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

ORDER WR 2023-XXXX

In the Matter of Petitions for Reconsideration of the Executive Director's May 6, 2022 Approval of a Sacramento River Temperature Management Plan Pursuant to Order WR 90-5

ORDER DENYING PETITIONS FOR RECONSIDERATION

BY THE BOARD:

1. INTRODUCTION

By this Order, we deny petitions for reconsideration of the Executive Director's May 6, 2022 approval of the Sacramento River Temperature Management Plan for 2022 (TMP) that was prepared by the U.S. Bureau of Reclamation (Reclamation) pursuant to State Water Resources Control Board (State Water Board) Order WR 90-5 (Order 90-5).

Order 90-5 requires Reclamation to operate Shasta Dam and Reservoir on the Sacramento River and other related components of the federal Central Valley Project (CVP) in a manner that maintains daily average water temperatures of 56 degrees Fahrenheit (F) at Red Bluff Diversion Dam (RBDD) on the Sacramento River. This requirement only applies when higher temperatures would be detrimental to the fishery, and the compliance location may be changed to the extent that factors outside Reclamation's reasonable control preclude Reclamation from meeting the requirement at RBDD.

Reclamation's TMP for 2022 proposed to meet a target temperature of 54.5 degrees F on the Sacramento River upstream of the Highway 44 bridge from June 7 through September 27 or until the cold water available in Shasta Reservoir was depleted (Section 2.8). Reclamation identified the alternative temperature compliance point in consideration of low inflow and low storage conditions. The compliance location was approximately five river miles downstream of Keswick Dam, which regulates releases from Shasta Dam, and 55 river miles upstream of RBDD. By targeting 54.5 degrees F upstream of the Highway 44 bridge, the TMP was expected to meet 56 degrees F five miles downstream from the Highway 44 bridge, above the confluence with Clear Creek. Reclamation's operational strategy, which was designed to achieve the temperature target, included a release schedule of 4,500 cubic-feet per second (cfs) from Keswick Dam and Reservoir, and an allocation to the Sacramento River Settlement Contractors (SRSC) of 18 percent of the total amount of water they can potentially receive under their water supply contracts with Reclamation.

The Executive Director's May 6, 2022 approval of the Sacramento River TMP acknowledged the extreme dry conditions at the time and associated limitations in supplies for various purposes, including temperature management. The approval included several conditions, including condition one, which required Reclamation to take all actions within its reasonable control to improve temperature conditions for Sacramento River winter-, spring- and fall-run Chinook salmon and ensure that temperature dependent mortality (TDM) levels were minimized, and carryover storage levels were maximized to the extent feasible.

The following parties filed petitions for reconsideration of the TMP approval: (1) the Natural Resources Defense Council, Golden State Salmon Association, Save California Salmon, the Bay Institute, Pacific Coast Federation of Fishermen's Associations, Institute for Fisheries Resources, and California Sportfishing Protection Alliance (hereafter collectively referred to as NRDC); and (2) the Sacramento River Settlement Contractors Corporation, Glenn-Colusa Irrigation District, Natomas Central Mutual Water Company, Reclamation District No. 108, and Sutter Mutual Water Company (hereafter collectively referred to as the SRSC). NRDC contends that the Executive Director's approval of the TMP was contrary to Order 90-5 and other laws and not supported by substantial evidence because the TMP: would result in unreasonable impacts to the salmon fishery; the TMP failed to require Reclamation to take all actions within its reasonable control to maintain adequate temperatures in the Sacramento River; the TMP resulted in temperature-related impacts to the Trinity River fishery; and the TMP assumed low water supply allocations to wildlife refuges. The SRSC contend that condition one of the Executive Director's approval exceeded the Executive Director's authority under Order 90-5.[1] Contrary to petitioners' contentions, however, we conclude that the Executive Director has authority to conditionally approve a TMP pursuant to Order 90-5, for the reasons given below. Moreover, the 2022 TMP was consistent with Reclamation's responsibility under Order 90-5 to take all actions within its reasonable control to protect the salmon fishery from temperature-related impacts when meeting the temperature requirement at RBDD is outside of Reclamation's reasonable control, and to avoid redirected impacts to the Trinity River fishery. Accordingly, the Executive Director's conditional approval of the TMP was appropriate and proper, and therefore the petitions for reconsideration are denied.

[1] In their memorandum of points and authority in support of their petition, the SRSC discuss the Deputy Director's authority under Order 90-5, but they do not contest that the Executive Director has delegated authority to take action on a TMP in accordance with Order 90-5 instead of the Deputy Director. For ease of reference, and because the Executive Director took action on the 2022 TMP, this order refers to the Executive Director's authority under Order 90-5.

2. FACTUAL AND LEGAL BACKGROUND

2.1. Shasta Trinity Complex of the Central Valley Project

The Shasta and Trinity River Divisions of the CVP consist of two major reservoirs - Shasta Reservoir formed by Shasta Dam on the Sacramento River, and Trinity Reservoir formed by Trinity Dam on the Trinity River - as well as the Clear Creek Tunnel that connects the Trinity River to the Sacramento River watershed. Below Shasta Dam, three major tributaries join the Sacramento River- the Feather River, the Yuba River, and the Lower American River. After flowing through the Sacramento Valley, the Sacramento River flows through the Sacramento-San Joaquin Delta Estuary (Delta), then through Suisun and San Francisco Bays, and into the Pacific Ocean. Numerous other rivers and streams also flow into the Delta, most notably the San Joaquin River, which flows into the Delta from the south, and the Cosumnes, Calaveras, and Mokelumne Rivers, which flow into the Delta from the east. In the southern Delta, the CVP diverts a combination of natural flows and water released from storage in Shasta and other upstream reservoirs for export to its south-of-Delta service area. A significant portion of the water exported by the CVP is conveyed through the Delta-Mendota Canal to the Delta-Mendota Pool on the San Joaquin River for delivery to the San Joaquin River Exchange Contractors (SJREC), who obtain water under contract with Reclamation in exchange for San Joaquin River water, which they would otherwise divert under their own water right claims.

Shasta Reservoir is fed by three major upstream tributaries: the Pit, McCloud, and Sacramento Rivers. Water released from Shasta Dam flows through Keswick Reservoir, which is located approximately nine miles downstream. Water from the Trinity River, which is a tributary to the Klamath River, is exported from that watershed through the Clear Creek Tunnel to Whiskeytown Reservoir. From Whiskeytown, water from the Trinity system can be delivered to Keswick Reservoir via the Spring Creek Power Conduit and Powerplant, or it can be released to Clear Creek, where it eventually flows into the Sacramento River downstream of Keswick.

Keswick Dam is an impassable barrier for aquatic species and there is no fish ladder or similar infrastructure to allow for migratory fish passage. As a result, spawning habitat for anadromous fish is limited to the reach immediately downstream of Keswick Reservoir. To mitigate in part for the impacts of the passage barrier on anadromous fish, Reclamation is required to manage its releases of cold water from Shasta Reservoir during the summer and early fall months.

In order to manage temperatures below Shasta Reservoir for the protection of salmonids, Reclamation was required to install a temperature control device (TCD), which it began to operate in 1997. The TCD allows for selective water withdrawal from a wide range of depths and corresponding temperatures. The TCD allows Reclamation to withdraw warmer surface waters in the spring and deeper colder water in the summer and fall when temperature management is most important for salmon protection. Prior to

installing the TCD, Reclamation was only able to manage temperatures by releasing water from river outlets in Shasta Dam that bypassed the power generation facility. The TCD gives Reclamation access to water at lower reservoir levels to generate power, so Reclamation is not forced to bypass the power inlet in order to release cold water.

2.2. Basin Plan

The Central Valley Regional Water Quality Control Board (Regional Water Board) developed, and the State Water Board approved, the Water Quality Control Plan for the Sacramento River Basin and the San Joaquin River Basin (Basin Plan) in accordance with the California Porter-Cologne Water Quality Control Act (Wat. Code, § 13000 et seq.). The Basin Plan designates the beneficial uses of water within the Sacramento and San Joaquin Rivers and their tributaries, establishes water quality objectives to ensure the reasonable protection of those beneficial uses, and includes a program of implementation for the water quality objectives. The beneficial uses together with the water quality objectives and an anti-degradation policy constitute water quality standards within the meaning of the federal Clean Water Act. (33 U.S.C. § 1313.)

The Basin Plan establishes water quality objectives for temperature to ensure the reasonable protection of cold freshwater habitat in the Sacramento River. Of particular relevance in this proceeding, the Basin Plan provides that "temperature shall not be elevated above 56°F in the reach from Keswick Dam to Hamilton City . . . when temperature increases will be detrimental to the fishery." (Basin Plan, p. 3-14.)

