

STATE OF CALIFORNIA
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
STATE WATER RESOURCES CONTROL BOARD

ORDER WR 2022-0095

In the Matter of Petitions for Reconsideration of

the Executive Director's June 1, 2021 Order Conditionally Approving 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; and the Executive Director's June 10, 2021 Sacramento River Temperature Management Plan Approval Pursuant to Order 90-5

ORDER DENYING IN PART AND GRANTING IN PART PETITIONS FOR RECONSIDERATION AND ADDRESSING OBJECTIONS

BY THE BOARD:

1.0 INTRODUCTION

By this Order, the State Water Resources Control Board (State Water Board or Board) denies in part and grants in part petitions for reconsideration of two decisions of the Executive Director: (1) a June 1, 2021, Order Approving a Temporary Urgency Change Petition (TUCP Order) that modified conditions of the Department of Water Resources' (DWR) and U.S. Bureau of Reclamation's (Reclamation) water rights¹ imposed pursuant to State Water Board Revised Decision 1641 (D-1641); and (2) a June 10, 2021 Sacramento River Temperature Management Plan (TMP) approval pursuant to State Water Board Order 90-5. Although this Order denies in part the petitions for reconsideration, this Order imposes additional conditions on DWR and Reclamation's water rights in response to substantial issues raised in the petitions to the extent that the petitions seek to improve future planning for dry conditions. In doing so, this Order considers the set of interim measures proposed for DWR's State Water Project (SWP) and Reclamation's Central Valley Project (CVP) (collectively Projects) joint operations (hereafter Interim Operations Plan or IOP) that is pending in federal district court. State

¹ The petition was filed for Permits 16478, 16479, 16481, 16482 and 16483 (Applications 5630, 14443, 14445A, 17512 and 17514A, respectively) of the Department of Water Resources for the State Water Project and License 1986 and Permits 11315, 11316, 11885, 11886v, 11887, 11967, 11968, 11969, 11970, 11971, 11972, 11973, 12364, 12721, 12722, 12723, 12725, 12726, 12727, 12860, 15735, 16597, 20245, and 16600 (Applications 23, 234, 1465, 5638, 13370, 13371, 5628, 15374, 15375, 15376, 16767, 16768, 17374, 17376, 5626, 9363, 9364, 9366, 9367, 9368,e 15764, 22316, 14858A, 14858B, and 19304, respectively) of the United States Bureau of Reclamation for the Central Valley Project.

plaintiffs and federal defendants propose to stay litigation challenging the sufficiency of the 2019 biological opinions (BiOps) issued pursuant to the federal Endangered Species Act (ESA) for the Projects' coordinated operations and, pending reconsultation on those BiOps, to jointly operate in accordance with the IOP to protect listed species in the event water year 2022 is below normal, dry, or critically dry.²

This Order also addresses some of the major objections to the TUCP Order and Sacramento River TMP. Although a formal response to petitions and objections to the TUCP Order and Sacramento River TMP has not been provided until now, the Executive Director reviewed and considered all of the incoming petitions and objections on a continual basis. This Order also requires additional temperature management planning and related measures to respond to the issues raised in the petitions for reconsideration of the Sacramento River TMP approval. Finally, this Order acknowledges that on December 1, 2021, DWR and Reclamation submitted a TUCP to the State Water Board requesting to modify certain terms of the Projects' water rights permits and licenses from what is currently required by D-1641 from February 1 through April 30, 2022.³ The Executive Director may take action on that request in late January or early February.

The TUCP Order approved, subject to conditions, temporary modifications to the conditions of the water right permits for DWR's SWP and the water right license and permits for Reclamation's CVP. To address critically dry conditions associated with California's drought, the Executive Director approved temporary modifications to water right requirements imposed pursuant to [D-1641](#)⁴ to implement water quality objectives included in the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan) that were designed to protect fish and wildlife and agricultural beneficial uses.

The following parties filed petitions for reconsideration of the TUCP Order: (1) California Sportfishing Protection Alliance (CSPA), AquAlliance, and California Water Impact Network (CWIN) (CSPA et al. 1); (2) Natural Resources Defense Council (NRDC), the Bay Institute (TBI), Defenders of Wildlife, San Francisco Baykeeper, Sierra Club California, Restore the Delta (RTD), Golden State Salmon Association, CSPA, and Pacific Coast Federation of Fishermen's Associations, Institute for Fisheries Research (NRDC et al. 1); (3) RTD, Little Manila Rising, and Save California Salmon (RTD et al.);

² *California Natural Resources Agency, et al. v. Raimondo* (E.D.Cal. Case No. 1:20-cv-00426-DAD-EPG) (hereafter *CNRA v. Raimondo*), [Proposed] Order Granting Plaintiffs' Motion for Interim Injunctive Relief and Temporary Stay of Litigation (filed November 23, 2021) and [Proposed] Order Granting Federal Defendant's Motion for Voluntary Remand Without Vacatur (filed November 23, 2021) (collectively "Proposed Orders.").

³ A copy of DWR and Reclamation's December 1, 2021, TUCP can be accessed at: https://www.waterboards.ca.gov/drought/tucp/docs/2022/2021.12_2022_TUCP.pdf.

⁴ https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/decisions/d1600_d1649/wrd1641_1999dec29.pdf.

and (4) South Delta Water Agency (SDWA), Central Delta Water Agency, and Rudi M. Mussi Investment LP (SDWA et al.).

Reclamation's Sacramento River TMP identified meeting an average daily temperature of 55 degrees Fahrenheit (F) on the Sacramento River at the Highway 44 bridge. Reclamation identified the alternative temperature compliance point in consideration of low inflow and storage conditions. The compliance location is approximately 5 river miles downstream of Keswick Dam and 55 river miles upstream of Red Bluff Diversion Dam (RBDD), the compliance point required in Order 90-5. The Executive Director's approval of the Sacramento River TMP acknowledged the extreme dry conditions and associated limitations in supplies for various purposes, including temperature management. The approval included several conditions including a requirement for Reclamation to take all actions within its control to achieve a Shasta Reservoir end-of-September (EOS) storage volume of 1,250,000 acre-feet and a requirement for Reclamation to take all actions within its reasonable control to improve temperature conditions and ensure that TDM levels are minimized to the maximum extent feasible.

The following parties filed petitions for reconsideration of the TMP approval:

(5) NRDC, Defenders of Wildlife, RTD, Sierra Club California, Save California Salmon, CSPA, San Francisco Baykeeper, TBI, and Pacific Coast Federation of Fishermen's Associations, Institute for Fisheries Research (NRDC et al. 2); and (6) CSPA, CWIN, Save California Salmon, and AquAlliance (CSPA et al. 2).

2.0 FACTUAL AND LEGAL BACKGROUND

2.1 State Water Board Revised Decision 1641

In D-1641, the State Water Board amended the Projects' water right license and permits to require meeting specified water quality objectives set forth in the Bay-Delta Plan. The flow and water quality requirements established in D-1641 are summarized in the tables and figures contained in [Attachment 1](#) to this Order: Table 1 (Water Quality Objectives for Municipal and Industrial Beneficial Uses), Table 2 (Water Quality Objectives for Agricultural Beneficial Uses), and Table 3 (Water Quality Objectives for Fish and Wildlife Beneficial Uses). Included in Attachment 1 are the footnotes to Table 3 and Figure 1 (Sacramento Valley Water Year Hydrologic Classification), Figure 2 (San Joaquin Valley Water Year Hydrologic Classification), Figure 3 (Formulas for Net Delta outflow Index and Percent Inflow Diverted), and Table 4 (Chippis Island and Port Chicago Maximum Daily Average Electrical Conductivity).

2.2 Drought Conditions

2.2.1 Hydrology

California and the Central Valley have experienced extremely dry conditions for two consecutive years from 2020 to 2021. Precipitation conditions in the Sacramento Valley are an indicator of water supply for the Projects because most of the Project reservoirs that capture northern California water supply are in the Sacramento Valley, including Shasta, Oroville, and Folsom Reservoirs. Two major reservoirs, New Melones and

Millerton, are in the San Joaquin Valley. At the end of Water Year 2021, the Northern Sierra 8-Station Precipitation Index was at 24 inches, 45 percent of average and the third lowest on record since water year 1921, the first year of precipitation records available on the California Data Exchange Center (CDEC).⁵ Water years 2020 and 2021 are the second driest two-year period on record behind 1976 and 1977 in the Sacramento Valley. Precipitation and runoff conditions degraded in 2021 after poor conditions in 2020. Figure 1 shows the level of precipitation for the Northern Sierra as of October 22, 2021.

⁵ California Data Exchange Center (CDEC) precipitation records.
<https://cdec.water.ca.gov/reportapp/javareports?name=8STATIONHIST>;
<https://cdec.water.ca.gov/precipapp/get8SIPrecipIndex.action>.

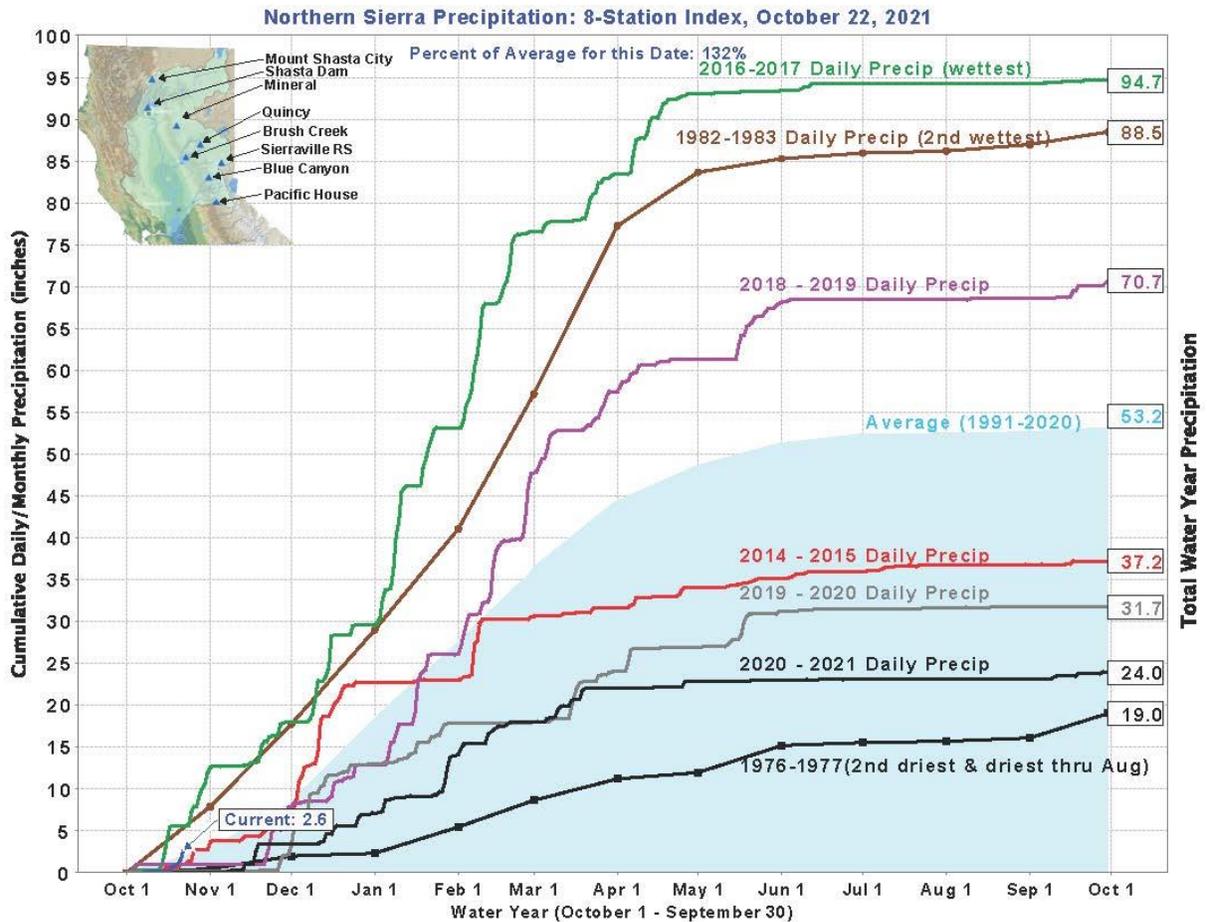


Figure 1. Northern Sierra Precipitation: 8-Station Index as of October 22, 2021. Source: https://cdec.water.ca.gov/reportapp/javareports?name=PLOT_ESI.pdf, accessed October 22, 2021, showing the 2020-2021 precipitation record ended at 24 inches.

Precipitation conditions were also extremely low in the San Joaquin Valley. As of September 30, 2021, the San Joaquin 5-Station Precipitation Index was at 18.8 inches, 47 percent of average for that time of year. Water year 2021 in the San Joaquin Valley was the third driest on record. Water years 1924 and 1977 were the driest and second driest at just below and just above 15 inches of precipitation, respectively.

Of greater concern when the TUCP was approved was the lack of snowmelt runoff in the watersheds feeding into the major Sacramento Valley reservoirs in water year 2021. The amount of Northern Sierra snowpack in late March peaked at 70 percent of historic average. However, expected water supply conditions significantly changed during the month of April 2021 when very little precipitation occurred, and the snowpack did not produce the expected runoff. A conservative forecast of expected Sacramento River inflow to reservoirs (90 percent exceedance) was 685,000 acre-feet higher in April than

May.⁶ Low runoff efficiency may have been due to depletions such as snowmelt directly absorbing into soils with dry antecedent conditions from water year 2020, or because of sublimation directly into the dry atmosphere. As of May 19, 2021, snowpack in the Northern Sierra region was five percent of the historic average, while the Central Sierra and Southern Sierra regions were two percent of average. Figure 2 shows California Snow Water Content as of May 19, 2021.

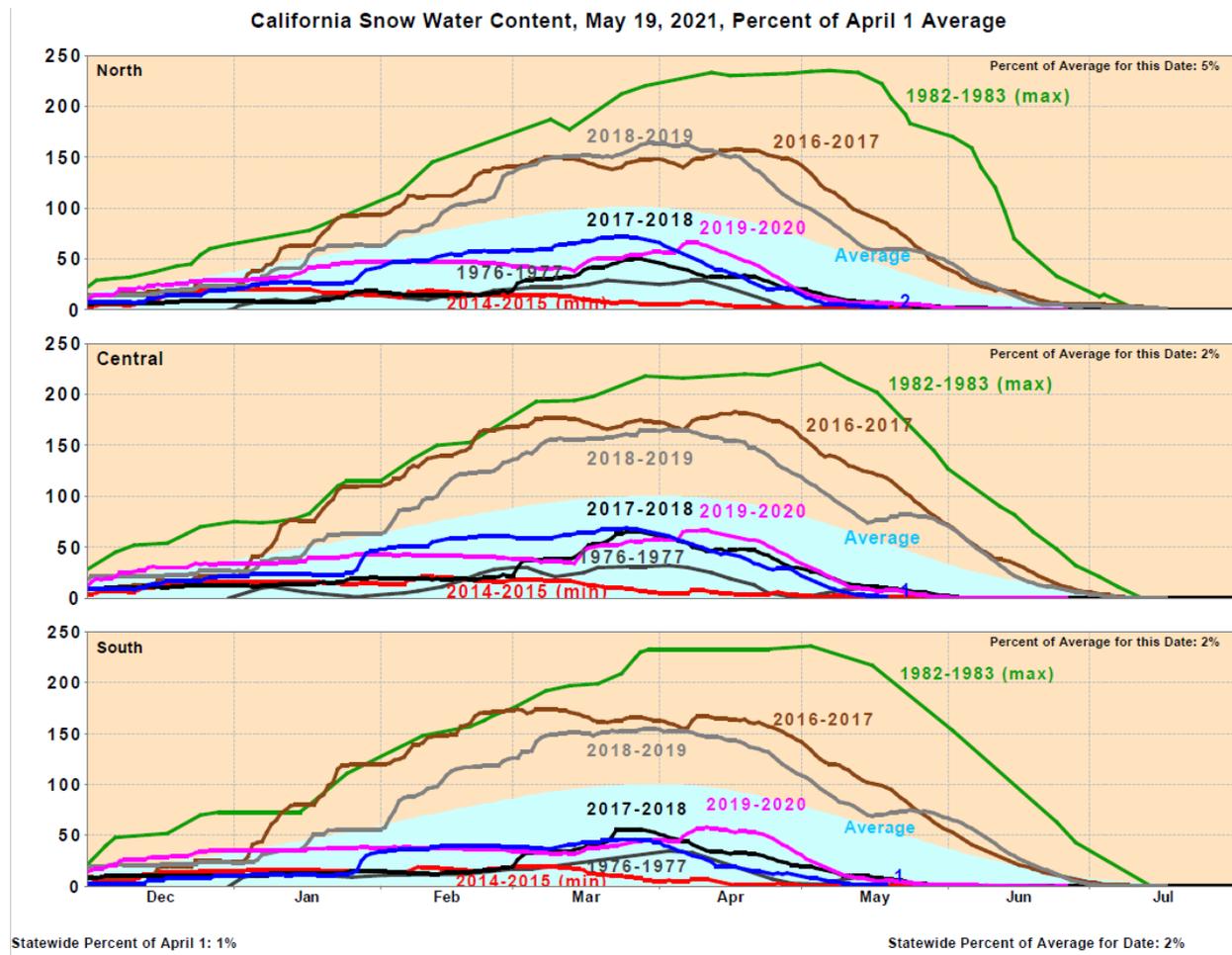


Figure 2. Daily Regional Snowpack Plots from Snow Sensors in California
 Source: https://cdec.water.ca.gov/reportapp/javareports?name=PLOT_SWC.pdf, accessed May 19, 2021.

2.2.2 Reservoir Storage Levels

Water storage levels in many Project reservoirs were significantly lower than historic average conditions when the TUCP was submitted. Typically, snowmelt throughout the

⁶ California Data Exchange Center (CDEC) forecast records.
<https://cdec.water.ca.gov/cgi-progs/products/210401SRWSI.pdf>;
<https://cdec.water.ca.gov/cgi-progs/products/SRWSI.pdf>.

spring and summer provides inflows to streams and reservoirs for use during the dry summer and fall months. As discussed above, extremely low precipitation, lower than average snowpack volume, and lack of snowmelt runoff in the Northern Sierra resulted in very low inflows to the reservoirs with a significant reduction in expected runoff of 685,000 acre-feet that occurred from April to May. Figure 3 shows the storage levels of major reservoirs in California as of May 16, 2021, the day before the TUCP was submitted to the Board. The storage levels of most reservoirs in the Central Valley were significantly below historical average. Folsom Reservoir, which provides municipal water supply for cities in the Sacramento area, was particularly low at approximately 370,000 acre-feet, 48 percent of historical average, and 38 percent of total capacity. Low storage conditions combined with low precipitation and runoff resulted in the need to rapidly reevaluate and modify Project allocations for different purposes, including water deliveries and water supplies to meet water quality and flow objectives.

