

**Addendum to the
State Water Project and Central Valley Project
Drought Contingency Plan**

May 31, 2022

**State Water Project and Central Valley Project
Drought Contingency Plan
May 1, 2022 – September 30, 2022**

This Drought Contingency Plan (Drought Plan) is prepared by the California of Water Resources (DWR) and the U.S. Bureau of Reclamation (Reclamation) to provide updated information about areas of potential concern given the current hydrology and water operation conditions in 2022.

DWR and Reclamation operate the State Water Project (SWP) and the Central Valley Project (CVP), respectively, to the 2019 U.S. Fish and Wildlife Service (USFWS) Biological Opinion and 2019 National Marine Fisheries Service (NMFS) Biological Opinion (Collectively the 2019 Biological Opinions), and DWR also operates to the 2020 California Department of Fish and Wildlife Incidental Take Permit (ITP). Certain operational requirements have been modified by an interim operational plan for the 2022 water year (2022 IOP) that was proposed by the federal and state agencies and ordered by federal court in ongoing litigation regarding the 2019 Biological Opinions.¹ This Drought Plan is submitted by DWR to the California Department of Fish and Wildlife (CDFW) in response to Condition 8.21 of the ITP. Concurrently, this plan will also be shared with the members of the Water Operations Management Team (WOMT) which includes representatives from DWR, Reclamation, USFWS, NMFS, CDFW, and the SWRCB (collectively referred to as Agencies).

This Drought Plan also includes current hydrologic conditions, a species status update, SWP and CVP (collectively referred to as Projects) operations forecasts which utilize the May 1 hydrology forecasts, water supply forecasting improvements, and known WY 2022 drought actions. This Drought Plan reflects the very dry conditions experienced between January and March as well as the above average April, as captured in the updated May 1 water supply forecast.

DWR and Reclamation are committed to working with the Agencies through further development of drought actions, weekly WOMT coordination, and other forums as necessary.

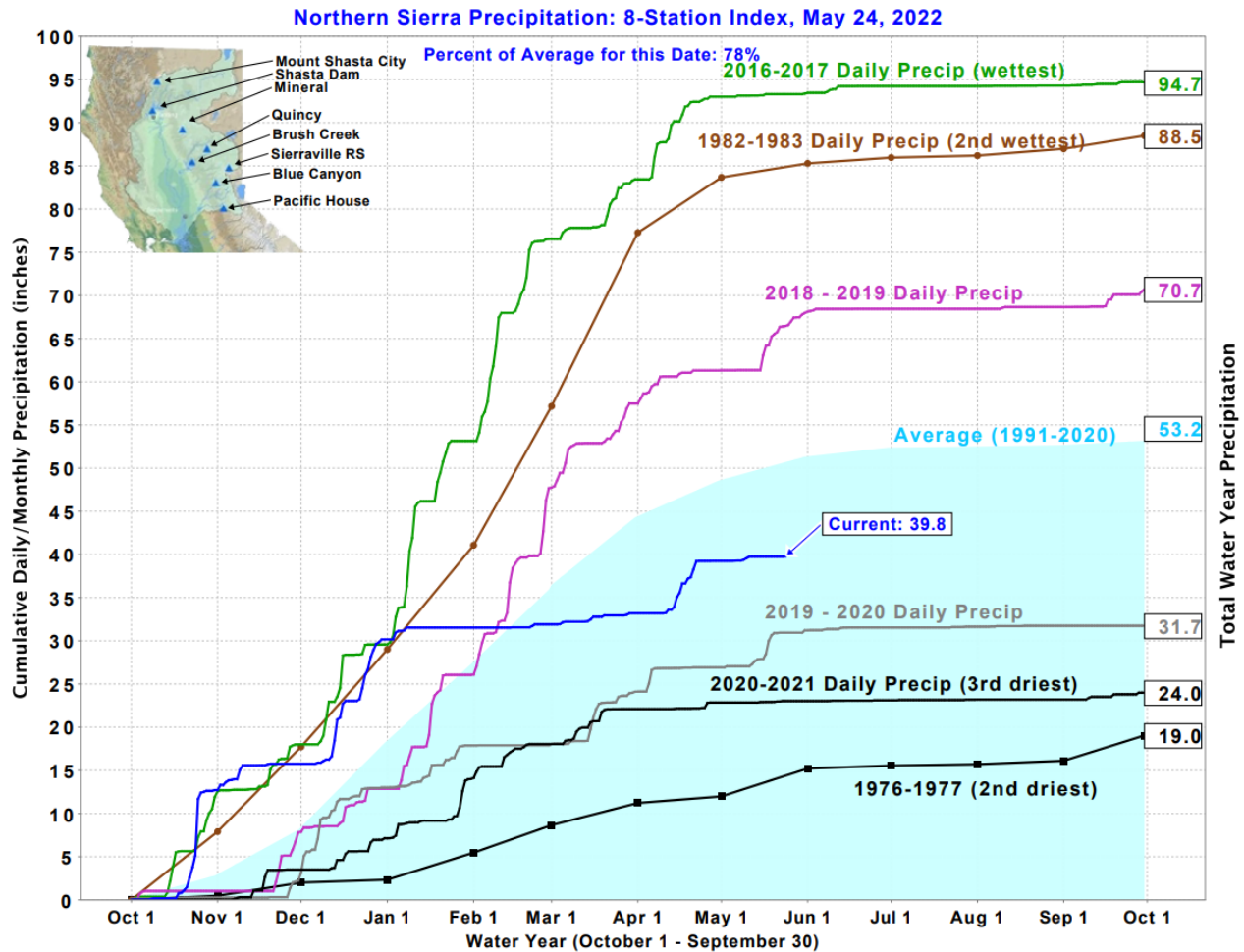
[Hydrology Update](#)

