Long-Term Operation of the California State Water Project

North Delta Food Subsidies

State Clearinghouse No. 2019049121

Addendum to the Final Environmental Impact Report

California Department of Water Resources
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Sacramento, CA 95814

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Acronyms

NDFS	North Delta Food Subsidies
EIR	Environmental Impact Report
SCH	State Clearinghouse
CEQA	California Environmental Quality Act

1.0 INTRODUCTION AND PURPOSE

1.1 Introduction

The Delta Smelt Summer-Fall Habitat Action (Summer-Fall Action) is a compensatory mitigation measure outlined in the Incidental Take Permit (ITP) for the Long-Term Operation of the California State Water Project (SWP) issued to the California Department of Water Resources (DWR, permittee) (CDFW 2020, Permit No. 2081-2019-066-00). Implementation of the Summer-Fall Action (ITP Condition of Approval (COA) 9.1.3) is intended to improve habitat and food sources for federal and state listed Delta Smelt (*Hypomesus transpacificus*). The North Delta Food Subsidies (NDFS) - Colusa Basin Drain action is one of three food enhancement actions that may be implemented each year in addition to operation criteria required for habitat benefits (ITP COA 9.1.3.1).

DWR has prepared this Addendum for the proposed change in compliance with the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.), augmenting the 2020 Final Environmental Impact Report for Long-Term Operation of the California State Water Project (2020 FEIR) (DWR 2020, State Clearinghouse No. 2019049121). The 2020 FEIR covered the NDFS action at a project level; however, new analysis of water quality (e.g., contaminants and dissolved oxygen) has become available since certification of the FEIR (March 27, 2020). As described in this Addendum, the proposed revisions to the ITP do not require revisions to the conclusions or findings presented in the FEIR because no new or substantially more intense or severe significant environmental impacts or potentially significant environmental impacts would occur. No changes to SWP facilities or other operations are proposed.

1.2 Background

The SWP facilities in the Delta provide for delivery of water to areas within and immediately adjacent to the Delta, and to regions south of the Delta consistent with applicable laws, contractual obligations, and agreements. DWR stores, diverts, and conveys water in accordance with DWR's existing water rights to deliver water pursuant to water contracts and agreements up

to full contract quantities. The main SWP Delta features are Suisun Marsh and Bay facilities, the Harvey O. Banks Pumping Plant (Banks Pumping Plant), the Clifton Court Forebay (CCF), the Skinner Fish Facility, and the BSPP. The SWP also includes the ongoing operation of existing facilities in coordination with the CVP. The locations of the various facilities of the SWP in the Delta are shown in Figure 1.

The SWP implements measures benefiting state and federal listed species, not limited to Delta Smelt. One measure includes the Delta Smelt Summer-Fall Habitat Action (ITP COA 9.1.3), aimed at improving Delta Smelt recruitment, growth, and survival by providing contiguous high-quality habitat and food supplies in a geographic area extending from the Cache Slough Complex (CSC) to Suisun Marsh. To accomplish these improvements, the Summer-Fall Action includes project operations to maintain low salinity habitat in this area by maintaining a monthly average 2 ppt isohaline (X2) at 80 km from the Golden Gate in above normal and wet water years in September and October, along with additional measures including Suisun Marsh Salinity Control Gate operations in above normal, below normal, and dry years in June through October (see ITP Table 9-A, p.115), and food enhancement actions.

The North Delta Food Subsidy (NDFS) action is one of several food enhancement actions for annual consideration in the Delta Smelt Summer-Fall Habitat Action (ITP COA 9.1.3.1), aimed at transporting food from relatively high productivity areas (e.g., Yolo Bypass) to less productive waters downstream. The NDFS action, in general, redirects water from either the Sacramento River or agricultural return drainage from the Colusa Basin Drain through the Yolo Bypass to generate a moderate flow pulse to restore net positive flow downstream (that is otherwise negative during summer-fall due to diversions) and increase availability of plankton (food) in Delta Smelt habitat.

In coordination with the Delta Coordination Group (US Bureau of Reclamation, US Fish and Wildlife Service, CDFW, National Marine Fisheries Service and Public Water Agencies), DWR is responsible for annual planning, implementation of operation alternatives (e.g., Sacramento River or Agriculture drainage at varied intensity and duration, or no-action), monitoring, and reporting of the NDFS action. The Sacramento River action

occurs during summer (late June-Sept.) and the agricultural action during fall (Aug.-Oct.). These time periods include before, during, and after flow pulse monitoring of hydrodynamics, water quality, plankton, and some fish species. Given past experimental actions, flow volumes associated with the action are not sufficient to inundate the floodplain in the Yolo Bypass, nor does it constitute a consumptive use of water because the water used for this action would be allowed to move through the North Delta and contribute to Delta outflow.

The FEIR, certified on March 27, 2020, included analysis of the NDFS action at a project level (See FEIR at 5-57 – 5-58). The FEIR concluded and DWR found that the impacts of the project as approved—including the impacts to the federal Endangered Species Act (ESA) and California Endangered Species Act (CESA)-listed fish and surface water quality—were less than significant (See Findings of Fact).

Since the completion of the certified FEIR, new data analysis of water quality during flow pulses in the North Delta (seasonal non-managed pulses and experimental NDFS actions) has been completed (Davis et al. 2022). This new analysis of dissolved oxygen and contaminants identified potential effects not analyzed in the FEIR; but would not result in new or substantially more intense, severe environmental impacts, or potentially significant environmental impacts.