Achievement of water quality objectives depends on applying them to controllable water quality factors, which the Basin Plan defines as "those actions, conditions, or circumstances resulting from human activities that may influence the quality of the waters of the State, that are subject to the authority of the State Water Board or Regional Water Board, and that may be reasonably controlled." (Basin Plan, p. 3-2.) The Basin Plan also provides that controllable factors are not allowed to further degrade water quality in instances where uncontrollable factors have already caused water quality objectives to be exceeded. (*Ibid*.)

2.3. Water Right Order 90-5

Adopted by the State Water Board in 1990, Order 90-5 amended Reclamation's water right permits and licenses for Keswick Dam, Shasta Dam, and the Spring Creek Power Plant facilities of the CVP in order to mitigate the effects of the construction and operation of those facilities on winter-run Chinook salmon and other fish species that depend on cold freshwater habitat. As stated above, the completion of Shasta Dam created an impassable barrier for Chinook salmon that prevented them from reaching 100 percent of their historical spawning habitat along the Sacramento, McCloud, and Pit Rivers, and restricted spawning to the upper Sacramento River below Keswick Dam. Historically before the construction of Shasta Dam, natural conditions on the McCloud River provided cool and clean water year-round to support optimum spawning conditions for winter-run, spring-run, and fall-run Chinook. (See Central Valley

Operations Office, Bay-Delta Office, U.S. Bureau of Reclamation, 2021 Seasonal Report for the Shasta Cold Water Pool Management (March 2022) p. 49, Figure 26.)

Shasta Dam and Reservoir also can adversely affect temperatures in the Sacramento River downstream. In Shasta Reservoir, surface waters experience significant warming and can reach temperatures above 80 degrees F during August and September. Due to the size and depth of Shasta Reservoir, the reservoir stratifies, and the deeper water remains cool, with the deepest water maintaining temperatures below 46 degrees F during typical conditions. Water temperatures below Keswick Dam and Reservoir are primarily affected by the temperature of water released from Shasta Reservoir. (Miles E. Daniels and Eric M. Danner, The Drivers of River Temperatures Below a Large Dam, Water Resources Research, Volume 56, Issue 5 (April 4, 2020) [p. 10].) Reclamation controls temperatures needed for suitable spawning conditions below Keswick Dam by selectively releasing deeper, colder water from Shasta Dam. The capacity for Reclamation to release cold water and maintain suitable spawning conditions is dependent on the volume of cold water stored in Shasta Reservoir and the rate at which that water is released. During drought and dry year conditions, the volume of cold water can be relatively small and limit Reclamation's ability to maintain cold water temperatures suitable for spawning for the complete spawning season with typical high summer releases for water supplies. Once the cold-water pool is depleted, temperatures rapidly rise above optimum conditions and can cause temperature related mortality in winter-, spring-, and fall-run Chinook salmon eggs.

Order 90-5 amended Reclamation's water right permits and licenses to partially implement the 56 degrees F temperature objective from the Basin Plan. Specifically, Condition one of Order 90-5 partially implements the objective by requiring Reclamation to meet an average daily temperature of 56 degrees F on the Sacramento River at RBDD, which is located upstream of Hamilton City, the compliance location established in the Basin Plan, and 60 miles downstream of Keswick Dam. By its terms, Condition one only applies when higher temperatures would be detrimental to the fishery.

Order 90-5 incorporates the principle of controllable water quality factors that is contained in the Basin Plan. (Order 90-5, pp. 18-20.) In that order, the State Water Board recognized that factors outside Reclamation's control, such as ambient air temperatures and tributary inflows, might preclude Reclamation from maintaining 56 degrees F in the entire reach from Keswick Dam to RBDD. The Board also recognized that spawning adults and eggs might not be present in the entire reach during certain times of year. For these reasons, the Board concluded that the length of the reach to be protected should be flexible. The Board cautioned, however, that any shortening of the protected reach could limit salmon production. The Board concluded that Reclamation would need to plan its releases from Shasta Dam carefully to maximize salmon production with a limited supply of water and avoid running out of cold water late in the season. (*Ibid*.)

During periods when daily average temperatures above 56 degrees F would be detrimental to the fishery and factors beyond Reclamation's reasonable control prevent Reclamation from meeting 56 degrees F at RBDD, Condition one of Order 90-5 requires Reclamation to designate an alternative compliance location where Reclamation will meet a daily average of 56 degrees F, after consultation with the California Department of Fish and Wildlife (CDFW), the National Marine Fisheries Service (NMFS), and the U.S. Western Area Power Administration. Order 90-5 required Reclamation to immediately report the alternative compliance location to the Chief of the Division of Water Rights (now the Deputy Director for Water Rights), and file an operations plan showing Reclamation's strategy for meeting the temperature requirement at the new location. Reclamation can operate to the new compliance location unless the Deputy Director objects to the change within 10 days of submission of the plan. (Order 90-5, pp. 54-55.) In describing Condition one, the Board clarified that, whether a particular factor is within Reclamation's reasonable control depends on the circumstances, and ultimately is for the Deputy Director or Board to decide when Reclamation proposes to change the compliance location. (Order 90-5, pp. 19-20.) The Board also stated that parties who believe that it is within Reclamation's reasonable control to meet the temperature requirement at a different location may so advise the Deputy Director. (*Id*. at p. 20.)

In practice, Reclamation rarely if ever operates to meet 56 degrees F at RBDD. Instead, Reclamation submits a TMP every year, with a draft generally provided by late April, which identifies an alternative compliance location and describes Reclamation's strategy 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. State Water Board staff consider input received from the public when providing comments on or concerns with the Draft TMP to Reclamation. Reclamation customarily submits a Final TMP to the Board by the end of May.

2.4. Status of Chinook Salmon Species

Winter-run Chinook salmon were listed as endangered under the California Endangered Species Act (CESA) in 1989, and under the federal Endangered Species Act (ESA) in 1994. (Cal. Code Regs., tit. 14, § 670.5, subd. (a)(2)(M), Register 89, No. 39 (Sept. 22, 1989); 59 Fed. Reg. 440 (Jan. 4, 1994.) The federal listing includes both natural and artificially propagated stocks. The survival of 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 having sublethal and lethal effects as temperatures increase (Martin et al. 2017). Temperature protection is needed from the onset of spawning through juvenile emergence, which spans from May through as late as November. Following emergence,

juveniles may experience less temperature impacts due to their ability to seek thermal refugia.

Central Valley spring-run Chinook salmon were listed as threatened under CESA and the ESA in 1999. Although Central Valley fall-run Chinook salmon are not listed as threatened or endangered, they are a species of concern due to their ecological and economic importance, supporting a large commercial and recreational fishery in California. Similar relationships for egg survival and temperature exist for spring-run and fall-run Chinook. Peak spawning for spring-run and fall-run Chinook occurs from mid-August through October, and from October through December, respectively. However, there have been no models developed to estimate temperature dependent mortality experienced by either spring-run or fall-run Chinook salmon in the upper Sacramento River.

2.5. Biological Opinions

Section 7 of the ESA (16 U.S.C. § 1536) directs federal agencies to ensure, in consultation with the U.S. Fish and Wildlife Service (USFWS) or NMFS, that any action that they authorize, fund, or carry out is not likely to jeopardize the continued existence of any listed species or result in destruction or adverse modification of critical habitat. Under the consultation process, USFWS and NMFS issue Biological Opinions that determine whether proposed federal actions will jeopardize the continued existence of listed species. If USFWS or NMFS determines that a federal action is likely to result in jeopardy, then the Biological Opinion must include any reasonable and prudent alternatives (RPA) to the proposed action that will avoid jeopardy. (16 U.S.C. § 1536(b)(3)(A).)

In 2008, USFWS issued a Biological Opinion pursuant to section 7 of the ESA that determined that the proposed coordinated long-term operations of the CVP and State Water Project (SWP) would jeopardize the continued existence of certain threatened and endangered species within its jurisdiction. In 2009, NMFS also issued a Biological Opinion that determined that the coordinated operations of the Projects would result in jeopardy to listed species, including endangered Sacramento River winter-run Chinook salmon and threatened Central Valley spring-run Chinook salmon. NMFS RPA Action 1.2.4 required Reclamation to manage operations to provide suitable temperatures for winter-run and spring-run Chinook salmon habitat. Reclamation was required to develop an annual TMP to achieve daily average water temperatures not in excess of 56 degrees F at compliance locations between Balls Ferry and Bend Bridge, which are located upstream from RBDD, from May 15 through September 30, for winter-run protection, and from October 1 through October 31, for the protection of spring-run, whenever possible.