After the large storms of October and December 2021, there was minimal precipitation across the state in January, February, and March, which resulted in the driest January-through-March period on record. April brought above average precipitation, which did help in increasing storages in Folsom and Oroville reservoirs; however, it has not alleviated the overall deficit in the amount of precipitation during the previous three months. The Northern Sierra 8-Station Precipitation Index (8SI) saw its second wettest October on record and a well above-average December, but January through March saw only three inches of precipitation (during this period, average precipitation would be 26.1 inches). After three consecutive months of well below

¹ Order Re Motions to Remand Without Vacatur, Stay, and Impose Interim Injunctive Relief, U.S. District Court Eastern District of California, Case Nos. 1:20-cv-00431-DAD-EPG and 1:20-cv-00426-DAD-EPG (Mar. 11, 2022).

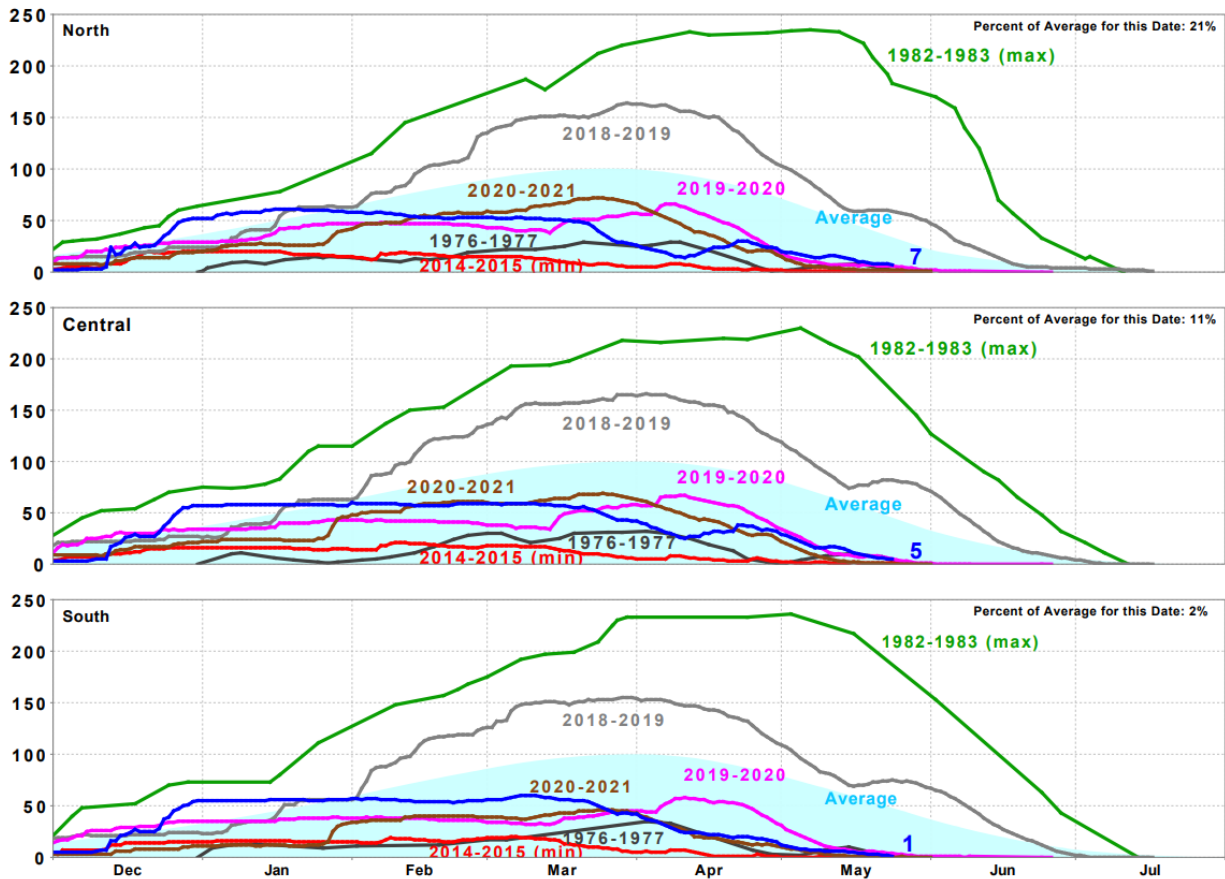
average precipitation, the state finally saw significant precipitation in April. The northern part of the state was the most impacted with the Northern Sierra 8-Station Precipitation Index (8SI) seeing a total of 6.1 inches in April, 141% of the monthly average. While the central and southern Sierras saw precipitation, it was still below average with the San Joaquin 5-Station Precipitation Index (5SI) and the Tulare Basin 6-Station Precipitation Index (6SI) measuring 2.2 and 1.1 inches, respectively, which is 62% and 44% of their April averages.