1.3 Purpose of the EIR Addendum

According to Section 15164(a) of the CEQA Guidelines, the lead agency or a responsible agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the conditions described in Section 15162 requiring preparation of a subsequent EIR have occurred. Section 15162 of the CEQA Guidelines lists the conditions that would require the preparation of a subsequent EIR rather than an addendum. These include the following:

1. Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

2. Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
3. New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time of the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:
    a. The project will have one or more significant effects not discussed in the previous EIR or negative declaration;
    b. Significant effects previously examined will be substantially more severe than shown in the previous EIR;
    c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the Project, but the project proponents decline to adopt the mitigation measure or alternative; or
    d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

This Addendum concludes that the proposed change of new information from NDFS analysis does not trigger any of the CEQA Guidelines Section 15162 conditions described above. This is because the proposed change to the ITP does not require revisions to the conclusions or findings presented in the 2020 FEIR because no new or substantially more intense, severe significant environmental impacts, or potentially significant environmental impacts would occur.

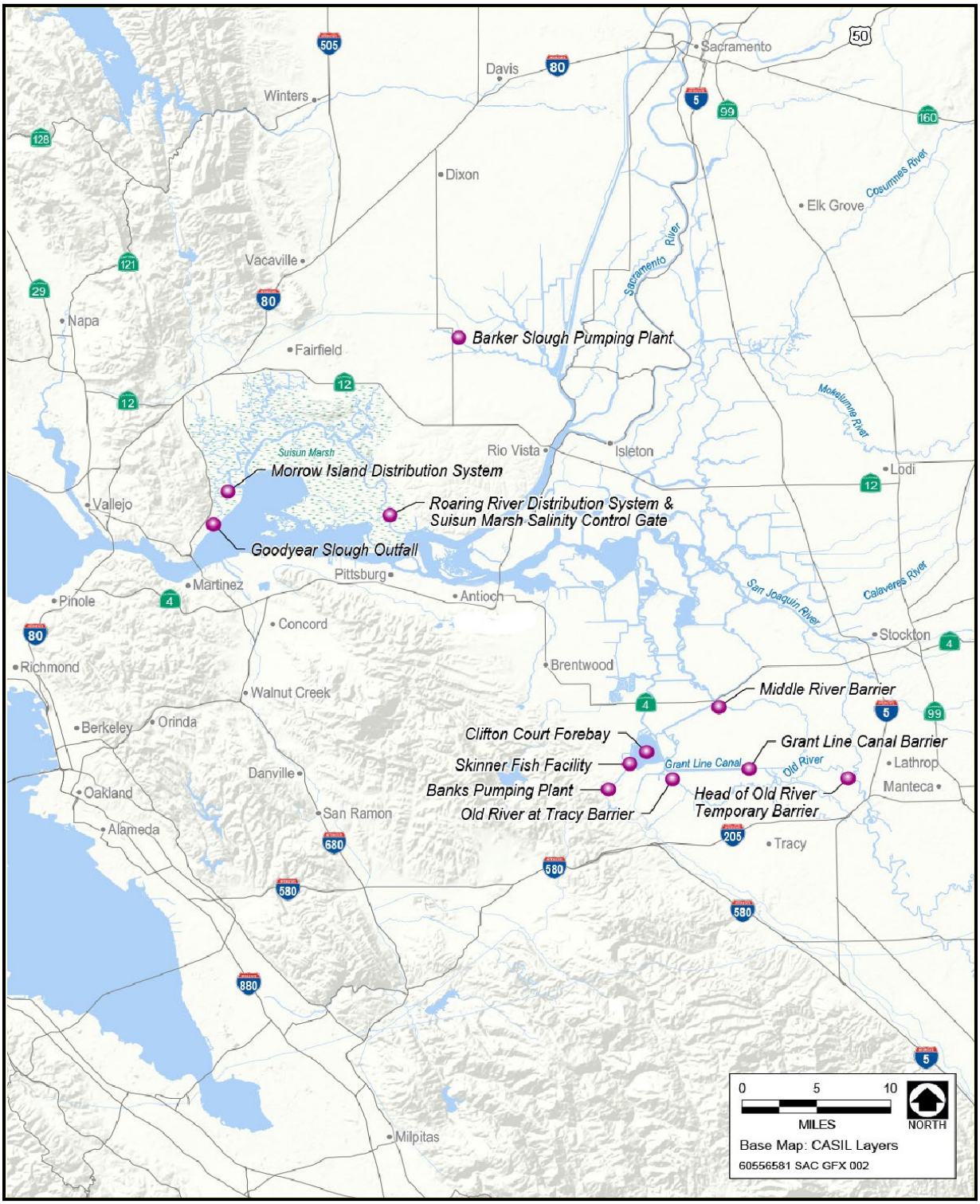

Figure 1. State Water Project Facilities Located in the Delta

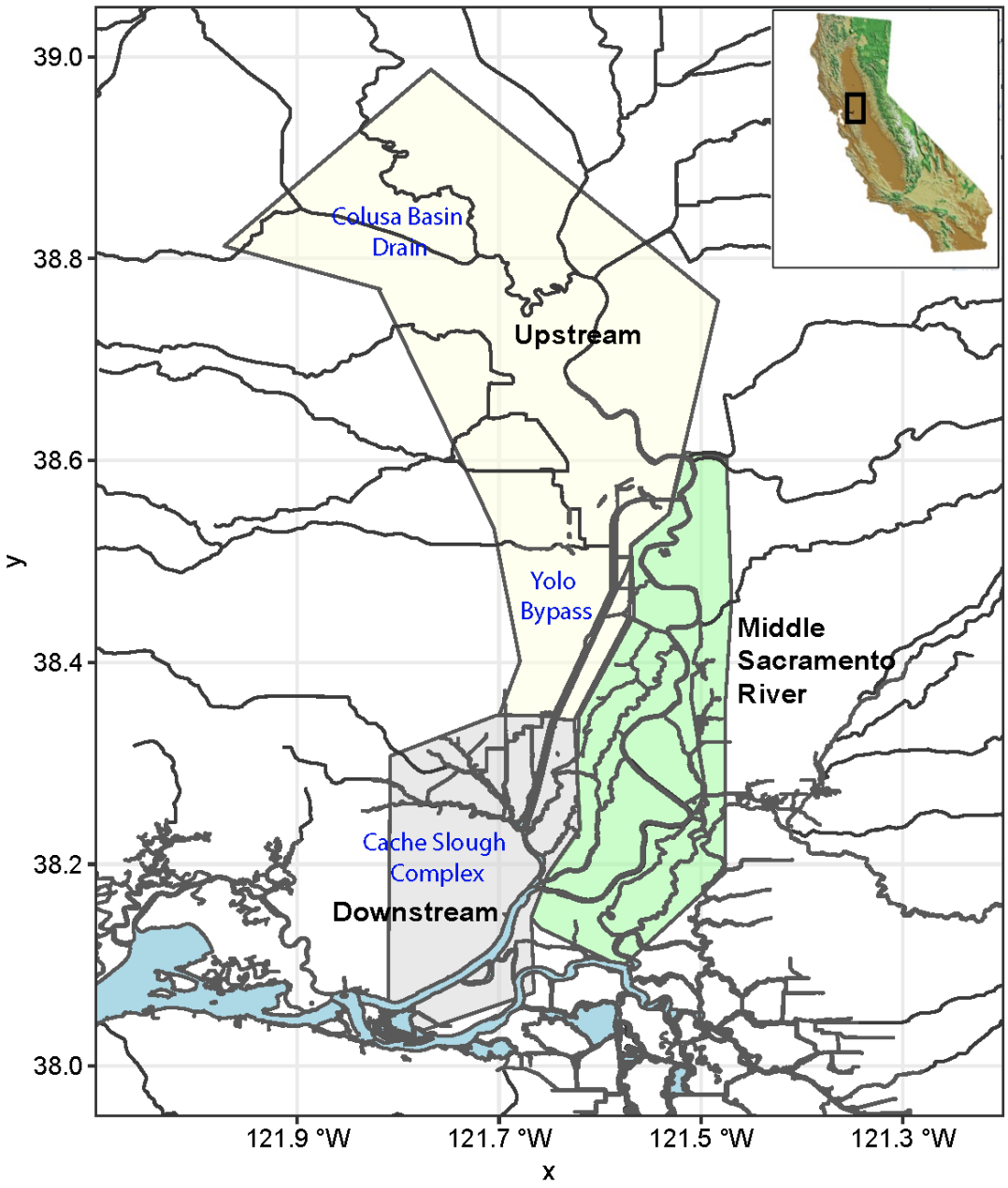

Figure 2. North Delta Food Subsidies project area.

2.0 Environmental Review

2.1 Summary of Previous FEIR Environmental Review

The effects on the environment of long-term operation of the SWP facilities in the Delta and issuance of an ITP to provide incidental take coverage for four CESA-listed fish species were addressed in the 2020 FEIR. The analyses presented in the FEIR concluded that the Proposed Project and the alternatives considered would have either no impact or a less-than-significant impact on the environment. DWR selected Refined Alternative 2b as the long-term operation of the SWP.