On August 2, 2016, Reclamation and the Department of Water Resources (DWR) requested reinitiation of consultation with USFWS and NMFS pursuant to section 7 of the ESA on the Projects' coordinated long-term operations. As part of CVP operations,

Reclamation committed to temperature management on the upper Sacramento River following a tiered approach dependent on Shasta Reservoir storage on May 1. Under Tier 1, Reclamation would target 53.5 degrees F above the Clear Creek (CCR) monitoring station from May 15 through October 31. In Tier 2, with less than optimal storage, Reclamation would optimize its use of cold water to target 53.5 degrees F at Clear Creek during the critical egg incubation period, a limited window when salmon eggs are most susceptible to temperature related impacts, and 56 degrees F outside of this window. The duration of this management window would be dependent on storage conditions in Shasta Reservoir and would be developed in coordination with the Sacramento River Temperature Task Group (SRTTG).[2] In Tier 3 years, Reclamation would target 56 degrees F at Clear Creek for the entire season. In Tier 4 years, Reclamation did not specify a temperature target, but proposed to operate to a less than optimal temperature target and period to minimize temperature dependent mortality that would be determined by Reclamation in real-time with assistance from NMFS and USFWS. On October 21, 2019, NMFS issued a Biological Opinion that concluded that the long-term operations of the Projects as proposed, including the tiered approach to Sacramento River temperature management, would not jeopardize the continued existence of endangered winter-run and threatened spring-run Chinook salmon. Likewise, the USFWS issued a biological opinion on the same date finding no jeopardy to the species within its jurisdiction due to Project operations.

2.6. Legal Challenge to Biological Opinions and Interim Operations Plan

On February 20, 2020, Reclamation approved a Record of Decision modifying CVP operations pursuant to the 2019 Biological Opinions. 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 Biological Opinions as insufficiently protective of threatened and endangered species, among other causes of action. (*California Natural Resources Agency, et al. v. Raimondo* (E.D.Cal., No. 1:20-cv-00426-DAD-EPG).) 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) to DWR in connection with SWP operations, which did not apply to the CVP.

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

[2] The SRTTG is a multiagency technical group formed to assist with Sacramento River temperature management by Reclamation for the protection of Chinook salmon populations in the Sacramento River. Entities that attend the SRTTG meetings include representatives from Reclamation, DWR, CDFW, NMFS, the State Water Board, the Western Area Power Administration, tribal governments, and members of the SRSC.

environmental objectives and bolster resilience to climate change. As part of EO 13990 implementation, Reclamation, USFWS, and NMFS agreed to review the 2019 Biological Opinions and, after discussions with the California Parties, on September 30, 2021, reinitiated consultation under the ESA on the Projects' coordinated long-term operations.

In the interim, the California Parties and the U.S. Department of the Interior, Reclamation, USFWS, and NMFS (Federal Defendants) agreed to an interim operations plan (IOP) for Water Year 2022 with the goal of aligning the CVP's Delta operations with the SWP's operations under the ITP and establishing Shasta operational priorities, temperature requirements for different year types, and storage goals.

The IOP provided that if Water Year 2022 was a critical or dry water year, Reclamation would not schedule or make deliveries of stored water from Shasta for other than public health and safety, as defined in the IOP, until Reclamation received approval of a TMP from NMFS that showed that Reclamation would meet temperature criteria and end of September carryover storage consistent with the IOP terms and conditions. Pursuant to the IOP, drought conditions in 2022 required Reclamation to operate Shasta Reservoir to meet the following priorities in the order set forth below.

1. Public Health and Safety
2. Habitat Criteria for winter-run Chinook Salmon
    a. Defined as 55 degrees F from May 15 to Oct 31 at the Clear Creek Gauge for a critically dry water year
3. Senior water contractor deliveries and CVPIA level 2 refuge supplies
4. Other Deliveries

The IOP further provided that if Reclamation was unable to meet the habitat criteria for the entire period, the agencies would agree upon an operation to provide sufficient habitat for the longest period possible.

In addition to the operating requirements summarized above, the IOP created a Shasta Planning Group consisting of NMFS, USFWS, Reclamation, DWR, CDFW, and the State Water Board. The IOP identified that the Shasta Planning Group would work with the technical groups to solicit operational guidance and risk assessments and provide policy guidance as necessary. [3]

[3] The district court approved the 2022 IOP on March 14, 2022. (*CNRA v. Raimondo*, *supra*, Order Granting Federal Defendants' Motion for Voluntary Remand without Vacatur (filed March 14, 2022).) The 2022 IOP expired on September 30, 2022. On February 24, 2023, the district court granted a request to extend the IOP until December 31, 2023. (*Id.*, Order Granting Request To Extend Interim Operations Plan; Granting in Part and Denying as Moot in Part Requests for Judicial Notice; Granting Motion To Strike SRS Contractors' Request for Alternative Relief; Denying all other Alternative Requests for Relief; and Staying Case through December 31, 2023 (filed Feb. 24, 2022).)

2.7. Drought Conditions and Responses

2.7.1. Hydrology

California and the Central Valley experienced extremely dry conditions for three consecutive years from 2020 through 2022. Precipitation conditions in the Sacramento Valley are an indicator of water supply for the Projects because most of the Project reservoirs that store surface water are in the Sacramento Valley, including Shasta Reservoir, Oroville Reservoir, a component of the SWP that is located on the Feather River, and Folsom Reservoir, a component of the CVP that is located on the lower American River. Two major CVP reservoirs, New Melones Reservoir, which is located on the Stanislaus River, a tributary to the San Joaquin River, and Millerton Reservoir, formed by Friant Dam on the San Joaquin River, 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). Water years 2020 and 2021 were the second driest two-year period on record behind 1976 and 1977 in the Sacramento Valley.

Water year 2022 began with a modest amount of precipitation in October and December of 2021 in the Northern Sierra but was followed by the driest January through March time period on record (*Figure 1*). With a third consecutive year of drought conditions, water years 2020 through 2022 became the driest three-year period on record.

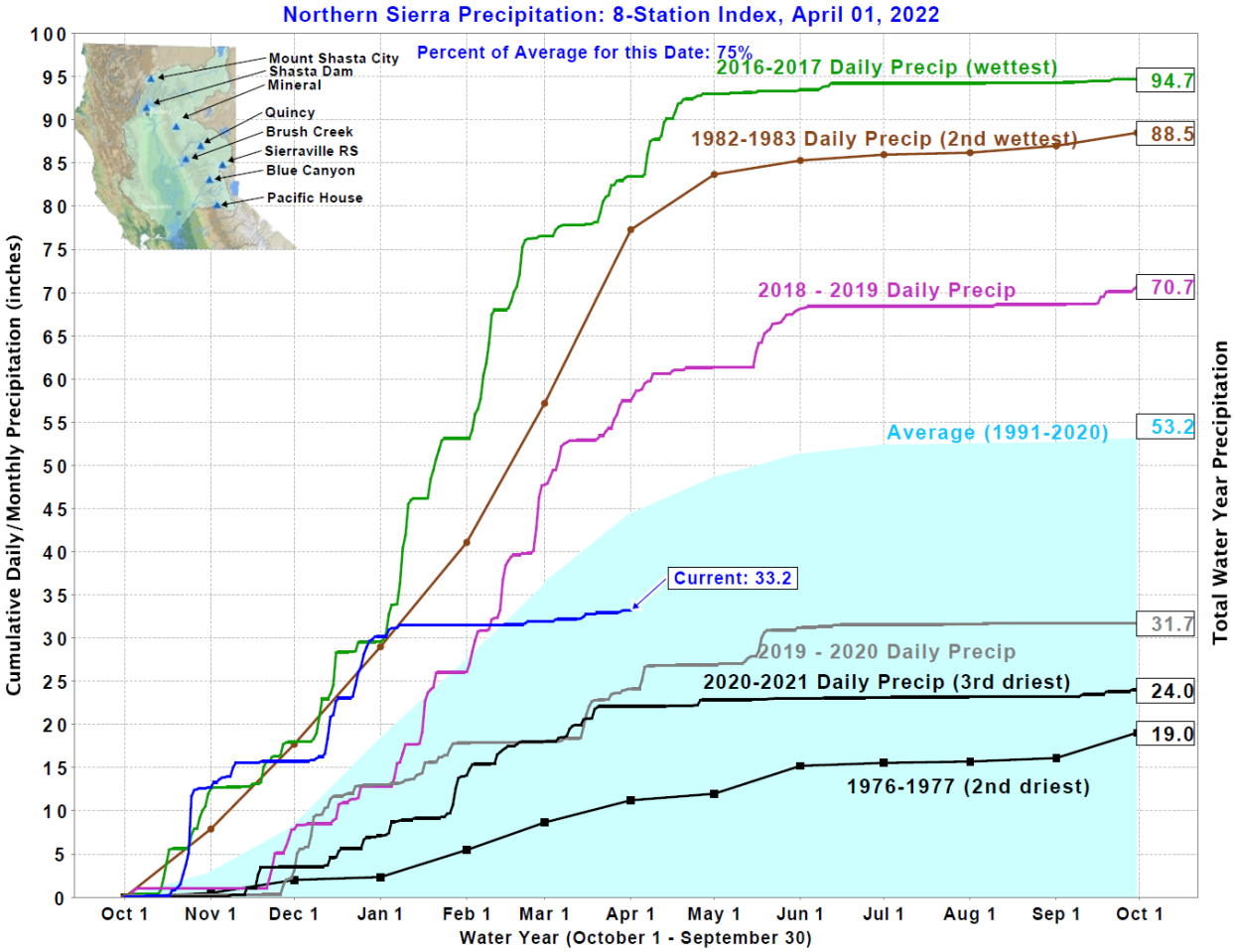

Figure 1. Northern Station Precipitation Index (DWR. *Northern Sierra Precipitation: 8-Station Index*. (April 1, 2022) <https://cdec.water.ca.gov/cgi-progs/products/PLOT_ESI.pdf> [as of 2/7/2023].)