As shown in blue on the following chart, the Northern Sierra Precipitation total as of May 24, 2022, is 39.8 inches and 78% of average to date.



The state saw a series of significant storm events in December leading to large accumulations of snowpack across the state, especially in the Central Sierras. However, since the first of the year, there has been minimal additional snow accumulation and, by the time of this report, most of the snowpack has melted. This year's snowpack was the fifth smallest snowpack on record dating back to 1950, behind WYs 2015, 1977, 2014, and 1988. While statewide snowpack continued to fall throughout the winter, there was a small increase from April storms; however, the peak snowpack remained well below average at 15% of normal. The following chart shows snowpack statewide across the Sierra Nevada as of May 24, 2022:

California Snow Water Content, May 24, 2022, Percent of April 1 Average



Statewide Percent of April 1: 5%

Statewide Percent of Average for Date: 12%

SWP and CVP Conditions

Storage

Storage conservation at Shasta, Trinity, Folsom, New Melones and Oroville reservoirs has been a priority this winter and spring. The 2022 TUCO, which was conditionally approved on April 4, allowed the Projects to decrease reservoir releases in April and continue conserving storage this spring to help meet needs this summer. Above average April precipitation in the Northern Sierra Basin also allowed for higher than forecasted inflows into primarily Oroville and Folsom reservoirs. As of May 24, storage in Oroville remains well below average for this time of year, whereas Folsom is now above average after the April storms.

Lake Oroville storage is about 1.93 million acre-feet (MAF) (55% of capacity and 69% of historical average). Due to both early season snowmelt and April's above average precipitation, storage continues to increase. Oroville storage at the end of April was over 200 TAF above what was forecasted in March.

Lake Shasta storage is about 1.82 MAF (40% of capacity and 48% of historical average). Trinity Reservoir storage is about 747 TAF (31% of capacity and 39% of historical average). Unfortunately, Lake Shasta and Trinity Reservoir have not benefited significantly from the storm events in WY 2022 since most of the storms centered on watersheds further south or west. It is likely these reservoirs are at or near their maximum storage for the water year. Folsom Lake storage is approximately 857 TAF (87% of capacity and 110% of historical average). Due to both early season snowmelt and April's above average precipitation, storage continues to increase and may not reach maximum storage until early June.

In the San Joaquin watershed, storage in New Melones Reservoir is 887 TAF, which is 37% of capacity and 59% of historical average.

Releases

As of May 24, releases to the Sacramento River from Keswick Reservoir are at 3,750 cubic feet per second (cfs). Reclamation is operating Shasta Reservoir and the Sacramento River consistent with a multi-agency agreement on maximum average Keswick releases of 4,500 cfs from May through August. Total releases to the Feather River from Lake Oroville are currently 2,700 cfs.

Releases from Folsom are at 1,500 cfs for both storage conservation and to conserve cold water for temperature management later in the summer and fall.

Releases from New Melones from mid-April to mid-May have been for the Stepped Release Plan Spring pulse flow. The remainder of May and for the month of June, releases will be targeted to achieve a monthly average Vernalis flow of 710 cfs as per the TUCO Condition 1.c.

Species Status Update

Salmonids

As of May 23, 2022, all natural juvenile winter-run Chinook Salmon are considered to have migrated past the Red Bluff Diversion Dam, and the total estimate for this brood year is 572,535, based on USFWS rotary screw trap monitoring. A large proportion of natural winter-run Chinook Salmon entered the Delta during the unusually wet fall months of 2021. The eventual cumulative catch record at the end of the migration season will likely show that well over half the winter-run catch in monitoring stations near the entrance to the Delta occurred prior to January 1, resulting in this year's cohort having the earliest migration timing into the Delta of any cohort on record (i.e., for any given percentile on each cohort's cumulative catch curve). As of May 17, 2022, SaMT estimated 100% of the population had entered the Delta, and as much as 95% had exited the Delta (see Table 1 below). On May 17, 2022, the Salmonid Monitoring Team (SaMT) determined the weekly risk forecast of exceeding yearly entrainment thresholds remains low due to low salvage, and this risk assessment will likely stay low for the duration of the migration

season ending in June. However, SaMT estimated the risk level for exceeding the daily loss threshold for natural winter-run Chinook salmon is high, and the risk assessment will likely continue to be high through May due to low loss thresholds, which will typically be exceeded by a single SWP salvage event. In fact, the daily loss threshold for natural winter-run was exceeded on two days in April prior to April 19 but did not require a change in operations because other regulatory requirements were causing OMR to be less negative than required by the ITP Condition of Approval 8.6.3. The low daily natural winter-run daily loss thresholds are in turn due to a relatively low winter-run Juvenile Production Estimate. Risk of exceeding daily thresholds in June will relax to low in June, as few to no winter-run juveniles are expected to remain in the Delta this year past May.

