



January 21, 2020

Delivered via email: ecosystemamendment@deltacouncil.ca.gov

Ms. Jessica R. Pearson
Executive Officer
Delta Stewardship Council
980 Ninth Street, Suite 1500
Sacramento, CA 95814

Subject: Delta Plan Ecosystem Restoration Amendment (Chapter 4)

Dear Ms. Pearson:

Thank you for meeting with us on January 9 to discuss the Delta Stewardship Council's ("Council") approach to amending the Delta Plan's Chapter 4 (Ecosystem Restoration). The State Water Contractors (SWC) appreciate the work that has gone into developing the preliminary draft amendment and the Council's role in bringing together a strategic vision for ecosystem restoration outside of just mitigation actions.

The SWC is an organization representing 27 of the 29 public water entities that hold contracts with the California Department of Water Resources (DWR) for the delivery of State Water Project (SWP) water.¹ Collectively, the SWC members provide a portion of the water supply delivered to approximately 27 million Californians, roughly two-thirds of the State's population, and to over 750,000 acres of irrigated agriculture. Water supply delivered to the Bay Area, San Joaquin Valley, central coast and southern California from the SWP is diverted from the Sacramento-San Joaquin River Delta. Through charges for participation in the SWP, SWC's members have funded and continue to fund extensive ecosystem restoration required as mitigation in SWP permits. SWC and some of its largest member agencies have a long history of supporting and funding improved monitoring and scientific research to inform both water management and ecosystem restoration in the Delta. Thus, the SWC has a substantial interest and expertise that can inform any Delta activities, regulations, and policies, including those that affect Delta ecosystem restoration.

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¹ The SWC members are: Alameda County Flood Control & Water Conservation District, Zone 7; Alameda County Water District; Antelope Valley East Kern Water Agency; Central Coast Water Authority; City of Yuba City; Coachella Valley Water District; County of Kings; Crestline-Lake Arrowhead Water Agency; Desert Water Agency; Dudley Ridge Water District; Empire-West Side Irrigation District; Kern County Water Agency; Littlerock Creek Irrigation District; Metropolitan Water District of Southern California; Mojave Water Agency; Napa County Flood Control & Water Conservation District; Oak Flat Water District; Palmdale Water District; San Bernardino Valley Municipal Water District; San Gabriel Valley Municipal Water District; San Geronio Pass Water Agency; San Luis Obispo County Flood Control & Water Conservation District; Santa Clara Valley Water District; Santa Clarita Valley Water Agency; Solano County Water Agency; Tulare Lake Basin Water Storage District; and, Ventura County Watershed Protection District.

As noted in our comments on the synthesis papers prepared last year, which form the foundation of this amendment, the Council has undertaken a tremendous challenge, accounting for a range of physical and environmental factors that affect the Delta ecosystem, the synthesis and distillation of many relevant scientific studies to provide feasible recommendations, policies, and performance measures for amending Chapter 4 (Ecosystem Restoration) of the Delta Plan. We acknowledge the difficulty of bringing together diverse stakeholders in a dynamic ecosystem with complex problems created over decades, and factoring in changing demands. The SWC appreciates the opportunity to comment and engage with the Council and offer the following comments. In addition, the enclosed table summarizes specific remarks, provides recent citations to relevant scientific research, and individual recommendations provided in an effort to help the Council meet the best available science mandate, and to make the chapter stronger.

We agree that the state needs a long-term, feasible plan to achieve landscape-scale habitat restoration in the Delta and that flows or ecosystem restoration alone will not work. A combination of ecosystem restoration and functional flows is necessary to activate floodplain, generate turbidity and/or food web production, send signals to migratory species, etc. That strategy is consistent with the Voluntary Agreement approach we have been advancing with other stakeholders in the update to the Bay-Delta Water Quality Control Plan.

We commend the Council for including new recommendations ER Recommendation “A” (increase funding for restoring ecosystems), “B” (use DWR’s good neighbor checklist to coordinate restoration projects with neighboring landowners or users), “F” (coordination of local, state and federal agencies to remove institutional barriers to and streamline or expedite permitting for restoration), and “G” (align local, state and federal restoration to maximize priority attributes). While sound in concept, we encourage the Council to provide more details in future draft amendments on how these recommendations should be implemented.

We also support new ER Recommendation “C” subsection (a) advising the Delta Conservancy to develop incentives to implement targeted subsidence reversal actions. However, we urge you to delete or modify the subsection (b) recommendation that state investment in habitat restoration actions in subsided areas direct ecosystem restoration investments to areas that have opportunities to both reverse subsidence and restore intertidal marsh. This could limit beneficial projects such as rice farming, identified as a subsidence reversal action in footnote #3 of Performance Measure 4.3, which has been shown to reduce subsidence. Allowing for rice farming without ecosystem restoration investments would be consistent with the Delta Plan because it would continue to support Delta agriculture, and Delta as an evolving place, and by slowing or halting subsidence, it can help mitigate risks of levee failure. The focus on intertidal habitat also diminishes the importance of other types of habitats to support non-aquatic sensitive species. Development of non-tidal wetland/managed marsh can be a subsidence reversal action that provides important habitat for avian and terrestrial species, and even has the opportunity to provide food /nutrients for aquatic species. Without the support of state investments in these types of restoration actions because of higher-priority tidal marsh restoration projects, valuable habitat restoration opportunities may be unduly constrained.