CURRENT CONDITIONS FOR MAJOR RESERVOIRS: 16-MAY-2021

Data as of Midnight: 16-May-2021

Change Date: 16-May-2021

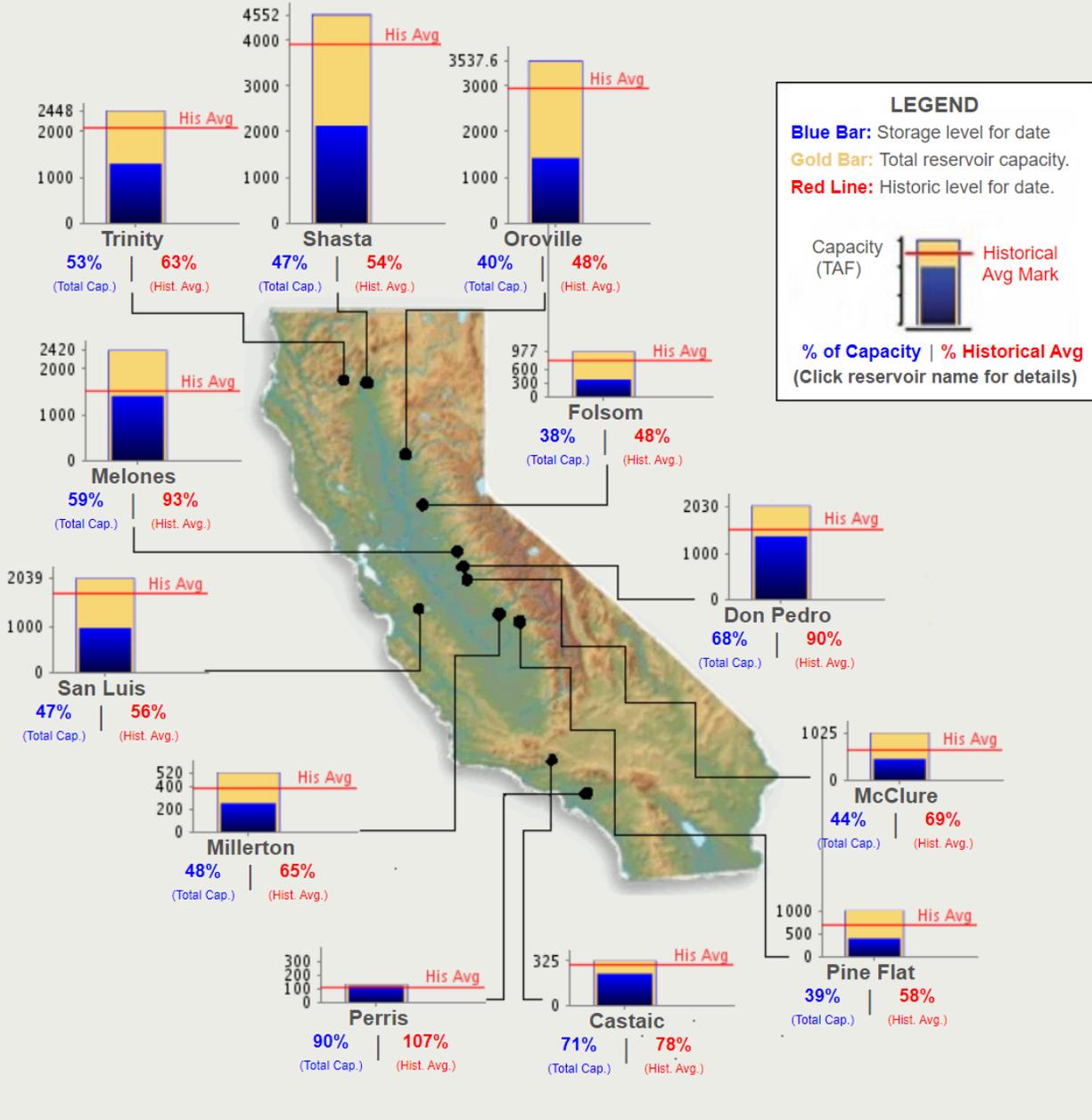


Figure 3. Major Reservoir Conditions in California as of May 16, 2021

Source: <https://cdec.water.ca.gov/reportapp/javareports?name=rescond.pdf>, accessed May 16, 2021.

Reservoir storage in Shasta, Oroville, and Folsom Reservoirs is also particularly important for providing cold water to protect fish habitat for threatened and endangered and commercially, recreationally, and culturally important salmon runs. Storage levels in Shasta Reservoir affect Reclamation’s ability to control temperatures in the Sacramento

River. Pursuant to State Water Board Order 90-5, Reclamation is required to provide for temperature management on the Sacramento River for the protection of fish species, including endangered winter-run Chinook salmon. Order 90-5 requires Reclamation to submit a plan for maintaining temperatures on the Sacramento River if factors outside Reclamation's reasonable control preclude Reclamation from maintaining 56 degrees at Red Bluff Diversion Dam (RBDD), approximately 55 miles downstream of Keswick Dam, during periods when higher temperatures at RBDD would be detrimental to the fishery.

Reclamation submitted a Draft Sacramento River TMP⁷ on May 5, 2021, reflecting the April hydrologic conditions. Even under those conditions, reservoir storage conditions in Shasta Reservoir were projected to be very low, presenting significant concerns for temperature management and survival of winter-run Chinook salmon and other salmon runs. With the significant reductions in inflows identified later in May, these concerns intensified for Shasta Reservoir, as well as Folsom and Oroville. Consequently, DWR and Reclamation worked to identify actions to address the shortages in expected reservoir inflow. Among the actions that DWR and Reclamation identified to address the shortfall were the changes in required outflows and salinity levels that were approved in the June 1, 2021 TUCP Order. The final Sacramento River TMP submitted by Reclamation on May 27, 2021, reflected the actions proposed to be taken to address the shortfalls in supplies and make modest improvements to storage conditions, including projected savings from the TUCP Order assuming accretion and depletion estimates at the time. DWR and Reclamation have identified that the changes from the TUCP Order conserved 289,000 acre-feet of water in Shasta Reservoir.⁸

2.3 Governor's Drought Proclamations

On April 21, 2021, Governor Newsom proclaimed a [State of Emergency](#) to exist in Mendocino and Sonoma counties due to drought conditions in the Russian River Watershed.⁹ On May 10, 2021, Governor Newsom extended the [State of Emergency](#) to 39 additional counties in the Klamath River, Sacramento-San Joaquin Delta, and Tulare Lake Watershed Counties due to drought conditions.¹⁰ Among other things, the proclamation called for: voluntary approaches to move water, consideration of request

⁷ State Water Board, Sacramento River Temperature and Order 90-5 Compliance. https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/sacramento_river/docs/2021/20210504_Letter_to_SWRCB_from_White,_Kristin_RE_DRAFT_Sacramento_River_Temperature_Management_PlanSigned.pdf.

⁸ See DWR emails submitted on July 29, August 27, and September 24, available at https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/tucp/.

⁹ Governor Newsom April 21, 2021, Proclamation of a State of Emergency, available at: <https://www.gov.ca.gov/wp-content/uploads/2021/04/4.21.21-Emergency-Proclamation-1.pdf>

¹⁰ Governor Newsom May 10, 2021, Proclamation of a State of Emergency, available at: <https://www.gov.ca.gov/wp-content/uploads/2021/05/5.10.2021-Drought-Proclamation.pdf>.

to modify requirements for reservoir releases or diversion limitations, and actions to ensure critical instream flows for salmon, steelhead, and other native fish species.

Ordinarily, the State Water Board must comply with any applicable requirements of the California Environmental Quality Act (CEQA) (Pub. Resources Code, Division 13, § 21000 et seq.) prior to issuance of a temporary urgency change order pursuant to Water Code section 1435. (See Cal. Code Regs., tit. 23, § 805.) Directive 11 of the Governor's May 10, 2021, Drought Proclamation and Executive Order waived CEQA and the regulations adopted to implement CEQA for the purposes of carrying out Directives 3, 4, 5, 6, 8, and 9 to the extent that CEQA otherwise would have applied to specified actions necessary to mitigate the effects of the drought, including the State Water Board's action on the TUCP.

The Governor's Proclamation also suspended Water Code section 13247 as applied to actions taken pursuant to Directive 4. Section 13247 requires state agencies, including the State Water Board, to comply with water quality control plans unless otherwise directed or authorized by statute. Absent suspension of section 13247, the State Water Board could not approve a petition to modify water right permits and licenses in a way that does not provide for full attainment of the water quality objectives as specified in the Bay-Delta Plan, even during a drought emergency.

On July 8, 2021, due to worsening drought conditions and the increased risk of the drought continuing into 2022, Governor Newsom extended the [State of Emergency](#) to the nine additional counties of Inyo, Marin, Mono, Monterey, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, and Santa Cruz, such that the drought State of Emergency was in effect in 50 counties.¹¹ On that same day, Governor Newsom issued [Executive Order N-10-21](#), calling on Californians to voluntarily reduce water use by 15 percent to preserve the State's surface and groundwater supplies and better prepare for the potential for continued dry conditions.¹² On October 19, 2021, due to continued drought conditions and the hottest meteorological summer on record, Governor Newsom extended the [State of Emergency](#) to include all remaining counties in California.¹³

2.4 State Water Board Actions to Address Water Unavailability

In response to the extreme dry conditions, the State Water Board took actions to protect senior water right holders and prevent unauthorized diversion of previously stored water, including Project reservoir storage supplies needed to meet minimum health and

¹¹ Governor Newsom July 8, 2021, Proclamation of State of Emergency, available at: <https://www.gov.ca.gov/wp-content/uploads/2021/07/7.8.21-Drought-SOE-Proc.pdf>.

¹² Governor Newsom July 8, 2021, Executive Order N-10-21, available at: <https://www.gov.ca.gov/wp-content/uploads/2021/07/7.8.21-Conservation-EO-N-10-21.pdf>.

¹³ Governor Newsom October 19, 2021, Proclamation of a State of Emergency, available at: <https://www.gov.ca.gov/wp-content/uploads/2021/10/10.19.21-Drought-SOE-1.pdf>.

safety water supply needs, salinity control in the Delta, and minimal environmental needs for temperature control and minimal flows in the Bay-Delta watershed. In late winter of 2021, the State Water Board sent letters to all water right holders advising them to prepare for water supply shortages and expedited efforts to develop a method to assess water unavailability in the Delta watershed. The State Water Board released a draft methodology in May of 2021 for public comment that was finalized in June of 2021. Based on the methodology, in June of 2021 notices of water unavailability were issued to all post-1914 appropriative water rights holders and a warning was issued to senior water rights claimants that water was likely to be unavailable for many of those users.

The May 10 drought proclamation also directed the State Water Board to consider emergency regulations to issue formal curtailments of water diversions when water is not available at water right holders' priority of right or to protect previously stored releases of water. The State Water Board released a draft emergency regulation and notices of water unavailability to senior claimants in July of 2021. On August 3, 2021, the Board adopted an emergency curtailment regulation. On August 19, 2021, the Office of Administrative Law approved the regulation, which became effective upon filing with the Secretary of State on the same day. Curtailment orders were then issued on August 20, 2021.

Unless repealed or renewed, the emergency regulation will remain in effect until August 19, 2022, and future curtailment orders issued pursuant to the regulation are likely to assist in drought response actions and overall management in water year 2022.

2.5 SWP and CVP Water Supplies

Water supplies from the SWP and CVP are provided under different types of contracts, including: service contract supplies to SWP and CVP contractors north and south of the Delta that do not have their own underlying rights; settlement and other contractor supplies to users within the Delta watershed (Sacramento River, Feather River, Stanislaus River, and North Delta) who divert water under their own rights and claims and also divert previously stored Project water when those rights are not adequate (settlement/supplemental supply contractors); and settlement and exchange contractors who receive replacement and supplemental supplies from the CVP exported from the Delta in exchange for diversions by those users under their own rights and claims from the upper San Joaquin River. Table 1 describes the SWP and CVP allocations in 2021. The allocations to settlement/supplemental supply contractors include both diversions under these contractors' underlying water rights and claims and their SWP and CVP supplemental supplies. It is not clear at this time what portion of the water used by the settlement/supplemental supply contractors in 2021 occurred under SWP and CVP water rights. Further, actual delivery amounts are not yet available and may differ from allocations.

Table 1: SWP and CVP 2021 Water Allocations¹⁴

Project	Contractor Type/Source	Maximum Contract Amount or Historical Use (acre-feet)	2021 Allocation as percent of maximum contract or historical use	2021 ¹⁵ Allocation (acre-feet)
SWP	Table A/Feather River and Delta	4,172,786	5%	208,639
SWP*	Feather River Agencies /Feather River	955,000	55%	585,745
SWP Total				794,384
CVP	M & I/Sacramento and American River and Delta (Sac-Delta)	544,695	25%	136,174
CVP	Agricultural/Sac-Delta	2,416,550	0%	0
CVP	Wildlife Refuges/Sac-Delta	422,251	75%	316,688
CVP*	Sacramento River Settlement/Sacramento River	2,115,620	75%	1,586,715
CVP	Exchange/Sac-Delta	875,623	75%	656,717
CVP	East Side Contractors (Central San Joaquin Water Conservation District and Stockton East Water District)/Stanislaus River	155,000	100%	155,000
CVP*	Oakdale and South San Joaquin Irrigation Districts/Stanislaus River	600,000	100%	600,000
CVP	Friant – Class 1/San Joaquin River	800,000	20%	160,000

¹⁴ Table does not include North Delta Water Agency which has an agreement with DWR that includes provisions for meeting water quality levels.

¹⁵ SWP Allocations - https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Management/SWP-Water-Contractors/Files/NTC_21-06_032321.pdf; CVP Allocations - <https://www.usbr.gov/mp/cvp-water/docs/cvp-allocation.pdf>; CVP allocation update <https://www.usbr.gov/newsroom/#/news-release/3843>.

CVP	Friant – Class 2/San Joaquin River	1,401,475	0%	0
CVP	Friant - Buchanan + Hidden/San Joaquin River	48,000	100%	48,000
CVP Total				3,822,703
CVP	Adjusted Settlement with 10% voluntary reduction	2,115,620	65%	1,375,153
CVP Adjusted Total				3,611,141
Total				4,617,087
Adjusted Total				4,405,525

*Includes both underlying water right and claim amounts and supplemental CVP and SWP supplies.

Table 2 describes end of April and EOS storage for major CVP and SWP reservoirs in 2021. End of April storage was known at the time of the TUCP Order and Sacramento River TMP approval, but EOS storage was not. Water year 2022 started with a combined EOS storage volume of 3,982,640 acre-feet. Large October storms provided some improvements in storage conditions by adding approximately 200,000 acre-feet of storage in Shasta, Oroville, and Folsom reservoirs, representing approximately 2 percent of the storage capacity of the three reservoirs. However, the improvements are far from addressing the reservoir deficits from the last two years. Further, National Oceanic Atmospheric Administration’s (NOAA) 2021 3-month winter outlook¹⁶ is predicting warmer and drier than normal conditions for most of California, suggesting low storage conditions at the start of water year 2022 will continue to present water management challenges.

¹⁶ “U.S. Winter Outlook: Drier, warmer South, wetter North with return of La Niña Drought likely to persist across the West, improve in the Northwest,” <https://www.noaa.gov/news-release/us-winter-outlook-drier-warmer-south-wetter-north-with-return-of-la-nina>; US Seasonal Drought Outlook https://www.cpc.ncep.noaa.gov/products/expert_assessment/sdo_summary.php.

Table 2: End of April and September Water Supply Conditions in SWP and CVP Major Storage Reservoirs in Water Year 2021.

Reservoir	Water Project	Reservoir Capacity acre-feet	2021 Storage Volume ¹⁷				
			April acre-feet	TUCP Storage Savings acre-feet	September acre-feet	April to September change (acre-feet)	End of September % capacity
Trinity	CVP	2,447,650	1,306,061		710,444	-595,617	29%
Shasta	CVP	4,552,000	2,288,150	289,000	1,074,380	-1,213,770	24%
Oroville	SWP	3,537,577	1,486,386		787,578	-698,808	22%
Folsom	CVP	977,000	359,049		226,541	-132,508	23%
New Melones	CVP	2,400,000	1,461,454		842,513	-618,941	35%
San Luis	SWP/CVP	2,041,000	1,025,593		251,184	-774,409	12%
TOTALS		15,955,227	7,926,693		3,892,640	-4,034,053	24%

2.6 Status of Fish Species

2.6.1 Delta Smelt

Delta smelt are listed as threatened under both the ESA and the California Endangered Species Act (CESA). Relative abundance has been persistently low since prior to the last drought, and the population is at high risk of extinction. Delta smelt have a strong positive relationship with a specific location in the low salinity zone (LSZ), referred to as X2, where the average daily salinity at the bottom of the water column measures 2 practical salinity units (psu). By local convention, X2 is described in terms of distance in kilometers from the Golden Gate bridge to the 2 psu isohaline. Ecologically, X2 serves as an indicator of habitat suitability for many San Francisco Estuary organisms and is associated with variance in abundance of diverse components of the ecosystem.¹⁸ The LSZ expands and moves downstream when river flows into the estuary are high. Similarly, it contracts and moves upstream when river flows are low. At all times of year, the location of X2 influences both the area and quality of habitat available for Delta smelt to successfully complete their life cycle. In general, Delta smelt habitat quality and surface area are greater when X2 is located in Suisun Bay. Both habitat quality and quantity diminish the more frequently and the further the LSZ moves upstream, toward the confluence of the Sacramento and San Joaquin rivers,¹⁹ thus further constraining

¹⁷ https://cdec.water.ca.gov/reservoir_map.html, last accessed October 20, 2021.

¹⁸ Jassby, A. D., W. J. Kimmerer, S. G. Monismith, C. Armor, J. E. Cloern, T. M. Powell, J. R. Schubel, and T. J. Vendlinski. 1995. Isohaline position as a habitat indicator for estuarine populations. *Ecological Applications* 5:272–289.

¹⁹ Feyrer, F, M. L. Nobriga, and T. R. Sommer. 2007. Multi-decadal trends for three declining fish species: habitat patterns and mechanisms in the San Francisco Estuary, California, USA. *Canadian Journal of Fisheries and Aquatic Sciences* 64:723–734.

the habitat for juvenile Delta smelt closer to the upstream spawning areas in the lower Sacramento River, San Joaquin River, and the Cache Slough Complex/Sacramento Deep Water Ship Channel (SDWSC). The TUCP was expected to shift X2 upstream by up to an additional 2 km further than would have occurred without a change in Delta outflow in June and July.

Delta smelt distributions are correlated with water temperatures in addition to the LSZ. Delta smelt are sensitive to temperatures approaching 77 degrees F and above.²⁰ Delta smelt tend to occupy habitat close to their thermal maximum and may not be able to transition to and occupy the cooler, higher salinity habitat in Suisun Bay and San Pablo Bay.²¹ Delta smelt summer distribution is also correlated with turbidity which is hypothesized to increase survival of Delta smelt and reduce their predation risk. Studies have shown that turbidity is higher in Suisun Bay and Marsh relative to upstream locations because dynamic variables, such as wind, interact with static variables, such as bathymetric complexity and increased erodible sediment, found in the Suisun region. A more eastward position of the LSZ exposes Delta smelt to less turbid waters and increase vulnerability to predation.

The majority of the Delta smelt population was expected to be centered around the low salinity zone, near X2, between June and August. Due to limited ability to detect Delta smelt in monitoring surveys, habitat and historical data were used to estimate the location of Delta smelt in the estuary. Delta smelt spawning is likely to have peaked in March or April based on historic timing. As water temperatures rise, larvae recruit to juvenile size and may disperse further throughout the system. Juvenile surveys reported presence in the SDWSC and the lower Sacramento River regions.²² A smaller portion of the Delta smelt population was expected to be located in the freshwater North Delta, the Cache Slough Complex, and the SDWSC between June and August. These locations

²⁰ Swanson, C., T. Reid, P. S. Young, and J. J. Cech Jr. 2000. Comparative environmental tolerances of threatened delta smelt (*Hypomesus transpacificus*) and introduced wakasagi (*H. nipponensis*) in an altered California estuary. *Oecologia* 123:384–390.

²¹ California Department of Fish and Wildlife (CDFW) May 24, 2021 Letter to State Water Board regarding Temporary Urgency Change Petition Regarding Delta Water Quality; available at https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/tucp/docs/2021/20210524_tucp_letter.pdf.

²² The fourth 20 mm Survey sampled 1 larval Delta smelt on May 6, 2021, in the SDWSC. The EDSM surveys have sampled a total of 8 Delta smelt, 7 in the SDWSC (1 on 4/12, 1 on 4/13, 2 on 4/27 and 3 on 5/4) and 1 in the Lower Sacramento River on 5/6.

may serve as cold water refugia during high summer temperatures provided that lethal temperature thresholds were not reached.²³

The magnitude of potential impacts of the TUCP Order on Delta smelt were, and still are, uncertain; however, they were considered in the context of the population status of Delta smelt at the time the TUCP was approved. The fall midwater trawl (FMT) abundance index was zero in 2020 for the third year in a row, suggesting a very low adult stock available to produce the next generation of Delta smelt. In 2021, the FMT abundance index for the month of September was zero for the sixth consecutive year. The 20-millimeter Survey failed to capture any Delta smelt in 2021 to date. The reduction in Delta outflow approved in the TUCP Order was expected to shift the LSZ and X2 up to 2 km eastward and possibly expose a significant portion of the juvenile Delta smelt to warmer water temperatures, reduced bathymetric complexity, and decreased turbidity. A smaller portion of the population may have been able to reside in thermal refugia in North Delta freshwater habitats or more saline habitat in Suisun Bay to reduce these effects, but it is not clear how long that cool water refugia persisted through the summer. The effects of reduced Delta outflow were expected to negatively impact survival of juvenile Delta smelt for June through August. Delta smelt were not expected to be distributed in the central and south Delta, so salvage effects associated with the TUCP Order were not expected. Reductions in Delta outflow combined with export restrictions were expected to preserve upstream storage and cold water resources which was and will be important for ecosystem protection later in the year, particularly salinity control in the Delta, and in the event that 2022 is another dry year. Low catch of Delta smelt makes it difficult to assess any impacts of the TUCP Order on the population.