In 2022, overall storage levels in most Northern California reservoirs were precipitously low because of the prior drought years. In October 2021, Lake Shasta had less than one million acre-feet (AF) of water in storage, which was the lowest since the previous drought (Figure 2). By April 2022, Lake Shasta storage reached 1.7 million AF, well below the historic average of 3.5 million AF. Oroville Reservoir was in a similar condition to Shasta Reservoir: partially full, while Folsom Reservoir was comparatively full.

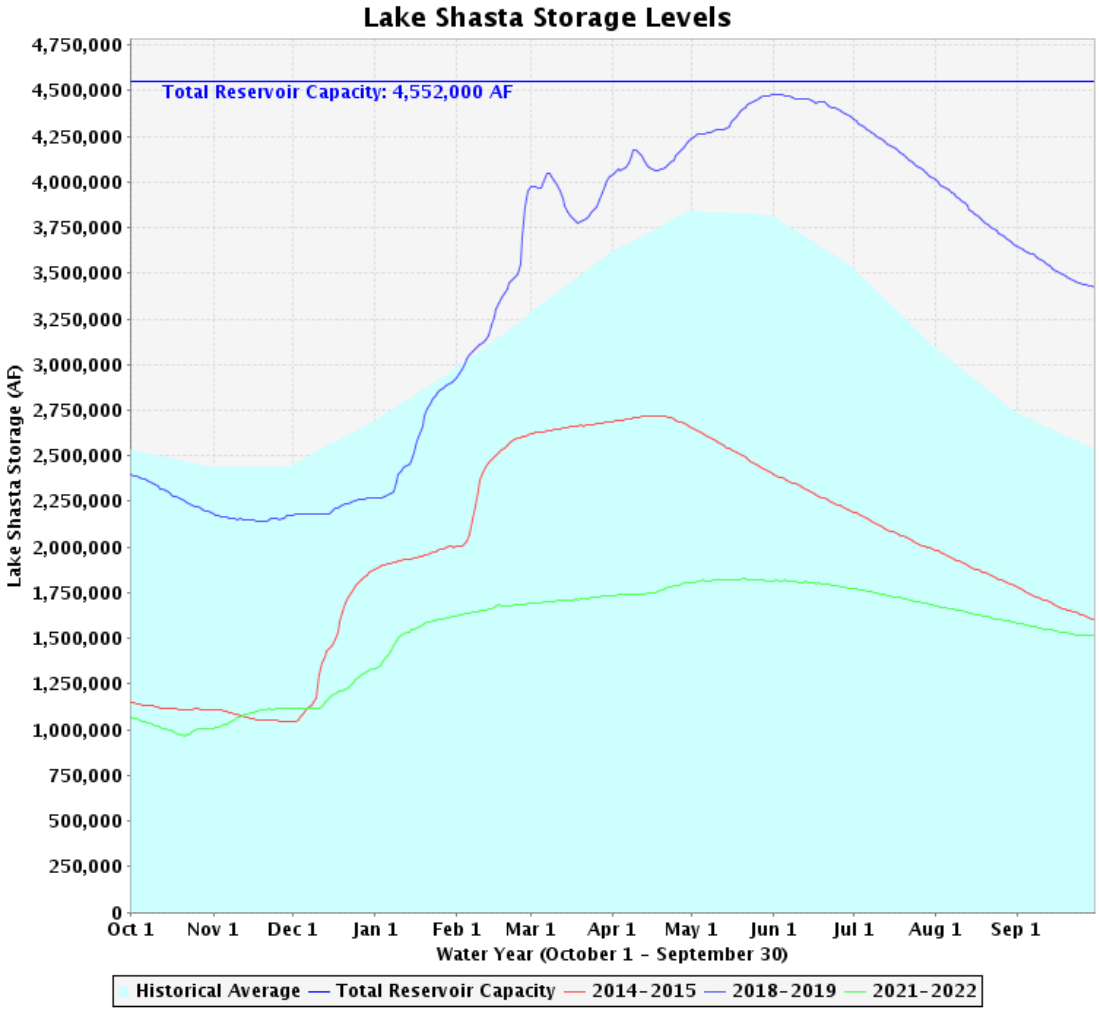

Figure 2. Historical Shasta Reservoir storages for WY 2015, 2019 and 2022. (DWR *Lake Shasta Storage Levels.* (April 1, 2023) <https://cdec.water.ca.gov/resapp/ResDetail?resid=SHA> [as of 2/7/2023].)

Despite some improvement to the amount of water in storage nearing the end of the wet season, snowpack was below normal in the Northern Sierra as of the measurements on April 1, 2022 (Figure 3).

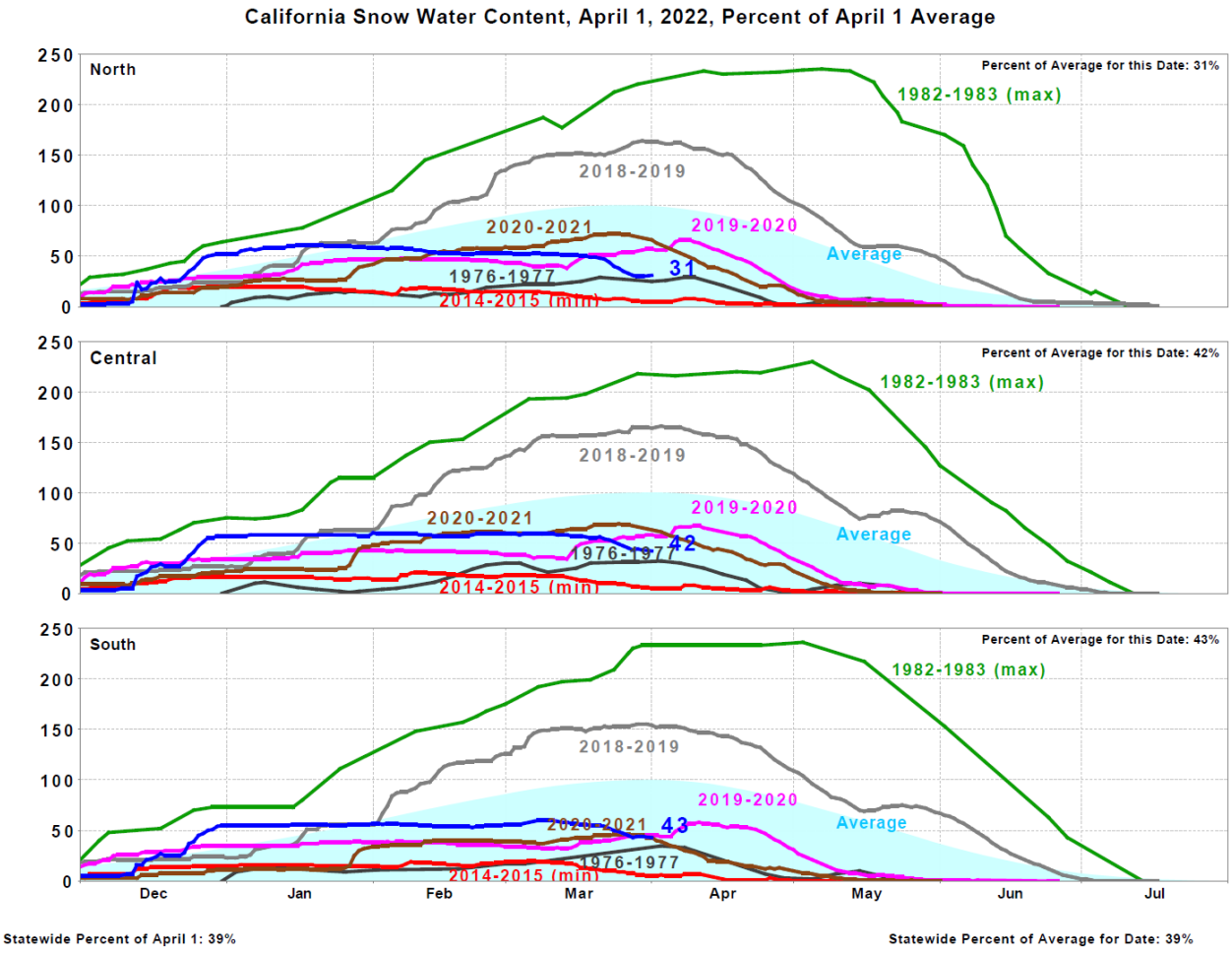

Figure 3. Daily Regional Snowpack Plots from Snow Sensors in California (DWR, *California Snow Water Content: Percentage of April 1 Average.* (April 1, 2022) <https://cdec.water.ca.gov/reportapp/javareports?name=PLOT_SWC.pdf> [as of 2/7/2023].)

