-change for the Delta becoming like a warm water lake dominated by introduced black bass fish species.

Our friend and colleague Bill Jennings of California Sportfishing Protection Alliance has warned for years that the Delta increasingly resembles a typical warm freshwater lake in Arkansas, with its fish species dominated by black bass species like largemouth bass, smallmouth bass and striped bass. Recent research presented at the 2015 Annual Workshop of the Interagency Ecological Program confirms this trend. Little evidence exists that black bass species' distribution changed during drought conditions, and increased salinity of Delta waters seems not to discourage the proliferation of these fish.⁶ These piscivores often feed on each other as well as other introduced and native fish species, but the more they become established in Delta channels,

⁵ Presentation by Peggy Lehman of DWR, "Response of Microcystis to Drought," at Interagency Ecological Program 2015 Annual Workshop, March 20.

⁶ Presentation by Denise Barnard, US Fish and Wildlife Service, "Black Bass Drought Response," at Interagency Ecological Program 2015 Annual Workshop, March 20.

the more they are able to prey on vulnerable native species like juvenile Chinook salmon, Delta smelt, and longfin smelt, adding to ecological stress on these listed species.⁷

Conclusion

The Corps has requested information from commenters on the proposal's probable impacts on the affected aquatic environment as well as on secondary and cumulative effects. The MAST conceptual model for Delta smelt will be a useful tool for the Corps to ensure it takes account of all relevant environmental drivers and habitat attributes involved in drought barrier impacts, as well as help identify mitigation measures that will avoid or reduce impacts so they are no longer significant.

Restore the Delta prefers that the US Army Corps of Engineers deny the proposed 10-year program permit on grounds that DWR has not demonstrated need for the project and that its impacts to fisheries, aquatic ecosystems, and water quality are unreasonable for a project whose need is at best uncertain for lack of identifying meaningful trigger conditions for its use.

Restore the Delta further requests that the Corps require DWR to produce an environmental impact report/statement on the proposed 10-year program permit application for drought barriers. We believe there is a substantial, fair argument that DWR has failed to identify and mitigate all significant adverse effects of the barriers.

We finally request that the Corps hold a public hearing that addresses the impacts of DWR's proposed emergency drought barriers project on migratory salmonids and listed resident fish species, on the problems of predation and invasive clams, on water quality problems downstream of the barriers, and what permit conditions should attach to the project should the Corps choose to issue a program permit to DWR as requested.

Again, we thank you for the opportunity to comment on this important proposal. If you have questions or concerns about these comments, please feel free to contact Barbara Barrigan-Parrilla (barbara@restorethedelta.org) or Tim Stroshane (510.524.6313, or tim@restorethedelta.org).

Sincerely,



Tim Stroshane
Policy Analyst



Barbara Barrigan-Parrilla
Executive Director

Attachment: Letter of Restore the Delta to the California Department of Water Resources, March 16, 2015.

⁷ See our analysis of predation hotspots as well, in the attached letter from RTD to DWR, March 16, 2015, pp. 8-14.



March 16, 2015

Transmitted via email: DWREDBCOMMENTS@water.ca.gov

Jacob McQuirk, Supervising Engineer
Bay-Delta Office
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

Subject: Emergency Drought Barriers Initial Study/Proposed Mitigated Negative Declaration

Dear Mr. McQuirk:

Restore the Delta here provides the California Department of Water Resources its comments on the above referenced environmental document to your office prepared by the California Department of Water Resources (DWR) concerning emergency drought barriers in the Delta. We understand DWR requests a 10-year program permit from the U.S. Army Corps of Engineers (Corps) to allow temporary installation of barriers at specific locations in Sutter and Steamboat sloughs, and along False River, in three years out of the next ten.

Restore the Delta is a grassroots campaign by residents and organizations committed to restoring the Sacramento-San Joaquin Delta so that fisheries and farming can thrive there together. We work through public education and outreach so that all Californians recognize the Sacramento-San Joaquin Bay Delta as part of California's natural heritage, deserving of restoration. We fight for a Delta with waters that are fishable, swimmable, drinkable, and farmable, able to support the health of the estuary, San Francisco Bay, and the ocean beyond. Our coalition envisions the Sacramento-San Joaquin Delta as a place where a vibrant local economy, tourism, recreation, farming, wildlife, and fisheries thrive as a result of resident efforts to protect our waterway commons.

The Corps' notice, posted January 30, 2015, states that "the Corps is particularly interested in receiving comments related to the proposals probable impacts on the affected aquatic environment and the secondary and cumulative effects." The notice also indicates that if the Corps determines "that the information received in response to this notice is inadequate for thorough evaluation, a public hearing may be warranted." We understand that the administrative record of this Initial Study/Mitigated Negative Declaration (IS/MND) will be incorporated into the Corps' consideration of DWR's program permit application.

Restore the Delta appreciates DWR's relaxation of the comment deadline to March 18th. In the same announcement, DWR staff states that the department's application to the Corps "seeks to allow the installation of rock barriers for no more than eight months in a single year across Steamboat Slough, Sutter Slough, and West False River." We note that most if not all other references to construction and removal in the IS/MND indicates construction would occur in May, while removal would occur in November, and by no later than November 15th. This is at most seven months, and should be clarified in the Department's application to the Corps.

We thank you for the opportunity to comment on this project. Restore the Delta believes that information provided in the Corps and DWR's notices, as well as in DWR's environmental documentation, is inadequate for a thorough review of this proposal. The barriers, if installed, would close off migratory corridors for fish, subject juvenile salmon and larval and subadult Delta smelt to additional predation pressures, worsen water quality in some parts of the Delta for the sake of export pumping from the Delta elsewhere, and disrupt boating corridors and activity during the busy summer recreation season, even with DWR's proposed mitigation. Few boaters wish to spend precious recreational time porting their boats around a barrier if it can be prevented.