2.6.2 Longfin Smelt

Longfin smelt, which is listed as threatened under CESA and is a candidate for listing as threatened or endangered under ESA, experienced its fourth lowest FMT survey index in 2020.²⁴ In 2021, the FMT survey index for the month of September was 1 for longfin smelt, up from 0 in 2020. Longfin smelt tend to migrate seaward with most having dispersed into marine environments during summer. Some individuals will rear in San Pablo Bay and Suisun Bay through fall.

The TUCP changes in June and July were expected to shift the LSZ upstream by up to 2 km and may have further reduced food availability for longfin smelt rearing in Suisun Bay. The abundance of an important prey species, *P. forbesi*, in the LSZ is subsidized by freshwater inflows from marsh areas into the Delta. This subsidy is important to offset the loss of local zooplankton production caused by feeding by the overbite clam.

²³ CDFW (May 24, 2021) letter to State Water Board regarding the 2021 TUCP and effects to fish and wildlife resources. Available at https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/tucp/docs/2021/20210524_tucp_letter.pdf.

²⁴ CDFW, Fall Midwater Trawl. <https://wildlife.ca.gov/Conservation/Delta/Fall-Midwater-Trawl>.

As inflows were reduced, this subsidized food source and food availability for longfin smelt had the potential to decrease to some degree.

Given the limited distribution of larvae and juveniles in the central and south Delta and the relatively low levels of planned exports at the time of the TUCP Order, the Biological Review²⁵ found that the proposed changes were not expected to substantially raise the entrainment risk of the longfin smelt population. While larvae in southern areas would be at risk of entrainment during operations due to their proximity to the export facilities, the minimal export levels should result in a low level of risk. In addition, only a small portion of the population was thought to be in the south Delta (less than 1 percent of the total larval catch). However, potential existed for longfin smelt to migrate into the south Delta toward the end of the period of these changes. During the TUCP Order, there was zero cumulative salvage of longfin smelt at the salvage facilities for the SWP and CVP, and data from the 20 mm survey indicate that longfin smelt distribution shifted away from the south Delta towards Suisun Bay.

The TUCP Biological Review indicated that the proposed changes were not expected to result in a substantial degradation of rearing habitat for longfin smelt over conditions that would be experienced in a dry year. The Biological Review found that reductions in outflow due to the proposed changes could have some negative impact on longfin smelt spawning and recruitment, though this effect was found to be hard to quantify given the already poor environmental conditions due to the drought.

2.6.3 Estuarine Habitat and Species

The Biological Review focused on species listed under ESA and CESA, but the proposed action likely had adverse effects on other beneficial uses. In particular, the Delta outflow objectives in Tables 3 and 4 of D-1641 are designed to protect the estuarine ecosystem in order to provide habitat for several species of pelagic fish and crustaceans whose populations show strong positive relationships to Delta outflow. Many of these species have undergone population declines over the history of water development in the Delta. As discussed above for Delta smelt, decreasing Delta outflow constrains habitat by moving X2 and the LSZ inland from the shallow, more favorable habitats of Suisun Bay to the deeper, channelized, and less hospitable habitats of the lower Sacramento and San Joaquin Rivers and their confluence. This reduction in habitat quantity and quality likely resulted in somewhat lower survival and recruitment of several other estuarine dependent species than would have occurred without a reduction in outflow. Similar to the longfin smelt review, reductions in Delta outflow combined with export restrictions were expected to preserve upstream storage, for ecosystem protection later in the year and into 2022, including salinity control in the Delta.

²⁵ As an attachment to the TUCP, DWR and Reclamation submitted a Biological Review evaluating the potential effects of the changes on fish species listed as threatened or endangered under the ESA and CESA. Available from the State Water Board website at https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/tucp/docs/2021/20210517_dwr_usbr_tucp.pdf.

2.6.4 Winter-Run Chinook Salmon

Winter-run Chinook salmon was listed as endangered under CESA in 1989 and listed as endangered under the ESA in 1994. The federal listing includes both natural and artificially propagated stocks. The endangered winter-run Chinook salmon is of particular concern during drought years. Prior to the summer spawning period for winter-run Chinook salmon, adults migrate through the Delta and hold in the upper Sacramento River below Keswick Dam until they are ready to initiate spawning, with the majority of spawning typically occurring between June and July upstream of Clear Creek. After spawning, the fertilized eggs require cold water to ensure their proper development, with temperatures below 53.5 degrees F being optimal and warmer temperatures becoming lethal.²⁶ These optimal temperatures are needed from the onset of spawning through juvenile emergence which spans from May through October and into November. Following emergence, juveniles may experience less temperature impacts due to their ability to seek thermal refugia. Downstream rearing and migration of juveniles occurs from fall through the spring when temperature conditions are typically more favorable. Winter-run Chinook salmon display a 3-year life cycle, with adults generally returning to spawn 3 years after egg hatch.

Juvenile survival and adult escapement continued to decline after ESA listing. Adult escapement has been persistently low since 2006.²⁷ Adult escapement in 2021 is estimated to be 9,956 adults²⁸, the largest escapement since 2006. Assuming a 3-year life cycle, the adults that returned to spawn in 2021 originated from eggs laid during 2018 that migrated downstream as juveniles during water year (WY) 2019. While there was a modest return of 2,458 adults in 2018, juvenile production from that return was high due to favorable instream conditions and temperatures. WY 2018 was a below normal year following the wettest year on record in 2017 resulting in favorable storage conditions and cold water supplies in Shasta Reservoir. WY 2019 was a wet year resulting in favorable migration conditions for juvenile winter-run. These conditions led to a relatively high egg-to-fry survival level of 26.3% and an overall survival of eggs reaching the smolt life stage and reaching the Delta of 8% in WY 2019, which yielded the second largest number of juveniles reaching the delta since 2013 that returned as spawners in 2021. While 2021 had the largest adult run in the past 15 years, a number of factors discussed below resulted in a record low egg-to-fry survival rate of 2.6%, worse than the previous low for brood year 2015 of 4.2%, and only 0.4% of viable eggs

²⁶ Martin, B. T., Pike, A., John, S. N., Hamda, N., Roberts, J., Lindley, S. T., & Danner, E. M. 2017. Phenomenological vs. biophysical models of thermal stress in aquatic eggs. *Ecology Letters*, 20 (1), 50-59.

²⁷ CDFW. 2020. Fisheries Branch Anadromous Assessment. California Central Valley Sacramento and San Joaquin River Systems Chinook Salmon Escapement: Hatcheries and Natural Areas. GrandTab. Compiled 5/22/2020 by Jason Azat.

²⁸ Available in the NMFS JPE Letter. Available at: <https://media.fisheries.noaa.gov/2022-01/jpe-letter-2021.pdf>.

successfully surviving to reach the delta as smolts according to the January 20, 2022 National Marine Fisheries Service (NMFS) Juvenile Production Estimate.²⁹

This year's low survival levels due to drought conditions and temperature impacts are also compounded by nutritional deficiencies. Specifically, this year's winter-run Chinook salmon have experienced a third year of thiamine deficiency. A thiamine deficiency in spawning Chinook salmon can substantially reduce egg and juvenile survival rates. Biological sampling from the Livingston Stone Fish Hatchery indicated a majority of spawning winter-run Chinook salmon had a thiamine deficiency in 2021, with nearly half the sampled population with thiamine levels below the concentration that would result in 50 percent mortality to eggs. While the thiamine deficiency was not impacted by the Sacramento River TMP and TUCP Order, it is another stressor on winter-run Chinook salmon in 2021.

In addition, in an effort to conserve cold water for later in the season this year, a warm water bypass was implemented in May while some spawning adults were present. While the bypass helped to conserve approximately 300,000 acre-feet of cold water, it also resulted in daily maximum temperatures approaching 60 degrees F right below Keswick Dam which contributed to the 5.6 percent pre-spawn mortality observed in winter-run Chinook salmon³⁰.

In addition to the effects of the thiamine deficiency and warm water bypass, this year's juvenile winter-run Chinook salmon were subject to suboptimal temperatures during much of the egg incubation period. While the conservation of storage in Shasta Reservoir as a result of the TUCP Order and final Sacramento River TMP provided some improvement in conditions for winter-run Chinook salmon spawning and egg incubation by increasing storage by approximately 289,000 acre-feet, this additional storage was not adequate to avoid significant temperature related mortality given other reservoir releases.

Reclamation's TMP identified a temperature target of 55 degrees F from June 15th to October 31st at the SAC gauging station located at the Highway 44 bridge in Redding, CA. While the TMP represented less than optimal conditions for winter-run Chinook salmon, the Executive Director found that the TMP reflected the currently known feasible and reasonable management actions that Reclamation could take to control temperatures this year and approved the TMP subject to conditions, including a requirement for Reclamation to take all actions within its control to achieve a Shasta Reservoir EOS storage volume of 1,250,000 acre-feet to provide sufficient cold water storage for meeting the temperature levels identified in the TMP.

Due in part to unexpected losses in runoff and other factors discussed further below, Reclamation did not meet the EOS storage target of 1,250,000 acre-feet in Shasta Reservoir and did not meet a temperature of 55 degrees F at the TMP compliance location starting August 19th. However, TDM levels were still estimated to be within

²⁹ Available at: <https://media.fisheries.noaa.gov/2022-01/jpe-letter-2021.pdf>.

³⁰ Doug Killam with CDFW, Personal Communication, November 11, 2021.

ranges identified in the TMP. Shasta EOS storage in 2021 was 1,074,380 acre-feet (see Table 2, Section 2.3, SWP and CVP Water Supplies). Without the TUCP Order, absent any other changes in operations of Shasta Reservoir, EOS storage could have been less than 800,000 acre-feet and temperature control could have been lost sooner, likely resulting in near total temperature related mortality to this year's cohort. Early estimates of total temperature dependent mortality (TDM) are approximately 75 percent according to modeling from the National Marine Fisheries Service-Southwest Fisheries Science Center (NMFS-SWFSC, presented 10/28/21 to the Sacramento River Temperature Task Group (SRTTG)³¹), which is within the range projected in the TMP. In addition, the changes conserved storage going into next year for temperature management and other purposes. While this level of TDM is far above optimal, it is likely better than the TDM that would be expected with EOS Shasta storage levels of less than 800,000 acre-feet. Further, the improvement in storage from the TUCP Order is expected to help to some degree to provide for improved conditions if next year is also dry. Given the critical need to protect winter-run Chinook salmon next year due to three years of very low survival for a three-year species, this Order includes conditions requiring actions to provide for improved EOS storage levels and temperature. This Order also includes provisions for improved water supply planning to address issues with forecasting that occurred in 2021.

2.6.5 Spring-Run Chinook Salmon

Central Valley spring-run Chinook salmon were listed as threatened under the ESA and CESA in 1999. The ESA listing was reaffirmed in 2005 and expanded to include the Feather River hatchery stock. Escapement of Central Valley spring-run Chinook salmon has remained persistently low since 2012. Spring-run Chinook salmon adults hold in cool water habitats through the summer, then spawn in the fall from mid-August through early October. Optimal water temperatures for egg incubation are below 53.5 degrees F.³² Eggs that incubate at temperatures higher than 60 degrees F suffer high mortality rates, culminating with 100 percent egg mortality at 62 degrees F.^{33,34}

The preliminary escapement estimate for adult spring-run Chinook salmon on Butte Creek is greater than 15,000 fish, but the number of fish estimated to have survived to spawn is less than 1,500. Increased rates of disease due to warm temperatures and impassable fish barriers on Butte Creek and other locations resulted in over 90 percent pre-spawn mortality. Neither the approval of the Sacramento River TMP or the TUCP Order impacted temperatures on Butte Creek or other non-Project tributaries where

³¹ The SRTTG is a multi-agency technical group formed to support Sacramento River temperature management by Reclamation.

³² U.S. Environmental Protection Agency. 2003. EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards. EPA 910-B-03-002. Region 10 Office of Water, Seattle, WA.

³³ Doug Killam with CDFW, Personal Communication to the SRTTG.

³⁴ Myrick, Christopher A., and Joseph J. Cech. Temperature effects on Chinook salmon and steelhead: a review focusing on California's Central Valley populations. Bay-Delta Modeling Forum, 2001.

spring-run Chinook salmon spawn, but conditions on the mainstem Sacramento River likely did affect returning adults. While likely not influenced by the TMP or the TUCP, temperatures on the mainstem Sacramento River at Hood exceeded the EPA region 10 criteria of 68 degrees F for suitable salmonid migration in May and may have created a temperature barrier that impeded upstream migration of spring-run Chinook salmon after May 1.

While conditions were generally poor due to the drought and to some extent reduced Delta outflows, the additional 300,000 acre-feet of storage in Shasta Reservoir resulting from the changes from the TUCP Order and the Sacramento River TMP likely provided for some improvements in temperatures benefiting migrating spring-run Chinook salmon to some extent this year and possible improvements next year if the hydrology remains dry. However, holding and spawning spring-run Chinook salmon have been exposed to increasingly warm temperatures since the late summer on the Sacramento River. Temperatures in October of 2021 reached nearly 60 degrees F downstream of Keswick Reservoir and likely had significant impacts on spawning success and egg survival for spring-run Chinook salmon. In November, conditions cooled reaching suitable levels. Unlike winter-run Chinook salmon, there is no biological model calibrated to estimate the temperature dependent mortality experienced by spring-run Chinook salmon eggs.

2.6.6 Fall-Run Chinook Salmon

Central Valley fall-run Chinook salmon are a California Fish Species of Special Concern. Historically, fall-run Chinook salmon migrate upstream as adults from July through December and spawn from early October through late December. Like spring-run Chinook salmon, fall-run Chinook salmon experienced warmer than ideal temperatures for spawning in October when cold water supplies from Shasta Reservoir had been depleted, despite the conserved water from the TUCP Order and TMP. However, the conserved water from the TUCP Order and TMP will provide for improved storage conditions going into next year if conditions remain dry. Further, the fall-run Chinook salmon spawning season extends through December so some fish should benefit from cooling temperatures beginning in November. Conditions will also improve for the remainder of the spawning season and for egg incubation prior to emergence.

The drought is expected to impact fall-run Chinook salmon population viability, which may increase their risk of extirpation in some streams and possible extinction if poor conditions persist. Impacts to fall-run Chinook salmon population abundances could result in significant impacts to the commercial and recreation fishing industry. In addition, fall-run Chinook salmon are a primary prey base for ESA listed, endangered Southern Resident Killer whales. Reductions in fall-run Chinook salmon may also negatively impact the food availability and survival of Southern Resident Killer whales.

Similar to spring-run Chinook, there is no biological model calibrated for fall-run Chinook salmon to estimate rates of TDM. A final estimate for egg to fry survival will not be available until juveniles have completed their migration past RBDD and total fish passage is known.

2.6.7 Steelhead

California Central Valley steelhead were listed as threatened under the ESA in 1998. Steelhead have also likely been affected by long-term stressors and recent drought cycles but given the difficulty in sampling for these fish it is not possible to determine exactly how the species has been affected. Adult steelhead abundance is not estimated in the mainstem of the Sacramento River or any waterways of the Central Valley. The drought conditions are causing increased stress to steelhead populations (with or without water project operations) from low flows causing reduced rearing and migratory habitat, increased water temperatures affecting survival, and likely higher than normal predation of juvenile steelhead. The changes in the TUCP Order conserved Project storage, which may mitigate these effects to some extent. Regardless of the changes, steelhead survival will likely be low in all tributaries and migratory pathways and is likely to result in a smaller year class of steelhead emigrating this year.

2.6.8 Green Sturgeon

Green sturgeon southern Distinct Population Segment were listed as threatened under the ESA in 2006. Information on green sturgeon is extremely limited. Adult green sturgeon may be present in the Delta from March to September, with the principal occurrence in upstream spawning areas in the Sacramento River occurring from mid-April to mid-June. Juvenile green sturgeon are routinely collected at the Projects salvage facilities throughout the year. Salvage records indicate that sub-adult green sturgeon may be present in the Delta during any month of the year in low numbers but are most commonly salvaged in July and August. The proposed changes were expected to have similar impacts and benefits for green sturgeon as described above for salmon and steelhead related to improved storage and cold water resources. In 2021, there was no salvage of green sturgeon during the duration of the TUCP Order.

2.7 Emergency Drought Barrier

On May 28, 2021, the State Water Board issued a water quality certification to DWR in connection with the installation of an emergency drought barrier at West False River to help preserve water quality in the Delta.³⁵ The temporary rock barrier was installed in June 2021 and reduced the intrusion of high-salinity water into the central and south Delta; helped protect water supplies used by people who live in the Delta, San Francisco Bay Area, and southern California; and allowed water managers to retain more water in upstream reservoirs for release later in the year. The permitting for the emergency drought barrier consisted of a different regulatory process than the TUCP; however, the combined impacts of both efforts were considered for the TUCP Order.

The emergency drought barrier was scheduled to be removed by November 30, 2021; however, due to the continuation of the drought conditions, DWR has proposed to delay the removal of the drought emergency barrier until November 30, 2022, to provide

³⁵ State Water Board, Water Quality Certification Program Public Notices. https://www.waterboards.ca.gov/waterrights/water_issues/programs/water_quality_cert/docs/emergency_drought_barriers/edb_2021_public_notice.pdf.

continued protection of beneficial uses in the central and south Delta during the ongoing drought. To allow for fish and boat passage with the barrier in place, DWR proposes to incorporate a notch in the barrier from January to April 2022 to allow for passage of juvenile fish migrating out of the Delta.

2.8 Harmful Aquatic Blooms and Aquatic Weeds

Harmful algal blooms (HABs) are an overgrowth of algae that cause harm to the aquatic ecosystem or limit the use of waterbodies. Cyanobacteria blooms, also called blue-green algae, are typically the type of HAB found in California's freshwater and estuarine systems, including the Delta. Cyanobacteria can quickly multiply into a bloom when conditions are favorable with abundant light, elevated water temperature, elevated levels of nutrients, high residence time, and lack of water turbulence and velocity. Some cyanobacteria produce toxins that can cause adverse health effects, including mortality, to fish and wildlife, humans, and pets. Although not every cyanobacteria bloom is toxic, blooms can cause adverse impacts in their toxic and nontoxic forms to drinking water, recreation, tribal and cultural uses, irrigation, aquatic life, and local communities adjacent to bloom sites that experience odor, visual impairment, and other associated impacts.

Environmental conditions that promote HABs can also promote the excessive growth of submerged and floating invasive aquatic vegetation, generally referred to as aquatic weeds. Excessive aquatic weeds cause adverse effects in the Delta including changes to water chemistry (e.g., low dissolved oxygen), reduced flow and turbidity, out competition of other primary producers, changes to the food web, impedance of navigation and water conveyance, odor, and poor aesthetics.³⁶ Excessive aquatic weeds can alter the complexity of aquatic habitat and harm native fishes by impeding movement or increasing predation risk to non-native fish. Individually and in combination, excessive aquatic weeds and HABs adversely impact the ecology, economy, culture, and quality of life in the Delta watershed.

The frequency and duration of HABs and expansion of aquatic weeds tend to increase in the Delta with drought conditions due to elevated water temperatures and increased residence times from reduced freshwater inflows, reduced circulation, and elevated air temperatures. The June 1, 2021 TUCP Order recognized that the changes authorized by the TUCP Order and the installation of the emergency drought barrier could contribute to increases in HABs and expansion of aquatic weeds in the Delta. To address these concerns, Condition 8 in the June 2021 TUCP Order required DWR and Reclamation to fund and complete a special study evaluating and documenting the effects of the TUCP Order and associated actions, including the drought barrier, on the prevalence and extent of HABs and expansion of invasive aquatic weeds and identify

³⁶ Boyer, K. and M. Sutula. 2015. Factors Controlling Submerged and Floating Macrophytes in the Sacramento-San Joaquin Delta. Southern Coastal Water Research Project Technical Report 870. August 2015. Available at: https://www.waterboards.ca.gov/centralvalley/water_issues/delta_water_quality/delta_nutrient_research_plan/science_work_groups/2015_10_macro_whitepaper.pdf.

possible mitigation. On December 15, 2021, DWR and Reclamation submitted an initial report in response to Condition 8. DWR and Reclamation plan to submit a supplemental report with complete analyses in the spring of 2022 in order to incorporate additional data and provide more time to process multiple sources of information.