Ms. Jessica R. Pearson

January 21, 2020

Page 3

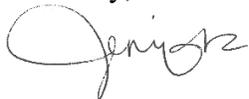
As we discussed, we agree in concept on the focus of Core Strategy 1: Create More Natural Functional Flows, but have concerns with describing them as “more natural.” We recommend using “functional flows”, which activate or mimic natural processes rather than “natural” flows. We think this is consistent with how ecosystem flows are explained in the text of the preliminary draft chapter discussion of Core Strategy 1.

During our meeting, we confirmed the intent of new ER Policy “A” which requires covered action ecosystem restoration projects to include information in the certifications of consistency explaining what ecosystem, recreational, cultural, and social benefits the project is expected to produce. It is our understanding that this policy is intended to be informational, focused on disclosing information to document priority attributes and social benefits. This new policy is not intended to require every restoration covered action to achieve a certain threshold number or types of attributes. Instead, by requiring disclosure in the certification, it is intended to require project proponents to consider ways to incorporate more priority attributes or social benefits into projects to avoid missed opportunities, and for the DSC to track the types of projects that are completed over time, something the SWC fully supports.

Again, we recognize and appreciate the immense effort that the Council and its staff have put into the Preliminary Draft Amendment. We hope that the Council will take this opportunity to continue to make improvements as this important process proceeds.

We are interested in continuing to work with the Council and staff as the process moves forward. If you have any questions about our comments, or would like to discuss ways we can help support the process, please call me at (916) 447-7357.

Sincerely,

A handwritten signature in cursive script, appearing to read "Jennifer Pierre".

Jennifer Pierre
General Manager

Enclosure

**Delta Plan Amendment – Chapter 4 (Ecosystem) Update
Summary of Comments**

Page		Comment	Recommended Resolution
		NARRATIVE	
1.	4-4	<p>Quote: “Other fish species, including the native delta smelt, longfin smelt, and Sacramento splittail, are year-long Delta residents.”</p> <p>It is stated that longfin smelt are year-long Delta residents. However, longfin are anadromous and are known to spend a portion of their life cycle in the San Francisco Bay and Pacific Ocean outside the Delta.</p>	Longfin should not be grouped together with delta smelt and splittail.
2.	4-5	<p>Quote: “Restoration actions may include restoring interconnected habitats within the Delta and its watershed, restoring more natural Delta flows, or improving ecosystem water quality (23 CCR section 5001[bb]). This, in turn, can lead to species recovery.”</p> <p>This definition does not acknowledge significant landscape modifications and numerous stressors/threats such as invasive species, contaminants, climate change/sea level rise, etc.</p> <p>It is unclear how the restoration actions as defined in 23 CCR section 5001[bb] would lead to species recovery with certainty.</p>	Suggest deleting highlighted text or acknowledge the stated uncertainties in the outcomes.
3.	4-11	<p>Releases from upstream reservoirs are for more than water exports. Reservoir releases serve multiple purposes such as flood control, meeting in-basin water demands (along river and in the Delta), meeting environmental and water quality regulatory requirements in the rivers and in the Delta.</p> <p>Comparing change in outflow between two years (from 1986 to 2005) does not capture the hydrologic conditions in those years and preceding years (water supply), changes in the water demands, and changes in regulatory requirements among others. All of these factors affect Delta outflow and it is inappropriate to tie the change in outflow between 1986 and 2005 to water exports alone.</p>	<p>Suggest referencing other works that provide a comprehensive picture on historical changes in Delta outflow, such as: Hutton, P.H., Rath, J.S., & Roy, S.B. (2017a). Freshwater flow to the San Francisco Bay-Delta estuary over nine decades (part 1): Trend evaluation. Hydrological Processes. https://doi.org/10.1002/hyp.11201 Hutton, P.H., Rath, J.S., & Roy, S.B. (2017b). Freshwater flow to the San Francisco Bay-Delta estuary over nine decades (part 2): Change attribution. Hydrological Processes. https://doi.org/10.1002/hyp.11195</p>
4.	4-12	<p>Quote: “The dams used to regulate flows for water supply and flood management purposes also create fish migration barriers and block access to spawning areas critical to salmonids, Sacramento splittail, and other native fish.”</p>	Splittail and salmon are not the same and should not be categorized together.