When the 2022 TMP was submitted to the Board, reservoirs had below average water supply metrics, the Northern Sierra had experienced the driest January through March time period, the Northern Sierra snowpack was lower than average, and concerns about the estimated inflow to Shasta Reservoir lingered from the previous two drought years. All of these factors contributed to the formation of the 2022 TMP.

2.7.2. 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 ITP for operation of the SWP. The purpose of the DCP is to describe planned drought actions and outline the areas of potential concern given the dry hydrology. Water year (WY) 2020 was an exceptionally dry year, and dry conditions continued through WY 2022. Accordingly, a DCP was required.

In 2022, DWR submitted an initial DCP to CDFW in February, with subsequent updates provided on a monthly basis through the end of the water year. As hydrological conditions continued to worsen into April, the April 2022 DCP update identified drought actions that DWR and Reclamation had implemented, including filing a Temporary Urgency Change Petition with the Board that sought to change Project operations during April through June, reducing water supply allocations to the SRSCs, and planned water transfers. The May 2022 DCP update outlined additional actions DWR and Reclamation were implementing to address shortfalls in water supplies, including reducing allocations to Feather River Settlement Contractors and increasing releases from Friant Dam on the San Joaquin River. No additional drought actions were identified in subsequent DCP updates for WY 2022.

2.7.3. 2022 Temporary Urgency Change Order

On April 4, 2022, the Executive Director issued a Temporary Urgency Change Order (TUCO) that approved DWR and Reclamation's request for changes from April through June in their water right requirements, which were imposed by State Water Board Decision 1641 (1999, as revised by State Water Board Order WR 2000-02) , to meet water quality objectives included in the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta for Delta outflow, San Joaquin River inflow, and western Delta salinity. The purpose of the TUCO was to allow the Projects to conserve stored water supplies for multiple beneficial uses, including the conservation of limited cold-water supplies stored in Shasta Reservoir and needed for temperature management. As a condition of approval, the TUCO required Reclamation to implement the Sacramento River TMP required by Order 90-5 as approved by the Executive Director. At the time of the TUCO, a release schedule for Shasta Reservoir and reduced allocations for the SRSCs (as described in Section 2.8) had been agreed upon.

2.7.4. CVP and SWP Water Allocations in 2022

In response to historic drought conditions, water supplies across the Central Valley were extremely limited in 2022. For the CVP (Reclamation, *Central Valley Project (CVP) Water Quantities for Delivery 2022*. (April 1, 2022) https://www.usbr.gov/mp/cvp-water/docs/cvp-water-quantities-for-delivery-2022.pdf> [as of 3/28/2023].), no water allocations were made for agricultural service contractors north and south of the Delta, five percent allocations were made for municipal and industrial service contractors (M&I) north of the Delta, 33 percent for M&I south of the Delta, 18 percent for wildlife refuges (Level 2) north of the Delta, 75 percent for wildlife refuges (Level 2) south of the Delta, and 18 percent for the SRSCs. 2022 was the first year that the SRSCs received less than 50 percent of their total contractual entitlement.

Reclamation reduced allocations to service contractors reliant on Millerton Reservoir in order to meet the competing CVP obligations to the San Joaquin River Exchange Contractors (exchange contractors), who receive water exported from the Delta under contract with Reclamation in exchange for San Joaquin River water that they would otherwise divert under their own claimed water rights. As a result of a critically dry water year on the Sacramento River in 2022, the exchange contractors received 75 percent

(640,000 AF) of their total contract amount. Limited supplies north of the Delta led Reclamation to release over 200,000 AF of water from Millerton Lake through Friant Dam into the San Joaquin River to meet the exchange contractors' demands. As a result of dry conditions and the deliveries to the exchange contractors, the water allocation for Friant Division Class 1 was 30 percent, with no allocations for Class 2 diverters.

The SWP also announced reduced allocations due to drought conditions. The final allocation to service contractors was five percent, plus deliveries to meet unmet human health and safety needs, and the Feather River Settlement Contractors received 50 percent of their total contract amounts. (Department of Water Resources, State Water Project Historical Table A Allocations Water Years 1996-2023 (April 20, 2023) <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Management/SWP-Water-Contractors/Files/1996-2023-Allocation-Progression-rev3-042023.pdf> [as of May 4, 2023].)

2.7.5. Delta Watershed Drought Emergency Curtailments

On May 10, 2021, Governor Newsom issued a proclamation declaring a drought emergency for 41 counties, including those within the Delta watershed. The Governor's proclamation outlined various actions that the State Water Board and other agencies should take or consider, including curtailments to prohibit diversions when water is not available at a water right holder's or claimant's priority of right. In response, the Board adopted an emergency regulation that authorized the issuance of curtailment orders in the Delta watershed. The regulation became effective on August 19, 2021, and was revised and renewed on July 20, 2022. On August 20, 2021, the Board issued orders pursuant to the emergency regulation to all water right holders and claimants in the Delta watershed, requiring all right holders and claimants to curtail their diversions when notified that water was unavailable at their priority of right, and imposing reporting requirements. The curtailments were intended to protect senior water right holders and claimants and prevent the diversion of previously stored water needed for salinity control in the Delta, human health and safety supplies, and minimal ecosystem protections. (State Water Board Resolution No. 2021-0028, pp. 2-3.) The curtailments were updated based on hydrology through the winter, spring, and fall of 2022 until December 6, 2022, when they were suspended indefinitely due to improved hydrology. All curtailment orders in the Delta watershed were rescinded on April 3, 2023, due to significantly improved hydrologic conditions in Water Year 2023.

2.8. Shasta Release Schedule and the 2022 Temperature Management Plan

In March of 2022, Reclamation, in consultation with CalEPA, DWR, NMFS, USFWS, CDFW and the State Water Board, and in coordination with the SRSC, developed a strategy for CVP operations on the Sacramento River to ensure the continued support of beneficial uses, including water for cities and rural communities, fish and wildlife, and agriculture, in response to historically low storage at Shasta. This operations strategy was designed to maintain winter-run Chinook salmon habitat for the longest period possible and created a target for an average water release schedule of 4,500 cfs from

Keswick Dam below Lake Shasta. In order to maintain this release schedule, it was necessary for Reclamation to reduce allocations to the SRSCs to a record low allocation of 18 percent of their maximum contract entitlements. In 2014 and 2015, SRSC reduced diversions below their contracted allocation of 75 percent for critically dry years in response to extraordinary drought conditions; that was the first time on record that SRSC received less than 75 percent of their maximum contract totals. As stated in section 2.7.4, above, there were no CVP allocations to more junior agriculture service contractors in 2022.

In developing the target release schedule, scenarios with irrigation season release schedules of 4,000 cfs, 4,500 cfs, and 5,000 cfs from Keswick Reservoir were evaluated. All of these flow levels are far below historical releases during the irrigation season, which at their peak are more than twice these release levels. Consideration was given to several sources of uncertainty, including inflow hydrology, meteorology, net flow depletions along the Sacramento River, public health and safety demands and associated infrastructure limitations, and the reliability of temperature modeling tools at flows well outside of the range of historical data available for calibration. On March 23, 2022, the NMFS- SWFSC modeled forecasted operations and estimated TDM under each scenario. TDM estimates were 41 percent, 45 percent, and 58 percent for 4,000 cfs, 4,500 cfs, and 5,000 cfs scenarios, respectively. The modeling showed a modest decrease of just four percent in estimated TDM under the 4,000 cfs scenario relative to the 4,500 cfs scenario, which is well within the range of variability in TDM estimates typically reported by the NMFS- SWFSC for a single operational scenario. In addition, agency staff were not confident that temperature control could be maintained consistent with temperature model results with releases below 4,500 cfs during the hottest months of July and August. The larger increase in estimated TDM associated with the 5,000 cfs scenario relative to the 4,500 cfs scenario reflected a substantially earlier predicted loss of temperature control and indicated that it would have been the least protective of winter-run Chinook salmon. Accordingly, the 4,500 cfs scenario was considered to have the greatest likelihood of providing sufficient winter-run Chinook habitat for the longest period possible and was agreed upon by the agencies as directed by the IOP.