Public comments highlighted and reinforced that impacts from HABs and aquatic weeds compound existing adverse conditions in economically disadvantaged and historically marginalized communities by further limiting access to clean drinking water, recreational opportunities (e.g., swimming, fishing, boating, adjacent biking and walking), sustenance, and affordable and safe housing. HABs also increase exposure to poor air quality, odors, and poor visual aesthetics which can depress property values.³⁷ Expansion of aquatic weeds contribute to historically low native fish populations such as Chinook salmon, which are important for supporting tribal culture and subsistence fishing. Public comments also identified that the initial HABs and aquatic weeds report submitted to the State Water Board pursuant to Condition 8 of the TUCP Order did not address the potential for disproportionate impacts to low-income and communities of color in the Delta, potentially missed relevant monitoring data, and commenters requested additional review by California Water Boards staff experienced with HABs. In response to these comments, Condition 5 of this order on reconsideration requires additional specific analyses be included in the next version of the HABs and aquatic weeds report. To inform future consideration of these issues, upon completion of the report, the State Water Board will also work with the Delta Science Program to complete a scientific review of the report and associated HAB and aquatic weed issues.

2.9 Drought Contingency Plan

DWR, in coordination with Reclamation, is required to develop and implement a Drought Contingency Plan (DCP) when a dry or critical water year is followed by dry conditions the next year, pursuant to Condition 8.21 of the 2020 California Department of Fish and Wildlife (CDFW) Incidental Take Permit for Operation of the SWP (CDFW ITP).³⁸ Water year 2020 was an exceptionally dry year, and dry conditions continued through the month of January 2021. DWR submitted the initial DCP to CDFW in February, with subsequent updates provided on a monthly basis through the end of the water year.³⁹ The purpose of the DCP is to describe planned drought actions and outline the areas of potential concern given the observed dry hydrology in 2021.

³⁷ [California Water Boards' Framework and Strategy for Freshwater Harmful Algal Bloom Monitoring: Full Report with Appendices](https://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/1141_FHABStrategy_FullReport.pdf) (March 2021 Southern California Coastal Water Research Project Technical Report 114.1B)
https://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/1141_FHABStrategy_FullReport.pdf.

³⁸ Available from the Department of Water Resources website at <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Files/ITP-for-Long-Term-SWP-Operations.pdf>.

³⁹ Available from the Department of Water Resources website at <https://water.ca.gov/Programs/State-Water-Project/Endangered-Species-Protection>. There was no June update.

The February 2021 DCP did not propose any specific drought actions for the water year, citing anticipated winter storms. The March 2021 DCP update on the hydrological conditions identified continued dry conditions for the water year and identified drought actions that DWR and Reclamation were considering and evaluating to improve temperature management and reservoir carryover storage. As hydrological conditions continued to worsen in April, the April 2021 DCP update identified drought actions that DWR and Reclamation had implemented, including reduced allocations to contractors and warm water power bypasses at reservoirs. DWR also included an Interagency Ecological Program Drought Ecosystem Monitoring and Synthesis Plan to evaluate the environmental impacts of drought and drought actions. The May 2021 DCP update outlined additional actions DWR and Reclamation were implementing to address the shortfalls in supplies, including the submittal of a TUCP, and additional releases from New Melones Reservoir to support Delta Outflow.

The July 2021 DCP update identified, as an additional action in June and July, a new operations approach of a one-facility export operation which allowed the Projects to use the Delta-Mendota Canal-California Aqueduct Intertie to help distribute exports from Jones Pumping Plant or Banks Pumping Plant. The August 2021 DCP update identified that a cold water power bypass test at Shasta Reservoir was conducted on August 29 to determine the feasibility of using the bypass to cool Sacramento River temperatures in the late summer and early fall. While the bypass was able to provide a cooling of temperatures on August 29, the efficacy of the bypass to provide cooling diminished as the Shasta Reservoir temperature profile warmed the next week.

The September 2021 DCP stated that DWR and Reclamation were developing a TUCP to address potential issues for calendar year 2022. In addition, it indicated that DWR was evaluating the delayed removal of the Emergency Drought Salinity Barrier until the barrier is no longer needed.

2.10 Sacramento River Temperature Management Plan Approval

In Order 90-5, the State Water Board amended Reclamation's water right permits and licenses for Keswick Dam, Shasta Dam, and the Spring Creek Power Plant facilities of the CVP to partially implement temperature water quality objectives that apply to the Sacramento River and other rivers in the Sacramento and San Joaquin Basins. Order 90-5 requires an average daily temperature of 56 degrees F on the Sacramento River at RBDD, located 60 miles downstream of Keswick Dam, to protect aquatic habitat conditions for spawning, rearing, and migration needs of native fish populations.

If there are factors beyond Reclamation's reasonable control that prevent Reclamation from meeting 56 degrees F at RBDD, Reclamation is required to prepare a TMP for consideration by the State Water Board. Order 90-5 requires Reclamation to consult with CDFW, NMFS, and the U.S. Western Area Power Administration in the development of the TMP and identification of an alternative compliance location. The TMP describes Reclamation's method for meeting the temperature requirement of 56 degrees F at the new compliance location while salmonids are at risk from thermal effects, typically from mid-May to the late fall.

In 2021, Reclamation determined that it could not reasonably maintain 56 degrees F at RBDD based on poor storage conditions in Shasta Reservoir and model predicted future dry hydrology, which is the case in most years, including non-drought years. Following a Draft Sacramento River TMP shared on May 5, 2021, the State Water Board provided guidance that the Final Sacramento River TMP needed to include an operations outlook that meets an EOS Shasta Reservoir storage of 1,250,000 acre-feet among other provisions in order to be approvable.⁴⁰ Modeling from the NMFS-SWFSC indicated that EOS storage of approximately 1,200,000 acre-feet was associated with a TDM of 62-85 percent. Reclamation submitted a Final Sacramento River TMP to the State Water Board on May 28, 2021 that included an EOS storage target of 1,250,000 acre-feet. The Sacramento River TMP shifted the compliance point to the SAC gauge station located at the Highway 44 bridge, 55 miles upstream of RBDD, and identified a temperature target of 55 degrees F starting on June 15. The Executive Director approved the Final Sacramento River TMP on June 10, 2021, subject to requirements that Reclamation:

- Take all actions within its reasonable control to improve temperature conditions and ensure that TDM levels are minimized to the maximum extent feasible;
- Take actions within its reasonable control to achieve an EOS storage level of 1,250,000 acre-feet.
- Operate in accordance with the final TMP, and report to the Executive Director in the event that Reclamation's operations deviate from, or are expected to deviate from, those outlined in the TMP and the TMP approval;
- Consult at least weekly through October, and more often if warranted or requested;
- Conduct monitoring, modeling, and other evaluations needed; and
- Provide a draft report to the State Water Board by October 4, 2021, on strategies that Reclamation will employ to rebuild storage and avoid temperature management concerns for winter-run, fall-run, and spring-run Chinook salmon next year in the event of dry conditions. This report has not been submitted.

The June 10, 2021, Executive Director approval also requested that in 2022 Reclamation develop and submit monthly temperature management plans for the February through May time period and that a draft Sacramento River TMP be submitted in April and a final submitted in May. This request remains, as modified by Condition 1 of this order, which requires a draft Sacramento River TMP on April 1, 2022 and a final TMP on May 1, 2022.

⁴⁰ Available from the SWRCB website at https://www.waterboards.ca.gov/drought/sacramento_river/docs/2021/2021.05.21%20draft%20tmp%20response.pdf.

On July 9, Reclamation informed the State Water Board that it would not be able to meet the EOS target of 1,250,000 acre-feet. Reclamation indicated that depletions, or diversions for agriculture and natural losses, above Freeport were greater than anticipated during the month of May and that these depletions were beyond the reasonable control of Reclamation. In lieu of the original EOS target, Reclamation informed the Board that operations would result in an EOS of 1,100,000 acre-feet and actual Shasta EOS was 1,074,380 acre-feet due in part to moving transfer water provided through forbearance agreements from October to September in order to avoid significant flow fluctuations and associated impacts to salmon that would have occurred if all of the planned transfer water was released in October.

2.11 Temporary Urgency Change Petition (TUCP)

On May 17, 2021, DWR and Reclamation submitted a TUCP that requested temporary modification to permit and license conditions imposed pursuant to D-1641 that require DWR and Reclamation to meet flow-dependent water quality objectives designed to protect fish and wildlife and agricultural beneficial uses in the Delta. The TUCP states that DWR and Reclamation requested changes to flow-dependent water quality requirements in response to two consecutive years of dry conditions and low rainfall in order to preserve water in storage in Project reservoirs to meet other Project obligations and improve reservoir storage conditions going into next year. DWR and Reclamation requested modifications, in June through August 15, to Delta outflow, western Delta salinity, and export limit objectives.

2.12 Temporary Urgency Change Order

The Executive Director's June 1, 2021 TUCP Order approved DWR and Reclamation's request to reduce the required Delta outflow level in June through July to 3,000 cubic feet per second (cfs). D-1641 would have required DWR and Reclamation to meet a Delta outflow level of 4,000 cfs in June (14-day running average) and July (monthly average). In addition, the TUCP Order approved DWR and Reclamation's request to move the required Western Delta agricultural salinity compliance location on the Sacramento River from Emmaton to Threemile Slough in June through mid-August. The TUCP Order also limited exports from the Delta to a combined maximum rate of no greater than 1,500 cfs, exclusive of transfers. D-1641 would have limited the combined export rate to 35 percent of Delta inflow in June, and 65 percent of Delta inflow in July and August.

As conditions of approval, the TUCP Order required DWR and Reclamation to:

- (1) calculate and maintain a record of the amount of water conserved and describe where that water was conserved;
- (2) submit updated monthly operations outlooks with information on inflows to and storage levels of Projects' reservoirs, Delta hydrology, water delivery volumes, and south-of-Delta water transfer volumes, transferees and transferors;
- (3) evaluate the possibility for dedicating a portion of the volume of water conserved to pulse flows or other improvements above and beyond D-1641 requirements in the next water year, to the extent feasible based on hydrologic conditions; and
- (4) conduct monitoring, analyses, and modeling to inform real-time operational decisions, assess drought emergency actions, and understand the effects of

changes authorized by the Order in combination with other associated actions such as Sacramento River temperature management and the emergency drought salinity barrier at False River.

The TUCP Order also required DWR and Reclamation to complete a special study to evaluate the effects of changes authorized by the Order in combination with other associated drought actions on harmful algal blooms and invasive aquatic weeds, to implement the Sacramento River TMP as approved by the Executive Director, to prepare a report summarizing the constraints that exist on minimal export pumping levels, and to develop an operational strategy for water year 2022 in the event that dry or critically dry hydrologic conditions occur next year.

2.13 Compliance with Changed and Unchanged Requirements

The Western Delta agricultural salinity objective was exceeded at the modified compliance location of Threemile Slough and at the unmodified compliance location on the San Joaquin River at Jersey Point while the TUCP Order was in effect. The San Joaquin River at Jersey Point compliance location exceeded 2.20 mS/cm from July 2 to July 8, 2021, and the TUCP Order Sacramento River at Threemile Slough compliance location exceeded 2.78 mS/cm from June 28 to July 14, 2021.⁴¹ DWR and Reclamation reported that higher-than-anticipated tidal conditions pushed significant seawater into the interior Delta, which greatly elevated salinity. In response to the elevated salinity conditions, the Projects adjusted management by decreasing exports, increasing reservoir releases, and closing the Delta Cross Channel Gates in an attempt to alleviate the elevated salinity levels.

The Projects remained in compliance with the TUCP Order minimum 3,000 cfs Delta outflow requirement and the maximum combined export rate of 1,500 cfs. The dry conditions required the Projects to reduce their exports to meet the Delta outflow requirements without depleting reservoir storage in the Sacramento River watershed. The combined maximum export rate from June through August 15 was less than 1,200 cfs (3-day running average). Furthermore, to maintain more storage in Sacramento River watershed reservoirs, the Projects relied on reservoir releases from New Melones Reservoir on the Stanislaus River to meet Delta outflow requirements. Unlike the other major Project reservoirs in the Central Valley, the amount of water stored in New Melones Reservoir was close to the historic average in June.

The reliance on New Melones Reservoir to meet Delta outflow helped to improve flow and water quality conditions in the San Joaquin River and southern Delta. Monthly average flow in the San Joaquin River at Vernalis during June 2021 was greater than 400 cfs above D-1641 requirements. Salinity concentrations at the Old River at Tracy Road Bridge exceeded D-1641 requirements from February 11 through May 10, 2021. The release of low salinity water from New Melones River helped to reduce salinity

⁴¹ Exceedances letter available from the State Water Board website at https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/tucp/docs/2021/20210723_dwrusbr_tms_jp_exceedances.pdf.

concentrations in the southern Delta prior to and during the effective period of the TUCP Order.

2.14 Water Code Section 1435

Water Code section 1435 provides that a permittee or licensee who has an urgent need to change the point of diversion, place of use, or purpose of use from that specified in the permit or license may petition for a conditional temporary change order. The State Water Board's regulations set forth the filing and other procedural requirements applicable to temporary urgency changes. (Cal. Code Regs., tit. 23, §§ 805, 806.) The State Water Board's regulations also clarify that requests for changes to permits or licenses other than changes in point of diversion, place of use, or purpose of use may be filed, subject to the same filing and procedural requirements that apply to changes in point of diversion, place of use, or purpose of use. (*Id.*, § 791, subd. (e).)

Before approving a temporary urgency change, the State Water Board must make the following findings:

1. the permittee or licensee has an urgent need to make the proposed change;
2. the proposed change may be made without injury to any other lawful user of water;
3. the proposed change may be made without unreasonable effect upon fish, wildlife, or other instream beneficial uses; and
4. the proposed change is in the public interest.

(Wat. Code, § 1435, subd. (b)(1-4).)

The Water Code defines "urgent need" to mean "the existence of circumstances from which the board may in its judgment conclude that the proposed temporary change is necessary to further the constitutional policy that the water resources of the state be put to beneficial use to the fullest extent of which they are capable and that waste of water be prevented . . ." (Wat. Code, § 1435, subd. (c).) The Water Code also provides, however, that the State Water Board shall not find a petitioner's need to be urgent if the Board in its judgment concludes, if applicable, that the petitioner has not exercised due diligence in petitioning for or pursuing a change pursuant to other provisions of the Water Code governing non-urgent changes. (*Ibid.*)

The State Water Board may issue a temporary urgency change order in advance of public notice. (Wat. Code, § 1438, subd. (a).) Public notice must be provided as soon as practicable, unless the change will be in effect less than 10 days. (*Id.*, § 1438, subds. (a), (b) & (c).) Any interested person may file an objection to a temporary urgency change. (*Id.*, subd. (d).) The Board must promptly consider and may hold a hearing on any objection. (*Id.*, subd. (e).) State Water Board [Resolution No. 2012-0029](#) delegates to the Board Members individually and to the Executive Director the authority to hold a hearing, if necessary, and act on a temporary urgency change petition. (Resolution No.

2012-0029, 2.2, 4.4.1.)⁴² The authority to act on temporary urgency change petitions is also included in the delegation of authority to the Executive Director in State Water Board [Resolution No. 2012-0061](#).⁴³

The State Water Board exercises continuing supervision over temporary urgency change orders and may modify or revoke temporary urgency change orders at any time. (Wat. Code, §§ 1439, 1440.) The authorization to divert and use water under a temporary urgency change order expires automatically 180 days after the authorization takes effect, unless an earlier expiration date is specified, or the order is revoked. The 180-day period does not include any time required for monitoring, reporting, or mitigation before or after the authorization to divert or use water under the temporary change order. (*Id.*, § 1440.) The State Water Board may renew temporary urgency change orders for a period not to exceed 180 days. (*Id.*, § 1441.)

2.15 Findings of the State Water Board's Executive Director

The Executive Director's June 1, 2021 TUCP Order included all the findings necessary to approve the TUCP. The Executive Director found that there was an urgent need for the proposed changes in response to extremely dry conditions, low reservoir levels, and lower than expected inflows from snowmelt. The Executive Director relaxed the Delta outflow and western Delta salinity requirements and modified the Delta export limits from June 1 through August 15, 2021, to avoid loss of salinity control in the Delta and contribute to reservoir storage supplies for protection of fishery resources and to meet minimal water supply needs in the approaching water year. The Executive Director balanced the need for export restrictions to protect fish and wildlife and conserve Project storage against the need for exports to meet minimum health and safety needs of Project contractors and in consideration of infrastructure limits.

The Executive Director found that the temporary urgency changes would not injure other lawful users of water. The Executive Director reasoned that other water right holders were not entitled to divert water previously stored or imported by the Projects that is released for use downstream, and therefore no water right holders would be injured to the extent that the changes would cause a reduction in storage releases and not a reduction in natural and abandoned flows. To the extent that the changes could cause a reduction in natural and abandoned flows, the Executive Director found that other lawful users would not be injured because DWR and Reclamation would continue to meet changed flow requirements, and adequate flows were expected to remain in the system to meet the demands of other lawful users of water.

⁴² The Deputy Director for Water Rights may act on a temporary urgency change petition if there are no objections to the petition. (Resolution No. 2012-0029, ¶ 4.4.1, available at:

https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0029.pdf.)

⁴³ Resolution No. 2012-0061, available at:

https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0061.pdf.

To the extent that the change in the salinity compliance location from Emmaton to Threemile Slough could increase salinity in the Delta, the Executive Director reasoned that any lawful users would not be injured because salinity levels would still be less than the levels that would exist without the Projects, which prevent salinity intrusion into the Delta in very dry conditions by supplementing natural inflow with storage releases. Further, the TUCP Order required DWR and Reclamation to bypass natural and abandoned flows when they were not meeting the Sacramento River at Emmaton agricultural salinity requirement in order to ensure the protection of other water right holders and reduce the impact of the change on fish and wildlife and water quality.

The Executive Director found that the TUCP Order would not unreasonably affect fish, wildlife, or other beneficial uses. The Executive Director found that although fish and wildlife could be negatively affected by the changes, these effects were not unreasonable given the consequences of not approving the changes and depleting stored water supplies needed to prevent sea water intrusion into the Delta, protect fish and wildlife, and satisfy other demands for water, including health and safety now and in the future, if conditions remained dry. The Executive Director relied on the fact that the fisheries agencies⁴⁴ had been consulted and did not object to the proposed changes. In addition, the Executive Director required Reclamation to implement the Sacramento River TMP as approved by the Executive Director, including meeting the EOS storage of 1,250,000 acre-feet.

Drought conditions and management of Project reservoirs severely impacted water supply availability in the Sacramento and San Joaquin basins such that there was inadequate water to meet all demands in 2021. Considering the drought conditions and foregone opportunities to improve reservoir management and storage conditions, the Executive Director found the changes made the best use of limited water supplies and were in the public interest. Further, the Executive Director required planning, reporting, consulting, and monitoring requirements, and retained authority to modify the Order, if needed, to ensure that it remained in the public interest.

2.16 Petitions for Reconsideration

The State Water Board received seven Petitions for Reconsideration. The State Water Board also received numerous comments, protests, and objections. The petitions are listed in Table 3.

⁴⁴ The fisheries agencies are CDFW, NMFS, and the USFWS.

Table 3: Petitions for Reconsideration

Petitioners	Process		Date Filed
	TUCP Order	TMP	
California Sportfishing Protection Alliance, California Water Impact Network, and AquAlliance	X		June 4, 2021
Natural Resources Defense Council, the Bay Institute, Defenders of Wildlife, San Francisco Baykeeper, Sierra Club California, Restore the Delta, Golden State Salmon Association, California Sportfishing Protection Alliance, and Pacific Coast Federation of Fishermen's Associations, Institute for Fisheries Research	X		June 4, 2021
Restore the Delta, Little Manila Rising, and Save California Salmon	X		June 28, 2021
California Sportfishing Protection Alliance, California Water Impact Network, and AquAlliance	X		June 29, 2021
South Delta Water Agency, Central Delta Water Agency, and Rudi M. Mussi Investment LP	X		July 1, 2021
Natural Resources Defense Council, Defenders of Wildlife, Restore the Delta, Sierra Club California, Save California Salmon, California Sportfishing Protection Alliance, San Francisco Baykeeper, The Bay Institute, and Pacific Coast Federation of Fishermen's Associations, Institute for Fisheries Resources		X	July 8, 2021
California Sportfishing Protection Alliance, Save California Salmon, California Water Impact Network, and AquAlliance		X	July 12, 2021

2.17 Interim Operations Plan

On August 2, 2016, Reclamation and DWR requested reinitiation of consultation pursuant to the ESA on the Projects' coordinated long-term operations. In response, on October 21, 2019, the U.S. Fish and Wildlife Service (USFWS) and NMFS issued new BiOps. On February 20, 2020, Reclamation approved a Record of Decision modifying CVP operations pursuant to the 2019 BiOps. The same day, the California Natural Resources Agency (CNRA), California Environmental Protection Agency (CalEPA), and the California Attorney General, on behalf of the people of California (collectively "California Parties"), filed litigation in federal district court challenging the 2019 BiOps as insufficiently protective of threatened and endangered species, among other causes of action. On March 31, 2020, CDFW, finding coverage under the ESA no longer sufficient to also meet CESA standards, issued its own more protective Incidental Take Permit (ITP).