Further, DWR's environmentally preferred alternative, Refined Alternative 2b, proposed mitigation to meet the legal standard under CESA to minimize and fully mitigate the take of listed species consistent with DWR's application for an ITP. Refined Alternative 2b provides additional freshwater flows in the spring and summer, and physical barriers and other deterrents to keep fish away from the SWP pumps. Implementation of this alternative is expected to result in multiple environmental benefits that would contribute to the greater protection of special status aquatic species than historical operations.

Refined Alternative 2b was determined to have less than significant impacts on all environmental resources evaluated and includes mitigation that minimizes and fully mitigates impacts to CESA-listed fish species. Therefore, the long-term operation of the SWP and issuance of the ITP:

1. Will not degrade environmental quality, substantially reduce habitat, cause a wildlife population to drop below self-sustaining levels, reduce the number or restrict the range of special-status species, or eliminate important examples of California history or prehistory.
2. Does not have the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals.
3. Will not have impacts that are individually limited but cumulatively considerable.
4. Will not have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly.

The environmental analyses and findings presented in the FEIR reflect the independent judgment of DWR as the lead agency under CEQA.

2.2 Environmental Analysis

This section of the addendum analyzes the potential effects on the physical environment from the new NDFS information. This analysis has been prepared to determine whether any of the conditions in Section 15162 or 15163 of the State CEQA Guidelines (as described in Section 1.3) would occur as a result of the new NDFS study information.