All hatchery winter-run are estimated to have exited the Delta, and the risk of exceeding annual loss thresholds is low and will remain low for the duration of the migration season. The majority of natural spring-run have been estimated to have exited the Delta, spring-run are regulated using hatchery surrogate releases rather than estimates of natural production, and because of overall low salvage rates of salmon, the risk of exceeding annual loss thresholds for spring-run surrogates this migration season is and will remain low. Although daily loss of natural winter-run Chinook Salmon was the greatest issue of concern regarding salmon-related export management, historically and consistent with current monitoring, their migration season is rapidly nearing conclusion, and other regulatory actions will likely continue to be the controlling factors governing OMR and project operations.

Table 1. Salmon Monitoring Team estimated salmon distributions as of May 17, 2022.

Location	In River	In Delta	Exited Delta
Winter-run (natural)	Current: 0%	Current: 5-10%	Current: 90-95%
	Last Week: 0-1%	Last Week: 4-20%	Last Week: 80-95%
Spring-run (natural)	Current: 1-5%	Current: 5-29%	Current: 70-90%
	Last Week: 1-10%	Last Week: 10-39%	Last Week: 60-80%
Winter-run (hatchery)	Current: 0%	Current: 0%	Current: 95-100%
	Last Week: 0%	Last Week: 0%	Last Week: 100%

Delta Smelt

The Smelt Monitoring Team (SMT) began meeting to discuss current-year conditions at the end of November 2021. The 2021 Fall Midwater Trawl was completed in December, and the 2021 index was zero (“0”) for the fourth year in a row. The only survey that has caught Delta Smelt on a quasi-regular basis in recent years is the Enhanced Delta Smelt Monitoring Program (EDSM). WY 2022 was the first year of Delta Smelt experimental releases, with 55,733 hatchery-reared fish released into the lower Sacramento River, Sacramento Deep Water Shipping Channel, and

Suisun Marsh. Releases occurred from December 15, 2021, through February 17, 2022, and have concluded for the water year. In the period since the first release, as of May 20, 2022, EDSM has caught 56 released (i.e., tagged) Delta Smelt in the lower Sacramento River, the Sacramento Deep Water Ship Channel (DWSC), Suisun Marsh, and the lower San Joaquin River. Additionally, two Delta Smelt were collected by the Chipps Island Trawl during this period. One released fish was also collected in salvage at the CVP on January 16, 2022, 18 released fish were collected in the Spring Kodiak Trawl, and one released fish was collected by the January Bay Study survey in the lower Sacramento River. One wild Delta Smelt, confirmed genetically, has been collected in WY 2022 by EDSM in the lower Sacramento River on January 5, 2022. Larval and juvenile Delta Smelt have been detected among several surveys in WY 2022, with one larva in Smelt Larva Surveys, 14 larvae and juveniles in 20mm Surveys (including one larva in Old River), and 14 larvae and juveniles in EDSM Phase 2 (20mm gear) sampling. Lastly, SWP Barker Slough Pumping Plant (BSPP) operations can be affected under the ITP (Condition of Approval 8.12) when Delta Smelt larvae are detected between March 1 and June 30 at station 716 in Cache Slough in Dry and Critical years. This trigger was met by the first 20mm Survey of WY 2022, but the second, third, and fourth 20mm Surveys did not detect larvae and there are currently no restrictions on BSPP operations as of May 20, 2022. ITP Condition of Approval 8.12 protections for Delta Smelt end on June 30, 2022.

Longfin Smelt

Salvage data from WY 1994 through WY 2014 indicates that salvage of adult Longfin Smelt is generally rare and typically occurs between the months of December and February. In WY 2021, young of year (age 0) Longfin Smelt were mostly observed at the salvage facilities between April and May. The majority of Longfin Smelt salvage typically occurs after February when young of year fish rearing in the south and central Delta have grown large enough to be effectively screened by the fish collection facilities.

As of May 17, 2022, 7,218 juvenile Longfin Smelt have been salvaged this water year at both the SWP and CVP. Additionally, qualitative larval sampling at both salvage facilities has detected Longfin Smelt under 20 mm in length. Longfin Smelt larvae have been regularly detected by the Smelt Larva Survey (SLS) and 20mm Survey in the lower San Joaquin River and Old and Middle Rivers throughout WY 2022, most recently with 20mm Survey #3 during April 18-21, 2022. 20mm #4, during May 2-5, 2022, sampled larval and juvenile Longfin Smelt in the lower San Joaquin River but not in the south Delta. Additionally, the pilot Larval Smelt Entrainment Monitoring Program detected Longfin Smelt larvae in West Canal near Clifton Court Forebay from January to May of 2022.

Overall monitoring catch in the central and south Delta has generally been low relative to other areas of the estuary, but detections suggest that spawning in the Delta has occurred in both the San Joaquin River and Sacramento River corridors. Large catches have also occurred downstream of the confluence by EDSM, SLS, and 20mm. The SMT tracks Longfin Smelt distribution and salvage to assess risk and make appropriate operational recommendations consistent with the Longfin Smelt ITP, and the most recent assessment showed low risk of entrainment for fish outside the OMR corridor, and high risk for fish within the OMR corridor. As

of 20mm #4, ITP Condition of Approval 8.4.2 was not triggered, and the SMT has not provided an OMR recommendation since May 10, 2022.