We appreciate too DWR staff public comments that the department would prefer not to have to exercise any permit it receives and install barriers to prevent salinity intrusion into the Delta. We agree it is and always should be a last resort. In effect, however, due to its water system mismanagement, DWR is saying that if they do not put in the barriers, South Delta communities would suffer; if they do put them in, North Delta would communities suffer. And the barriers will harm fisheries, commercial and recreational fishing economies, and the Delta recreation economy. In proposing the "emergency" drought barriers yet again¹, DWR casts the Delta in a lose/lose position so that the Federal and State Water projects can win. This is patently and demonstrably unfair to make Delta residents and ecosystems victims of the failures by state and federal water project mismanagement.

Moreover, DWR's proposal to install these barriers, if implemented as requested, in three consecutive years out of ten could be enough to contribute to extinction of some runs of Chinook salmon, Delta smelt, and perhaps longfin smelt. Because of this crucial ecological issue, the IS/MND must examine cumulative impacts of the emergency drought barriers in the context of DWR and the Bureau's other drought operations and State Water Board actions as best it can. We urge the Corps to look closely at this proposed project's relationship to other cumulative projects

¹ DWR's documentation acknowledges consideration in 2009 of these three barriers and in 2012 of the barriers across Steamboat Slough and Sutter Slough below their confluences with the Sacramento River. *DWR Delta Emergency Channel Closure Locations Study*, Agreement No. 4600007756 Activity No. 110702, June 2012, which did not include the West False River Barrier as an alternative site. Accessible online at <http://www.water.ca.gov/waterconditions/docs/EmergencyChannelClosureLocationReport-FINAL-June2012.pdf>. See also Department of Water Resources, Bay-Delta Office, *Delta Drought Emergency Barriers*, Administrative Draft, April 2009. Accessible online at <http://www.water.ca.gov/waterconditions/docs/DWR-EmergencyBarriersDraftReport-Apr2009.pdf>.

and plans in order to fully assess the project's impacts, and condition any program permit it issues to DWR to that it mitigates or avoids these impacts altogether.

Because these issues involve potential extinction of Delta fish and economic disruption to Delta interests, they are inexorably significant adverse impacts meeting the test under the California Environmental Quality that necessitates preparation of an environmental impact report.²

Comments

- 1. It appears that the program permit application and project description are not complete. The California Environmental Quality Act requires full disclosure of the project description.***

The project description at the Corps' web site states "The applicant is currently finalizing project design drawings." When will the final project design drawings be completed? Only conceptual footprints are provided in the IS/MND. Other renderings are available in the above cited background studies from previous, but DWR does not incorporate these descriptions and designs by reference in the IS/MND, and so they do not represent a bona fide project description. They are also dated (at least three to six years old), and DWR's designs for each barrier project may have been altered, even if as yet they are undisclosed.

It is now mid-March, and it is just six weeks until May. How can the Corps reasonably issue a 10-year program permit for a project that is not fully designed, yet would start this May?

DWR has also yet to provide information and analysis to the Corps of project alternatives. Will the Corps rely on the Initial Study/Mitigated Negative Declaration that DWR prepared and posted to its own web site? "All reasonable project alternatives, in particular those which may be less damaging to the aquatic environment, will be considered." We urge the Corps to consider at least two alternatives: a "no action alternative" in which none of the barriers are installed, and an alternative in which just the False River barrier is installed.

We note that while DWR has provided aerial views of the likely footprints of each barrier in their respective channels, DWR provides no lateral elevation views or more detailed barrier drawings in channels. Consequently, it is difficult to gain perspective on the relative scale of each barrier

² The California Department of Water Resources has failed to make a "fair argument" justifying its use of a mitigated negative declaration for the proposed emergency drought barriers project. "[CEQA] requires the preparation of an EIR whenever it can be fairly argued on the basis of substantial evidence that the project may have a significant environmental impact." *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal. 3d 68, 75. In *City of Antioch v. City Council* (1986) 187 Ca. App. 3d 1325, 1331, the court stated, "[d]eciding whether a fair argument can be made requires the agency to weigh the evidence on both sides of the question..." and "[i]f there is substantial evidence of a significant environmental impact, evidence to the contrary does not dispense with the need for an EIR when it can still be 'fairly argued' that the project may have a significant impact." Michael H. Remy, Tina A. Thomas, James G. Moose, and Whitman F. Manley, *Guide to CEQA: California Environmental Quality Act*, 11th edition, 2007, p. 183.

relative to its host channel. The lack of elevations and plan views inhibit a reviewer's ability to also gain perspective on the size, length, ingress and egress designs of fish passage culverts in and through the barriers. Such parameters are vital to assessing whether or not these new aquatic structures will introduce new predation hotspots, adding to many that already exist in the Delta (Figure 1). While the IS/MND discloses that culverts will be 48 inches in diameter and equipped with downstream slide gates, the expected operational use of the gates is not disclosed, nor is the mode of operation of these gates disclosed, nor why slide gates were chosen over alternative designs.

It is expected that generally four culverts will be installed in each barrier, each equipped with gates. Some of DWR's modeling indicates operational periods when only one culvert will be openable, and other times when up to four may be opened. The project description fails to disclose under what conditions the other three culvert slide gates would be opened to facilitate flow and fish passage.

DWR's proposal to install, operate, and remove the drought barriers in three of the next ten years is an unstable project description for CEQA purposes. It fails to define the nature of the drought conditions under which the public, Delta stakeholders, and the Corps may expect that DWR would install the barriers. In other words, what are the specific trigger conditions by which DWR would be authorized by the Corps' permits to install, operate, and later remove the barriers? We see this as a critical missing piece of the emergency drought barriers project description, and is a fatal flaw to the IS/MND.

CEQA requires full disclosure of the project in the description, and the IS/MND fails to meet this requirement.