2.2.1 Topics Considered in this Addendum

The new NDFS information shared in this addendum would not modify the long-term operations or substantively modify the actions evaluated in the FEIR. Therefore, the proposed change of new information would not result in new significant impacts or a substantial increase in the intensity or severity of environmental effects for any of the following topic areas:

- Agricultural Resources
- Air Quality
- Cultural Resources
- Environmental Justice
- Geology, Soils, and Mineral Resources
- Noise
- Recreation
- Transportation and Circulation
- Utilities and Service Systems
- Visual Resources

Additional analysis on biological resources, hazards and hazardous materials, water quality, and hydrology and hydraulics resources related to the new NDFS study information is provided in analysis below.

2.2.2 Analyses of New Information

The first evaluation of potential NDFS effects (e.g., potential benefits or unintended consequences) were described in Frantzich et al. (2019) that reported ecological responses during summer-fall across three years (one Sacramento River action [2016], one agricultural drainage action [2018], and one no-action year [2017]), resulting in high uncertainties. These initial analyses in combination with previous studies characterizing factors in the Yolo Bypass (Frantzich et al. 2018; Owens et al. 2019; Orlando et al. 2020) were the best available information for the current FEIR. Since the FEIR, one additional experimental agricultural drainage action was conducted in 2019. DWR has since conducted new analysis including; 1) a comprehensive study evaluating nine years of flow pulses in the Yolo Bypass, assessing high- and low-flow pulses (managed and non-managed) in effort to provide a more robust evaluation of action effects to inform future adaptive management of the action (Davis et al. 2022), and 2) a series of Delta Simulation Models (DSM2) to assess the effect of NDFS action scenarios on North Delta water quality, exports, and outflow (DWR 2022, Summer Fall Habitat Action Plan).

2.2.2.1 Hydrology and Hydraulics

Consistent with previous analysis (Frantzich et al. 2019), new hydrodynamic modeling showed the NDFS action affects local hydrology in the Yolo Bypass and may affect downstream Cache Slough Complex (Davis et al. 2022, Anchor QEA LLC 2020), but does not significantly affect long-term operations (see DWR 2022, Summer Fall Habitat Action Plan), or water quality among North Delta compliance stations (Appendix 2 in Twardochleb et al. 2021). For example, new analysis showed all flow pulses (managed NDFS actions and non-managed) in the Yolo Bypass from 2011-2019 resulted in a small to moderate period of positive net flow in the upstream region, and larger than normal (managed) flows created positive net flow downstream (Davis et al. 2022). These flow increases contrast with normal conditions during summer-fall, when net flows are negative (in the upstream direction) because of water diversions in the Cache Slough and Yolo Bypass regions. Hence, flow increases help generate more natural transport conditions. Moreover, years with experimental NDFS actions (2016, 2018, 2019) resulted in better flows (i.e., net positive flow downstream) than would otherwise have not been seasonally present. New modeling information of NDFS operation scenarios

showed water used in managed NDFS flow pulses is re-routed with minimal difference between the paths (down the Yolo Bypass Toe Drain or Sacramento River), therefore, the NDFS action is considered non-consumptive, water costs are inconsequential to long-term operations of the SWP and CVP, and electrical conductivity is not affected at key North Delta compliance stations.

Correlated with flow augmentation and restored net positive flow in the summer-fall time period, specific water quality factors and biological resources may be affected by NDFS actions, as indicated by new information on contaminants and dissolved oxygen (Davis et al. 2022); however, new analyses include moderate uncertainty, are relatively localized to upstream habitats where ESA-listed species presence is limited and does not imply a substantial increase in the intensity or severity of environmental effects as compared to non-managed high-flow years.

The new information from the NDFS analysis does not change or alter the hydrology in the Yolo Bypass beyond what the bypass can currently experience under existing conditions and what was described in the FEIR. Therefore, there would be no new or substantially more intense or severe significant environmental impacts to hydrology or hydraulics.

2.2.2.2 Hazards and Hazardous Materials

New information on contaminants has demonstrated that pesticide concentrations in water and zooplankton may increase during flow pulses due to increased net positive flow; however, results varied by year correlated with the type of flow pulse (e.g., seasonal non-managed pulses, Sacramento River action, or agriculture action) (see Figures 3 and 4; Davis et al. 2022, Herbold et al. 2018, Johnston et al. 2020, and Sommer et al. 2014). Pesticide increases in water and zooplankton were relatively localized with higher pesticides upstream in the Yolo Bypass compared to downstream, and concentrations returned to baseline levels or lower after the pulse. The study also found that some pesticides exceeding EPA benchmarks for toxicity to aquatic life were present in the North Delta, but presence varied across flow pulse periods (before, during, and after) and years, suggesting contaminants are likely ubiquitous in the project area regardless of the NDFS action. Since some NDFS actions have only been

implemented once or twice within with only a few years of monitoring, the study lacked statistical comparisons of pulse types. Further studies are needed to evaluate how pesticides may affect higher trophic levels through toxicity or indirect effects to fish through reductions in plankton abundance and nutrition.

Because pesticides exceeding EPA benchmarks for toxicity to aquatic life are present in the North Delta under existing conditions, the NDFS action would not create new or substantially more intense or severe significant environmental impacts to hazards and hazardous materials.