Lastly, Barker Slough Pumping Plant (BSPP) operations can be affected under the ITP (Condition of Approval 8.12) when Longfin Smelt larvae are detected between January 15 and March 31 at station 716 in Cache Slough in Dry and Critical years. This trigger was reached by several SLS surveys in WY 2022, and on March 31, 2022, BSPP protections for Longfin Smelt under ITP Condition of Approval 8.12 off-ramped.

SWP and CVP Operational Considerations

DWR and Reclamation have developed preliminary operational forecasts through September 2022, using the 90% exceedance forecast from the May 1, 2022, Bulletin 120 forecast developed by DWR's Division of Flood Management. The operational forecast included in this Drought Plan reflects a potential outcome given the hydrologic forecast on May 1 and assumptions on initial regulatory and policy decisions regarding prioritization of a limited water supply. The forecast is designed to make the most efficient use of the limited water resources in 2022 for multiple beneficial uses while meeting regulatory requirements and managing the potential risks of continued drought conditions into next year. There are four main goals of Project operations within the forecasts: 1) Meet health and safety requirements throughout the SWP and CVP service areas, including those that rely on Project exports; 2) Preserve upstream storage to the extent possible for temperature management, instream uses in the water year, and carry-over storage for future drought protection; 3) Meet regulatory and senior/riparian water right obligations throughout the basins; and 4) Deliver available project water not needed to meet the previous three goals.

Operations Forecasts - Projected Hydrology and Runoff, Releases and Storage

The DWR's Hydrology and Flood Operations Branch within the Division of Flood Management produces estimates of water year runoff, or the water supply index (WSI), for the major watersheds of the Sacramento and San Joaquin River basins. The WSI forecast is a statistically based forecast of Water Year runoff for each major river basin in the Sacramento and San Joaquin valleys (Sacramento, Feather, Yuba, American, Stanislaus, Tuolumne, Merced, and San Joaquin). The runoff forecasts are produced for six exceedance levels--99%, 90%, 75%, 50%, 25%, and 10%--and are done at the beginning of the month from December through May.

The Projects used the 90% exceedance Water Supply Index (WSI) forecast for the joint operations plan included in this May Drought Plan update. The hydrologic forecast is unique to this water year and informed by precipitation, runoff, snowpack, and other antecedent hydrologic conditions as they existed on May 1, 2022. The forecast also combines the runoff associated with the antecedent conditions with the anticipated runoff resulting from precipitation forecasted to occur through September 30. For example, the 90% exceedance hydrology assumes inflows from rainfall and snowmelt at levels that are likely to be exceeded with a 90% probability, or in

other words, there is a 10% or less chance of actual conditions turning out to be this dry or drier from this point forward.

The May 1 WSI forecast water year classifications and runoff for the Sacramento Valley and San Joaquin Valley are summarized as follows:

Sacramento River Unimpaired Runoff (50% Exceedance)	10.6 MAF (60% of average)
Sacramento Valley Index (SVI) (50% Exceedance)	4.5 MAF (Critical)
San Joaquin Valley Index (SJI) (75% Exceedance)	1.5 MAF (Critical)

SWP and CVP Operations Forecasts

The May 1, 2022 SWP and CVP operations forecast is shown in Attachment 1 and includes storage and flows under the 90% exceedance hydrologic scenario. Given the above average precipitation conditions for Northern Sierra Basin in April, the Projects expect that the 90% exceedance forecast represents a conservative outcome for the remainder of WY 2022. The operations forecast uses the runoff forecast as model inputs to simulate Project operations under various regulatory requirements and produce forecasted reservoir storages, releases, and flows under the same hydrologic exceedances. This operations forecast gives general guidance for annual water delivery, storage management, and power planning purposes for this exceedance assumption. Actual hydrologic events unfold in time steps shorter than a month and are often unpredictable more than a few days to a week out. Day-to-day operations are driven by operating criteria such as those found in U.S. Army Corps of Engineers flood control manuals, SWRCB D-1641 Bay-Delta Standards, the NMFS and USFWS Biological Opinions, and the ITP for the SWP. Outputs from forecast models, as provided in this May Drought Plan, represent system responses to the overlay of specific expected monthly operating criteria on each of the discrete hydrologic scenarios provided in the May 1 water supply forecasts.

Differences in snowpack distribution, variation among basin and sub-basin hydrologic circumstances, disparity among month-to-month hydrologic conditions, and other meteorological uncertainties can also affect real-time reservoir and Delta operations and the available water supply at any given time. The 90% exceedance forecast presented in Attachment 1 of this document includes forecasted inflows, reservoir releases, water supply deliveries, and reservoir storage levels. This forecast is used for planning purposes, but it is not the only driver of actions that may be needed in the future. The purpose of this document is to identify generally foreseeable areas of concern in the 90% exceedance scenario as shown in operations forecast based on the May 1 Water Supply forecast. As described above, hydrological conditions can vary widely, as recently seen in a very dry January, February, and March followed by the above average April. Consequently, the condition described below is based on the May 1 water supply forecast, and the system and hydrological conditions known at the time this Drought Plan was developed. System operations and forecasts will change with actual conditions, thus each

subsequent water supply forecast and resulting areas of concern will be updated in future Drought Plan updates.