On January 20, 2021, President Biden issued Executive Order 13990 (EO 13990), entitled “Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis.” EO 13990 directed federal agencies to review all actions taken during the four previous years and to consider whether to take additional actions to fulfill environmental objectives and bolster resilience to climate change. As part of EO 13990 implementation, Reclamation, USFWS, and NMFS signed a plan for reviewing the 2019 BiOps and, after discussions with the California Parties, on September 30, 2021, reinitiated consultation under the ESA on the Projects’ coordinated long-term operations.⁴⁵

In the interim, actions are needed to harmonize the operations of the CVP and SWP, particularly if the 2022 water year is below normal, dry, or critically dry. In response, the California Parties and the U.S. Department of the Interior, Reclamation, USFWS, and NMFS (Federal Defendants) agreed to the proposed IOP for Water Year 2022 with the goal of aligning the Projects’ Delta operations with the ITP and establishing Shasta operational priorities, temperature requirements for different year types, and storage goals.⁴⁶ The IOP also adds the State Water Board as a member of the Water Operations Management Team, which makes real-time species risk assessments for the Projects’ Delta operations, and requires that the Executive Director be included in Director level operational discussions. Among other measures, the IOP creates a Shasta Planning Group consisting of NMFS, USFWS, Reclamation, DWR, CDFW, and the State Water Board. The Shasta Planning Group is intended to work with the technical groups to solicit operational guidance and risk assessments and provide policy guidance as necessary. The IOP provides that if Water Year 2022 is a critical or dry water year, Reclamation will not schedule or make deliveries of stored water from Shasta for other than public health and safety, as defined in the IOP, until Reclamation receives approval of a TMP from NMFS that shows Reclamation will meet temperature criteria and end of September carryover storage consistent with the IOP terms and conditions.

On November 23, 2021, the California Parties and Federal Defendants each filed motions in federal district court requesting a stay of litigation and adoption of the IOP as the order of the Court, governing the Projects’ operations until September 30, 2022. Plaintiffs in a related matter filed a proposed Order on December 16, 2021, seeking a preliminary injunction imposing an alternative set of interim operations.⁴⁷ Various other parties intervened in both matters opposing the imposition of the IOP or the alternative operations proposed by the plaintiffs in the related matter. Briefing concluded in the two related cases on January 24, 2022, and a hearing is scheduled for February 11, 2021, after which the court will rule on the pending motions. The Court’s Order will establish

⁴⁵ *CNRA v. Raimondo, supra*, Third Declaration of Ernest Conant (filed November 23, 2021) at 2-3.

⁴⁶ *Id.*, at 3.

⁴⁷ *Pacific Coast Federation of Fishermen’s Associations v. Raimondo* (E.D.Cal. Case No. 3:19-cv-07897-LB).

minimum thresholds necessary for the Projects' joint operations to comply with the ESA for the period set forth in the Order.

In determining appropriate action in response to the petitions for reconsideration, the State Water Board has considered the measures included in the IOP, but recognizes that the IOP was developed as an interim measure in the context of litigation raising ESA and related claims.

3.0 GROUNDS FOR RECONSIDERATION

Any interested person may file a petition for reconsideration of an order or decision made under authority delegated to an office or employee of the State Water Board pursuant to Water Code section 1122 and California Code of Regulations, title 23, sections 768 -770. Section 768 of the Board's regulations provides that an interested person may petition for reconsideration upon any of the following causes:

- (a) Irregularity in the proceedings, or any ruling, or abuse of discretion, by which the person was prevented from having a fair hearing;
- (b) The decision or order is not supported by substantial evidence;
- (c) There is relevant evidence which, in the exercise of reasonable diligence, could not have been produced; or
- (d) Error in law.

On reconsideration, the Board may:

- (a) Refuse to reconsider the decision or order if the petition fails to raise substantial issues related to the causes for reconsideration;
- (b) Deny the petition upon a finding that the decision or order was appropriate and proper;
- (c) Set aside or modify the decision or order; or
- (d) Take other appropriate action.

(Cal. Code Regs., tit. 23, § 770.)

4.0 DISCUSSION

As discussed above, numerous and detailed comments were submitted on the TUCP Order and TMP. All of those comments have been thoroughly reviewed and considered. However, this Order does not provide a point-by-point discussion of each issue raised in the comments, nor is that necessary to determine whether reconsideration should be granted, particularly since the changes authorized by the TUCP Order expired August 15, 2021, and the TMP period has ended. Instead, this Order addresses the major substantive issues that commenters raised to determine if the decision to approve the changes authorized by the TUCP Order and the TMP approval, based on the available information at the time that the decision was made, merits reconsideration.

For the reasons set forth below, the Board finds that although the TUCP Order and TMP approval were appropriate and proper, additional measures are needed to improve drought planning and response in the event of an additional dry year in 2022, and therefore the petitions for reconsideration should be denied in part and granted in part. In consideration of the issues raised by petitioners and objectors, this Order includes several conditions to provide for improved drought and temperature management planning next year including:

- Improved temperature management planning requirements based on the best available hydrologic information, including requirements for EOS storage levels and maintenance of temperatures for the protection of winter-run Chinook salmon and other species.
- A requirement that DWR and Reclamation evaluate and identify minimum Delta export thresholds for the purposes of meeting health and safety and wildlife refuge needs that are consistent with any infrastructure and operational safety constraints.
- A requirement that DWR and Reclamation identify and implement needed improvements to forecast methods to avoid significant over or underestimates of available water supplies and provide monthly updates to the Board on these efforts.
- A requirement that DWR and Reclamation provide monthly updates on current hydrologic and operational forecasts for the water year, including information on forecasted inflows; reservoir releases; water supply deliveries; reservoir storage levels; planned water transfers, and other actions of this nature; and other relevant information that may be requested by the State Water Board's Executive Director to inform future drought related decision making.
- A requirement that DWR and Reclamation provide a report accounting for the actual monthly contract deliveries that occurred during water year 2021, including identification of deliveries to the groups of contractors identified in Table 1 of this Order.

Major comments, issues, and criticisms raised in the petitions, protests, and objections are addressed below. To the extent that any issue raised is not addressed in this Order, we conclude that the issue is not a substantial issue that merits review. (Cal. Code Regs., tit. 23, § 770, subd. (a)(1).)

4.1 Findings Regarding the Public Interest

Multiple petitions and comments addressed the issue of whether the changes approved by the TUCP Order were in the public interest. Primarily, comments and concerns stated that the changes approved by the TUCP order were not in the public interest because (1) water quality requirements are already insufficient to protect fish and wildlife and the Delta watershed in general, and therefore relaxing those requirements results in unreasonable impacts to fish and wildlife and other beneficial uses of water,

and (2) changes did not adequately limit Project operations, including allowing releases and diversions for Project settlement/supplemental supply and exchange contractor deliveries to be prioritized above fish and wildlife, ecosystem function, recreation, public water supplies, and Delta agriculture. Other comments suggested the changes were in the public interest as the State Water Board already determined that the purpose and use of SWP and CVP water supplies and deliveries are in the public interest, and therefore the State Water Board cannot re-examine the public interest determination in the TUCP Order. Finally, some commenters asserted that the Executive Director does not have delegated authority to act on export limits in a TUCP order based on public interest. The public interest aspects of these comments are discussed below but may also be discussed under other findings if a comment was more substantively focused on another issue.

The rationale for many of the petitioners' arguments that the TUCP Order was not in the public interest were based on their contentions that modifications to D-1641 would cause unreasonable impacts to fish and wildlife and the Delta. These issues are discussed below and with additional detail in the section addressing findings regarding fish and wildlife and other instream beneficial uses. Several commenters argued the Executive Director lacked the authority to change the TUCP Order after approval and contended that would violate due process requirements. These issues are discussed in the section addressing the Executive Director's authority to impose conditions and due process. A commenter expressed concern regarding the error in forecasting methodology that led to a significant overestimation of water availability and requested the State Water Board impose conditions in the TUCP Order related to that issue. This issue is discussed in the section addressing water supply forecast. A petitioner argued the TUCP Order failed to consider reasonable use, public trust, human right to water and a variety of relevant water, environmental justice, and civil rights policies and laws. These issues are discussed in the section addressing error in law. A petitioner argued the TUCP Order was contrary to the Delta Reform Act. This issue is discussed in the section addressing consistency with the Delta Reform Act.

Verbal comments received at a January 5, 2022 public workshop included concerns with impacts of HABs and invasive aquatic weeds on Delta residents, specifically disadvantaged communities. These issues are discussed in more detail in the section describing Harmful Algal Blooms and Aquatic Weeds. In response to comments on the draft order and to provide additional information for future public interest determinations, Condition 5 of this order on reconsideration requires that the final HABs and aquatic weeds report include additional analysis of impacts to disadvantaged communities and includes a public review process prior to finalizing the report. In collaboration with the Delta Stewardship Council, the State Water Board also is committed to an independent review of the final HABs and Aquatic Weeds report and associated HAB and aquatic weed issues.

4.1.1 Project Operation Limits & Drought Planning

Petitioners and commenters argued that the Executive Director's approval of the TUCP was not in the public interest because the water supply conditions supporting the need for a TUCP were created by a lack of planning for drought by DWR and Reclamation

and their decisions to allocate and release millions of acre-feet of reservoir storage for the purposes of delivering water to settlement and exchange contractors in excess of their underlying water rights. Specifically, petitioners argued that Project allocations to settlement and exchange contractors were substantially greater than their underlying water rights and claims and that delivery of water to settlement and exchange contractors in excess of amounts they were reasonably entitled to under their water rights and claims was not in the public interest and violated terms of DWR's and Reclamation's water rights. Petitioners further argued that Project allocations and deliveries in excess of volumes available to settlement and exchange contractors under the basis of their water rights and claims was an unreasonable use of water and requested the State Water Board reduce Project contract deliveries to amounts that the parties would reasonably be entitled to divert under their water rights and claims.

Petitioners and commenters acknowledged the extremely dry hydrologic conditions of 2020 and 2021 and the contribution of dry hydrology to difficult water management choices, but argued that it was not in the public interest to reduce reservoir storage to the extent that the Projects no longer had enough water to meet flow and water quality requirements for Sacramento River temperature control for salmon, Delta ecosystem conditions, and Delta agriculture. Petitioners and commenters further argued that adverse impacts to agricultural and fish and wildlife beneficial uses resulting from temporary changes to D-1641 were unreasonable and not in the public interest because DWR and Reclamation could have managed reservoir storage and deliveries to meet flow and water quality requirements and most of their contract allocations in 2021.

Although the petitioners provided information regarding historic deliveries, unimpaired flow, and Project allocations to support the request that the State Water Board limit contract deliveries to amounts available under contractors' own water rights and claims, more time and information is needed to fully consider this matter beyond what was available when the TUCP was considered and acted upon. To address this issue next year, as discussed above, this Order is conditioned on improved temperature management planning requirements. In addition, the efforts the State Water Board has taken to evaluate water unavailability and notify water users when water is unavailable at their priority of right will provide better clarity on Project water deliveries to settlement contractors next year and into the future, as will enhanced water diversion reporting requirements under the emergency curtailment and reporting regulation and this Order.

Further, the temporary changes to D-1641 were approved to maintain salinity control in the Delta and contribute to protecting reservoir storage, even if minimally, for temperature management in the Sacramento River and water supplies for the following water year while balancing impacts to water supplies for municipal, industrial, agricultural, and fish and wildlife beneficial uses.

The changes approved by the TUCP Order allowed the Projects to conserve 289,000 acre-feet in Shasta Reservoir. Condition 4 of the TUCP Order required DWR and Reclamation to submit monthly reports⁴⁸ on the amount of water conserved in storage and to identify the reservoir(s) where storage was conserved. See Table 4 below for a summary of water storage savings based on reports submitted in compliance with Condition 4. Reporting for exports and transfers required by Condition 1 and flow data also show that exports remained below the 1,500 cfs (3-day average) export limit, including transfers, during the term of the TUCP Order.

Table 4 Water Conserved in Storage from TUCP Order Changes

Reporting Date	Period of Conservation	Source of Savings	Quantity Conserved (acre-feet)
September 24, 2021	August 1-15	Shasta	26,000
August 27, 2021	July	Shasta	119,000
July 28, 2021	June	Shasta	144,000
Total			289,000

Based on the extreme magnitude of dry conditions, reservoir storage levels, and available information at the time of the TUCP, the Executive Director properly determined that the temporary changes to D-1641 flow and water quality requirements were in the public interest to conserve critically low reservoir storage for water quality, health and safety supplies, and temperature management.

Given the unexpected loss of inflow in April and May after settlement and exchange contractors had planted crops, begun irrigation, and made other irreversible commitments and that substantial amounts of reservoir storage had already been depleted and could not be regained, the changes in the TUCP Order were in the public interest to maintain salinity control in the Delta, which is necessary to protect water supply for large municipal populations, and contribute to reservoir storage for Sacramento River temperature management and multiple beneficial uses for the remainder of the water year.

Although it is clear that a portion of settlement contractor supplies and all exchange and service contractor supplies were provided from Project supplies, it is not clear what this total amount was given uncertainties in settlement contractor diversions under their own water rights versus Project rights. As discussed above, this Order requires additional reporting of those deliveries in WY 2021 and reporting of forecasted deliveries in WY 2022 to better inform future drought planning and response.

⁴⁸ See DWR emails submitted on July 29, August 27, and September 24, available at https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/tucp/.

4.1.2 Delta Exports

In related comments, multiple petitioners and commenters argued that allowing maximum Delta exports of 1,500 cfs in the TUCP Order was not in the public interest when D-1641 flow and water quality requirements that protect in-Delta agriculture and fish and wildlife resources were not being met. Petitioners and commenters stated that allowing exports of 1,500 cfs plus higher export rates to accommodate transfers of CVP and SWP water through the Delta were not in the public interest because they would have an unreasonable effect on fish and wildlife and prioritize the water supply needs of Project contractors above in-Delta and public trust needs in the upper watershed and the Delta. One comment letter argued that health and safety needs of SWP contractors should be supplied by sources outside the Delta watershed by purchase or reallocation. Many petitioners and commenters also identified that protecting human health and safety was a stated purpose for allowing exports in the TUCP and Order, but human health and safety needs were not identified or defined and export volumes to serve human health and safety needs were not quantified.

The maximum export level was reasonable and in the public interest given the urgent need to act to protect water storage in reservoirs, maintain salinity control in the Delta, and based on information available at the time. The TUCP proposed 1,500 cfs as a maximum export rate, with higher exports allowed for transfers, but there was uncertainty about the technical basis for the proposed maximum export rate at the time the TUCP was submitted and approved. Recognizing that additional information was needed to support a maximum export pumping threshold, the TUCP Order required reporting that described the primary purpose of export water under maximum export pumping rates, details regarding transfers exported through the Delta, and a report describing any constraints that may exist on export pumping levels, including infrastructure, minimum health and safety needs, and opportunities to use system infrastructure to further reduce exports.

Reporting required by the TUCP Order shows that SWP exports were expected to range between 300 and 350 cfs and CVP exports were expected to be 800 cfs, for a combined export rate of 1100 to 1150 cfs, which is an estimated export volume of 161,000 acre-feet from June through August 15. For CVP exports, 95 percent of export water was pumped for the purposes of meeting exchange and settlement contract obligations for irrigated agriculture; four percent for municipal and industrial purposes and one percent for wildlife refuge purposes. For the SWP, 68 percent of export water was diverted from the Delta for serving municipal and industrial supplies to South Bay Aqueduct contractors and 32 percent of SWP export water was diverted for agriculture and irrigation purposes. From the last half of July through August, CVP transfers were exported for a mix of purposes including municipal, industrial, agriculture, and irrigation, and accounted for approximately 30 percent of total CVP export pumping (250 cfs out of

800 cfs). During the same time, SWP transfer water accounted for 240 cfs (68 – 80 percent) of the total SWP export rate of 300 – 350 cfs.⁴⁹

SWP exports ranged from approximately 250 – 325 cfs (monthly average) and that CVP exports ranged from 611 – 803 cfs (monthly average). Total exports ranged from 725 cfs – 1200 cfs (3-day running average), below the 1,500 cfs export limit (3-day running average) in the TUCP order, inclusive of transfers, even though the TUCP Order allowed exports to exceed 1,500 cfs to accommodate transfer water. Total observed Delta exports, based on available data, are estimated to have been 143,600 acre-feet from June through August 15.⁵⁰

Reporting in compliance with the TUCP Order states that minimum health and safety exports will vary within a range, and that 1,500 cfs is a reasonable cap on that range.⁵¹ Petitioners and commenters are correct that health and safety needs are not defined or quantitatively identified in the TUCP or the TUCP Order and that the export limit in the TUCP Order may allow a reduction in reservoir storage by authorizing exports in excess of health and safety needs to some extent. Reporting on the purposes of minimal export pumping described above shows that exports of 1,200 cfs are higher than is required to meet reported minimum health and safety deliveries. For simplicity, municipal and industrial supplies are broadly considered to be for health and safety purposes,⁵² exports for settlement and exchange contracts are considered to be for primarily agricultural and irrigation purposes (though may also have a health and safety component), and wildlife refuge exports are considered to be for fish and wildlife purposes. An estimated 143,600 acre-feet of water was exported from the Delta in the June 1 – August 15 time period, a portion of which was for health and safety needs and a portion of which was not.

Reporting provided pursuant to Condition 10 of the TUCP Order states that the export pumping cap is influenced by infrastructure constraints. Specifically, the maximum CVP export amount is determined by operation of its smallest, 800 cfs, single-speed pump. Condition 10 reporting states that the CVP pumps cannot be power cycled (turned off and back on) very often because it increases risk of failure. Reclamation reports that a one-unit operation is maintained to avoid wear and tear on the infrastructure due to the age of the pumping plant. The next smallest pump and lowest CVP export rate

⁴⁹ See emails from DWR and Reclamation submitted on June 4, June 12, July 9, July 16, and August 3, 2021 available at https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/tucp/.

⁵⁰ CDEC <https://cdec.water.ca.gov/index.html>. Gauge codes TRP for Tracy Pumping Plant, sensor 70, discharge pumping; CLC for Clifton Court Forebay, sensor 76, reservoir inflow; and BBI for Byron Bethany Irrigation District Diversion, sensor 110.

⁵¹ See August 30, 2021 letter from DWR and Reclamation submitting information in accordance with TUCP Order Condition 10 available at https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/tucp/.

⁵² This is consistent with the definition of health and safety contained in the *CNRA v. Raimondo* Proposed Orders.

threshold is 1,100 cfs. DWR and Reclamation used a “single-facility export” approach that included turning off the CVP pump (without a failure) to achieve lower export rates for a short period of time this year and identified that the single-facility export operation could be used in the future if it does not cause “excessive wear and tear on the pumping units at the CVP Jones Pumping Plant.”⁵³

Given the extreme dry conditions of the last two years, the possibility of warm and dry conditions in the 2022 water year, and the modest health and safety demand filled by export pumping, this Order on Reconsideration requires DWR and Reclamation to evaluate and identify minimum Delta export rates for the purposes of meeting health and safety and wildlife refuge needs taking into consideration any infrastructure and operational safety constraints that are clearly defined and supported with evidence and documentation. As discussed above, this Order also requires additional reporting of water supply deliveries in WY 2021 and for WY 2022 that will better inform future drought planning.

In summary, based on information available at the time of the TUCP, the maximum export level was reasonable and in the public interest given the urgency to act to protect water storage in reservoirs and maintain salinity control in the Delta. Future drought response actions will be able to use additional information generated by the conditions of this Order and other actions taken by the Board to address drought conditions to inform public interest determinations regarding appropriate export rates.

4.1.3 Public Interest Determination for Exports

Condition 1.d.iii reserved the Executive Director’s authority to modify requirements of the TUCP Order, including export limits, and required DWR and Reclamation to provide a monthly accounting of total export quantities, the purposes for exports, and an explanation of why exports are in the public interest when D-1641 requirements are not being met. Multiple commenters stated, as they did in similar comments in 2014 and 2015 regarding TUCP Orders, that the Executive Director did not possess the authority to make a public interest determination regarding export limits in the TUCP Order or to modify export limits in the TUCP Order. A related comment argued that the State Water Board already determined that Project exports were in the public interest and the State Water Board had no authority to redetermine issues that were previously decided, including whether Project exports are in the public interest.

Although the Executive Director did not exercise her reservation of authority to modify export limits, the reservation of authority was appropriate and proper. As discussed in more detail in the section addressing the Executive Director’s Authority to impose conditions of approval, the Executive Director has authority to impose conditions of approval, including limits to export rates, to the extent necessary to support the findings that were required to be made to approve a TUCP. Moreover, Water Code section

⁵³ See August 30, 2021 letter from DWR and Reclamation submitting information in accordance with TUCP Order Condition 10 available at https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/tucp/.