Delta Plan Amendment – Chapter 4 (Ecosystem) Update Summary of Comments

	Page	Comment	Recommended Resolution
5.	4-12	The South Delta diversions also cause reverse flows in the Old and Middle River, causing entrainment of fish and other aquatic organisms at the export pumps.	Add reference to entrainment risk of the unscreened in-Delta and upstream agricultural diversions. The document should also acknowledge that the reverse flows are managed based on the regulations from USFWS, NMFS and CDFW to minimize entrainment of fish.
6.	4-13	Inland warming may enhance the Delta’s cooling breezes (Lebassi et al. 2009). There is evidence that the wind speeds in the Delta have been receding over the last two decades, which is also reducing the Delta turbidity.	Acknowledge this finding. Cite: Bever, et al. (2018). Influence of an Observed Decadal Decline in Wind Speed on Turbidity in the San Francisco Estuary.
7.	4-15	The text suggest that contaminants are an emerging concern. Contaminants are a present concern. See reports from Fong, S., Louie, S., Werner, I., Davis, J., & Connon, R. E. (2016). Contaminant effects on California Bay–Delta species and human health. San Francisco Estuary and Watershed Science, 14(4).and Delta Independent Science Board. (2018). Water Quality Science in the Sacramento-San Joaquin Delta. Chemical Contaminants and Nutrients. Sacramento. CA. The ISB found that contaminants are likely having an effect and there are likely effects that are not known.	Acknowledge that contaminants are a current concern.
8.	4-22	The citation Grimaldo et al. (2009) does not support the statement. The statement suggests that low flows “disrupt” migratory cues. This is not the correct term. This paper is not about migratory cues and should not be cited as one.	Change the term “disrupt” to “affect” as this more accurately conveys what Grimaldo et al. (2009) discusses.
9.	4-22	The citation of Grimaldo et al. (2009) is focused on multiple factors not just reverse flows, showing there are other factors that significantly affect entrainment risk. Also particle tracking models have found that passive behaviors have been found to produce biologically impossible results.	Add that there are multiple factors along with reverse flows that interact to affect entrainment risk. Once available, work by Ed Gross and colleagues as part of the CAMT effort should be referenced in regards to certainty about fish movement.
10.	4-23	The section on interannual variability uses Yarnell et al. (2015) as a citation but when you examine that citation they use Viers and Rheinheimer (2011)	Reference Viers and Rheinheimer (2011).

**Delta Plan Amendment – Chapter 4 (Ecosystem) Update
Summary of Comments**

	Page	Comment	Recommended Resolution
11.	4-25	The assumption of this core strategy is that restoring ecosystem function can be achieved via the five priority attributes. The ecosystem function may be “restored”, but delta smelt and longfin smelt are unlikely to recover if climate change pushes temperatures beyond their thermal limits. The ocean is a primary driver of salmon population dynamics. Restoring ecosystem function likely provides resilience to these external drivers, but may not be able to overcome their effect.	Acknowledge uncertainty associated with a changing climate and that “restored ecosystem function” may not produce expected population responses because of environmental drivers outside human control.
12.	4-25	It is unclear whether priority attributes are anchored on historical, current, or future conditions (both environmental and infrastructure).	Explain what ‘restored ecosystem function’ looks like under future climate change and how attributes will consider climate change.
13.	4-26	Quote: “the Delta Plan is not intended to be constrained by or limited to objectives that focus only on a subset of the Delta’s native species.” Policy ER PA does not allow projects to qualify for an Ecosystem Restoration Tier if they do not contribute to the recovery of special-status species, even if they have other priority attributes. This seems inconsistent with the intent of the Delta Plan as stated above.	Remove the quoted text or edit Policy ER PA to remove the restriction imposed by the recovery of special-status species qualification.
14.	4-26	The citations for “[b]est available restoration science identifies the following priority attributes ...” are not provided.	Provide the citation(s) that make up the “[b]est available restoration science”.
15.	4-27	“Small-scale” projects are not defined.	For scale purposes, provide an example of a “small scale” project.
16.	4-27	The priority attribute discussions are very high-level and it is difficult to find the supporting information for each attribute. The structure of the report makes it difficult to follow a single topic through all of the different sections and appendices, etc. The chapter would benefit with cross-references throughout.	Provide reference to the appropriate sections in Appendix 3A, Performance Measures, etc. that support each priority attribute.
17.	4-28	Improvement implies some sort of learning is occurring; however, prioritizing post-project monitoring or how future projects designs will be improved following implementation of initial series of projects is not discussed.	Describe if/how post-project monitoring is prioritized (funded) and results used to improve future project design.