The forecast assumptions utilize existing storage conditions, actual precipitation through April, forecasted runoff based on the hydrology, projected water supply deliveries, and meeting existing flow and water quality standards, and fish and wildlife protections. The forecast includes monthly storage levels, reservoir releases, Delta export rates, and Delta outflow through September 30, 2022. DWR and Reclamation will continue to update the operations forecasts with each new monthly water supply forecast, and expect that with each updated operations forecast, SWP and CVP operations may change.

SWP and CVP Operations Forecast Summary

The 90% exceedance forecast incorporates dry conditions for WY 2022. For the remainder of WY 2022, current system-specific operations and 90% exceedance forecast areas of potential concern are further described in detail below.

Trinity River

The Spring pulse flow on the Trinity River, consistent with the annual allocation as prescribed by the Trinity River Main-stem Fishery Restoration Record of Decision, was completed May 16, 2022. Consistent with fish health criteria, releases to augment flows in the Lower Klamath River may also be considered in late summer. The storage forecasted in the 90% exceedance forecast for the end of September is extremely low at under 500 TAF and does not leave a storage buffer in the event WY 2023 is also dry. In addition, low storage of this level also likely results in temperature management concerns both this water year and in WY 2023. To conserve storage in Trinity Reservoir to the largest degree possible, Reclamation is diverting minimal water from Trinity to the Sacramento River. Imports to the Sacramento River are limited to those necessary to reduce the residence time in Lewiston Reservoir and support temperature management down the Trinity River.

Sacramento River

Due to the very low storage at Shasta Reservoir and the two back-to-back years of low egg to fry survival for the endangered winter-run Chinook Salmon, Reclamation, DWR, NMFS, FWS, CDFW and the SWRCB worked with the Sacramento River Settlement Contractors to develop a Keswick release plan that conserves Shasta storage and prioritizes temperature management in the Sacramento River. Minimum flows were maintained through the month of April, and thus far, May Keswick releases have been below the anticipated 4,500 cfs. The expected monthly release schedule for the remainder of the water year is below.

The release schedule above includes very low releases from Keswick Reservoir into the Sacramento River as well as very low releases from Spring Creek Power Plant into the Sacramento River system. These low flows create a high level of uncertainty with both

flow/temperature relationships as well as other river operations such as impacts to riparian diverters. Additionally, downstream depletions, Delta demands, and infrastructure limitations may also change the releases from the schedule above. Reclamation will be working with DWR, NMFS, USFWS, CDFW and the SWRCB regularly regarding these uncertainties and any potential for deviating from the release plan above.

The Final Temperature Management Plan for the lower Sacramento River was submitted to the SWRCB on May 2, 2022, and the SWRCB provided a conditional approval on May 6.

Clear Creek

Flows on Clear Creek will be consistent with the 2019 NMFS Biological Opinion. The timing of any prescribed pulse flows will be closely evaluated through technical teams to minimize effects on temperature management and/or ability to help meet other system flow needs. Concerns with Clear Creek temperature management will be similar to those of the Trinity system.

Feather River – Lake Oroville

Based on this water supply forecast, the end of September carryover storage is projected to be about 1.19 MAF, which is about 400 TAF higher than the historical low storage experienced and the end of WY 2021. The increased storage is primarily attributed to the April storms; however, it is well below our planning carryover target of 1.6 MAF. The main intake structure at Lake Oroville has a number of shutters that can be added or removed to control the elevation and temperature of water released from Lake Oroville. Feather River temperature management can be achieved through the removal of shutters from the intake structure. Typically, once a shutter is removed, it is not re-installed until the following year. Because of low lake elevation this year, there was not enough storage to support the installation of all the shutters, which is typical in a critical year. Therefore, during the summer and fall, when ambient temperatures are high, storage is low, and the shutters are exhausted, DWR will blend warmer water being conveyed through the main Hyatt intakes with colder water from Oroville Dam's low-level outlet. Planned releases from Lake Oroville are for meeting in-basin demands, which includes Delta and instream requirements, deliveries to senior water right holders, and Delta exports to support minimum public health and safety.

American River

Flows on the American River will be consistent with the provisions of action included in the 2019 NMFS Biological Opinion. Folsom is currently gaining storage as the result of above average April precipitation, snowmelt and low releases. Current storage is 854 TAF (as of May 24) which is 487 TAF higher than the storage at this same time in 2021. Flows in late May and June will be higher than minimum flows outlined in the 2017 revised American River Flow Management plan to meet Delta requirements; however, releases will be limited in late May and June to continue preserving the cold water pool for temperature management later in the summer. Flows in the summer and into the fall will likely be adjusted for Delta needs or to meet the temperature management plan for the American River. Starting in June, flow releases may increase at Nimbus to facilitate temperature management along the American River, and these increased

flows will then be used to meet other Project purposes in the system. Reclamation's current forecast shows Folsom at approximately 300 TAF at the end of September. This volume minimizes the risk of not meeting public health and safety demands in the event of a dry fall and lowers the risk of early flood releases in an average fall. Reclamation will be working with the American River Group on a Folsom temperature management plan in June.