1435, subdivision (b)(4) expressly requires a determination that proposed temporary urgency changes to a water right permit or license are in the public interest, notwithstanding the fact that before approving the underlying water right application and issuing the permit the Board may have found that the appropriation in general would be in the public interest. (See, e.g., Wat. Code, § 1253.) Accordingly, any of the State Water Board's previous public interest determinations concerning the Projects' diversion and use of water in general did not relieve the Executive Director of her responsibility to impose conditions of approval of the TUCP to ensure that the Projects' diversion and use under the TUCP in particular, including Project exports, would be in the public interest. In addition, exports are one component of the Projects purpose and use, Condition 1.d.iii applies during a short period of exports, and does not affect all Project exports. For the foregoing reasons, the Executive Director's limitation on exports and reservation of authority to modify that limitation in the public interest was well within her authority.

4.2 Findings Regarding the Urgent Need for the Changes

Another issue raised in the petitions for reconsideration and comment letters is whether an urgent need existed for the changes approved by the TUCP Orders and whether DWR and Reclamation exercised due diligence in the need for a TUCP. Multiple petitioners and commenters argued that multiple years of dry hydrology, and drought sequences are expected conditions in California and do not, on their own, justify an urgent need for temporary changes to, or a relaxation of, flow and water quality requirements in D-1641 that protect public trust resources, downstream irrigated agriculture, and domestic water supply. Petitioners and commenters argued that DWR and Reclamation failed to plan for drought by over allocating water, primarily to settlement and exchange contractors in excess of their own water rights and claims, resulting in low storage conditions and insufficient water supplies for meeting obligations in D-1641 and that these conditions do not justify an urgent need to relax water quality and flow requirements.

Petitioners and commenters also argued that State Water Board approval of TUCPs perpetuates or encourages management of Project reservoirs that fail to plan for drought. Commenters argued that TUCPs are now a regular part of DWR and Reclamation drought response demonstrated by including TUCP changes in modeling for other water supply planning activities.

Petitioners and commenters disagreed with the statement in the TUCP that DWR and Reclamation exercised due diligence to avoid the conditions that created an urgent need for temporary changes to D-1641 requirements. The TUCP stated that due diligence was exercised by 1) managing reservoir storage conditions in 2020 to start the 2021 water year with relatively high carryover storage given that 2020 was a dry year, 2) initially issuing very low allocations to its water supply contractors and further reducing allocations when the declining severe dry pattern began to emerge, and 3) meeting with State Water Board and fishery agency staff to provide weekly hydrology and condition updates and seek input on how best to manage multiple needs for water supply (May 17, 2021 TUCP, pages 8-9).

Multiple petitioners argued that DWR and Reclamation did not exercise due diligence to avoid conditions that created the need for a TUCP because of the following factors: 1) DWR and Reclamation allocated millions of acre-feet of water to settlement and exchange contractors in excess of the contractors' own water rights and claims and did not reduce SWP service contract allocations to zero; 2) DWR and Reclamation persisted in using overly optimistic assumptions for runoff projections (90 percent exceedance even though conditions were drier than the 90 percent exceedance), which resulted in an overestimate of expected water supply that did not materialize; 3) nearly 500,000 acre-feet of water was provided from Shasta and Oroville reservoirs between April and May 2021 to deliver to settlement contractors despite storage conditions that were very low (lower than they were in 2014 and 2015) and very low known precipitation and inflow; and 4) DWR and Reclamation did not diligently pursue application for a non-emergency change to their water right requirements to address drought related challenges in achieving D-1641 requirements.

Petitioners and commenters argued that a substantial portion of the water that was released from storage for water supplies could have been held in storage and released at times to protect Chinook salmon and to meet D-1641 requirements. In related comments regarding the Sacramento River TMP, petitioners and commenters argued that the State Water Board could have protected storage in Shasta Reservoir earlier in 2021 (March) through administration and enforcement of Order 90-5, which would have helped to avoid the need for a TUCP.

The Water Code defines "urgent need" to mean "the existence of circumstances from which the [B]oard may, in its judgment conclude, that the proposed temporary change is necessary to further the constitutional policy that the water resources of the state be put to beneficial use to the fullest extent of which they are capable and that waste of water be prevented...." (Wat. Code, § 1435, subd. (c).) The State Water Board may determine that an urgent need for temporary changes exists based on circumstances resulting from either natural condition (dry hydrology), or operational decisions, some combination of the two, or other factors.

The Executive Director properly determined that an urgent need existed for the proposed changes to address critically low water supplies and the associated impacts to water quality and supply, as well as impacts to fish and wildlife (addressed in the section describing findings regarding fish and wildlife and other instream beneficial uses), given that foregone opportunities to conserve storage for later use could not be regained by the time the TUCP and TMP were considered.

The issue of whether an urgent need for the changes existed should be distinguished from the issue of whether DWR and Reclamation exercised due diligence. Water Code section 1435, subdivision (c) provides that the State Water Board shall not find a petitioner's need to be urgent "if the board in its judgment concludes, if applicable, that the petitioner has not exercised due diligence either (1) in petitioning for a change pursuant to provisions of [division 2 of the Water Code (commencing with section 1000)] other than [chapter 6.6 (commencing with section 1435)], or (2) in pursuing that petition for change." In other words, petitioners must exercise due diligence in pursuing non-

urgent changes. In addition, the decision whether to find a lack of diligence is discretionary. Given the extraordinary circumstances presented by the current drought, the Executive Director appropriately found that an urgent need for the changes existed.

To improve drought planning and response next year, this Order includes several conditions discussed above. In the long term, resolution of systemic drought planning and response needs are addressed through: 1) long-term water right and water quality control planning processes, 2) improving water right administration and other processes for producing accurate and real-time water supply and demand data, and 3) streamlining curtailment actions to be responsive to changing hydrology within a season.

4.3 Findings Regarding Injury to Lawful Users of Water

Multiple petitions for reconsideration and comment letters raised issues associated with potential injury to legal users of water resulting from the TUCP Order. RTD et al. argued that the TUCP Order 1) incorrectly and too narrowly applied the no injury rule in Water Code section 1435 to “propertied” water rights; 2) did not consider injury to other beneficial users of water; 3) should have used a broad interpretation of legal users of water for the purposes of compliance with Water Code section 1435, and 4) injures beneficial users of water due to lower water quality and flow conditions allowed by the TUCP Order. CSPA et al. 1 made a related argument that they were harmed by the TUCP Order due to the hours of staff time and expenses the organization has encumbered to protect the Bay-Delta watershed, reduced quantity and quality of recreational angling opportunities, and harm to fisheries resulting from implementation of the TUCP Order.

The Executive Director appropriately applied the no injury rule in consideration of the TUCP and approval of the TUCP Order. Water Code section 1435, subdivision (b)(2) requires a finding that a TUCP will not result in injury to any legal users of water. As used in Water Code section 1435, the term “injury” means invasion of a legally protected interest. (*State Water Resources Control Board Cases* (2006) 136 Cal.App.4th 674, 738-743.) The argument asserted by RTD et al. incorrectly conflates two distinct concepts: 1) the protection of beneficial uses of water through the adoption and implementation of water quality objectives, and 2) the invasion of legally protected interests held by legal users of water. Flow and flow-dependent water quality objectives in the Bay-Delta Plan establish the desired condition of water quality for the reasonable protection of established beneficial uses consistent with state and federal law. Legal users of water, by contrast, include water right holders and contractors, and whether a given change will invade a legally protected interest held by legal users of water depending on the nature of their entitlements and the effects of the change. Water quality objectives and beneficial uses in a water quality control plan are established to protect water for public use, but water quality objectives and beneficial uses neither modify nor determine water rights or contracts, and do not grant legal permission to use water for a beneficial purpose to all Californians or “any person drawn to waters of the Delta for any reason,” as suggested by RTD et al. (See *United States v. State Water Resources Control Bd.* (1986) 182 Cal.App.3d 82, 177-189 [discussing distinction between beneficial uses and water rights].) A water right or contract must exist for legal

injury to occur in the context of Water Code section 1435, even though water quality objectives are established and implemented for public beneficial use protection.

SDWA et al. argued that the TUCP Order approves adverse impacts to other legal users of water because less Delta outflow, as allowed by the TUCP Order, increases salinity, which can subsequently decrease crop production in the Delta. SDWA et al. further argued that the TUCP Order incorrectly makes a finding of no injury to other legal users of water without evaluating the effects of reduced Delta outflow on crop production in the Delta and was concerned that the TUCP would result in adverse impacts to southern Delta salinity and subsequently be harmful to south Delta farmers. SDWA et al. further stated that the TUCP Order misstates law on riparian and pre-1914 appropriative water rights, arguing that riparian water right claimants in the Delta can be harmed by changes to upstream operations even if they cannot demand previously stored water to be released for their benefit. Finally, SDWA et al. argued that increases in Delta salinity and injury to senior right holders in the Delta is inconsistent with Water Code section 12200 et seq. [the Delta Protection Act], as interpreted in the *Racanelli* decision [*United States v. State Water Resources Control Bd.*, *supra*, 182 Cal.App.3d 82], which requires a sufficient supply to satisfy in Delta users, Delta water rights, and to repel salinity intrusion before the Projects can export water from the Delta.

In related comments, CDWA et al. argued that reducing reservoir releases could injure legal users of water in the Delta because releases of stored water are mitigation for the impact to legal users of water in the Delta due to Project storage of natural flow in winter and spring, which would otherwise provide freshwater supply in Delta channels extending into summer.

Riparian and appropriative water right holders and claimants with rights and claims to divert water below Project reservoirs only are entitled to divert natural and abandoned flows, and in the case of riparian claims only natural flows; they are not entitled to divert water previously stored or imported by the Projects that is released for use downstream, including stored water that is released for purposes of meeting water quality objectives. (See *State Water Resources Control Board Cases*, 136 Cal.App.4th at pp. 738, 743, 771.) Similarly, water right holders only are entitled to the natural flows necessary to provide adequate water quality for their purposes of use; they are not entitled to have water released from upstream storage in order to provide better water quality than would exist under natural conditions, and they are not entitled to better water quality than necessary to allow them to use the water to which they are entitled. (See *Wright v. Best* (1942) 19 Cal.2d 368, 378-379; see also *Deetz v. Carter* (1965) 232 Cal.App.2d 851, 856.) In the *State Water Resources Control Board Cases*, *supra*, the Court of Appeal acknowledged that the Delta Protection Act precludes the diversion of water from the Delta that is necessary for salinity control or to provide an adequate water supply to users within the Delta. The Court rejected the argument, however, that the Delta Protection Act gives Delta riparians and appropriators a right to water stored upstream by others, and the Court held that the Board has discretion to determine what level of salinity control should be provided and what is an adequate supply of water for Delta users, having balanced all relevant factors and competing interests in the water that flows through the Delta. (*Id.* at pp. 767-772.)

Contrary to CDWA et al.'s assertion, the Projects maintained better water quality and lower salinity in the spring and summer of 2021 than would have existed under natural conditions. Further, as described above, elevated releases from New Melones Reservoir provided for very low salinity levels in the south Delta for a portion of the year. Given the circumstances, including the extremely dry hydrology, Project storage conditions, Project water supply allocations, and the low level of Project exports, the level of salinity control in the Delta required under the TUCP Order was adequate and consistent with the Delta Protection Act. Accordingly, the Executive Director correctly concluded that legal users of water would not be injured to the extent that the Projects released less previously stored water as a result of the changes.

4.4 Findings Regarding Fish and Wildlife and Other Instream Beneficial Uses

Various petitioners and commenters argued that the TUCP Order and Sacramento River TMP approval would have unreasonable effects on fish and wildlife. Petitions for reconsideration of the TUCP Order were received from CSPA et al. 1, NRDC et al. 1, RTD et al., and SDWA et al. and petitions for reconsideration of the Executive Director's approval of the Sacramento River TMP were submitted by CSPA et al. 2, and NRDC et al. 2. Numerous comments were also received on fish and wildlife issues which are similar to those presented in the petitions. The Executive Director considered all submittals as they were received, even though a formal response has not been provided until now. Since the modifications to D-1641 and the 2021 Sacramento River TMP are no longer in effect, the following discussion focuses on major issues raised in the petitions and comments concerning the effects of the changes on fish and wildlife, responses to those comments, and potential actions that may be needed going into the 2022 water year to ensure the protection of fish and wildlife beneficial uses, the public interest, and the reasonable protection of other beneficial uses of water. The major issues are discussed in more detail below.

4.4.1 Fish and Wildlife Comments on TUCP Order

Several petitioners and commenters argued that fish populations were undergoing precipitous declines prior to the 2013-2015 and 2020-2021 drought cycles and that any modifications to D-1641 requirements were not in the public interest because they would unreasonably affect fish and wildlife and could lead to extinctions. Specifically, several petitioners and commenters identified that the existing Delta outflow objective and implementation of that objective through D-1641 is already inadequate for protecting fish and wildlife. They further argued that relaxation of inadequate Delta outflows will have, and has had, irreversible impacts on threatened, endangered, and commercially important fish species and potentially could lead to extinctions. They argued that fisheries dependent on Delta outflow have experienced flow conditions equivalent to super critical droughts in half of all years since 1975 because of increased consumptive use of water allowed by inadequate requirements for the reasonable protection of fish and wildlife. They further argued inadequate requirements have resulted in continued declines of fishery populations since D-1641 was adopted in 2000.

Several petitioners and commenters argued that reduced Delta outflow and installation of the 2021 Emergency Drought Salinity Barrier would have unreasonable effects on fish and wildlife and the ecosystem by reducing Delta inflows and outflows. Petitioners and commenters further argued the combination of reduced Delta outflow and a salinity barrier slows flows in Delta channels, results in X2 migrating further upstream, and consequently reduces the amount and quality of estuarine habitat. Petitioners and commenters stated these conditions will result in the following: increased risk of harmful algal blooms, expanded abundance and distribution of non-native submerged aquatic vegetation, increased abundance and distribution of Asian Clams, increased abundance of non-native fish species, diminished components of the food chain for native species, and increased extinction risk for longfin smelt and Delta smelt.

Several petitioners and commenters argued that fishery resources have been disproportionately impacted by the 2013-2015 and 2020-2021 drought cycles. Specifically, petitioners and commenters argued that unreasonable impacts would occur to fish and wildlife because their portion of flows in the overall water supply was very small when compared to deliveries to SWP and CVP contractors. They further argued that existing conditions are the result of poor water management decisions prior to and during the drought and that impacts to fish and wildlife incurred due to the failure of DWR and Reclamation to plan for drought periods. They further argued that existing and historic practices of depleting reservoirs and maximizing deliveries has led to the deterioration of the Bay-Delta ecosystem and decline of fish populations. Multiple petitioners stated that the modifications to D-1641 requirements would further exacerbate poor ecosystem status, repeat the poor ecosystem outcomes of the 2014 and 2015 TUCP Orders, and facilitate unreasonable impacts to fish and wildlife, and contribute to extinctions.

Several petitioners argued the basis for a finding of no unreasonable impacts in the TUCP Order was unsupported. A petitioner argued that the assessment of impacts to fish and wildlife was unreasonable because it relied on a flawed methodology whereby the impacts were determined to largely be the result of overall drought conditions. A petitioner argued the assessment of impacts was narrowly focused and only considered information provided by DWR and Reclamation. A petitioner argued there would be no benefit to conserved water from the approved modifications.

Several petitioners and commenters argued that the export of water by the Projects to fulfill transfers out of the Delta while D-1641 is not being met was unreasonable and would adversely affect fish and wildlife. Petitioners and commenters further argued these transfers should not be allowed without an evaluation and determination that the water being transferred is not needed for fish and wildlife purposes. Petitioners requested that the State Water Board reconsider and further limit exports to different levels below 1,500 cfs (e.g., no exports, limit to 750 cfs, limit to export rate needed to meet municipal and industrial needs and wildlife refuge contracts). Petitioners requested further limiting transfers of water through the Delta, denying temporary transfers, and requiring additional reporting on approved transfers to avoid unreasonable impacts to fish and wildlife.

Petitioners requested the State Water Board partially or completely deny the TUCP, reconsider and rescind approval of the TUCP, and reconsider and rescind approval of the Sacramento River TMP and enforce Order 90-5. One petitioner requested that the TUCP Order require DWR and Reclamation to account for all water that was not released due to meeting modified D-1641 requirements in the TUCP Order and to require that conserved water be stored in Shasta Reservoir to improve Sacramento River temperature control. One petitioner requested that the TUCP Order require Reclamation to use water from New Melones to meet D-1641 requirements to the extent practicable. Another petitioner requested that the State Water Board issue emergency regulations requiring curtailment of water diversions when D-1641 requirements were not being met. Multiple petitioners requested moving forward with updating and implementing flow-dependent water quality objectives in the Bay-Delta Plan to improve abundance of fish populations in non-drought years and minimize negative effects to fish populations in drought years.

4.4.2 Sacramento River TMP Comments

Petitioners argued operations of Shasta Dam in WY 2021 would result in a similar consequence to salmonid species that occurred during drought years 2014 to 2015, that operations would violate the Central Valley Regional Water Quality Control Board's Basin Plan for the Sacramento and San Joaquin River basins, and a large percentage of endangered winter-run and fall-run Chinook salmon would be lost due to temperature-related mortality. Petitioners also argued that the TMP's EOS storage target would have unreasonable temperature effects on salmonid species. Petitioners also expressed concern that the Sacramento River TMP only included actions for Shasta Dam.

Petitioners argued that the final Sacramento River TMP would fail to provide adequate protection for salmonids from thermal stress as required by Order 90-5. The petitioners argued that these impacts to the fishery were not in the public interest and the approval of the Sacramento River TMP violated the public trust doctrine. The petitioners also commented that the Sacramento River TMP did not meet the requirements of Order 90-5 because it failed to address thermal impacts to spring-run Chinook salmon and fall-run Chinook salmon. Petitioners identified that modeled temperatures above 60 degrees F between September and November would result in significant mortality to spring-run and fall-run Chinook salmon. By not including an analysis of the impacts to these additional runs, the petitioners claim that the Sacramento River TMP is not an adequate plan for compliance with Order 90-5.

The petitioners argued that the Final Sacramento River TMP violated Order 90-5 by failing to evaluate options within the "reasonable control" of Reclamation. The petitioners stated that reductions in water allocations to the Sacramento River Settlement Contractors (SRSC) are a factor within Reclamation's reasonable control, CVP allocations to settlement and exchange contractors met with releases from Shasta Reservoir were in excess of their water rights and claims, and that Reclamation is obligated to fulfill the conditions of its water rights prior to authorizing deliveries. The petitioners cited modeling conducted by NMFS that showed a reduction in releases from Keswick could have reduced TDM of winter-run Chinook salmon eggs to as low as

32 percent while substantially improving conditions in the fall for spring-run and fall-run Chinook salmon. The petitioners argued that it is the responsibility of the State Water Board to dictate whether an action is considered within Reclamation's "reasonable control," and by not requiring Reclamation to implement such actions, the Water Board's approval of the Sacramento River TMP was unlawful.

Petitioners requested the State Water Board take the following actions: 1) reconsider and rescind approval of the 2021 Sacramento River TMP; 2) implement the CSPA TMP; limit deliveries to CVP and SWP settlement and exchange contractors to the amounts of water they could reasonably claim under their claimed water rights; and 3) require a Sacramento River TMP for 2022 that includes an EOS storage target for Shasta Reservoir of 1,900,000 acre-feet and submission of a draft Sacramento River TMP by February 1, 2022.

4.4.3 Response to Fish and Wildlife Comments on TUCP Order

The TUCP Order acknowledged that the approved changes to DWR's and Reclamation's requirements to meet flow and water quality objectives could negatively impact fish and wildlife, but concluded that those effects would not be unreasonable given the lost opportunities to conserve reservoir storage in this second year of a drought. In approving the TUCP Order, the Executive Director considered the critical dry hydrologic conditions and the associated below average storage levels (see section describing Drought Conditions) in Projects' reservoirs, impacts associated with lower than expected inflows, the rapidly changing hydrologic conditions, and potential impacts to fish and wildlife resulting from reduced Delta outflow and increased Delta salinity. The Executive Director reasoned that maintaining flow and water quality requirements would have reduced the storage available in Project reservoirs later in the year for temperature control for fish, municipal and industrial use, wildlife refuges and other users, Delta salinity control, and minimal reserves going into water year 2022 should drought conditions continue. The Executive Director further reasoned that, without the changes, water supplies for various purposes would have been significantly diminished, resulting in significant hardship to local communities and additional dependence on already depleted groundwater supplies.