On March 16, 2022, we hosted a workshop regarding temperature management considerations on the Sacramento River in 2022. A range of stakeholders, including California Native American Tribal representatives, state and federal agencies, and several non-government organizations, gave presentations. These presentations covered a range of topics including cultural uses of water and salmon in California, water quality concerns in the Delta including harmful algal blooms, water operations at the CVP and SWP facilities, the status of the fishery and winter-run Chinook salmon, temperature impacts on juvenile salmon survival, and temperature modeling results and limitations. The Executive Director took the presentations into consideration when reviewing the TMP.

On April 6, 2022, Reclamation submitted a draft TMP to the Board. We did not receive any public comments on the Draft TMP, and no substantive changes were made to the TMP prior to the final version.

Reclamation submitted a final TMP to the Board on May 2, 2022, that included a release schedule of 4,500 cfs from May 15 through August 31, as described above, as well as releases of 4,000 cfs from Sep 1 through Sep 30, and a modeled End of September (EOS) storage target of 1,135 thousand acre-feet (TAF). Reclamation developed the temperature management strategy in coordination with SRTTG and identified a new temperature compliance point at the SAC gage station located at the Highway 44 bridge in Redding, CA. The final temperature management strategy, based on recommendations received from SRTTG, was to target 58 degrees F at SAC from May 15 through June 6, and then target 54.5 degrees F from June 7 through September 27 or until cold water supplies were exhausted. TDM modeling from Reclamation for this strategy indicated a range from 36 to 51 percent, based upon assumed redd distributions and whether the model was stage-independent or stage-dependent. Stage-independent modeling from the NMFS-SWFSC projected TDM to range between 52 and 58 percent, based on the redd distribution modelled.

In the Final TMP, Reclamation identified several key areas of uncertainty related to future conditions and operations that could impact TDM. Areas of uncertainty that are common in most years include future meteorological conditions, future precipitation and inflows into Shasta Reservoir, and Sacramento River accretions and depletions. As described above, the low target release of 4,500 cfs created a novel area of uncertainty in 2022 for modeling of water temperatures on the Upper Sacramento River. The target releases were more than 2,300 cfs lower than any past summer flows since the construction of Shasta Dam. The temperature models used for the TMP rely on observed relationships in the historical data for calibration. At flows outside of the historic range, the relationships between water temperatures and other environmental drivers had not been verified and the models had not been calibrated for such conditions. Resource managers expressed concerns regarding the technical capability of modeling temperatures under such low flow conditions. As a result, significant uncertainty existed concerning the water temperatures that fish would experience during the 2022 management season, and it was unclear if suitable temperatures would be sustained across the entire spawning reach under flows as low as 4,000 or 4,500 cfs.

The Executive Director conditionally approved the final TMP on May 6, 2022. In determining whether the TMP, including the release schedule, would protect winter-run Chinook habitat to the extent it was within Reclamation’s reasonable control, the Executive Director relied on the professional judgement of State Water Board and NMFS-SWFSC staff to interpret the modeling results in light of the uncertainties described above.

The SRSC have petitioned for reconsideration of condition one of the Executive Director’s approval, which provided as follows:

> Reclamation shall take all actions within its reasonable control to improve temperature conditions for Sacramento River winter and fall-run Chinook salmon this year and going into next year, including actions to ensure that TDM levels are minimized and carryover storage levels going into next year are maximized. Reclamation shall specifically evaluate whether adjustments to hydropower operations could be implemented to improve temperature management. I reserve continuing authority to modify my approval of the TMP based on any changed circumstances.

The approval also required Reclamation to coordinate with the fisheries agencies to determine any feasible management actions to minimize impacts to spawning in the upper Sacramento River, hatchery operations at Livingston Stone National Fish Hatchery, and the Trinity River fisheries.

Although it is not directly germane to the validity of the Executive Director's approval, it merits note that temperature management in 2022 was largely successful as a result of a wetter hydrology than modelled and reduced depletions downstream of Keswick Reservoir which permitted releases less than 4,500 cfs from Keswick reservoir from May 15 through June. The EOS storage was 1,515 TAF, 380 TAF greater than what the Final TMP projected. As a result of more favorable hydrology and uncertainty in the original modeling described above, hindcast modeling by the NMFS-SWFSC estimated TDM to be 18 percent, a reduction of 36 percent relative to the modeling for the Final TMP. No estimates for spring-run Chinook survival currently exist. It remains unknown whether temperature control could have been maintained over a similar extent of habitat with lower releases during July and August.

Despite successful temperature management in 2022, overall egg-to-fry survival of winter-run Chinook salmon was a record low of 2.17 percent due to a third consecutive year of thiamine deficiency and other unattributed factors. NOAA Fisheries, *Survival of Endangered California Winter-Run Chinook Salmon in 2022* (Feb. 6, 2023) <https://www.fisheries.noaa.gov/west-coast/climate/survival-endangered-california-winter-run-chinook-salmon-2022> [as of May 4, 2023]; Cathy Marcinkevage, Assistant Regional Administrator, California Central Valley Office, National Marine Fisheries Service, letter to Kristin White, Operations Manager, Bureau of Reclamation, Jan. 20, 2023 <https://www.fisheries.noaa.gov/s3/2023-01/jpe-letter-2022.pdf> [as of May 4, 2023].) NMFS estimated that thiamine deficiency in adult spawners resulted in approximately 50 percent mortality in newly hatched salmon. Thiamine deficiency and TDM are understood to be independent sources of mortality for salmonid eggs and juveniles, meaning that if temperature management had not been as successful as it was in 2022, the overall survival of winter-run Chinook salmon would have been significantly lower and put the species at a greater risk of extinction.

2.9. 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.)

3. PETITIONS FOR RECONSIDERATION

NRDC filed a timely petition for reconsideration of the Executive Director's May 6, 2022 approval of the Final TMP on May 31, 2022, and the SRSC filed a timely petition for reconsideration on June 6, 2022.

In summary, the NRDC petition contends that the approval of the TMP was contrary to law and not supported by substantial evidence because it would cause unreasonable harm to winter-run, spring-run, and fall-run Chinook salmon, and because it failed to require Reclamation to take actions within its reasonable control to maintain adequate temperatures in the Sacramento River. In addition, NRDC contends that approval of the TMP violated Order 90-5 because operations under the TMP would adversely affect spawning conditions on the Trinity River. Finally, NRDC contends that the TMP was unlawful because it assumed a reduction in allocations to wildlife refuges that was prohibited by the Central Valley Project Improvement Act (P.L. 102-575, tit. XXXIV, §§ 3401-3412 (Oct. 30, 1992) 106 Stat. 4600) (CVPIA).

NRDC requested the Board to disapprove the TMP and require Reclamation to take the following actions: (1) provide updated modeling and consider limiting releases from Shasta and Keswick Dams to 4,000 cfs; (2) strictly limit releases in accordance with the

TMP and require DWR to increase releases from Oroville Reservoir as necessary to meet downstream demands and Delta water quality; (3) reduce water supply allocations to CVP and SWP contractors, including the exchange contractors and the Feather River Settlement Contractors sufficient to provide a 75 percent allocation to wildlife refuges north of the Delta; (4) provide notice of intent to renegotiate the San Joaquin River Exchange Contract; (5) reduce diversions from the Trinity River; and (6) model the effect of hydropower bypass operations at Shasta Reservoir in the late summer and fall.

The SRSC contend that the Board lacked legal authority under Order 90-5 to condition its approval and impose condition one, which required Reclamation to take all actions within its reasonable control to improve temperature management and to maximize Shasta Reservoir carryover storage. The SRSC requested that condition one of the Executive Director's approval of the TMP be removed; they do not seek reconsideration of the Executive Director's decision not to object to the TMP.

The petitioners' contentions concerning the validity of the Executive Director's approval of the 2022 TMP are moot because the TMP is no longer in effect. Nonetheless, we address their contentions in this order to provide guidance concerning implementation of Order 90-5 in the future. For the reasons given below, we find that the petitioners' contentions lack merit, and therefore their petitions for reconsideration should be denied.