**Delta Plan Amendment – Chapter 4 (Ecosystem) Update
Summary of Comments**

	Page	Comment	Recommended Resolution
18.	4-28	<p><u>Quote</u>: “It is inappropriate to implement ecosystem protection, restoration, or enhancement actions (whether for mitigation, recovery, or other objectives) that can only achieve one or two of the priority attributes in locations that could potentially support four or more of these attributes, since such areas are extremely limited within the Delta.”</p>	<p>Replace “inappropriate” with “desirable.”</p> <p>“It is desirable to implement ecosystem protection, restoration, or enhancement actions (whether for mitigation, recovery, or other objectives) that support the maximum priority attributes in locations that could potentially support four or more of these attributes, since such areas are extremely limited within the Delta.”</p>
19.	4-32	<p>The text does not explain how the priority areas were identified and evaluated.</p>	<p>Include information on how these areas were identified, evaluated, and selected.</p>
20.	4-41	<p>The text does not explain how the priority areas were identified and evaluated.</p>	<p>Include information on how these areas were identified, evaluated, and selected.</p>
21.	4-47	<p>“Managing invasive species in the Delta” lists agencies that detect and manage invasive species in the Delta. The Division of Boating and Waterways is not listed, but has the authority to control noxious aquatic weeds in the Delta under the California Department of Parks and Recreation.</p>	<p>Add the role of the Division of Boating and Waterways to the list.</p>
22.	4-48	<p><u>Quote</u>: “Other physical barriers in the Delta that interrupt fish migration include structures with ledges and drops, such as bridge pilings, boat docks, narrow channels with riprapped edges, or the intakes of the SWP and CVP pumps, which entrain out-migrating juvenile salmonids and create attractive spots for predatory fish to feed on migrating species.”</p> <p>These are not “barriers” in the sense that they interrupt migration.</p>	<p>Rephrase for clarity.</p>
23.	4-48	<p>The term “Fisheries Management” refers to a field of decision analysis for managing the exploitation of commercially or recreationally valuable fisheries, e.g. setting quotas, bag limits, stock assessments, etc.</p>	<p>Change “Fisheries Management” to “Fish Management.”</p>
24.	4-49	<p><u>Quote</u>: “Until priority barriers are removed and critical migration corridors are restored, maintaining populations of anadromous fish requires the use of hatcheries to ensure reproduction.”</p> <p>This is incorrect.</p>	<p>Remove sentence.</p>

**Delta Plan Amendment – Chapter 4 (Ecosystem) Update
Summary of Comments**

Page		Comment	Recommended Resolution
25.	4-49	Quote: “Hatchery fish interbreed and compete with wild fish, which can lead to a long-term decline in genetic diversity within the population.”	Include information on how hatchery fish can also out compete wild fish for spawning grounds, food, etc.
26.	4-50	Quote: “Over time, these management actions will help to sustain native fish populations until large-scale ecosystem restoration can be implemented, and fish populations become self-sustaining.”	Either reference results from a decision support model that supports this statement OR replace “these management actions <i>will</i> help to sustain native fish populations...” to “these management actions <i>are intended to</i> help to sustain native fish populations...”
27.	4-50	Quote: “All hatcheries releasing listed species should continue to develop and implement HGMPs to reduce genetic risk of those species, and CDFW should provide annual updates on the status of those HGMPs (see ER R8).” Some hatcheries are federal and produce the most hatchery fish.	Outline how federal hatcheries should reduce genetic risk to natural stocks without HGMP plan and provide annual updates. The Council can make recommendations for federal agency action.
28.	4-50	Quote: “These interventions are expected to contribute to increased abundance of native fish species, relative to the abundance of all fish species.” It is unclear how a HGMP to reduce genetic risk will result in increased abundance.	Include information and logic/conceptual model on how reducing genetic risk will lead to increased abundance.
29.	4-50	Grossman et al. (2016) is the only citation in the section on Predatory fish management.	Add more citations.
30.	4-51	Figure 4-7. Priority Migration Corridors.	Provide information on how these corridors were evaluated and selected.
POLICIES AND RECOMMENDATIONS			
31.	4-59	Core Strategy 1: Create More Natural Functional Flows.	Add Yarnell et al. (2015) to this strategy.
32.	4-60	Reference to Adaptive Management (“adaptive approach”).	Describe the Adaptive Management framework, what resources will be dedicated to it, and which/how stakeholders will be involved.
33.	4-67	Quote: “The Delta Conservancy, Delta Science Program, California Department of Fish and Wildlife, California Department of Food and Agriculture, and other State and federal agencies should develop and implement communication and funding strategies for rapid response to new introductions of non-native invasive species, based on scientific expertise and research.”	While SWC agrees with this recommendation, it could be improved by including a timeline including interim steps.

**Delta Plan Amendment – Chapter 4 (Ecosystem) Update
Summary of Comments**

Page		Comment	Recommended Resolution
34.	4-67	Quote: “Hatcheries and harvest regulation are important tools in fisheries management, but they also pose genetic and ecological risks to wild salmon runs, other native species, and the Delta ecosystem.”	Describe how hatcheries pose genetic risk to non-salmon species.
35.	4-67	Quote: “New ER Recommendation “H.” Improve Fish Migration within the Delta and Sacramento – San Joaquin Watershed (NEW)” State and federal agencies should implement priority actions to remove barriers to fish migration.” Fish migration could be improved through lots of different ways, not just by removing barriers to fish migration. For example, modifying a weir or installing a fish ladder.	Expand the recommendation to measures beyond complete removal of barriers.
36.	4-67	Quote: “State and federal agencies should implement priority actions to remove barriers to fish migration.” The recommendation is redundant with the subsequent recommendation (I). New Recommendation (H) is a means objective (improve fish migration) whereas New Recommendation (I) is a fundamental objective (improve survival of juvenile salmon). Recommendation (I) can be achieved with (H), but (H) is not the only means to achieve (I).	One approach to clarify would be to explain that removing barriers is one means of improving fish migration. Another approach would be to remove recommendation (H) and include ‘improve fish migration’ language in recommendation (I) as one means to achieve the objective of improving survival.
37.	4-68	ER R9. Coordinate Acoustic Telemetry Program (REVISED). SWC continues to support acoustic telemetry studies. However, this recommendation does not specify who is responsible for coordinating these efforts and who will fund the work.	Describe how the recommended coordination will be realized (e.g. funding and governance structure).
38.	4-69	New ER Recommendation “F” outlines actions that the DPICC could pursue with the intent of supporting and streamlining restoration actions.	Revise Recommendation F to clearly indicate that the outcomes of the recommendation are processes to streamline restoration/conservation action implementation that would be available to project proponents on a voluntary basis. Revise language to reflect that streamline processes or support tools developed under Recommendation F would be available to all restoration/conservation action not just Tier 1 and Tier 2 projects as defined under Appendix 3A.