The TUCP Order included provisions to avoid unreasonable effects to fish and wildlife, including requiring Reclamation to operate in compliance with the Sacramento River TMP (see the section describing the Sacramento River Temperature Management Plan Approval), limitations on exports to improve storage, evaluation of pulse flows or other flow enhancements at a later time to improve protection for fish populations, an operational strategy for 2022, and evaluation of TUCP and other drought actions, including the salinity barrier, on harmful algal blooms and invasive aquatic species. The TUCP Order also required DWR and Reclamation to submit supporting information to the State Water Board justifying water transfers while taking into consideration fish and wildlife needs. Condition 4 in the TUCP Order also required DWR and Reclamation to calculate the volume of water that was not released from storage due to meeting modified Delta outflow and western Delta salinity requirements in the TUCP Order and identify the location of the conserved water. Although Condition 4 did not require DWR and Reclamation to store conserved water in Shasta Reservoir as one petitioner

requested, reporting for Condition 4 identified that 289,000 acre-feet (see the section describing Project Operations Limits and Drought Planning) of water was stored in Shasta as a result of the TUCP changes. Although salmon survival and ecosystem outcomes this year are expected to be poor, the increase in reservoir storage attributable to the TUCP Order was and continues to be available to support temperature management in the Sacramento River for salmon and native fish, to provide salinity control in the Delta for human uses and ecosystem protections, and to provide health and safety supplies.

Based on the information presented at the time the TUCP Order was approved, it was appropriate for the Executive Director to determine that the modifications to D-1641 would not unreasonably impact fish and wildlife. The State Water Board relied on information provided by fisheries agencies in addition to the TUCP. Federal and state fisheries agencies did not identify significant concerns with reductions in Delta outflow or allowing proposed Delta exports of 1,500 cfs to continue when D-1641 requirements were not being met. USFWS, NMFS, and CDFW provided technical assistance in the preparation of the Biological Review and reviewed the final product that was submitted in support of the TUCP. CDFW separately submitted an assessment to the State Water Board which analyzed potential effects to fish and wildlife resources as a result of the TUCP. USFWS and NMFS⁵⁴ had no significant concerns with the analyses contained in the Biological Review. CDFW expected minimal changes to entrainment of Chinook salmon, longfin smelt, and Delta smelt due to the export restriction of 1,500 cfs. CDFW acknowledged that the modified outflow and salinity requirements could have negative effects on threatened and endangered species, but the effects relative to the overall effects of the drought were uncertain.⁵⁵ As discussed previously, Delta exports including transfers during the term of the TUCP Order were less than 1,200 cfs, further reducing the potential for impacts to fish and wildlife from export pumping. The fisheries agencies also acknowledged the need to preserve storage in upstream reservoirs to benefit salmonid species later.

To further address continuing impacts to fish and wildlife going into next year following the TUCP of 2021, as discussed above, this Order requires Reclamation to take actions to improve temperature management in WY 2022, including providing minimum EOS storage levels in Shasta Reservoir and maximum temperatures on the Sacramento River for the protection of fish and wildlife and other species. In addition, the order includes requirements for improving forecasting and reporting and other information requirements to ensure that the State Water Board and other decision makers have adequate timely information on which to base future drought decisions.

⁵⁴ USFWS and NMFS jointly submitted a letter to the State Water Board on May 30, 2021. Available at https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/tucp/docs/2021/20210530_nmfs_usfwsltr_tucp.pdf.

⁵⁵ CDFW submitted a letter to the State Water Board on May 24, 2021. Available at https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/tucp/docs/2021/20210524_tucp_letter.pdf.

In the long-term, the State Water Board has acknowledged that currently implemented flow and water quality requirements in D-1641 and the Bay-Delta Plan need to be strengthened based on current scientific information regarding the needs of fisheries and other instream beneficial uses. The State Water Board is in the process of updating and implementing updates to the Bay-Delta Plan. In 2018, the State Water Board adopted amendments to the Bay-Delta Plan to establish new and revised Lower San Joaquin River flow objectives for the protection of fish and wildlife, as well as revised southern Delta salinity objectives for the protection of agriculture. These plan amendments were approved by the Office of Administrative Law and are now in effect as water quality and flow objectives. The updated flow objectives are expected to provide better protection, based on current scientific information, to fish and wildlife and other instream beneficial uses. Implementation of updated objectives by a broader group of water users beyond Reclamation, who currently has responsibility for meeting San Joaquin River flow objectives, is also expected to provide for improved ability to meet flow requirements during drought periods. The State Water Board is now in the process of implementing those updated objectives. The implementation process is at the starting point and has not been completed. Accordingly, D-1641 flow-dependent water quality requirements for LSJR flows and southern Delta salinity from the 2006 Bay-Delta Plan (and 1995 Bay-Delta Plan) are still in regulatory effect until implementation of the updated objectives is complete.

State Water Board staff are also developing possible changes to the Bay-Delta Plan and implementation and other measures for flows and cold water habitat in the Sacramento River, its tributaries, and tributaries to the Delta (the Mokelumne, Cosumnes, and Calaveras rivers); Delta outflows; and water project operations in the interior Delta for the protection of fish and wildlife (collectively referred to as Sacramento/Delta updates to the Bay-Delta Plan). Similar to the LSJR flow objectives, updates to Sacramento/Delta components of the Bay-Delta Plan are expected to provide for improved protections for fish and wildlife in the long term that would allow species to better withstand drought effects. Further, expanding the responsibility for meeting flow and water quality objectives beyond DWR and Reclamation is also expected to provide for improved ability to meet these requirements during drought periods.

With respect to the comments related to the 2021 TUCP compared to TUCPs in 2014 and 2015, water supply conditions were significantly worse in 2021 and the changes approved in the TUCP Order were much more narrow which limited the impacts of the TUCP on fish and wildlife. Low precipitation and reduced inflow conditions in water year 2021 were more severe than those observed in 2014 and 2015.⁵⁶ For example, Shasta Reservoir total inflow for water year 2021 (2,444,266 acre-feet) was 266,000 acre-feet less than total inflow for water year 2014 (2,710, 026 acre-feet) and more than

⁵⁶ https://water.ca.gov/-/media/DWR-Website/Web-Pages/Water-Basics/Drought/Files/Publications-And-Reports/091521-Water-Year-2021-broch_v2.pdf.

1,000,000 acre-feet lower than total inflow for water year 2015 (3,599,259 acre-feet).⁵⁷ Due to the more extreme drought conditions in 2021, some Project allocations were reduced more in 2021 than they were in prior drought years. For example, DWR allocated 425,000 acre-feet more to service contractors in 2015 (635,759 acre-feet)⁵⁸ than 2021 (208,639 acre-feet).⁵⁹ Although inflows were much lower in 2021, the changes requested in 2021 were much less extensive than those requested in 2014 and 2015 and were applicable during a less sensitive time period for native species, particularly migratory species which had largely completed their migration before the changes became effective. The 2021 TUCP Order only applied during June through August resulting in significantly less impacts to species dependent on Delta outflows and LSZ habitat than 2014 and 2015 when TUCP changes occurred from February through July. Accordingly, fish and wildlife impacts associated with the 2021 TUCP Order are expected to be substantially lower than the impacts to fish and wildlife associated with the 2014 and 2015 TUCPs.

With respect to the 2021 Emergency Drought Salinity Barrier, the Executive Director considered its impacts through the water quality certification process under section 401 of the Clean Water Act. This process was subject to requirements for noticing and solicitation of public comments. No petitions for reconsideration were received on that action; however, State Water Board staff nonetheless considered the comments that were received related to this issue. Recognizing the interactive hydrodynamic effects between the salinity barrier and reduced Delta outflow, monitoring for the emergency drought barrier includes supplemental surface and bottom salinity monitoring prior to and after installation of the barrier to evaluate the changes to the movement and size of the low salinity field.

With respect to a comment that the TUCP Order should have required Reclamation to use water from New Melones Reservoir to contribute to the Delta outflow requirement to the extent practicable, Reclamation did use water from New Melones to achieve the lower Delta outflow requirement approved in the TUCP Order, though this was not a specific requirement of the TUCP Order.

Additional public interest comments are discussed in other sections of this Order if the substance of the argument was more closely aligned with another issue. Responses regarding the TUCP Order appropriately balancing beneficial uses consistent with the public trust and reasonable use doctrines are described in the section addressing consistency with the Public Trust and Reasonable Use Doctrines.

⁵⁷ <https://cdec.water.ca.gov/reportapp/javareports?name=FNFSUM.2021>;
<https://cdec.water.ca.gov/reportapp/javareports?name=FNFSUM.2015>;
<https://cdec.water.ca.gov/reportapp/javareports?name=FNFSUM.2014>.

⁵⁸ https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Management/SWP-Water-Contractors/Files/NTC_2015_031121.pdf.

⁵⁹ https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Management/SWP-Water-Contractors/Files/NTC_21-06_032321.pdf.

4.4.4 Response regarding Sacramento River TMP Comments

Reclamation released a draft Sacramento River TMP on May 5, 2021. In comments on the draft TMP the Executive Director indicated that she would not approve the TMP unless it included: an end of September carryover storage requirement of at least 1,250,000 acre-feet; actions to achieve the carryover levels; reporting requirements; real-time management on a weekly basis with staff from the fisheries agencies, the State Water Board, and other appropriate entities; and monitoring, modeling, and other evaluations needed to ensure that temperature management actions are optimized and to inform future management actions. Reclamation submitted a final TMP on May 28, 2021. The Executive Director approved the final Sacramento River TMP on June 10, 2021.

The Executive Director acknowledged the very challenging hydrologic conditions in her approval and also indicated that the expected high TDM levels raise significant concerns related to protection of winter-run Chinook salmon and that these high TDM levels could increase the risk of extinction significantly. The Executive Director also acknowledged that the conditions were concerning for fall-run Chinook salmon protection. Despite these concerns, due to the extremely dry conditions and the significant reduction in expected Shasta Reservoir inflows this year, the Executive Director approved the TMP indicating that the TMP reflected the known feasible and reasonable management actions Reclamation could take to control temperatures this year. The final TMP approval required Reclamation to: take all actions within its reasonable control to improve temperature conditions and ensure that TDM levels are minimized to the maximum extent feasible; evaluate additional options to improve temperature management; take actions within its reasonable control to achieve an EOS storage level of 1,250,000 acre-feet; and conduct regular consultation, reporting, monitoring, modeling, and evaluations.

While temperature management discussions started in the late winter, the rapidly degrading conditions in the spring left limited options for providing more optimal temperature management conditions. By the time the reduced cold water storage supply issues were identified and the Sacramento River TMP revised, options for achieving an EOS storage target sufficient to maintain temperatures protective of Chinook salmon were limited or eliminated. The TUCP was approved for this purpose and a warm water bypass was conducted. Both of which improved cold water supplies substantially, but not adequately to effectively improve conditions for winter-run Chinook salmon.

The remaining available options included further reducing water use by the settlement and exchange contractors and other water users. The State Water Board took actions to reduce water usage by users when supply was found to not be available at their priority of right by issuing notices of water unavailability and curtailments. However, it is not clear how effective these actions were at this point. For curtailments to be the most effective, a long-term system for curtailments is likely needed beyond the emergency procedures that were used this year.

Further, reductions in deliveries to settlement and exchange contractors after planting had occurred could have presented a significant hardship to those users and others who purchased water from those users. The SRSC identified that they would voluntarily reduce their use by 10 percent from their 75 percent reduced contract allocation applicable in 2021 (Shasta Critical Year allocations). However, average use in a non-Shasta Critical year is generally close to 75 percent. A significant portion of SRSC water (approximately 240,000 acre-feet or more) was sold through forbearance agreements and other transfers to other users south of Delta that received zero CVP allocation in 2021 and other users north of the Delta that experienced limited supplies under their own rights and contracts. These transfers helped to minimize economic damage to permanent crops and associated economic impacts to individual farmers and their communities. Supplies received by settlement contractors in the fall are also used for rice-straw decomposition that generates habitat for birds on the Pacific Flyway, and broadly contributes to fish and wildlife protection.

Although the Executive Director's approval of the final Sacramento River TMP was reasonable at the time, temperature control on the Sacramento River was lost prior to the end of the temperature management season, the EOS storage target was not met, and early estimates of TDM for winter-run Chinook salmon are high. Additional egg and juvenile mortality from thiamine deficiencies are having further impacts on winter-run Chinook salmon. In addition, spawning success and juvenile survival of spring-run and fall-run Chinook salmon are not yet quantified and understood; but temperature and other conditions were poor for those species as well, and survival is not expected to be high.⁶⁰

Based on the events of the past two years, temperature concerns that also occurred in the 2014-2015 drought, and poor survival of juvenile Chinook salmon from several factors discussed above, the State Water Board agrees with petitioners that significant changes to the temperature management process are needed to ensure that winter-run Chinook salmon do not go extinct, to avoid further declines in other salmon populations, and to ensure that there is timely, transparent, and accurate information provided to inform temperature management decisions.

Many of the issues that lead to poor ecological outcomes could be addressed by updating and strengthening the procedures associated with Sacramento River temperature management based on improved scientific knowledge and experience gained over the last thirty years since adoption of Order 90-5. The sequence and timing of temperature management actions required by Order 90-5 and Project operation

⁶⁰ Contrary to the SRSC's assertion, in acting on the petitions for reconsideration the Board may consider information concerning temperature management outcomes that post-dates approval of the 2021 TMP. (See Cal.Code Regs., tit. 23, §§ 768, subd. (c), 769, subd. (b), 770, subd. (a)(2) [authorizing reconsideration of a decision based on evidence that could not have been produced in the exercise of reasonable diligence before the decision was made]; State Water Board Order WR 96-1, p. 8 [recognizing that it may be appropriate to reconsider a decision based on new evidence of emergent facts].)

decisions limit the actions that can be taken to maintain temperature control in the Sacramento River. Project allocation decisions prior to evaluating and addressing temperature management needs substantially limits available temperature management actions. As observed this year, another factor that reduced options to maintain temperature control was the unexpected loss of reservoir inflows from snowmelt due to low runoff efficiency. Lower than expected inflows further reduced the ability to achieve sufficient Shasta Reservoir storage needed to meet temperature targets and maintain temperature control for Chinook salmon on the Sacramento River. Lower runoff efficiency may continue to occur given changes to hydrology and the water cycle associated with climate change. The risk associated with inflow forecasts should be conservatively managed to ensure sufficient reservoir storage for achieving temperature targets and maintaining temperature control in the Sacramento River.

Condition 1 of this Order is intended to provide for improved temperature control on the Sacramento River in water year 2022. Condition 1 outlines the requirements and sequencing of Sacramento River temperature management actions in 2022 pursuant to Order 90-5 in consideration of the IOP as filed with the court on November 23, 2021, in litigation challenging the 2019 BiOps for operation of the CVP.⁶¹ As discussed above, other conditions in the Order provide for improved forecasting and timely development of information to support Sacramento River temperature management planning and other drought decision making.

Based on the above, the Executive Director's approval of the 2021 Sacramento River TMP was reasonable based on information available at the time, with the additional conditions included in this Order.

4.4.5 Response to Fish and Wildlife Comments on TUCP Order and Sacramento River TMP

As described in the prior two sections, the Executive Director's approvals of the TUCP Order and the Sacramento TMP were reasonable based on information available at the time of approval, but the additional conditions included in this Order should be imposed on DWR and Reclamation to better prepare in case the drought continues. Specifically, improved drought management planning is needed in 2022. Several petitioners and commenters requested the denial or rescinding of the TUCP Order and Sacramento River TMP approval because the amount of water needed to achieve unchanged D-1641 requirements and the Sacramento River TMP (or an alternative to the Sacramento River TMP) was a small portion of the water allocated to CVP and SWP senior contractors. In May, the TUCP estimated that 60,000 – 120,000 acre-feet of water (approximately 1 – 3 percent of Project allocations) could be stored in reservoirs instead of being released to achieve D-1641 Delta outflow. In August, DWR and Reclamation reported that 289,000 acre-feet of water (approximately 7 percent of Project allocations) was stored in Shasta Reservoir instead of released for the purposes of meeting the unchanged Delta outflow and western Delta salinity requirements in D-1641. The approved Sacramento River TMP required EOS Shasta Reservoir to be

⁶¹ *CNRA v. Raimondo, supra.*

1,250,000 acre-feet, however, actual EOS storage in Shasta Reservoir was 1,074,380 acre-feet, approximately 176,000 acre-feet lower than the requirement.

The combined volume of water needed to achieve D-1641 requirements plus the Sacramento River TMP was approximately 465,000 acre-feet (289,000 + 176,620 acre-feet). To meet more protective temperature conditions for winter-run Chinook salmon, even more water would have been needed to remain in storage. CSPA et al. 2 recommended an EOS storage volume in Shasta Reservoir of 1,353,000 acre-feet and the operational scenario with lowest winter-run Chinook salmon TDM that was analyzed by NMFS (46-88 percent) included an EOS storage volume in Shasta Reservoir of 1,465,000 acre-feet.⁶² An additional 568,000 - 680,000 acre-feet (12-15 percent of 2021 Project allocations) of water would have been needed to meet the unchanged D-1641 requirements plus the more protective Shasta Reservoir EOS storage levels discussed above. Achieving these diversion reductions would require further Project allocation reductions, curtailment of other diversions, or a combination of those actions.

One petitioner requested that the State Water Board issue emergency regulations requiring curtailment of water diversions when D-1641 was not being met to ensure reasonable protection of fish and wildlife. Emergency regulations cannot be established or adopted through reconsideration of the TUCP Order or the Sacramento River TMP. However, as discussed above the State Water Board did adopt an emergency regulation in August of 2021, as soon as practicable after authority was provided in the May 2021 Executive Order for emergency regulations. Curtailment orders were then issued on August 20, 2021, immediately after the Office of Administrative Law approved the regulation but after the changes to Delta outflow, western Delta salinity, and export limits were no longer in effect. However, the curtailment orders were in place in time to provide modest benefits to, or reduce further declines in, reservoir storage for protection of fish and wildlife, specifically Shasta Reservoir EOS storage and Sacramento River temperature for salmon, by minimizing depletions along the Sacramento River. Unless repealed or renewed, the emergency regulation will remain in effect until August 19, 2022, and future curtailment orders issued pursuant to the regulation are likely to assist in preserving remaining Project stored water supplies and rebuilding Project storage to the extent that water becomes available to DWR and Reclamation in accordance with the priorities of their water rights.

In consideration of the extreme dry conditions this year and unanticipated loss of runoff late in the season, the changes in the TUCP Order, approval of the final Sacramento River TMP, and associated impacts to fish and wildlife were reasonable. The changes provided for improved reservoir storage needed to maintain salinity control in the Delta, which is necessary to protect water supplies for large municipal populations and fish and wildlife, as well as agricultural purposes. For all the reasons above, the State

⁶² NMFS May 14, 2021 letter to Reclamation regarding 2021 Draft Sacramento River Temperature Management Plan. Available from State Water Board website at https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/sacramento_river/docs/2021/2021-05-24_nmfs_final_comments_sacramento_tmp_2021_corrected_508_signed.pdf.

Water Board finds that the Executive Director's decisions were reasonable at the time they were made, and therefore the petitions for reconsideration are largely denied.

The conditions in this Order are intended to improve the Boards' approach to issues that occurred in 2021 associated with timing of decisions for Project allocations and storage needs for temperature management and issues experienced this year with inaccurate runoff efficiency and inflow estimates. Specifically, this Order includes conditions which should be imposed on DWR and Reclamation to better prepare in case dry conditions continue and that address the timing of Project allocations and temperature management planning, Delta export thresholds necessary to meet health and safety demand and infrastructure safety constraints, transparent explanation of forecast methods and improvements to those methods, and use of improved methods in temperature management planning and water resource planning for meeting requirements of D-1641 and Order 90-5.

4.5 Findings Regarding Other Comments

4.5.1 Consistency with Water Quality Law

A petitioner argued the TUCP and Order contravene the federal Clean Water Act by arbitrarily weakening criteria without following mandated processes and ignoring federally promulgated water quality criteria. The petitioner further argued neither the Governor nor the State Water Board has authority to unilaterally waive water quality standards that protect designated uses under the federal Clean Water Act. These arguments incorrectly conflate the State Water Board's planning authority under the Clean Water Act with its implementation authority under state law. The TUCP Order did not waive water quality standards; rather, it temporarily altered implementation requirements under state law as directed by Governor Newsom's State of Emergency Proclamations.