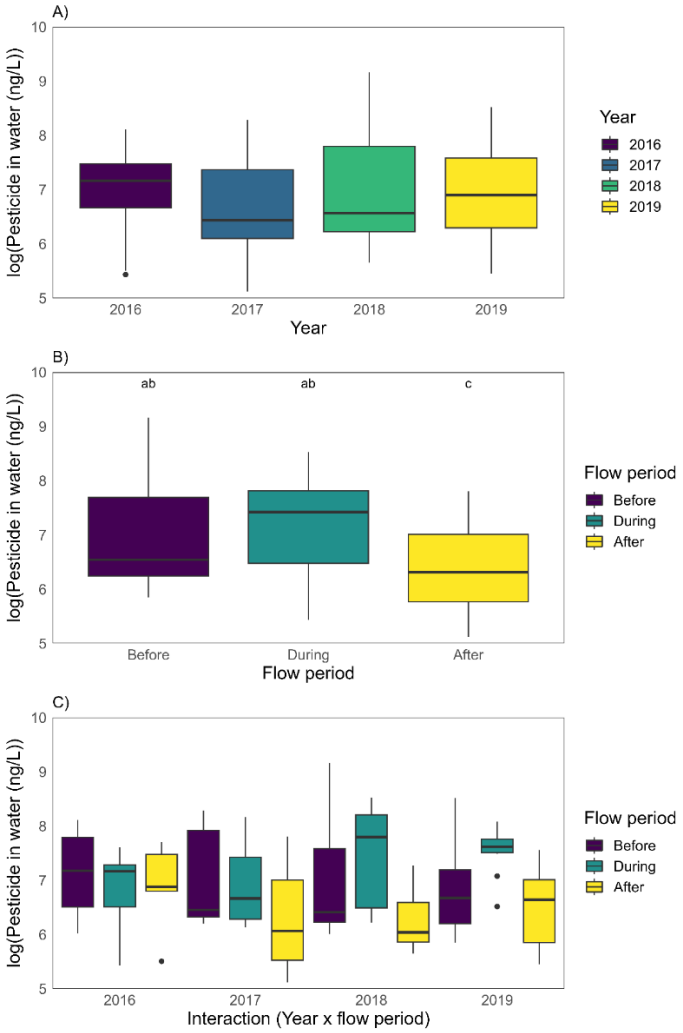

Figure 3. Boxplots of medians and quartiles of pesticide concentrations in water (ng/L) for 2016-2019 by A) year, B) flow period (before, during, and after the flow pulse), and C) the interaction between year and flow period for all study sites except the control site. Different

letters above boxes in B) indicate significant differences in contaminant concentrations among flow pulse periods according to post-hoc tests. 2016, 2018, and 2019 were years with managed flow actions. Figure from Davis et al. 2022.

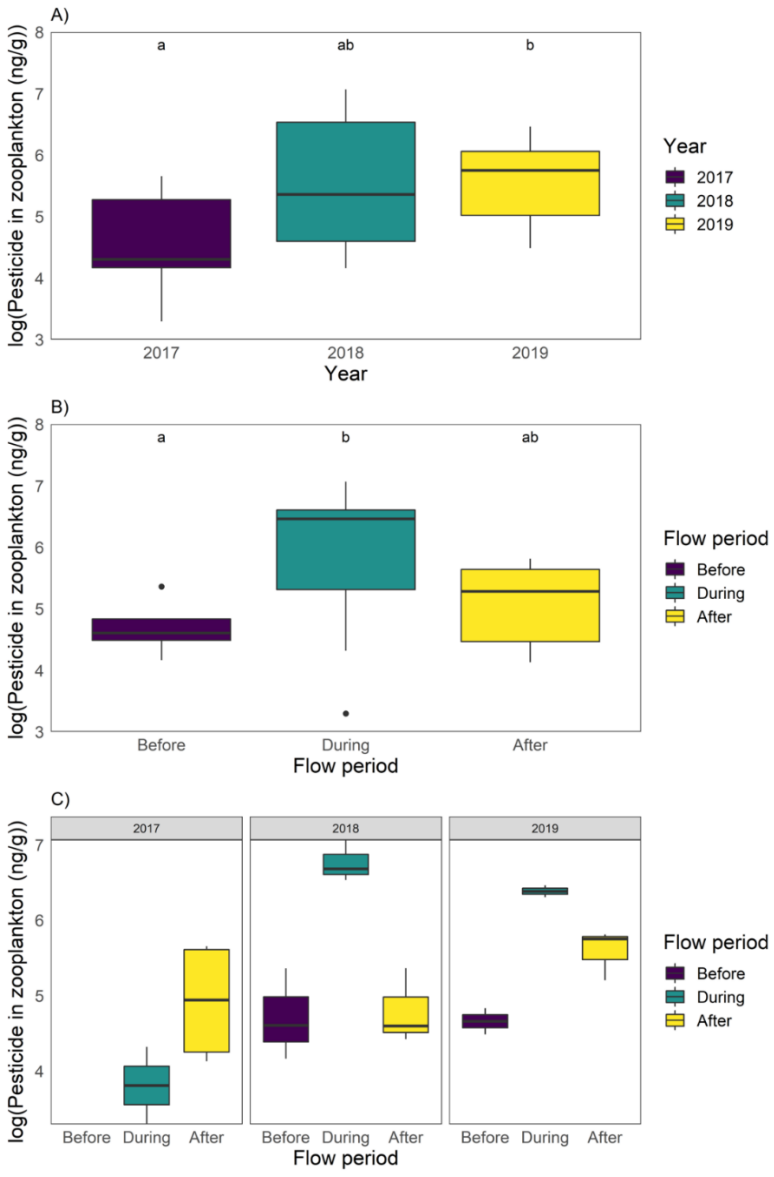

Figure 4. Boxplots of medians and quartiles for pesticide concentrations in zooplankton (ng/g) for 2017, 2018, and 2019 by A) year, B) flow period (before, during, and after flow pulse), and C) the interaction between year and flow period for a site in the lower Yolo Bypass (e.g., Screw Trap at Toe Drain). Note there was no data for 2017 in the "Before" period. Different letters above boxes in A) and B) indicate significant differences in contaminant concentrations among years and flow pulse periods, respectively, according to post-hoc tests.