2. The need for the proposed program permit is not demonstrated.

The purpose and objectives of the project are stated to "reduce the intrusion of saltwater into the Delta during drought conditions when stored water in upstream reservoirs is sufficient to meet Delta outflow required to repel San Francisco Bay salinity, which could (1) render Delta water undrinkable and affect roughly 25 million Californians, (2) render Delta water unusable by agriculture, and (3) decrease freshwater habitat in the Delta for sensitive aquatic species." (IS/MND, p. 2-3.) Its objectives are to benefit Delta communities and farmers that rely exclusively on in-Delta diversions; benefit upstream water supplies by reducing demand on supplies for meeting salinity objectives in the Delta, leaving water upstream for temperature control in rivers and for community supplies; and to help protect export supplies meeting health and safety needs.

The need for the project, however, has not been demonstrated and must be if the Corps is to properly condition its permit and protect Delta beneficial uses over the next 10 years.

The water supply picture has since changed since the IS/MND was drafted. Storms reached California in early and late February, and again on March 11th. Storage in state and federal upstream reservoirs has improved significantly since a year ago. Table 1 shows that the combined upstream storage of both the State Water Project and federal Central Valley Project have nearly 1

million more acre-feet of stored supplies than at this time last year. A year ago, DWR was considering whether to deploy similar emergency drought barriers, with less upstream storage on hand than the two projects now have, *and chose not to install them*. DWR proposes now to have a 10-year program permit for installing the barriers, yet has more storage now than it had a year ago. While we are aware that snowpack as of early March was found to be just 13 percent of normal and 12 percent of the April 1 average, this alone does not demonstrate need for the program permit.³ DWR must build its case for a “last resort” project like the emergency drought barriers; it has yet to do so.

Table 1 Change in Storage Conditions Major CVP and SWP Upstream Reservoirs, 2014-2015				
Reservoir	Storage, March 15, 2015 (TAF)	Storage, March 15, 2014 (TAF)	Change in Storage (TAF)	Percent of Average
Trinity	1,169	1,284	-115	63%
Shasta	2,657	2,049	608	79%
Oroville	1,775	1,594	181	70%
Folsom	575	397	178	104%
New Melones	599	1,069	-470	41%
San Luis	1,382	800	582	74%
Millerton	202	170	32	57%
Totals	8,359	7,363	996	NA

Source: California Data Exchange Center, March 15, 2015; accessible online at <http://cdec.water.ca.gov/cgi-progs/reservoirs/RES>.

DWR has failed to quantify the need: what is the volume of water, in the worst case scenario, needed for temperature control needs upstream, Delta salinity control needs (i.e., Delta outflow), and what is left over, if anything, for health and safety exports to state and federal water project contractors? When are upstream storage supplies expected to peak, and what storage volumes are forecast to result? How much of these stored supplies would be needed to maintain protective conditions in the Delta and how much for exports (should any be left)? How much upstream supplies could be conserved if the barriers are installed? And critical to this, again, is the question of what projected conditions among reservoir storage, Delta inflow, in-Delta salinity (and at which locations), and stored water releases must hold for DWR to justify installation and

³ <http://cdec.water.ca.gov/cgi-progs/snow/COURSES>.

operation of the barriers? DWR's IS/MND fails to disclose any of these amounts or conditions by which the need for the barriers would be justified. DWR should disclose these as part of its program permit application, and the Corps should insist on receiving them prior to issuance of the barriers' program permit. Since it proposes a program, DWR should state by what triggers the program would be operated; but the Department does not.

If DWR wants their barriers to operate under a program permit, the department should design a program that the public can understand through transparency and demonstrated need. Such a program should seek to keep dangerous salt water intrusion from harming fisheries and Delta communities, while allowing only for minimal exports for *real* health and human safety needs, not fake almond grower health and human safety needs.

This is precisely the time when such needs must be quantified and projected for decision makers. The California Water Code requires it. The Delta Protection Act of 1959 states that, "the Legislature finds that the maintenance of an adequate water supply in the Delta sufficient to maintain and expand agriculture, industry, urban, and recreational development in the Delta area...and to provide a common source of fresh water for export to areas of water deficiency is necessary to the peace health, safety, and welfare of the people of the State, except that the delivery of such water shall be" subject to area of origins requirements in state law. Moreover, the Act states that it is state policy that "no person, corporation or public or private agency or the state or the United States should divert water from the channels of the Sacramento-San Joaquin Delta to which the users within said Delta are entitled." Finally, the Act states that "[i]n determining the availability of water for export from the Sacramento-San Joaquin Delta no water shall be exported which is necessary to meet the requirements" of the Act.⁴

DWR and the Bureau of Reclamation began this drought "emergency" by mismanaging their supplies. As Table 2 shows, at the beginning of water year 2012 the two agencies had almost 9.3 million acre-feet in storage. At the start of water year 2013, they still had 7.1 million acre-feet in storage, but instead of harboring these supplies to plan for the following year for Delta salinity control, fish protection, and spreading surface supplies over a potential third year of dry conditions, they "spent" 2.9 million acre-feet of storage, leaving California with just 4.169 million acre-feet of storage last fall.

While these tables help explain the emergency DWR and the Bureau brought on themselves and their customers through their dwindling reservoirs, they do not demonstrate or justify the "need" for the drought barriers project. Instead, they demonstrate a need by the two project operators to use far different assumptions for how California's climate will deliver runoff and snowmelt to the watersheds of their reservoirs. Restore the Delta contends that upstream reservoir storage was poorly managed, and now DWR seeks authorization to dam up key Delta channels.

⁴ California Water Code Sections 12202, 12203, and 12204.