The Water Board can and does implement water quality objectives pursuant to its planning authorities and water right proceedings under state law. However, absent restraints imposed by the State Water Board itself (see Water Code section 13247, discussed below), the State Water Board has discretion to decide how to implement objectives in the context of statutory and common water rights law. This is consistent with the U.S. Supreme Court's interpretation of Clean Water Act section 101(g), which allows regulation of water users by a state to protect water quality while avoiding a fundamental interference with state water allocation authority. (*PUD No. 1 of Jefferson County v. Washington Dep't of Ecology* (1994) 511 U.S. 700, 720.) The TUCP Order temporarily changed some of the conditions of the water right permits and license for the Projects, which otherwise would have required DWR and Reclamation to fully meet water quality objectives in the Bay-Delta Plan. This was an implementation action under state law authority. The TUCP Order did not change the water quality objectives themselves in a manner inconsistent with the Clean Water Act.

There is no merit to the petitioner's argument that the State Water Board ignored federally promulgated water quality criteria. As a component of a coordinated initiative of federal agencies, U.S. Environmental Protection Agency (U.S. EPA) promulgated criteria pursuant to Clean Water Act section 303(c)(3) and 303(c)(4) after it disapproved

the State Water Board's 1991 Bay-Delta Plan. (60 Fed. Reg. 4668 (1995).) U.S. EPA subsequently approved the 1995 Bay-Delta Plan and has committed to withdraw the standards articulated in Code of Federal Regulations, title 40, section 131.37. The Third District Court of Appeal confirmed that, once approved by U.S. EPA, the applicable water quality standards are those in the 1995 Bay-Delta Plan as a matter of law. (*State Water Resources Control Board Cases*, *supra*, 136 Cal.App.4th at pp. 774-775 [citing 33 U.S.C. § 1313(c)(2)(A), (c)(3)].)

4.5.2 Water Supply Forecast

One commenter noted that DWR and Reclamation claimed that an error in forecasting runoff available as inflow to the reservoirs is one of the primary factors in determining the need for a TUCP. The commenter requested that the State Water Board include conditions in the TUCP order that require a report from DWR and Reclamation by September 30, 2021, describing their forecast methodology, the cause of the forecast error, and a workshop by November 30, 2021, to allow input from stakeholders. The commenter argued that these requirements are necessary to protect the public interest and public trust in future years. The State Water Board acknowledges that forecasting methods can be improved and has included conditions in this Order in response.

4.5.3 Authority to Impose Conditions of Approval

Multiple commenters, including the Exchange Contractors Water Authority (Exchange Contractors), alleged that the reservation of authority for the Executive Director to modify Project export limits based on an assessment of public interest had no due process of law and did not require approval of the five-member State Water Board prior to making changes to export limits, and was therefore an unconstitutional delegation of authority.

In Order WR 2014-0029, the State Water Board rejected similar arguments that the Executive Director lacked authority to impose conditions of approval of the 2014 TUCP. (See Order WR 2014-0029, pp. 21-22, 46-47.) As explained in Order WR 2014-0029, the State Water Board delegated to the Executive Director the authority to conditionally approve the TUCP, subject to reconsideration by the full Board. In addition, the Executive Director had authority to impose conditions of approval to the extent necessary to support the findings that were required to support approval of the TUCP. In particular, the conditions restricting exports and requiring a Sacramento River TMP to be implemented were necessary to ensure that the changes to Delta outflow and other water quality requirements would be in the public interest and would not result in unreasonable impacts to fish and wildlife.

Multiple commenters argued that requiring compliance with the Sacramento River TMP in the TUCP Order was unlawful because the impacts of the Sacramento River TMP were unknown at the time of approving the TUCP Order. Commenters stated that the Sacramento River TMP was still a draft at the time of approving the TUCP Order which did not provide an opportunity for parties to object to conditions of the Sacramento River TMP or raise concerns regarding potential injury resulting from the TUCP order condition that required implementation of the approved Sacramento River TMP. These arguments do not have merit. A substantial amount of information was known about the

potential impacts of the Sacramento River TMP even if the final version was not approved by the date of issuing the TUCP Order. The process for proposing, evaluating, and approving a Sacramento River TMP had spanned many months, included stakeholders, and was the subject of a public workshop held on April 20, 2021. In addition, the Executive Director communicated by letter (May 21, 2021)⁶³ the required elements for an approval of the Sacramento River TMP, prior to the June 1, 2021 TUCP Order. All of this information was made available to the public on the State Water Board website. In addition, interested parties had the opportunity to seek reconsideration based on any new information in the final Sacramento River TMP.

Multiple commenters also argued that conditions in a TUCP Order cannot extend beyond the 180-day expiration date of the order. In addition, commenters argued that the State Water Board lacks authority to add conditions to Reclamation's and DWR's water rights in response to the petitions for reconsideration of the TUCP Order, and that the conditions of this order are unlawful because they lack a nexus to the changes approved by the TUCP Order. Contrary to these arguments, however, Water Code section 1440 expressly provides that the authorization to divert and use water under a temporary change order expires after 180 days (unless a shorter time period is specified in the order or the order is renewed), but the 180-day period does not include any time required for monitoring, reporting, or mitigation before or after the authorization to divert or use water under the order. Moreover, on reconsideration of a TUCP Order, the Board may make any appropriate changes to the monitoring, reporting, or mitigation requirements that were imposed as conditions of approval of the TUCP. (See Cal. Code Regs., tit. 23, § 770, subd. (a)(2)(B)-(C).) As explained below, the conditions of this order constitute appropriate additions to the monitoring, reporting, and mitigation requirements that the Executive Director imposed as conditions of approval of the 2021 TUCP.

Specifically, Condition 1 is intended to mitigate for the impacts to fish and wildlife caused by the changes approved by the TUCP Order. Preparation and implementation of an adequate TMP in 2022, as required by this condition, will protect the Chinook salmon species that were adversely affected by the changes approved in 2021, and were not adequately protected by the TMP approved in 2021. In addition to mitigating for impacts to salmon, the Executive Director anticipated that the benefits of improved temperature control in 2021 would offset the impacts of the changes on other fish species in the Delta. Given the poor outcomes for salmon survival in 2021, ensuring adequate temperature control in 2022 is necessary to ensure that the impacts to multiple fish species in the Delta in 2021 were not in fact unreasonable.

Conditions 2, 4, and 5 of this order are monitoring and reporting requirements that will provide more information concerning the impacts of the changes approved in 2021, and whether those impacts were reasonable and in the public interest, taking into consideration CVP and SWP export and in-basin deliveries for various purposes in 2021, and the physical and legal constraints on CVP and SWP operations. Obviously,

⁶³https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/sacramento_river/docs/2021/2021.05.21%20draft%20tmp%20response.pdf.

this information will not be provided in time to inform the decision whether and under what conditions to approve the 2021 TUCP, but this information will serve to better inform future decision-making in the event that the drought emergency continues and DWR and Reclamation file a TUCP in 2022 seeking similar changes. Similarly, although condition 3 of this order is prospective, the improvements to water supply forecasting and the information concerning project operations required by that condition will inform the determination whether an urgent need for any future changes exists, or can be avoided, and will assist the Board in its efforts to effectively manage scarce water resources during the ongoing drought emergency.

4.5.4 Consistency with the Public Trust and Reasonable Use Doctrines

Several petitioners and commenters argued the TUCP and Order violated the public trust and reasonable use doctrines because they prioritized CVP and SWP contract obligations over public trust uses and did not demonstrate that more effective measures to protect carryover storage were infeasible. They specifically argued that agricultural uses were elevated above fish and wildlife uses.

The balancing between different uses effectuated by the TUCP, TUCP Order, and Sacramento River TMP did not violate the public trust and reasonable use doctrines. The public trust doctrine requires the State Water Board to protect public trust resources to the extent feasible and consistent with the public interest. (*State Water Resources Control Board Cases, supra*, 136 Cal.App.4th at p. 778.) Under the public trust doctrine, the Board has considerable discretion to balance competing demands for water to protect fish and wildlife and to serve municipal, industrial, and agricultural uses. (*Ibid.*) Article X, section 2 of the California Constitution and Water Code section 100 prohibit the waste, unreasonable use, unreasonable method of use, and unreasonable method of diversion of water. What constitutes a reasonable water use depends on the entire circumstances presented and varies as conditions change. (*Light v. State Water Resources Control Board* (2014) 226 Cal.App.4th 1463, 1479-1480.) As described in Sections 4.4.5 and 4.4.6, the Executive Director properly determined that the temporary changes to D-1641 and approval of the Sacramento River TMP were reasonable and consistent with the public trust doctrine given the extremely dry hydrology and low reservoir storage and the need to conserve critically low water supplies and minimize associated impacts to water quality and supply in downstream urban and rural communities, as well as minimize impacts to fish and wildlife. For the reasons above, we affirm that the TUCP Order achieved a reasonable balance of competing demands during the drought emergency, based on the information available at the time, consistent with the public trust and reasonable use doctrines.

CSPA et al. 1, in their petition, argued the TUCP Order violated a Settlement Agreement between CSPA and the State Water Board⁶⁴ because it failed to analyze

⁶⁴ In July 2020, a Settlement Agreement and Release of Claims was entered into by and between the California Sportfishing Protection Alliance, Aqualliance, and California Water Impact Network (Plaintiffs) and the State Water Board and Thomas Howard as Executive Director (Defendants).

impacts to public trust resources. This argument lacks merit. Consistent with the Settlement Agreement, the TUCP Order included an explicit discussion evaluating impacts to public trust resources. In particular, the TUCP Order included an analysis of the impacts of the temporary changes on water quality, including the potential for the changes to contribute to increased cyanobacteria blooms, and the associated effects to recreation and the availability of fish and wildlife habitat. This discussion was supplementary to the findings required by Water Code section 1435 (see section 2.12, Water Code 1435).

4.5.5 Consistency with Fish and Wildlife (Game) and Endangered Species Laws

CSPA et al. 1 argued the TUCP and Order violated California Fish and Game Code Section 5937 by failing to keep fish downstream of dams in good condition. Fish and Game Code Section 5937 reads as follows:

The owner of any dam shall allow sufficient water at all times to pass through a fishway, or in the absence of a fishway, allow sufficient water to pass over, around or through the dam, to keep in good condition any fish that may be planted or exist below the dam. During the minimum flow of water in any river or stream, permission may be granted by the department to the owner of any dam to allow sufficient water to pass through a culvert, waste gate, or over or around the dam, to keep in good condition any fish that may be planted or exist below the dam, when, in the judgment of the department, it is impracticable or detrimental to the owner to pass the water through the fishway.

Section 5937 applies to dam owners, and as such, it is their responsibility to comply with this section by releasing sufficient water to keep fish in good condition.

A petitioner argued the TUCP and Order violated the state and federal endangered species acts and would harm and result in the take of listed species. The petitioner made this argument notwithstanding the letters received from the fisheries agencies. In the joint letter submitted on May 30, 2020, NMFS and USFWS acknowledged the TUCP was consistent with the Drought and Dry Year Action planning process outlined in Reclamation's Proposed Action included in Reclamation's 2019 Biological Assessment and confirmed in the Biological Opinions on the Coordinated Long-Term Operations of the Central Valley Project and State Water Project issued on October 21, 2019. In addition, CDFW issued an amendment to the Incidental Take Permit for SWP operations to cover the changes requested in the TUCP.

In addition to the review of the fisheries agencies, a condition was included in the TUCP Order to preclude take of listed species without authorization. Condition 13 states:

This Order does not authorize any act that results in the taking of a candidate, threatened, or endangered species, or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the federal Endangered Species Act (16 U.S.C.A. sections 1531 to 1544). If a "take" will result from any act authorized

under this Order, the Petitioners [DWR and Reclamation] shall obtain authorization for an incidental take permit prior to construction or operation of the project. Petitioners [DWR and Reclamation] shall be responsible for meeting all requirements of the applicable Endangered Species Act for the temporary urgency changes authorized under this Order.

4.5.6 Consistency with the Delta Reform Act

A commenter argued the TUCP conflicted with the Delta Reform Act of 2009: (1) the policy of achieving the coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem (Wat. Code, § 85054); and (2) the policy of reducing reliance on the Delta in meeting California's future water supply needs by investing in improved regional supplies, conservation, and water use efficiency (Wat. Code, § 85021). As to the coequal goals, the purpose of the modifications to D-1641 approved by the TUCP Order was to improve water supply reliability during the drought emergency. Although the TUCP Order relaxed requirements that serve to protect the Delta ecosystem, approval of these modifications on a temporary basis during a drought emergency was not inconsistent with the long-term goal of protecting, restoring, and enhancing the Delta ecosystem. As to the second policy, the TUCP Order had no bearing on any efforts to reduce reliance on the Delta by improving regional supplies, conservation, and water use efficiency.

5.0 CONCLUSIONS

For the forgoing reasons, the State Water Board concludes that the Executive Director's June 1, 2021 TUCP Order and the Executive Director's approval of the Sacramento River TMP pursuant to Order 90-5 were consistent with applicable law and supported by substantial evidence available at the time, but additional requirements should be imposed on DWR and Reclamation to better prepare in case the drought continues. Accordingly, the petitions to reconsider the Executive Director's 2021 TUCP Order and Sacramento River Temperature Management Plan pursuant to Order 90-5 are denied in part and granted in part.

ORDER

IT IS HEREBY ORDERED that, the Executive Director's June 1, 2021, Order Approving a Temporary Urgency Change Petition (TUCP Order) to modify requirements of the Department of Water Resources' (DWR) and U.S. Bureau of Reclamation's (Reclamation) water rights included in State Water Board Revised Decision 1641; and June 10, 2021 Sacramento River Temperature Management Plan (TMP) approval pursuant to State Water Board Order 90-5 are affirmed. The petitions for reconsideration are denied in part and granted in part. Specifically, the conditions set forth below are added to DWR's and Reclamation's water rights to prepare for a potential future drought year.

NOW, THEREFORE, IT IS ORDERED that the following conditions are added to Permits 16478, 16479, 16481, 16482 and 16483 (Applications 5630, 14443, 14445A, 17512 and 17514A, respectively) of the Department of Water Resources (DWR) for the State Water Project (SWP) and License 1986 and Permits 11315, 11316, 11885,

11886, 11887, 11967, 11968, 11969, 11970, 11971, 11972, 11973, 12364, 12721, 12722, 12723, 12725, 12726, 12727, 12860, 15735, 16597, 20245, and 16600 (Applications 23, 234, 1465, 5638, 13370, 13371, 5628, 15374, 15375, 15376, 16767, 16768, 17374, 17376, 5626, 9363, 9364, 9366, 9367, 9368, 15764, 22316, 14858A, 14858B, and 19304, respectively) of the United States Bureau of Reclamation (Reclamation) for the Central Valley Project (CVP). All other terms and conditions of the subject license and permits, including those added by the State Water Resources Control Board (State Water Board) in Revised Decision 1641 (Decision 1641) shall remain in effect.

1. Reclamation shall develop a draft and final Sacramento River TMP, in consultation with the State Water Board and state and federal fisheries agencies, for water year 2022 as follows:
 - a. The Sacramento River TMP must demonstrate the fishery will be protected from detrimental temperatures to the extent within Reclamation's reasonable control.
 - b. The Sacramento River TMP shall be based on the best available hydrologic information including improvements to forecasting methods for estimating precipitation, runoff efficiency, and inflow.
 - c. The TMP shall include maximum temperature levels for the protection of winter-run Chinook salmon and end-of-September carryover storage goals. In evaluating the TMP the State Water Board will consider the applicable targets in the final IOP approved by the court,⁶⁵ and may require additional measures pursuant to its independent authority.
 - d. The agency consultation process and schedule for the draft and final Sacramento River TMP shall be consistent, to the extent possible, with the IOP as approved by the court for efficiency and consistency in multi-species and ecosystem management.
 - e. An initial draft Sacramento River TMP shall be submitted to the State Water Board no later than April 1, 2022. A final Sacramento River TMP shall be submitted to the State Water Board no later than May 1, 2022. The Executive Director may grant an extension to the May 1, 2022 due date upon a showing that the deadline cannot be met in the exercise of reasonable diligence because relevant and material temperature management information was not timely available.
 - f. Reclamation in coordination with other agencies and stakeholders involved in Sacramento River temperature management shall make information developed in the process of Sacramento River temperature planning for 2022 available to the public as soon as practicable.
2. DWR and Reclamation shall evaluate and identify minimum Delta export thresholds for the purposes of meeting human health and safety and wildlife refuge needs that are consistent with any infrastructure and operational safety constraints that are clearly defined and supported with evidence and

⁶⁵ *CNRA v. Raimondo*.

documentation. This evaluation shall include a definition of human health and safety supply, describe the recipients and uses of any water exported south of Delta during the effective period of the changes approved by the June 1, 2021 TUCP Order, describe whether DWR and Reclamation considered that use to have constituted a health and safety need, and quantify human health and safety supply (monthly volume in acre-feet). This evaluation shall be done in coordination with State Water Board staff. A draft report is due to the State Water Board no later than April 1, 2022. DWR and Reclamation shall present the draft report at a State Water Board meeting for public and Board comments. A final report is due to the State Water Board no later than 30-days after receiving staff and public comments.

3. DWR and Reclamation shall identify and implement needed improvements to forecast methods to avoid significant over- or under- estimates of available water supplies and shall provide updates to the Board on these efforts along with updates on current hydrologic and operational forecasts for the water year on a monthly basis starting in March of 2022 and continuing until the drought emergency is over. Monthly hydrologic and operational forecasts shall also be submitted in writing and include information on forecasted inflows; reservoir releases; water supply deliveries; reservoir storage levels; any Coordinated Operations Agreement debts; planned water transfers, forbearance agreement actions, exchanges, and other actions of this nature; and other relevant information that may be requested by the State Water Board's Executive Director to inform future drought related decision making.
4. By April 1, 2022, DWR and Reclamation shall provide a written accounting, in an electronic spreadsheet format, of the actual monthly contract deliveries that occurred during water year 2021. The accounting shall include deliveries to the groups of contractors identified in Table 1 of this Order. For Feather River Agencies and Sacramento River Settlement Contractors, the accounting shall identify: the monthly delivered volume that was made pursuant to SWP and CVP water rights; the monthly delivered volume that was diverted under the Feather River Agencies' and Sacramento River Settlement Contractors' own water rights and claims of right; SWP supply, CVP supply, Sacramento River Settlement Contract, and Feather River Agency contract supply that was transferred, exchanged, or part of a forbearance agreement and the groups of users that this water was provided to; and the monthly and total volume of water diverted under all rights and claims by these users and the allocation percentage that it represents.
5. In coordination with the State Water Board, Central Valley Water Board, the Interagency Ecological Program (IEP), and Delta Science Program (DSP), DWR and Reclamation shall complete the special study required by Condition 8 of the June 1, 2021 TUCP Order on the prevalence and extent of harmful algal blooms and expansion of invasive aquatic weeds in the Sacramento-San Joaquin Delta. Consistent with the June 1, 2021 TUCP Order, the special study shall identify the effects of the TUCP Order, any future TUCP Orders, and any associated actions

including drought barriers on the prevalence and extent of harmful algal blooms and expansion of invasive aquatic weeds in the Sacramento-San Joaquin Delta. DWR and Reclamation shall coordinate with local watershed groups to determine if additional data are available that should be incorporated into the analysis and report. The next draft report shall summarize impacts to sub-regions of the Delta consistent with the localized nature of HABs and aquatic weeds and analyze potential for (or presence of) disproportionate impacts to vulnerable communities such as low income communities and communities of color with respect to drinking water quality, contact and non-contact recreation, impacts to tribal cultural resources, and impacts to aesthetics including odors and the visual character of Delta waterways where HABs and aquatic weeds are prevalent. This work shall be coordinated with IEP and DSP, and any broader watershed evaluation of HABs and aquatic weeds. A complete draft Report shall be submitted to the State Water Board by June 1, 2022. A summary of the report shall be made available for State Water Board staff and public comment and presented at a public Board meeting. In coordination with State Water Board, Central Valley Water Quality Control Board staff, IEP, and DSP, DWR and Reclamation shall review and consider comments from the State Water Board and the public and modify the final report as appropriate based on these comments. A complete, final report shall be submitted to the State Water Board 30 days after receipt of public and State Water Board staff comments unless the Deputy Director for the Division of Water Rights grants an extension.

CERTIFICATION

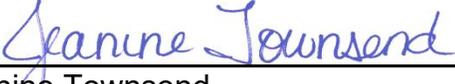
The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on February 15, 2022.

AYE: Chair E. Joaquin Esquivel
Vice Chair Dorene D'Adamo
Board Member Sean Maguire
Board Member Laurel Firestone
Board Member Nichole Morgan

NAY: None

ABSENT: None

ABSTAIN: None



Jeanine Townsend
Clerk to the Board