2018 and 2019 were years with managed flow actions using agriculture drainage. Figure from Davis et al. 2022.

2.2.2.3 Water Quality

New analysis of dissolved oxygen (DO) across the North Delta project area from 2013 to 2019 demonstrated lower DO in the upper and lower bypass before and during flow pulses compared to after (Davis et al. 2022, see Figure 3C). For example, the mean daily average DO values in the bypass were 6.76, 5.40, and 6.93 mg/L for before, during, and after phases of seven years of flow pulses, respectively. Lower DO is likely a combination of seasonal trends of DO, correlated with higher water temperature, respiration, and bacterial decomposition, but also transport of lower DO water with increased net flow due to flow pulses. While monitoring data from all years showed evidence of low DO, years with high-flow summer-fall pulses with >300 cfs (2015, 2016, 2018 and 2019), showed decreasing trends in DO that were correlated with the start of flow pulses, some of which were managed experimental NDFS actions and some not (Figure 4).

Across the seven-year dataset, daily average DO values fell below the 6.0 mg/L adult salmonid benchmark in at least one day of each flow pulse phase, specifically 18% of days in the before phase, 67% during, and 16% in the after phase. Low DO may affect species if present in the upstream project area but presence of CESA-listed species is during summer-fall pulses is rare (as described below in Section 2.2.2.4). Therefore, the fluctuation of DO from the NDFS action would not create new or substantially more intense or severe significant environmental impacts to water quality.

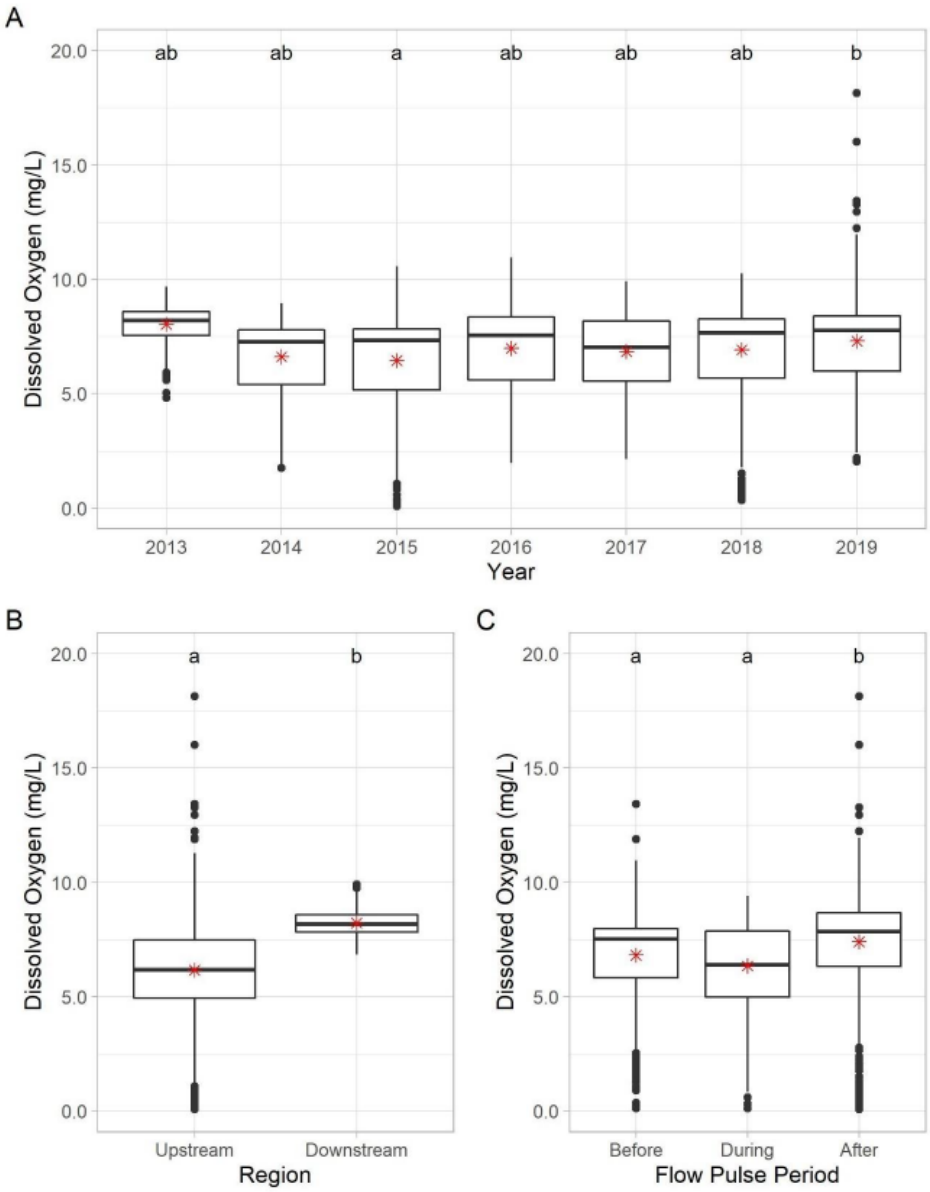

Figure 5. Daily average dissolved oxygen (DO in mg/L) across year (A), region (B), and flow pulse period (C). Boxplots of medians and quartiles are presented for model predictors, and the red asterisks represent the mean of each group. Different letters above boxes indicate significant differences in DO values among years, regions, and flow pulse periods, respectively, according to post-hoc tests. Figure from Davis et al. 2022.