**Delta Plan Amendment – Chapter 4 (Ecosystem) Update
Summary of Comments**

Page		Comment	Recommended Resolution
PERFORMANCE MEASURES			
39.	PM 4.14 Page 7	By summing the total cost of projects in ecosystem restoration Tier 1 and Tier 2 and calculating the percentage of cost of projects in Tier 1 and Tier 2 with the total cost of all projects under New ER Policy “A,” the ecosystem element cost of a project that includes ecosystem restoration as mitigation will not be calculated and included as part of the data.	Find a way to capture all ecosystem data, including acreages, of ecosystem elements that are implemented as project mitigation.
40.	PM 4.15 Page 5	An inundation frequency of 50% to 90% in this context would imply inundation for some undetermined duration at least once every two years up to nine out of every 10 years. This does not translate to a percent of time that a floodplain would be inundated.	This metric should be revised to reflect a duration as well as a frequency of inundation. The PM 4.15 Metric on page 1 as well as Appendix E page 8A-2 should be updated accordingly.
41.	PM 4.15 Page 6	Dividing the modeled areas needed to meet CVPIA goals by 17 percent greatly expands the required area. The 17 percent suitability of floodplains for salmonids is based on existing floodplain. This methodology implies that future floodplain restoration covered actions would be suitable for salmonids at the same rate as existing floodplains. This seems like a flawed assumption in that future floodplain restorations would likely be designed specifically to provide suitability for salmonids, so are likely to be more suitable.	Develop a methodology for calculating a connectivity target based on suitability of future floodplain restorations.
APPENDIX 8A			
42.	8A-2	The text does not explain why an inundation frequency of at least every two years was chosen.	Provide citations or references to other sections of Chapter 4 that provide explanation.
43.	8A-2	There is no explanation of why 2013 is the baseline for Seasonal Inundation and 2007 the baseline for Acres of Natural Communities Restored are used.	Add an explanation as to the choice of baseline year.
44.	8A-2	There is no explanation provided to show how priority areas were identified, evaluated, and selected.	Describe here or in appendix 8A how these areas were identified and selected.
45.	8A-2	The target thresholds of the long-term goals of the performance measures may be difficult to achieve and are not connected to specific actions that could be altered along the way if meeting the target thresholds is unachievable. There is also no connection between these goals and how they link into adaptive management.	Provide a stronger basis for the goals and steps needed to achieve these goals.
46.	8A-2	The baseline for the frequency of floodplain inundation every other year and the baseline of 2013 is not supported.	Add information to support.

**Delta Plan Amendment – Chapter 4 (Ecosystem) Update
Summary of Comments**

	Page	Comment	Recommended Resolution
		There is not enough evidence to support the citation to validate the baseline and change by 2050.	
47.	8A-3	The baseline for restored habitat 2007 is not supported.	Add information to support.
48.	8A-3	Quote: “1. Additional 51,000 acres added to the 75,000-acre baseline that are physically connected to the fluvial river and tidal system. 2. At least an additional 19,000 acres of floodplain area is inundated on a two-year recurrence interval, for the total of at least 34,000 acres.”	Provide interim time steps towards achieving these goals.
49.	8A-4	Quote: “Target: net increase of target acres of natural communities by 2050.”	Describe how these targets were established.
50.	8A-4	Quote: “Achieve the state and federal doubling goal for Central Valley Chinook salmon natural production against the baseline from the period of 1967-1991.”	Describe what measures will be taken if the PM is not met.
51.	8A-4	Quote: “The slope of the 15-year rolling annual average of natural production for all Central Valley Chinook salmon runs is greater than zero (i.e., positive) for the period of 2035-2065.” Ambitious goal, which could be unachievable given current stressors and anticipated stressors related to climate change.	Describe what measures will be taken if the target is not met.
52.	8A-4	The process used to determine the targets is not cited.	Provide the citation for the targets.
53.	8A-5	Quote: “Subsidence reversal activities will be located at shallow subtidal elevations to prevent net loss of future opportunities to restore tidal wetlands in the Delta and Suisun Marsh.”	Describe how this will be measured.
54.	8A-8	Quote: “The California Legislature provides state agencies with funding to provide resources and support to resource conservation districts, and other local agencies and districts, to improve agricultural land management practices that support native species (corresponds to NEW ER Recommendation “D”).”	After “support native species” add “and restore ecosystem functionality.”
55.	8A-8	Strategy 4.4 includes public agencies only.	Revise to allow for the incorporation of private entities.
56.	8A-8	Targets focus on means objectives (screening diversions, resolving barriers) without consideration of fundamental objectives (increasing survival, abundance of migratory fish).	Identify fundamental objective of this strategy and describe decision analysis framework that will optimize barrier removal/diversion screening to achieve this fundamental objective.