Stanislaus River

Flows on the Stanislaus River will be consistent with the provisions of the 2019 NMFS Biological Opinion and D1641 Vernalis base flow and water quality requirements. Stanislaus flows May through June are expected to be primarily driven by the D1641 Vernalis base flow requirement (as modified by the 2022 April-June TUCO), which is met through releases from New Melones combined with flows in the San Joaquin River upstream of the Stanislaus River confluence, and the Stepped Release Plan spring pulse flow. The key area of concern for the Stanislaus River basin is carryover storage. New Melones has a very low refill rate, meaning it only typically fills in very wet years (such as 2017) and can go many years between filling even with non-drought hydrology. The 90% exceedance forecast shows a carryover storage of approximately 655 TAF at the end of September, leaving very little buffer for New Melones should WY 2023 also be dry.

In 2021, Reclamation released a significant volume of water (approximately 148 TAF) from New Melones Reservoir to meet Delta needs and to offset the need for additional releases from Shasta, Oroville and Folsom reservoirs. This operation was implemented in consideration of the extremely low storages at Shasta, Oroville, and Folsom reservoirs and the relatively higher storage at New Melones Reservoir. Due to the lower storage at New Melones Reservoir this year, there is currently no plan to conduct a similar operation in WY 2022. Reclamation and DWR are coordinating on an appropriate mechanism to recognize this 2021 operation.

Sacramento-San Joaquin Delta

May through June Project operations are in accordance with the modified D-1641 outflow and water quality standards as conditionally approved by the SWRCB in the April 4, 2022, Temporary Urgency Change Order (TUCO). The TUCO is further described below. Due to the increase in storage at both Folsom and Oroville reservoirs, the Projects do not anticipate the need for further modifications to D1641 after June. In addition, the Projects are not planning to rely on the modified western Delta agricultural salinity objective as included in the April 4, 2022 TUCO.

Higher releases from Folsom throughout the summer is expected to result in increased exports after meeting the D1641 Delta requirements. For the CVP, increased exports are currently expected to contribute to meeting demands for public health and safety, refuge, and Exchange Contractor. The CVP's ability to increase deliveries to the Exchange contractors from the Delta is, in turn, currently expected to support a decrease in releases to the Exchange Contractors from Friant Dam. It is further expected that this decrease in Friant Dam releases could support both the San Joaquin River Restoration Program and water supply to Friant Division contractors. Releases from Oroville will be to meet D1641 Delta requirements as well as support exports to meet public health and safety needs.

Monitoring Efforts to Inform Operations

Ecosystem Drought Monitoring

Monitoring during the previous major drought demonstrated that there can be major ecological changes in the estuary. For example, the previous drought (2014-2016) showed increases in harmful algal blooms, aquatic weeds, and alien fishes (e.g., centrarchids). Some of these same changes have already been seen over the past two drought years and are likely to continue. Our monitoring focuses on measuring these effects to understand the impacts of this potential drought and efficacy of different management actions taken to address these ecological stressors. As a specific example, these data can help evaluate the effects of controllable factors (e.g., diversions) versus factors that can't be managed (e.g., Delta temperature). Many of these changes, such as increases in harmful algal blooms, are not within the reasonable control of the CVP and SWP and should be addressed through the broader science enterprise.

Our approach to drought ecosystem monitoring is expected to build on existing monitoring and synthesis efforts to examine the effects of flow management and extreme flow events (e.g., drought, flood) on critical ecological conditions. The Interagency Ecological Program (IEP) Drought Management Analysis and Synthesis Team (MAST) was originally formed in 2014 to assess the impact of the major drought of 2012-2016. This team was reformed in spring of 2021 with several of the original members, as well as many new members, to assess the drought of 2020-2021 and future drought impacts. The team includes members from DWR, DSP, Reclamation, CDFW, USFWS, NMFS, and USGS, who are all committed to synthesis and monitoring of ecosystem drought impacts.

The Drought Synthesis Team is analyzing a broad suite of ecosystem parameters in the Delta to assess the impact droughts on the Delta, with particular attention to the drought of 2020-2022 and associated drought actions. An initial report was submitted on February 1 (available at: https://www.waterboards.ca.gov/drought/tucp/docs/2021/20220201_report_cond7.pdf) and included major ecosystem changes observed in historical droughts and the current drought. A secondary report will be provided February 1, 2023, with a final report in summer of 2023. The team is also developing a series of articles for publication in a peer-reviewed journal on the impact of previous droughts on the Delta.

The team works closely with the Drought Response Year Team, the interagency group updating and reporting on the actions in the Drought Toolkit and the joint DWR/Reclamation team developing the annual Drought Contingency Plan. The Drought Synthesis Team also provides data, feedback, and support for the teams assessing the ecological impacts of the West False River Emergency Drought Barrier and the TUCOs, particularly in regard to TUCO condition 8, which requires an analysis of the impact of the TUCOs on harmful algal blooms and aquatic weeds.

For details, see the “Drought Ecosystem Monitoring and Synthesis Plan, 2021-2023” (available at: <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Endangered-Species-Protection/Drought/-/media/DWR-Website/Web->

[Pages/Programs/State-Water-Project/Endangered-Species-Protection/Drought-Ecosystem-Monitoring-and-Synthesis-Plan.pdf](#)).

Updates on 2022 Drought Actions

The Projects have undertaken the following actions in response to the continuing drought; however, future Drought Plan updates may include additional drought actions, should they be needed.