Table 2 Change in Storage Conditions at Start of Water Years 2012 through 2014 (Thousands of Acre-Feet)					
Reservoir	End of September Storage, 2012 (TAF)	End of September Storage, 2013 (TAF)	End of September Storage, 2014 (TAF)	Change in Storage, 2012-2014	Change in Storage, 2013-2014
Trinity	1,800	1,303	607	(1,193)	(696)
Shasta	2,592	1,906	1,157	(1,435)	(749)
Oroville	1,977	1,633	1,076	(901)	(557)
Folsom	452	361	345	(107)	(16)
New Melones	1,511	1,047	520	(991)	(527)
San Luis	640	504	464	(176)	(40)
Millerton	318	317	0	(318)	(317)
Totals	9,290	7,071	4,169	(5,121)	(2,902)

Source: Central Valley Project Operations, Daily CVP Water Supply Reports for September 30, 2012 through 2014; and Consolidated State-Federal San Luis Reservoir Daily Operations reports, 2012-2014.

In the past, DWR and Bureau project operators assumed that even after a dry fall season, odds were that precipitation would come and replenish state reservoirs. Instead, after eight of the last nine years have seen below normal precipitation in the Central Valley watershed, project operators must instead assume that the winter will be dry and plan their water priorities accordingly. Upstream storage for long-term integrity of Delta salinity control, fishery protection, and flood control must be protected. Exports south of the Delta must come *after* these requirements are met, as the Delta Protection Act of 1959 requires.

In the absence of reorienting water project priorities, DWR's emergency drought barriers project, spread over 10 years' time, would become a new crutch. DWR and the Bureau would lean on this crutch to continue their practice of managing upstream storage on the assumption that there would continue to be a 50-50 chance that the coming water year would be wet. We think it is reasonable to presume an 89 percent chance (i.e., 8/9) that the upcoming year is at least below normal to dry before any Delta exports are prioritized. Whatever percentage probability is chosen, such an approach is reinforced by the reality that neither their bloated water rights permits to store and divert, nor their over-promised supplies in water service contracts the State Water Project and Central Valley Project can be reliably fulfilled at present.

If approved, rather than an “emergency”, the barriers (should the project be implemented with a 10-year program permit) would become part of DWR’s regulatory entitlements on which it would rely in three years over the next ten to bail them out of “oops” shortages that they would do better to manage for affirmatively (again, for example by assuming that there is at least an 89 percent chance that the coming water year would be below normal or dry, rather than wet or average). In the absence of such operational and management changes, approving the program permit for it sends DWR and the Bureau the wrong message for future water management.

Climate scientists are concerned that such assumptions cannot hold any longer, that “stationarity is dead” and our water management practices must change.⁵ In addition, some climate models indicate that the shrinkage of arctic sea ice is contributing to a drying climate in western North America, including California. The mechanisms are still somewhat unclear but continuing research in this area bears attention by project operators.⁶

Triggers based on specific, measurable parameters relating to reservoir storage, salinity control and other water quality requirements in the Delta, and exports south of the Delta for health and safety needs must be identified and inserted into program permit conditions. Having the program permit should not reward DWR and the Bureau for poor management of the water system as a whole. Instead, it should be treated as a last resort, when the projects have been managed as well as they can and the weather still fails to bring precipitation and runoff. Then we will know the true certainty of the emergency and the worth of the barriers.

We recognize it is possible, even with improved management, for the Bureau and DWR to get into dire predicaments with the state’s water supplies and management of water in the future. With improved rainfall and storage totals this year, we remain skeptical that we are in that situation now, despite the fears of state water officials, and that the need for the “emergency” drought barriers is at best to prepare for an uncertain, but probably drier future. In that sense, Restore the Delta is not strictly speaking opposed to the program permit in concept. Identification of specific triggers for such situations might help build public confidence in a drought barriers program permit, but we are not there yet as this proposal now stands.

3. Impacts to fish mobility and predation avoidance are unreasonable and not fully mitigated.

⁵ Stationarity is the idea that the past is a reasonable guide to the future, for present purposes. P.C.D. Milly, Julio Betancourt, Malin Falkenmark, Robert M. Hirsch, Zbigniew W. Kundzewicz, Dennis P. Lettenmaier, and Ronald J. Stouffer, “Stationarity is Dead: Whither Water Management?” *Science* 319(2008): 573-574, February. Online at http://www.paztcn.wr.usgs.gov/julio_pdf/milly_et_al.pdf.

⁶ See for example, Jacob O. Sewall, “Precipitation Shifts over Western North America as a Result of Declining Arctic Sea Ice Cover: The Coupled System Response,” *Earth Interactions* 9(2005), paper no. 26. Accessible online at <http://journals.ametsoc.org/doi/pdf/10.1175/EI171.1>; and M.C. Serreze, M.M. Holland, and J. Stroeve, “Perspectives on the Arctic’s Shrinking Sea-Ice Cover,” *Science* 315(2007), 1533-1536, March 16. Accessible online at ftp://ftp.shef.ac.uk/pub/uni/academic/D-H/geog/felix/PAC_Summer_Reading/serreze_etal_2007.pdf.

- a. *Migrating juvenile salmon will see decreased survival rates through the Delta as a result of drought barrier installation because the barriers are likely to become predation hotspots.*

The premise of installing the barriers at Sutter and Steamboat Sloughs is to force more inflow into the mainstem of the Sacramento River, thereby relieving state and federal upstream reservoirs from providing flows that would maintain hydraulic barriers against salinity in these two sloughs.

This will have direct, potentially lasting effects on fish using Delta channels. In 1976, a three-month (September 1 through December 3) drought barriers project resulted in significant decreases in juvenile Chinook salmon survival rates in the Delta.⁷ The problem for fish is that the barriers can quickly become predation hotspots. (See Figure 1.) According to the Draft Bay Delta Conservation Plan, four noteworthy hotspots already exist in the vicinity of each emergency drought barrier:

- The Paintersville Bridge near the confluence of Sutter Slough with the Sacramento River (No. 7 on Figure 1);
- The North Delta Water Diversion facilities near Hood (No. 11);
- Georgiana Slough (No. 4) and
- Franks Tract (No. 6).