**Delta Plan Amendment – Chapter 4 (Ecosystem) Update
Summary of Comments**

Page		Comment	Recommended Resolution
57.	8A-8	Strategy focuses on a specific life-stage (migratory juvenile salmonids) of large enough size that can be tagged. The Winter Run Life Cycle Model workshops and CVPIA Science Integration Team have both shown that population dynamics are much more sensitive to our uncertainty about survival at earlier life-stages (smaller than what can be tagged acoustically) and not necessarily associated with migration pathways (e.g. survival benefits associated with restored habitats).	Incorporate recommendations from CVPIA SIT and WRLCM regarding where uncertainties in juvenile salmonid survival are limiting management decision making.
58.	8A-9	Quote: “CDFW, in cooperation with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service, coordinates with researchers conducting acoustic telemetry to identify fish migration pathways and survival (corresponds to ER R9).” The recommendation to use acoustic telemetry is very specific and limiting. Acoustic tags only allow large fish to be tagged and thus really only enable the tagging of hatchery fish.	Recommendation should be more general to identify and monitor fish migration pathways and survival. This will allow for technological advances and other sampling methods to be used to monitor the fish of real importance. Recommendations should not limit opportunity to study wild fish or specify the technologies that can and cannot be used.
APPENDICES			
59.	Q2-1	The Delta Plan does not include measures for all categories of stressors.	Add language to other sections to provide measures to reduce stressors significantly enough to improve the target species.
60.	Q2-10	The text assumes that large emergent wetland restoration will reduce invasives. There is no evidence provided to support this. Invasive aquatic weeds seem to have no relationship with size therefore this metric seems at odds with the current understanding of the ecosystem in the Delta.	Add more clarification on what kind of invasives are being addressed by emergent wetland size and provide the citation.
61.	Q2-13	The definition for “special-status species” seems at odds with itself. There are several species that are not included in this definition and others that are not listed that should be. For example splittail is neither threatened, endangered, nor rare. Also staghorn sculpin is a special species of concern like splittail but is not included. These are only a couple of the fish examples.	Recommend reviewing the definition of special status and make sure all the species that are included are covered in the Delta Plan and any additional species not under the definition need another criteria for inclusion.
62.	Q2-13	Quote: “The Delta Reform Act requires the Delta Plan to include measures that promote viable populations of native resident and migratory species; conditions conducive to meeting or exceeding the goals in the existing species recovery plans (California Water Code section 85302(c)(1) and (5)); and to promote self-sustaining, diverse populations of native and valued species by reducing the	Define ‘valued’ species to include only special-status species. Invasive bass may be highly valued by recreational anglers, but prey on special-status species and compete for food with native species.

**Delta Plan Amendment – Chapter 4 (Ecosystem) Update
Summary of Comments**

Page		Comment	Recommended Resolution
		risk of take and harm from invasive species, among other subgoals and strategies (California Water Code section 85302(e)).”	
63.	Q2-14	Recovery of the special-status species is noted as essential for preserving biodiversity, yet there is almost no consideration for the multitude of benthic natives that are likely essential as well such as Tule Perch, Sticklebacks, and Sculpins. It is not clear why this vital and very important subregion is excluded. Splittail and sturgeon are not sufficient for inclusion.	Add more language acknowledging that the recovery of the special status are one of many components to preserve biodiversity and that further work should be conducted on those areas of the foodweb that are not directly addressed by the Delta Plan.
64.	Q2-17	The text seems to suggest that recreational fisheries will benefit from the Delta Plan but there is text in this document that calls for the reduction of invasive impacts on natives. Most of the recreational fisheries prey on invasives. It is not clear how this conflict will be addressed. These are mutually exclusive goals. The Delta Plan should acknowledge that the measures to promote special-status species may conflict with some of the other goals of the plan.	Acknowledge measures to promote the special-status species may not indirectly benefit recreational fisheries and may actually impact them.
65.		Longfin smelt don’t just spawn in the Delta, but throughout the estuary, in both the San Francisco Bay and Suisun Bay with most occurring between San Pablo and Suisun Bay. Two studies by Grimaldo et al. (2017) and Lewis et al. (2019) confirm.	Change to include spawning and rearing throughout the estuary.
		Appendices 3A and 4A	
66.	3A-1	The text seems to imply that all the attributes are equally weighted. That is unlikely as Attribute 1.5 is much more desirable than any of the others.	Acknowledge that not all of these attributes are equally weighted and that Attribute 1.5 should be a minimum requirement.
67.	3A-2	It is unclear why these processes are listed.	Provide a citation to show that the processes are from peer-reviewed citations to add more weight to the guidelines.
68.	3A-2	Non-tidal wetlands also support the hydrologic, geomorphic, and biologic delivery of organic and non-organic compounds to the ecosystem.	The “Delivery of organic and non-organic compounds which support nutrient cycling, primary productivity, plant growth, and peat formation” process check box in Column 2 of Row 1 should also be added to the “Non-tidal wetland” ecosystem type in Row 2.
69.	3A-5	It is unclear how “large-scale” is determined for Proposed Restored Area designations.	Provide citations or references to other sections of Chapter 4 that provide explanation for these designations.