Temporary Urgency Change Petition

Given the historic dry conditions in January through March 2022, the Projects submitted a TUCP on March 18, 2022, for April, May, and June 2022. On April 4, 2022, the SWRCB issued a conditionally approved TUCO. The April through June modified D1641 standards are as follows:

- Delta outflow: reduced from 7,100-11,400 cfs to 4,000 cfs;
- Delta salinity: re-located western agriculture salinity compliance standard from Emmaton to Threemile Slough;
- San Joaquin River at Vernalis: reduced minimum Vernalis flows from a range of 710 cfs to 1,140 cfs to 710 cfs; and
- Exports: at or below 1,500 cfs combined when not meeting D1641

While the historic January through March dry conditions were setting up conditions for additional D1641 modifications beyond June 2022, the recent April storm events and subsequent storage gains have improved conditions in both Oroville and Folsom. Based on the May 1 B120 forecast, the Projects do not plan to submit an additional TUCP for July and August.

West False River Emergency Drought Salinity Barrier

Construction of this rock-filled channel closure, across West False River from Jersey Island to Bradford Island, began on June 3, 2021, and installation was completed on June 22, 2021. Removal of the barrier was originally planned to begin in October and full removal was anticipated by November 30, 2021.

However, in response to the continuing drought conditions, DWR received approval from CDFW, U.S. Army Corps of Engineers, and the SWRCB to keep the emergency drought salinity barrier in place through the winter. In January 2022, the barrier was notched by removing rock from approximately 400 feet from the center section to allow boat and fish passage. The notch was backfilled on April 13, 2022. The barrier is planned to be fully removed no later than November 30, 2022.

In addition, DWR is working to get all environmental approvals, through standard non-emergency processes, to allow for up to two additional installations of the West False River barrier between 2023 and 2032, if needed. These future barrier installations would occur no sooner than April 1

of any given year and would be fully removed no later than November 30 that same year or the following year.

Feather River Settlement Contractors

The official determination of the delivery to the Feather River Settlement Contractors (FRSC) is based on the April 1 B120 Feather River runoff forecast. The April 1 B120 forecast triggered the drought deficiency criteria of the FRSC Agreements, and as such, the contractual deliveries to the FRSC have been reduced to 50% for WY 2022.

Reduction to water available for Sacramento River Settlement Contractors and North of Delta Wildlife Refuges

As noted above, due to the very low storage at Shasta Reservoir and the two back-to-back years of low egg to fry survival for the endangered winter run chinook salmon, Reclamation, DWR, NMFS, FWS, CDFW and the SWRCB worked with the Sacramento River Settlement Contractors to develop a Keswick release plan that conserves Shasta storage and prioritizes temperature management in the Sacramento River. This release plan was used to determine the available water for diversion by the Sacramento River Settlement Contractors and the wildlife refuges north of the Delta. The current estimate is that approximately 18% of the total contract value will be available for delivery in WY 2022 based on this release assumption. The shortage provision for a Shasta Critical year included in their contracts is 75%.

Release of water from Friant Dam for Contractual Demands in Mendota Pool

Due to the inability of Reclamation to provide enough water from the Delta in 2022 for the contractual demands of senior water rights contractors in Mendota Pool, Reclamation began making releases from Friant Dam on April 1, 2022 to meet these demands. As a result, the San Joaquin River Restoration Program had to cease San Joaquin River releases on April 11, 2022 due to the unavailability of river capacity for the Restoration Program flows. The Friant Dam releases are anticipated to continue through early July and may be reduced or ceased mid-July through September due to the increased Delta exports expected in the summer.

[Next Steps](#)

DWR and Reclamation continue to provide weekly condition and Project operations updates to members of the WOMT. In addition, DWR and Reclamation will continue to coordinate with the existing Long-term Operation Agency working groups and Drought Relief Year Team to develop a robust drought monitoring program with updates to WOMT and other forums as necessary. In addition, this Drought Plan will be updated in June to include the current hydrological conditions, SWP and CVP operational forecasts that incorporate any forecast updates, and additional potential drought actions, if warranted.

MODELED FORECAST RESULTS

For the 2022 Drought Action Plan

May 1st WSI - 90% HYDROLOGY

END OF MONTH STORAGES (TAF)					
RESERVOIRS	MAY	JUNE	JULY	AUGUST	SEPTEMBER
Shasta	1,778	1,669	1,540	1,407	1,317
Folsom	856	770	548	350	300
Oroville	1,865	1,644	1,334	1,176	1,123
New Melones	863	776	720	674	655
MONTHLY AVERAGE RELEASES (CFS)					
RIVERS	MAY	JUNE	JULY	AUGUST	SEPTEMBER
Sacramento	3,800	4,500	4,500	4,500	4,000
American	1,400	2,600	4,400	4,100	1,800
Feather	1,850	2,700	4,350	3,300	2,150
Stanislaus	610	500	150	150	150
DELTA SUMMARY (CFS)					
	MAY	JUNE	JULY	AUGUST	SEPTEMBER
Sac River at Freeport	6,150	7,750	10,450	9,900	6,750
SJ River at Vernalis	850	700	500	550	650
Computed Outflow	4,150	4,000	4,000	3,000	3,050
Combined Project Pumping	1,500	1,100	2,850	3,900	2,250