From the standpoint of salmonid survival strategy, it benefits juvenile salmonids to have multiple channel paths through the Delta to reach San Francisco Bay and the ocean. The proposed barriers are expected to contain four 48-inch culverts with slide gates that will open when sufficient net downstream flow in the channel pushes them open. They would be located downstream of the entries to each slough off the Sacramento River. They risk becoming predation hotspots.

It is a perfect scenario for predators to ambush juvenile salmonids and other small fish daring to pass through a culvert. Known predation hotspots nearby means that piscivorous fish like largemouth bass, striped bass and others will experience an expansion of predation loci, in close proximity to where they are already active.

⁷ California Department of Water Resources, *Bulletin 132-77: The California State Water Project, Appendix E: Water Operations in the Sacramento-San Joaquin Delta During 1976*, p. 27. Accessible online at http://www.water.ca.gov/waterconditions/docs/DWR-Bulletin132-77_ApdxE.pdf. “To assess this impact, special releases of marked salmon were made during the closure period, then sampled by trawling in the vicinity of Chipps Island. The test fish were raised at the Coleman National Fish Hatchery in the northern Sacramento Valley from eggs obtained at Keswick Dam in February, 1976. The fish were released at five Delta sites in mid-October, 1976. Analysis of the recapture rates of fish released in the Central Delta showed significantly lower recaptures than for those released in the Sacramento River system below the Delta Cross Channel and Georgiana Slough. These results suggest adverse effects on Sacramento River salmon subject to a migration route through the Central Delta.”

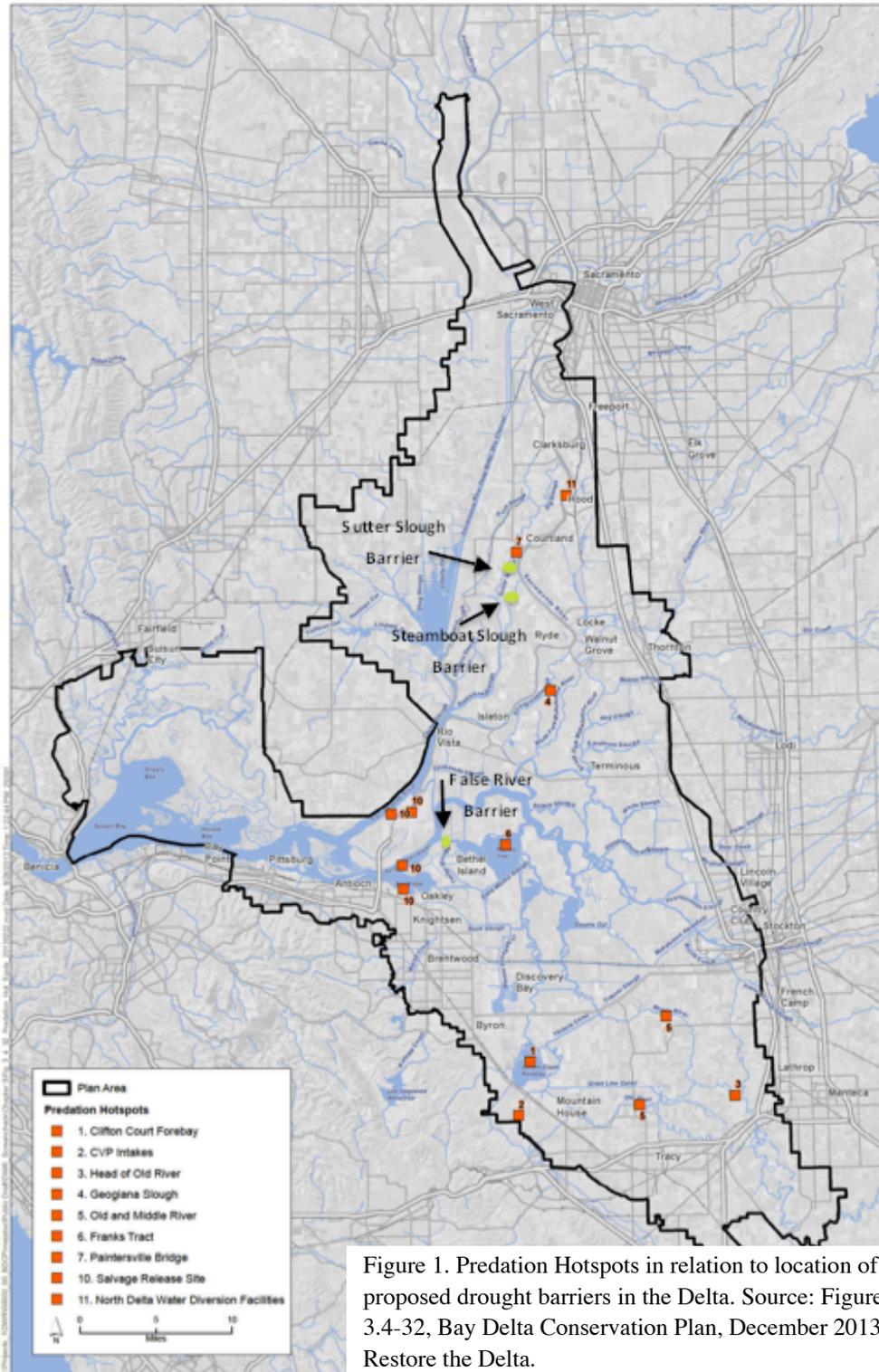


Figure 1. Predation Hotspots in relation to location of proposed drought barriers in the Delta. Source: Figure 3.4-32, Bay Delta Conservation Plan, December 2013; Restore the Delta.

Figure 3.4-32
Predation Hotspots in the Plan Area

Salmon survival rate problems will likely also be compounded by opening of the Delta Cross Channel gates during winter months, according to the trigger system approved by the State Water Resources Control Board in its recent Temporary Urgency Change Petition Order (TUCP Order).⁸

Normally, under Water Rights Decision 1641, between February 1 and May 19 the Delta Cross Channel gates are required to be closed to keep migrating salmon out of central Delta channels where biologists have repeatedly shown that their survival rates to Chipps Island and points west are lower than when they stay in the Sacramento River and its other north Delta distributaries. Opening the gates during other periods may also result in further reduced salmon survival.