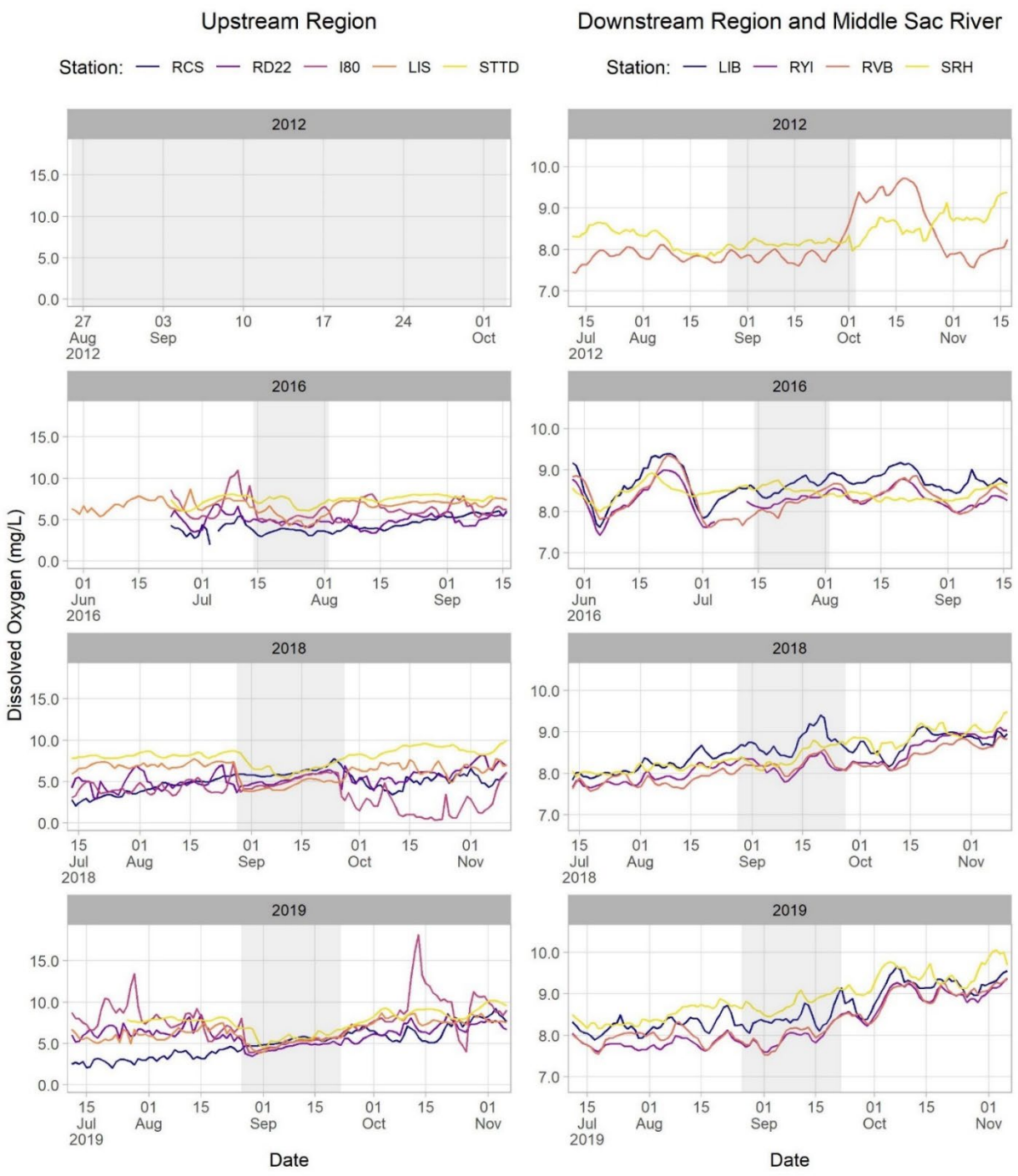

Figure 6. Daily average dissolved oxygen values in the upstream region (Yolo Bypass), downstream region (Cache Slough Complex and lower Sacramento River), and middle Sacramento River (SRH) in 2012, 2016, 2018, and 2019. The light grey shaded box represents the flow pulse period, and the plots for each region have different y-axis scales. 2016, 2018, and 2019 were years with managed flow actions. Figure from Davis et al. 2022.

2.2.2.4 Biological Resources

Analysis of new information suggest NDFS actions will not significantly affect biological resources. For example, the Davis et al. (2022) study found no evidence for changes to overall fish abundance through analysis of long-term fish catch surveys in NDFS project area. Additionally, Davis et al. (2022) found no evidence for increased straying of Fall-run Chinook salmonid from flow pulses (low-flow or high-flow), and instead described a number of factors that may influence salmonid straying external to NDFS actions. In general, the Yolo Bypass has high straying rates seasonally of adult salmon because strong tidal flows at the base of the system (+/- 80,000 cfs) aid in guiding fish into the Cache Slough Complex and the floodplain (Sommer et al. 2014; Johnston et al. 2020). Additionally, a study that tracked acoustically tagged Fall-run Chinook from 2012-2018, suggest that most (74%) straying fish are able to successfully exit the Yolo Bypass (Johnston et al. 2020). However, species and salmonids that are in the NDFS project area may be exposed to poor water quality including increased pesticides and decreased DO if they are present in the system during the pulse indicating there may be a less-than-significant effect to these species. Additionally, increased contaminants may negatively impact species diet through affects to the lower trophic food web. However, it should be noted that the pulse effects on water quality are relatively localized to upstream regions, and only if species were present in the upstream would they be likely to experience adverse effects. The goal of the NDFS action is to improve food in downstream habitat which did not show increased severity to water quality or biological resources or differ from previous analysis. The action is targeted to benefit Delta Smelt that are historically present only in the downstream region of the project area during summer-fall.