3.1. Response to the NRDC Petition

3.1.1 Impacts to the Salmon Fishery and Temperature Control Measures

NRDC contends that the approval of the TMP was contrary to law and not supported by substantial evidence because it would result in ongoing violations of the Basin Plan's temperature objectives and unreasonable impacts to winter-run, spring-run, and fall-run Chinook salmon. Specifically, NRDC argues that the modeled TDM of 52 to 58 percent was higher than the maximum TDM of 30 percent previously identified by NMFS as necessary to avoid extinction of winter-run Chinook salmon. They also fault the TMP for failing to consider even higher potential levels of TDM to spring-and fall-run Chinook salmon. NRDC argues that the projected TDM of salmon eggs was especially unreasonable given additional mortality risks to salmon in subsequent life stages, and the possibility that TDM could be even higher due to modeling uncertainty.

Similarly, NRDC contends that approval of the TMP was contrary to law and not support by substantial evidence because it did not require implementation of all measures within Reclamation's reasonable control to maintain temperatures to protect salmon in the Sacramento River. In particular, NRDC argues that it was within Reclamation's reasonable control to further reduce water supply allocations to CVP contractors, including the exchange contractors. NRDC also suggests that DWR should have reduced allocations to SWP contractors, including the Feather River Settlement Contractors, in order to reduce the amount of water that Reclamation must release from Shasta Reservoir to satisfy Sacramento Valley in-basin uses in accordance with the

Coordinated Operations Agreement between Reclamation and DWR. NRDC maintains that approval of the TMP was flawed because the Executive Director's approval letter failed to explain why the potential TDM levels associated with the TMP were reasonable when modeling indicated that limiting Shasta and Keswick releases to 4,000 cfs would have reduced TDM to winter-and fall-run Chinook salmon and resulted in higher EOS storage in Shasta Reservoir.

Contrary to these arguments, we find that the Executive Director's approval of the TMP, and decision not to require a different release schedule, was consistent with the Basin Plan and Order 90-5, and supported by substantial evidence. As explained in sections 2.2 and 2.3, above, Order 90-5 incorporates the principle of controllable factors that is contained in the Basin Plan, and limits Reclamation's obligation to control temperatures in the reach above RBDD to factors within Reclamation's reasonable control.

In this case, the record does not support the conclusion that it was within Reclamation's control to reduce SWP allocations, or that it would have been reasonable to reduce Shasta releases and CVP allocations even further in order to achieve lower TDM levels, taking into consideration the extreme drought conditions that existed in 2022, the need to supply water for human health and safety needs, and the already severe reductions in allocations to CVP contractors, including the unprecedented and significant reduction in allocations to the SRSC. As described in Section 2.7.3, Reclamation participated in discussions to identify a release schedule that maximized suitable habitat for winter-run Chinook salmon after meeting human health and safety needs. In its letter approving the TMP, NMFS determined that Reclamation had complied with the IOP and would provide sufficient habitat for winter-run for as long as possible given the conditions at the time of planning. (Cathy Marcinkevage, Assistant Regional Administrator, California Central Valley Office, National Marine Fisheries Service, letter to Kristin White, Operations Manager, Bureau of Reclamation, May 4, 2022 <https://www.waterboards.ca.gov/drought/sacramento_river/docs/2022-05-04_nmfs_letter_approval.pdf> [as of May 4, 2023].)

The fact that the TMP prioritized protection of habitat for winter-run Chinook salmon was also consistent with Reclamation's obligations under Order 90-5, even though the TMP was projected to result in warmer fall temperatures that may have been detrimental to spring- and fall-run Chinook salmon. Order 90-5 specifies that factors beyond the reasonable control of Reclamation include conditions where higher temperatures are necessary to implement measures to conserve winter-run Chinook salmon. (Order 90-5, p. 55.) Although spring-run Chinook salmon have been listed as threatened since the Board adopted Order 90-5, they have not been listed as endangered. And although fall-run Chinook is a culturally, commercially, and recreationally important species, the fall-run has not been listed as threatened or endangered. In addition, spring-run and fall-run Chinook populations persist in several streams across the Central Valley, while winter-run Chinook spawn exclusively below Keswick Reservoir and are uniquely susceptible to temperature impacts on the Upper Sacramento River compared to other salmon runs.

Therefore, it would not have been reasonable for Reclamation to maintain cooler temperatures in the fall for the benefit of spring-run and fall-run at the possible expense of maintaining suitable cold water habitat in the spring and summer to protect winter-run given the uncertainty that existed for protection of winter-run with lower releases.

Uncertainty due to the extremely dry conditions in 2022 also supported the Executive Director's approval of the TMP. In particular, modeling TDM was uniquely challenging due to novel areas of uncertainty with respect to the capacity to model temperatures at flows lower than the calibration data set. The Keswick release plan was more than 2,300 cfs lower than any past summer flows and it was unclear how such low flows would influence thermodynamics in Keswick Reservoir and in the upper Sacramento River. A lower release schedule of 4,000 cfs may have improved temperature management modestly, but it would have increased uncertainty in the modeling, possibly resulting in warmer than modeled temperatures, and it may have presented concerns for the availability of water supplies needed for human health and safety. The degree of uncertainty that existed in 2022 is borne out by the fact that TDM turned out to be significantly lower than estimated in the final TMP. As described above in Section 2.7.3, NMFS estimates winter-run Chinook experienced TDM of 18 percent in 2022, significantly lower than the 54 percent estimate in the TMP.

3.1.2 Impacts to the Trinity River Fishery

NRDC also claims that the TMP violated Order 90-5 because it would result in temperature exceedances that adversely impact spawning and incubation conditions on the Trinity River. In support of this claim, NRDC cites to NMFS's April 27, 2022, comments on the draft TMP, which included the assertion that Reclamation was using the Trinity River Division for water temperature control on the Sacramento, notwithstanding projected violations of temperature requirements on the Trinity River. Contrary to NRDC's contention, however, we find that the temperature strategy outlined in the TMP did not rely on Trinity River imports to control temperatures in the Sacramento River, and there is no evidence that Reclamation operated in that manner in the summer or fall of 2022.

Order 90-5 added a condition to Reclamation's permits and licenses to ensure that Reclamation's efforts to meet temperature requirements in the Sacramento River do not cause thermal impacts to the salmon fishery in the Trinity River. (Order 90-5, p. 53.) The condition prohibits Reclamation from operating its Trinity River Division for water temperature control on the Sacramento River in a manner that adversely affects salmonid spawning and egg incubation in the Trinity River. Adverse effects are deemed to occur if certain temperatures at specified locations on the Trinity River are exceeded "due to factors which are (a) controllable by [Reclamation] and (b) are a result of modification of Trinity River operations for temperature control on the Sacramento River." (*Id.*, pp. 61-62.)

To support Trinity River temperature management, the Final TMP kept Trinity River imports to the Sacramento River watershed to a minimum in 2022 t, resulting in the lowest annual imports since 2001. During WY 2022, approximately 253 TAF of water was diverted from the Trinity River, which is significantly less than the average annual diversions from 2001 to 2022 (654 TAF), and is less than WY 2010 (275 TAF) or WY 2016 (278 TAF), the next two lowest years on record. Flow releases to the Trinity River from Lewiston Reservoir are limited by the 2000 Record of Decision, and according to Reclamation, exporting some water from the Trinity River during the summer months is important to reduce the residence time of water in Lewiston Reservoir and minimize the thermal warming of water that is released to the Trinity River. In addition, imports from the Trinity River during the temperature management season historically have been warmer than releases from Shasta Reservoir on the Sacramento River. Although water temperature data for Trinity River imports is not available for 2022, conditions are unlikely to have been different that year.[4] The minimal volumes of water imported from the Trinity and the likely lack of temperature benefits from those imports indicate that the water imported after the May 6 approval of the Final TMP was not imported for the purposes of temperature management on the Sacramento River, notwithstanding the April 27, 2022, comment letter from NMFS. While exceedances on the Trinity River were reported to the Board in October 2022, Board staff did not find that that those exceedances were a result of modified Trinity operations for temperature control on the Sacramento River. Instead, the exceedances were the result of persistent drought conditions and water supply decisions. As a result, we find that the 2022 TMP and Reclamation's operations in accordance with the TMP did not violate Order 90-5 due to temperature exceedances on the Trinity River.

3.1.3 Compliance with the CVPIA

NRDC's final contention is that approval of the TMP was contrary to law because the TMP violated the CVPIA. In support of this contention, NRDC argues that the CVPIA prohibits Reclamation from reducing Level 2 water supplies to wildlife refuges below 75 percent, and contrary to this prohibition the TMP assumed an 18 percent allocation to wildlife refuges north of the Delta. Under both section 8 of the federal Reclamation Act (43 U.S.C. § 383) and section 3406(b) of the CVPIA, Reclamation is required to operate the CVP in compliance with State Water Board decisions establishing conditions in CVP water right licenses and permits. Accordingly, Reclamation is obligated to comply with both Order 90-5 and the CVPIA. NRDC's contention that approval of the TMP violated the CVPIA lacks merit because the Executive Director's approval of the TMP did not relieve Reclamation of its independent obligation to comply with the CVPIA. In addition, NRDC has not shown that Reclamation's obligation to control temperatures as

[4] Water temperature data are available through Station ID "SPP" for Trinity River imports through Spring Creek Powerhouse and Station ID "SHD" for water released from Shasta Reservoir on CDEC.water.ca.gov.

required by Order 90-5 precluded Reclamation from delivering water to wildlife refuges as required by the CVPIA.