However, under the TUCP Order, the Board authorizes the Bureau to open the Delta Cross Channel gates in real time when the Bureau believes salmonids will not be present at Walnut Grove (based on upstream fish data and central Delta water quality conditions). Whether the Bureau can manage these gates in real time adequately to protect juvenile salmon, which are small fish, remains to be seen.⁹

Nonetheless, when the Delta Cross Channel gates are closed, at low flows in the Sacramento River mainstem, migrating fish are still likely to stray into Georgiana Slough, the aforementioned predator hotspot.

Finally, we note that False River barrier's abutments (consisting of sheet piles and king piles) "would be left in place and would result in permanent alteration of the habitat at this location." DWR's mitigated negative declaration states that "installation of rock transitions would limit the potential for creation of hydrodynamic eddies that could form ambush habitat for predatory fishes, although some increase in predation on more susceptible species could occur."¹⁰ In other words, the abutments of the False River barrier could themselves become permanent predation hotspots west of Franks Tract, another known hotspot.

⁸ State Water Resources Control Board, *Order Approving in Part and Denying in Part a Petition for Temporary Urgency Changes to License and Permit Terms and Conditions Requiring Compliance with Delta Water Quality Objectives in Response to Drought Conditions*, February 3, 2015. Accessible online at http://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/docs/tucp/2015/tucp_order020315.pdf. The triggers are specified in Appendix G of the 2014 Drought Operations Plan. Accessible online at http://www.usbr.gov/mp/drought/docs/2015-01-29_NMFS_TUCP_response_letter--enclosure.pdf. It is this *style* of trigger system that Restore the Delta advocates developing for drought barriers to have in place by which state and federal water agencies and regulators may have reasonable, last-resort grounds for authorizing installation, operation and removal of the barriers, rather than the *improvisational* system used at present.

⁹ We understand that the Appendix G trigger method relies on a combination of early warning surveys measuring salmon presence upstream (e.g., at Tisdale Weir and Wilkins Slough), and closer along the Sacramento in mid-water and beach-based surveys. Despite these methods, while important, some fish may still go undetected, as they are necessarily sampling methodologies.

¹⁰ DWR, *op. cit.*, p. 3-39.

In sum, Restore the Delta is concerned that the drought barriers will increase the number of predation hotspots, decrease the alternative paths by which emigrating juvenile salmonids can exit the Delta to reach the Bay and Pacific Ocean, and reduce their rates of survival. This would come at a time when salmon stocks have already been hard hit by drought actions that have yet to include use of these barriers. Obvious mitigations could include subjecting predators at hotspots to predation pressure themselves: Encourage amateur and professional anglers, perhaps using financial bounties, to use these locations to catch predator sport fish. But such actions are not even suggested by DWR for coordination with the California Department of Fish and Wildlife in the IS/MND.

b. The construction and operation period of the drought barriers will overlap and interfere with migration periods of several runs of Chinook salmon.

DWR proposes to install the barriers in May and remove them in early November (False River barrier by mid-November). The construction process would occur largely in river channels with each barrier's construction relying on delivery of rock boulders via barge and installed by floating cranes. The Steamboat Slough barrier will also have boat ramps on either side to facilitate portage of boats up to 24 feet and 10,000 pounds around the barrier. These construction activities represent significant disturbances of the river channel and for an extensive reach of the water column at their respective locations as construction proceeds at key times of year for fish.

In May, according to the mitigated negative declaration on the emergency drought barriers released by DWR, some juvenile fall-run Chinook salmon will be migrating downstream into and through the Delta.¹¹

Winter-run Chinook salmon juveniles rear and emigrate in the Sacramento River from July through March. Seine and trawl data reported in the NMFS salmon biological opinion from 2009 indicates that juvenile winter-run Chinook salmon are found in the lower and "west" Sacramento River from November through May, meaning that installation and removal of barriers in those months would likely interfere with rearing activity by these fish in the months of May and November.¹²

Spring-run Chinook salmon are found in the lower Sacramento River at Knights Landing, north of the Delta in November and December, as well as in low numbers in June.¹³ Installation and

¹¹ California Department of Water Resources, *Initial Study/Proposed Mitigated Negative Declaration: Emergency Drought Barriers Project*, January 2015, p. 3-30. Online at http://www.water.ca.gov/waterconditions/docs/Emergency_Drought_Barriers_Initial_Study_and_Proposed_Mitigated_Negative_Declaration.pdf.

¹² National Marine Fisheries Service, 2009, Biological Opinion and Conference Opinion on the Long-Term Operations of the Central Valley Project and State Water Project, Southwest Region, June 4, Table 4-1. Online at http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations.%20Criteria%20and%20Plan/nmfs_biological_and_conference_opinion_on_the_long-term_operations_of_the_cvp_and_swp.pdf.

¹³ *Ibid.*, Table 4-4.

removal of barriers in those months would likely interfere with rearing activity by these fish in the months of June and November.

Migrating juvenile steelhead trout are found throughout the Delta, but especially in the months of May and June, including in the Sacramento River at Hood.¹⁴ Installation and removal of barriers in those months would likely interfere with rearing activity by these fish in the months of May and June. DWR's mitigated negative declaration states that "Most juvenile steelhead spend 2 years in freshwater; however, many juveniles may emigrate as young-of-the-year."¹⁵

In short, DWR proposes to install and remove barriers simultaneous with when juvenile stages of three different listed salmonids would be attempting to rear in or emigrate through the Delta prior to departing for the Pacific Ocean. The most invasive and disruptive activities associated with the barriers proposal occur at critically sensitive times in the life histories of these sensitive and vulnerable listed species. Should the Corps choose to issue a program permit for this proposed project, it should condition installation and removal so that these activities occur outside of these calendar windows when listed salmonids are likely to be present: May, June, October, and November. Stated another way, the Corps should limit installation, operation and removal to July through September, if it is to be done at all. During these months, listed salmonid species are not generally present according to the best available science.

c. Implementing the barriers projects in three consecutive years could cumulatively contribute to extinction for salmonids, as well as open-water fish like Delta smelt and longfin smelt.