ESA and CESA-listed Sacramento River Winter Run Chinook Salmon and California Central Valley Spring Run Chinook Salmon (O*ncorhynchus tshawytscha*) are not anticipated in the NDFS project area during summer-fall and therefore are unlikely to be affected by short-term changes in water quality (e.g., low DO). The Yolo Bypass Fish Monitoring Program, through operation of their fyke trap in the Yolo Bypass Toe Drain, and DWR acoustic telemetry studies from 2015-2021 found no detections of Winter Run or Spring-Run Chinook Salmon with >80% genetic probability (Davis et al. 2022). However, there may be a slight potential for straying by individuals

into the study area during the fall period of NDFS pulses. If a rare occurrence of presence were to occur, migrating adult salmonids are not consuming prey during this period and therefore individuals would not be affected through potential bioaccumulation effects on the food web.

In contrast to Winter Run and Spring Run, Central Valley Fall-run Chinook Salmon and Central Valley Steelhead (O*ncorhynchus mykiss*) can become present toward the end of the action and may have acute exposure to poor water quality. Fish Passage in the North Delta is currently affected by water quality as stated on page 4-74 of the EIR. These conditions include low dissolved oxygen and high water temperatures in the summer. These conditions currently exist, therefore, the NDFS pulses will not significantly impact Central-Valley Fall-run Chinook Salmon and Central Valley Steelhead through short-term changes in water quality beyond normal conditions experienced in the project area.

ESA and CESA-listed Giant Garter Snake (GGS), that utilize both aquatic and upland habitat, are anticipated to be present in the NDFS project area during summer and fall; however, given GGS life history strategies, they are unlikely to be affected by short-term changes in water quality (e.g., low DO) described in the new analyses (Figure 3, 4; Davis et al. 2022).GGS can breathe air, so acute changes in water DO would be discounted as require oxygen from the air anyways. The analysis also demonstrated that NDFS actions may affect contaminants in food resources by increasing pesticide concentrations in zooplankton within the upstream region of the Yolo Bypass Toe Drain, during flow pulses when agriculture drainage water is used (Davis et al. 2022), that in turn, may bioaccumulate into prey fishes of GGS. However, similar to decreased DO, potential impacts of contaminants should be discounted due to the life-history strategies of the species. GGS are common in regions of rice agriculture and use the agricultural floodplain habitat and upland levee habitat. They forage on small fishes in the flooded rice fields exposing them to similar or even higher pesticide concentrations and bioaccumulation effects than the NDFS pulses. Because of the life history of GGS and the existing habitat and conditions in the NDFS area, there is no additional significant impacts to GGS from the NDFS.

With the addition of the new information from the NDFS action related to contaminants and water quality, there would be little effect on biological

resources (specifically the above ESA and CESA-listed species) due to the timing of the pulse flows and life history strategies of species. Therefore, the NDFS action would not create new or substantially more intense or severe significant environmental impacts to biological resources.

2.2.2.4 Analysis Conclusion

Since the study does not provide sufficient statistical information as to the effects of the NDFS action analyzed at the project level in the FEIR, the study would be included in the CEQA analysis for informational purposes only. The new data does not result in any new significant or potentially significant environmental effects, nor does it substantially increase the intensity or severity of previously identified significant effects. Further, the study implies there is no effect on mitigation measures of the NDFS action nor its alternatives.

2.2.3 Cumulative Impacts

There are no changes in cumulative impacts due to the NDFS action from those described in the FEIR.

2.3 Conclusions

As described in this Addendum, the new information shared regarding the NDFS study do not require revisions to the conclusions or findings presented in the 2020 FEIR because no new or substantially more intense or severe significant environmental impacts or potentially significant environmental impacts would occur.

Based on the discussion presented in Section 2.2, Environmental Analysis, the new NDFS study information shared would not result in any of the conditions described in Sections 15162 and 15163 of the State CEQA Guidelines that call for preparation of a subsequent EIR or supplemental EIR.

In summary, the new supplemental NDFS study information would not result in any of the following:

- new significant or potentially significant environmental effects,
- substantially increase the intensity or severity of previously identified

significant effects,

- mitigation measures or alternatives previously found to be infeasible becoming feasible, or
- the availability/implementation of mitigation measures or alternatives that are considerably different from those analyzed in the 2020 FEIR that would substantially reduce one or more significant or potentially significant effects on the physical environment.

These conclusions confirm that a subsequent or supplemental EIR is not warranted, and this Addendum to the 2020 FEIR is the appropriate CEQA document pursuant to State CEQA Guidelines Section 15164 to evaluate and document the changes and additions to the long-term operation of the SWP facilities in the Delta. No changes are needed to the certified 2020 FEIR for the Long-Term Operations of the SWP.

3.0 References

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