**Delta Plan Amendment – Chapter 4 (Ecosystem) Update
Summary of Comments**

Page		Comment	Recommended Resolution
70.	3A-11	It is unclear how 75% of the aggregate area as the percent needed to qualify as increasing native vegetation cover was determined.	Provide citations or references to other sections of Chapter 4 that provide justification.
71.	3A-18	It is unclear how the identification of the social benefits that would be provided by the covered action, and the disclosure of supporting information in Section 2 would be evaluated.	Clarify how Section 2. Social Benefits will be evaluated.
72.	3A-21	Subsidence reversal, although a soil conservation or improvement is more a natural resource benefit than a specific agricultural benefit.	Move the example of “subsidence reversal” from Table 2.3 Agricultural Benefits Selections to Table 2.4 Natural Resource Benefits Selections.
73.	4A-2	Column 2 lists two conservation actions for Shallow Subtidal Elevation Bands: 1) Subsidence halting 2) Subsidence reversal but provides no additional information on the restoration actions that may meet these criteria. Performance Measure 4.12 Subsidence Reversal for Tidal Reconnection provides examples of conservation actions that would be appropriate in this elevation band including managed wetlands, rice cultivation and tidal marsh. Other natural communities such as Grasslands and seasonal wetlands may also be helpful in halting or reversing subsidence.	Expand list of Conservation Actions for this Elevation Band to reflect a range of actions that may be suitable and to be consistent with Performance Measure 4.12.
DATA SHEETS			
74.	PM 4.6 page 1	Quote: “The annual average natural production of all Central Valley Chinook salmon runs is 990,000 fish by 2065, which is double the 1967-1991 levels.” <ul style="list-style-type: none"> • Doubling goal is aspirational and implies a threshold utility function (<990K = Fail; > 990K = Success) when increases up to the doubling goal have value. • Central Valley Chinook salmon runs increase by 50%, but because this is less than the 990K threshold the performance is considered a failure. <p>A panel report by Dahm et al. (2019) found the following: BOX 4.3: Comment on AFRP Doubling Goals USFWS (2001) established a goal to double natural production of Chinook salmon and steelhead (and other anadromous species)</p>	PM should define expectations and targets that reflect reasonable value/utility functions and avoid threshold functions.

**Delta Plan Amendment – Chapter 4 (Ecosystem) Update
Summary of Comments**

	Page	Comment	Recommended Resolution
		<p>within 10 years and the goal was set in public law (www.usbr.gov/mp/cvpia/title_34/public_law_complete.html). Nevertheless, the Panel believes this goal to be unrealistic (e.g., 990,000 natural Chinook salmon, including harvested fish). Values in the baseline period likely underestimated hatchery-origin Chinook salmon in total returns, which appear to be based on professional opinion rather than actual data for hatchery-origin fish (see Mills and Fisher 1994). Recent estimates of pHOS confirm that hatchery fish on the spawning grounds are higher than those assumed in the doubling goal analysis (e.g., Willmes et al. 2018, Palmer-Zwahlen et al. 2018; Figure 4.4). The Panel is uncertain whether estimated harvests of natural-origin Chinook salmon in the doubling goal analysis were reasonably accurate, but suspect that they were too high because they probably include some hatchery fish.</p>	
75.	PM 4.6 page 1	<p>Quote: “Fifteen-year rolling annual average natural production of all Central Valley Chinook salmon runs (fall, late fall, spring, and winter). This metric is measured annually.”</p> <p>It is unclear how natural production is measured.</p>	<p>Define "natural production"</p> <p>Clarify if increasing abundance/production of all runs is a goal or is only in aggregate. If only in aggregate explain why PM does not consider runs individually and make case for how this PM will still benefit all runs if that is the intent.</p>
76.	PM 4.6 page 1	<p>Quote: “2) The slope of the 15-year rolling annual average of natural production for all Central Valley Chinook salmon runs is greater than zero (i.e., positive) for the period of 2035-2065.”</p> <p>Slope cannot be positive in perpetuity, at some point the population will approach carrying capacity. If/where capacity is limiting will vary over the years as the population grows and new/restored habitats come online.</p>	<p>PM should account for productivity as a function of available habitat.</p> <p>Provide interim time steps.</p>
77.	PM 4.13	<p>Quote: “1. By 2030, resolve all (100 percent) of the priority fish migration barriers (listed in CDFW 2018 Priority Barriers (2018) and CVFPP 2016 Conservation Strategy).</p> <p>2. By 2050, resolve 50 percent of fish passage at rim dams in the Sacramento-San Joaquin River watershed, and screen 50 percent of</p>	<p>Propose adaptive management approach to sequencing of fish passage projects; prioritize actions where habitat is currently limiting and/or newly accessible habitat provides cold water refugia under future climate change scenarios.</p>