DWR requests that the Corps permit it to install and remove each of these barriers in up to three consecutive years out of the next ten.

The Central Valley Chinook salmon races, coincidentally, have three-year life histories. Delta smelt generally have one-year life histories, though occasionally some females live two years and spawn twice. Longfin smelt generally have a two-year life history.

"From a population dynamics perspective," says DWR's IS/MND on the proposed barriers, "the worst-case scenario for salmonids may be proposed project implementation in 3 consecutive years." Large portions of the winter-run and spring-run Chinook salmon and steelhead spawn in their third years. DWR acknowledges that installing, operating, and removing the barriers in three consecutive years

could overlap with the Delta occurrence of the majority of individuals from a single generation. This could result in greater effects on salmonid populations than may arise from having three proposed project implementation years separated by several years,

¹⁴ *Ibid.*, Table 4-7.

¹⁵ DWR, *op. cit.*, p. 3-31.

during the 10-year period; implementation in three non-consecutive presumably would result in a lesser effect to several generations.¹⁶

Similarly, Delta smelt and longfin smelt could confront the worst-case scenario should DWR install, operate, and then remove the barriers in three consecutive years. According to its IS/MND:

For these species, evidence exists that abundance in [one] year affects abundance in the subsequent year. At relatively low abundance, a greater number of smelt tends to give greater numbers during the subsequent life stage, regardless of which life stage is considered. The currently low abundance of both these smelt species, therefore, suggests that negative effects of the proposed project in [one] year could be compounded by subsequent negative effects in [one] or more consecutive years. In contrast, implementation of the proposed project in 3 non-consecutive years out of 10 years may avoid such compounding effects as there presumably would be more opportunity for the delta smelt population to compensate for any negative effects in a given year.¹⁷

Restore the Delta recommends that, should the Corps choose to issue a program permit to DWR for the proposed project, the permit should be conditioned on providing at least three years in between each year in which drought barriers are installed, operated, and removed. Together with the hydraulic triggers we suggest, DWR should be required to choose carefully which years it installs the barriers, so as to err on the side of precaution for the Delta's most vulnerable listed fish species.

d. The Corps should consider the effects of drought barriers installation on potential for upstream migration of Potamocorbula amurensis (the overbite clam) and its effect on food availability for Delta smelt and other pelagic organisms. The IS/MND fails completely to address this significant adverse biological impact to listed species.

The presence of nonnative invasive clams (overbite clam, *Potamocorbula amurensis*, and the Asian clam, *Corbicula fluminea*) poses problems for Delta smelt and longfin smelt. They graze the same water column as Delta smelt and longfin smelt, making it difficult if not impossible for the two small fish species to compete for food. The overbite clam appeared in 1987, while the Asian clam appeared in the 1940s.

According to Appendix 5.F of BDCP, at typical north Bay densities, *Potamocorbula* (which tends to occupy benthic sediments in Delta and Suisun Bay waters downstream of X2's position in fresh water areas), can filter phytoplankton from the entire water column more than once per day in open water Delta channels and almost "13 times per day over shallow areas." This

¹⁶ *Ibid.*, p. 3-42.

¹⁷ *Ibid.*

filtration rate by *Potamocorbula* enables its consumption to exceed the phytoplankton growth rate in the Delta.¹⁸

Corbicula, which tends to occupy benthic sediments in Delta and Suisun Bay waters *upstream of X2's position*, is considered less efficient than *Potamocorbula* at filtering out shallow water bodies like Franks Tract. But *Corbicula* can still “filter out the entire water column in less than a day.”¹⁹

The filter-feeding efficiencies of these nonnative invasive clams creates formidable ecological competition for Delta smelt and longfin smelt. The good news, however, is that the invasive clams' relative abundances and location are susceptible to changes in habitat conditions, especially salinity. Salinity can be managed with applications of freshwater flows to affect their location and abundances. *Potamocorbula* larvae have a tremendous salinity tolerance range (suspended but mobile in the water column) ranging from 2 to 30 parts per thousand (ppt) salinity in the Delta.²⁰ This tolerance range enables *Potamocorbula* to become established upstream in the Delta during low flow/high salinity and drought years. Fresh water flows are lethal to adult *Potamocorbula* specimens. Their numbers and distribution decline and move westward in wet years consistently; the opposite in dry years.

In wetter years and seasons, *Corbicula* is more adapted to freshwater conditions and can migrate downstream of the Delta into Suisun Bay sediments, displacing *Potamocorbula*'s range further downstream to some extent.

However, with drought barriers in place, salinity of the two sloughs connecting to the lower Cache Slough area is likely to increase, creating favorable water quality conditions for landward (upstream) migration of *Potamocorbula* and excessive competition for Delta smelt, should the smelt be limited to channels below Sutter and Steamboat slough drought barriers.

Salinity below the Sutter and Steamboat Sloughs' barriers is important because *Potamocorbula* thrives in more saline conditions and outcompetes Delta smelt and longfin smelt for food. The IS/MND includes Figure C-20 from Appendix C that indicates significantly increased salinity conditions at Miner Slough, which is upstream in the Cache Slough complex, where in dry years and warm seasons Delta smelt uses Liberty Island as a refuge. Installation of the two barriers appears to more than double daily mean EC from June to November. This suggests that salinity reaches further north into the Cache Slough complex, but the IS/MND fails to disclose whether such conditions could affect the refugia of Delta smelt in the Cache Slough region. It also fails to analyze the potential for *Potamocorbula* to expand its range and abundance up into the Cache Slough region (including Miner Slough, Steamboat Slough, and potentially Sutter Slough), further crowding Delta smelt, spatially and in food web competition.