3.2. Response to Sacramento River Settlement Contractors' Petition

As summarized above, the SRSC contend that the Executive Director's conditional approval of the TMP exceeded the Executive Director's authority under Order 90-5. This contention is based on the SRSC's interpretation of ordering condition one of Order 90-5, which specifies that, when factors outside Reclamation's reasonable control prevent Reclamation from maintaining 56°F at RBDD, Reclamation must designate an alternative compliance location, report the change in location to Deputy Director, and file an operation plan showing Reclamation's strategy to meet the requirement at the alternative location. Subsequently, ordering condition one provides that Reclamation may meet the requirement at the alternative location until it is within Reclamation's control to meet the requirement at RBDD, unless the Deputy Director timely objects to the change within 10 days of Reclamation's report.

Based on ordering condition one, the SRSC argue that Order 90-5 9 does not require Reclamation to take all actions within its reasonable control to improve temperature conditions, including actions to maintain carryover storage levels, when Reclamation designates an alternative compliance location. Instead, they maintain that Reclamation's only obligation under these circumstances is to demonstrate that it can maintain 56°F at the alternative compliance location. They argue further that the Executive Director's authority is limited to objecting to the alternative compliance location proposed by Reclamation, and the Executive Director lacks authority to approve a TMP subject to conditions. For these reasons, the SRSC object to condition one of the Executive Director's approval of Reclamation's TMP, which required Reclamation to take all actions within its reasonable control to improve temperature conditions for winter- and fall-run Chinook salmon, including minimizing TDM and maximizing carryover storage, and reserved the Executive Director's authority to modify the conditions of approval based on changed circumstances.

Preliminarily, the argument that the Executive Director may not conditionally approve a TMP lacks merit. The authority to conditionally approve a TMP is implicit in the Executive Director's authority to object to the alternative compliance location proposed by Reclamation and the associated operations plan. If the Executive Director has authority to object to a TMP altogether, it follows that the Executive Director may approve the TMP, subject to conditions. (See *Nichols v. County of Santa Clara* (1990) 223 Cal.App.3d 1236, 1244 [statutory authority to issue licenses to carry concealed firearm includes implied authority to revoke the licenses]; see also State Water Board Order WQC 84-5, pp. 6-17 [authority to issue wastewater treatment plant operator certificates includes implied authority to revoke certificates].) It also merits note that, if the SRSC were correct, and the Executive Director could not impose conditions of approval to ensure compliance with Order 90-5, then the Executive Director would be forced to object to any TMP submitted by Reclamation that is deficient in any respect, no matter how minor the deficiency. The likely result would be frequent violations of Order 90-5, which does not allow Reclamation to meet the temperature requirement at

an alternative compliance location if the Executive Director objects to Reclamation's proposed change. Order 90-5 should not be interpreted to require such a draconian and inefficient process whenever factors outside Reclamation's reasonable control preclude Reclamation from meeting the temperature requirement at RBDD.

The SRSC's arguments concerning the substance of condition one of the Executive Director's approval lack merit as well. As stated above, they argue that condition one is invalid because it requires Reclamation to take all actions within its reasonable control to improve temperature conditions. They reason that Order 90-5 specifies that a TMP must show Reclamation's strategy for meeting the temperature requirement at the alternative compliance location designated by Reclamation, and they conclude on this basis that a TMP *only* needs to show Reclamation's strategy for meeting the requirement at the alternative location. Order 90-5 does not expressly provide, however, that a TMP is limited to showing Reclamation's strategy for meeting the temperature requirement at the alternative compliance location. Moreover, petitioners' interpretation of Order 90-5 is fundamentally inconsistent with Reclamation's responsibility under Order 90-5 to meet the temperature requirement at RBDD, subject to controllable factors as that concept is discussed in Order 90-5 and defined in the Basin Plan. (See Order 90-5, pp. 18-21 [discussing controllable factors as applied to the temperature requirement], 54-55 [imposing the temperature requirement as a condition of Reclamation's permits, subject to controllable factors].)

As explained in section 2.3, above, Order 90-5 incorporates the Basin Plan's principle of controllable factors and discusses the need for the length of the protected reach below Keswick Reservoir to be flexible, depending on controllable factors and the presence of spawning salmonids. The concept of controllable factors provides flexibility when meeting water quality objectives cannot reasonably be achieved, but it also precludes further degradation of water quality due to controllable factors when uncontrollable factors have already caused water quality objectives to be exceeded. (Order WR 90-5, p. 18; Basin Plan, p. 3-2.) Consistent with this principle, Reclamation may move the compliance location upstream when Reclamation is unable to maintain 56°F at RBDD, but when Reclamation is not meeting the requirement at RBDD, Reclamation must take all actions within its reasonable control to improve water temperatures to the extent possible. Accordingly, the Executive Director may object to the alternative compliance location designated by Reclamation and require Reclamation to meet the temperature requirement at a more protective, downstream location, if the Executive Director determines that doing so is within Reclamation's reasonable control. (Order 90-5, pp. 20, 55.) Similarly, if circumstances change after Reclamation's TMP is approved, and as a consequence controllable factors allow Reclamation to maintain 56°F closer to RBDD, or for a longer period of time, then Reclamation may be required to modify its TMP. Under those circumstances, Order 90-5 should not be interpreted to allow Reclamation to continue to meet the temperature requirement at the original, alternative compliance location. For these reasons, condition one of the Executive Director's approval properly required Reclamation to take all actions within its reasonable control to improve temperature conditions for winter- and fall-run Chinook salmon, and reserved authority to modify the approval of the TMP based on any changed circumstances.

Similarly, the provision of condition one that required Reclamation to maximize carryover storage in Shasta Reservoir was consistent with the concept of controllable factors and Reclamation's obligations under Order 90-5. Based on their argument that a TMP is limited to demonstrating compliance with the temperature requirement at the alternative compliance location designated by Reclamation, the SRSC maintain that the Executive Director lacks authority to require Reclamation to address temperature concerns outside the temperature management season. Contrary to this argument, however, temperature concerns outside the temperature management season are germane to the Executive Director's determination of whether the alternative compliance location and operations plan proposed by Reclamation is consistent with Reclamation's obligation to take all actions within its reasonable control to improve water temperatures. This determination requires an evaluation of the reasonableness of the temperature control measures proposed by Reclamation, which in turn requires consideration of both the near-term temperature benefits and water supply costs or other trade-offs of those measures, as well as any long-term benefits or costs.

Thus, for example, in determining the reasonableness of a particular release schedule, the Executive Director must consider the level of temperature control and fish protection that would be achieved under that schedule during the temperature management season, the near-term water supply impacts and other trade-offs of the release schedule, and the resulting carryover storage levels and associated implications for temperature management and water supplies the subsequent year. As the State Water Board stated in Order 90-5, maximizing salmon production with a limited supply of water will require careful planning, and Reclamation must plan its releases from Shasta Reservoir so it does not run out of cool water late in the season. (Order 90-5, pp. 18-19.) Similarly, Reclamation must plan its releases to ensure adequate carryover storage to effectively manage temperatures the subsequent year, especially given that Reclamation rarely if ever meets the temperature requirement at RBDD. In fact, NMFS-SWFSC scientists have demonstrated that a strong correlation exists between May 1 storage and effective temperature management, and increased carryover storage can benefit temperature management in subsequent dry years when Shasta Reservoir does not refill. (James Gilbert, Ph.D., Specialist, Southwest Fisheries Science Center, presentation to the State Water Board during March 16, 2022 workshop on temperature management.)

4. CONCLUSIONS

As stated above, the petitions for reconsideration of the Executive Director's approval of Reclamation's 2022 TMP are moot because the TMP is no longer in effect. In addition, for the reasons explained above, we find that the Executive Director's conditional approval of the TMP was consistent with Order 90-5 and other applicable law and supported by substantial evidence. Accordingly, the petitions for reconsideration of the Executive Director's approval should be denied.

ORDER

IT IS HEREBY ORDERED that, the Executive Director's May 6, 2022 approval of Reclamation's Sacramento River temperature management plan prepared pursuant to State Water Board Order 90-5 is affirmed. The petitions for reconsideration are denied.

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 MONTH XX, 2023.

_____

Courtney Tyler
Clerk to the Board