**Delta Plan Amendment – Chapter 4 (Ecosystem) Update
Summary of Comments**

Page		Comment	Recommended Resolution
		<p>unscreened diversions along native, anadromous fish migration corridors in the Delta.”</p> <p>Timelines and targets are aggressive. Prioritization of barrier removal/passage projects should take into account status of population relative to existing available habitat and climate change refugia benefits.</p>	
78.	PM 4.13, page 1	<p>Quote: “Rim dams in the Sacramento-San Joaquin River watershed”</p> <p>This may not be possible or appropriate for large dams such as rim dams.</p>	Define how the dams to be removed would be selected.
79.	PM 4.13, page 5	<p>Figure 1. Unscreened Diversions (1,400 locations) Along Native, Anadromous Fish Migration Corridors in the Delta and Suisun Marsh.</p>	Figure legend should include the source of the data provided in the map.
80.	PM 4.13, page 8	<p>Table 1. Comparative List of Priority Fish Migration Barriers Identified in the Sacramento River Watershed.</p> <p>It is unclear which barriers are being recommended in these tables and if only the priorities in 2018 will be considered.</p>	Provide clarification on which barriers are top priority.
81.	PM 4.13, page 9	<p>Table 2. Comparative List of Priority Fish Migration Barriers Identified in the San Joaquin River Watershed.</p> <p>It is unclear which barriers are being recommended in these tables and if only the priorities in 2018 will be considered.</p>	Provide clarification on which barriers are top priority.
82.	PM 4.13, page 10	<p>Table 3. Rim Dams to Provide Fish Passage Identified in Recent Recovery Plan Biological Opinion for Salmonids.</p> <p>2009 BO did not require passage above all dams but did require a fish passage assessment for evaluating steelhead passage above Goodwin, Tulloch, and New Melones Dams on the Stanislaus River and a pilot program on the American River above Nimbus and Folsom dams, and on the Sacramento River above Keswick and Shasta dams. Fish passage above rim dams is</p>	Change title table to: Table 3. Rim Dams to Provide Fish Passage.

**Delta Plan Amendment – Chapter 4 (Ecosystem) Update
Summary of Comments**

	Page	Comment	Recommended Resolution
		extremely difficult and expensive and may not be appropriate if waters above dams are too warm under predicted climate change scenarios. The Council does not have authority to require this, but could be supportive of evaluations and pilot programs.	
83.	PM 4.13, page 10	<p>Setting the target of resolving 50 percent of fish passage at the rim dams, and screening 50 percent of unscreened diversions, considers the feasibility of developing technological solutions to fish passages at large dams that also provide water supply and flood control benefits and the large number of mostly agricultural water diversions within the Delta.</p> <p>Timeline is aggressive and it is unknown if passage above rim dams is feasible or warranted.</p>	Provide interim time steps and consequence of not achieving this target in the timeline given.
84.	PM 4.15, page 6	<p>Quote: “Basin. Analysis for the CVFPP identified that on average, only 17 percent of floodplains are considered suitable for salmonid species (DWR 2016a). To account for this, the areas required were divided by 17 percent to generate 64,705 acres needed for the Sacramento River Basin and 26,471 acres for the San Joaquin River Basin. Council staff then scaled these areas by the relative proportion of the Conservation Planning Areas (CPA) for the CVFPP within the Delta and Suisun Marsh as determined by a spatial analysis: approximately 52 percent of the Lower Sacramento CPA and 67 percent of the Lower San Joaquin CPA fall within this area. Multiplying by these respective factors (see equations below) results in 33,647 acres in the Lower Sacramento CPA and 17,735 acres in the Lower San Joaquin CPA, for a sum of 51,382 acres of floodplain habitat (see below). After rounding, the connectivity target is set to 51,000 acres. Here are the equations to set the targets:</p> <ul style="list-style-type: none"> • Sacramento CPA: 64,705 acres x 52% = 33,647 acres • San Joaquin CPA: 26,471 acres x 67% = 17,735 acres” 	<p>Conduct an analysis to see if these areas are actually capable of having connectivity rather than assigning based on scale.</p> <p>PM should target defined suitable habitat criteria for groups of target species (salmonids, smelts, etc.) and regions (riverine vs. tidal).</p>
85.	PM 4.16, page 5	Quote: “Targets for each natural community (ecosystem) type were derived from conservation and restoration targets identified in conservation and recovery plans within the Delta and Suisun Marsh	Ensure that the targets identified in Appendix Q4 have gone through an external review and approval process before adopting them.

**Delta Plan Amendment – Chapter 4 (Ecosystem) Update
Summary of Comments**

Page		Comment	Recommended Resolution
		(Council 2019, Delta Plan Amendment, Appendix Q4 Conservation and Recovery Plan Target Species -Preliminary Draft)."	
86.	PM 4.16, Page 6	Quote: "These targets were identified based on the modeled estimate of rearing habitat area required to help recover spring and fall-run Chinook salmon to meet the 1992 Central Valley Project Improvement Act salmon doubling goal."	Describe the consequences of using fall-run values to set conservation and restoration targets for all species and establish a process such that if achieving these goals is successful for fall-run, but not for other species (for instance, longfin) then this will not be considered a failure.
87.	PM 4.16, PM 4.15	PM 4.15 (Seasonal Inundation) seems to be redundant as it is nested within 4.16 (Acres of Natural Communities Restored).	Either delete PM 4.15 or clarify how it is different from PM 4.16 and necessary as its own PM.