¹⁸ Bay Delta Conservation Plan, Appendix 5.F, p. 5.F-110, lines 7-13.

¹⁹ *Ibid.*, Appendix 5.F, p. 5.F-111, lines 18-25.

²⁰ *Ibid.*, Appendix 5.F, Table 5.F.7-1, p. 5.F-113.

Restore the Delta recommends that the Corps require DWR to evaluate and mitigate these issues on behalf of Delta smelt as a condition of permit issuance.

4. Impacts to local water quality and supply are unreasonable and not fully mitigated.

As we have stated, DWR and the Bureau need to plan for droughts before they occur and need to establish clear operational criteria by which the State Water Project and the Central Valley Project manage their activities to avoid the worst effects of drought on their system, such as avoiding waste of stored water, loss of salinity control in the Delta, protection of all Delta beneficial uses, and maintenance of minimum export supplies for health and safety of south of Delta municipal and industrial contractors.

DWR's IS/MND acknowledges that this is not currently done.

The installation and operation of the EDB would be done within the broader framework of drought contingency planning through multi-agency collaboration between DWR, Reclamation, SWRCB, NMFS, USFWS, and CDFW; *this type of planning by its nature only occurs following periods of extremely low precipitation leading to drought conditions.* As such the EDB would be installed and operated in order to meet prevailing water quality and outflow objectives, which during critically dry drought conditions may be temporarily amended from those in the Bay-Delta Water Quality Control Plan listed in D-1641, as occurred in 2014.²¹

The IS/MND goes on to acknowledge that conservation of upstream storage “can only be achieved if barrier implementation is carried out in concert with modification of various Delta salinity D-1641 requirements.”²² Changes to D-1641 during drought periods has always meant relaxing Delta outflow, identifying trigger methods to open the Delta Cross Channel gates during periods they are normally closed, and adjusting objectives relating to Delta exports. This project is thus inextricably linked, and therefore cumulative in its impacts, with the provisions of temporary urgency change petition orders emanating from the State Water Resources Control Board. DWR cannot install and operate drought barriers in the absence of relaxation of the controlling water rights decision and water quality control plan for the Bay Delta estuary.

The IS/MND further acknowledges that residence times of water immediately upstream and downstream of the barriers will increase. This means that the dilution action of flows is greatly reduced, as well as interactions of the water surface with wind and shorelines that promote re-aeration of the water column. When residence times increase, water temperatures tend to increase, salinity is projected to increase (at least downstream from tidal incursion and mixing from San Joaquin River sources), and pollutant and contaminant concentrations can increase as well.

²¹ IS/MND, p. 3-86. Emphasis added.

²² *Ibid.*

Barriers not placed at the mouths of sloughs confluent with the Sacramento River may see little mixing. The farther from the mouth, the larger the volume of water in the slough or channel that receives less mixing action, and as temperatures rise during the summer, water quality may decline as evaporation contributes to increased concentrations of salts, nutrients, pollutants and contaminants.

The IS/MND fails to analyze these components of water quality, despite having at least identified residence time as a key factor. In relation to this matter, the IS/MND has failed to identify any agricultural drains that may reach Sutter Slough, Steamboat Slough, and False River, which could directly contribute to water quality conditions of waters arriving as Delta inflow via the Sacramento and San Joaquin Rivers, as well as other sources along the mainstem channels within the Delta.

We also note that the IS/MND and its Appendix C (“DSM2 Modeling of Tidal Flows and Salinity”) fail to analyze effects of the barriers on water supply diversions of the City of Antioch, and, as mentioned above, effects of increased salinity in the Cache Slough on the Delta smelt refugium at and near Liberty Island, including in relation to the potential spread of the nonnative invasive clam, *Potamocorbula amurensis*.

5. The cumulative impacts of the proposed project are unreasonable and not fully mitigated.

DWR is remiss in failing to evaluate the proposed program permit application for emergency drought barriers for their cumulative impacts. Cumulative projects and plans should include, but not be limited to:

- DWR and the Bureau’s Temporary Urgency Change Petition (TUCP),
- TUCP Order (most recent revised version) issued by the Executive Director of the State Water Resources Control Board.
- DWR and the Bureau’s Drought Contingency Plan for 2015.
- The Delta Plan.
- Habitat restoration and conservation plans in the vicinity of the proposed emergency drought barriers.

A good faith cumulative impacts analysis is necessary for DWR to obtain its proposed program permit for the drought barriers from the Corps.

6. Should it issue a 10-year program permit to DWR for emergency drought barriers in the Delta, the Corps should condition the permit on DWR and the Bureau having met specific emergency triggers based on management of state and federal upstream storage and diversion systems.

This would reflect the policy principle that it is always better to employ an hydraulic barrier to salinity in Delta channels than to introduce physical rock barriers that disrupt hydrologic, fishery, and boating circulation. Installing emergency drought barriers should be a last resort action by

DWR. This last-resort action should be enforced by the Corps through its program permit conditions. Those conditions should include verifiable findings that the barriers may be installed and operated only after key triggers in the permit conditions have occurred.

Conclusion

Restore the Delta urges that DWR withdraw its IS/MND because it has failed to identify certain unmitigated significant adverse impacts of drought barriers. These significant adverse impacts represent a fair argument that an environmental impact report should be prepared.

Again, we thank you for the opportunity to comment on this important proposal. If you have questions or concerns about these comments, please feel free to contact Barbara Barrigan-Parrilla (barbara@restorethedelta.org) or Tim Stroshane (510.524.6313, or tim@restorethedelta.org).

Sincerely,



Tim Stroshane
Policy Analyst



Barbara Barrigan-Parrilla
Executive Director