BUREAU OF RECLAMATION

Sacramento River Group Summary

July 23, 2026

Participants

- California Department of Fish and Wildlife (CDFW): Marelle Arndt, Mallory Boro, Tracy Grimes, Matt Johnson, Vanessa Lo, Michael Memeo, Erica Meyers, Ryan Revnak, Crystal Rigby
- California Department of Water Resources (DWR): Mike Ford, Ryon Kurth, Kevin Reece
- Contra Costa Water District: Barb Byrne, Deanna Sereno
- Friends of the River: Devon Pearse
- MBK Engineers: Catherine Morales-Sandoval, Anne Williams
- National Oceanic and Atmospheric Administration (NOAA): Miles Daniels, Kyra Fitz, James Gilbert, Darren Howe
- Pacific States Marine Fisheries Commission (PSMFC): Jamie Chelberg, Darin Olsen
- State Water Resources Control Board (SWRCB): Claudia Bucheli, Diane Riddle, Craig Williams
- Sacramento River Settlement Contractors (SRSC): Mike Deas
- San Luis-Delta Mendota Water Authority: Scott Petersen
- Save CA Salmon: Regina Chichizola
- U.S. Bureau of Reclamation (USBR): Randi Field, Andrea Hamilton, Josh Israel, Alyse Lacey, Ryan Lucas, Mandy Migura, Mechele Pacheco, Tom Patton, Kevin Thielen
- U.S. Fish and Wildlife Service (USFWS): Craig Anderson, Kaitlin Dunham, Bill Poytress
- Westlands Water District (WWD): Bradley Cavallo
- Western Area Power Administration (WAPA): Michael Prowatzke
- Yurok Tribe: Chris Laskodi
- Kearns & West (K&W): Michael Ding, Mia Schiappi

Action Items

1. Reclamation and SWFSC will align the redd and aerial row labels on TDM modeling tables before the next meeting to avoid inverted results.
2. Reclamation will add a Balls Ferry trace to the modeled temperature plot, and PSMFC will reach out to CDFW regarding water surface elevation data.
3. K&W will follow up with Kaitlin Dunham on Livingston Stone Hatchery updates and share with the SRG via email.

Summary of Actions

Welcome, Agenda Review, and Purpose

Mia Schiappi, Kearns & West, welcomed all participants.

Hydrology Update

Tom Patton, Reclamation, provided the latest forecast and implications for the Sacramento River system, and reported on current hydrologic conditions and dam operations. Patton presented the information contained in the meeting packet shared with the SRG. Sections below correspond to groups of graphs, images, and tables in the meeting packet provided by Reclamation.

Current Storage, Releases, Water Temperatures, and Current Operations: Daily CVP Water Supply as of July 22, 2026.

- Precipitation:
    - The Northern Sierra 8-Station Index is 50.8 inches, 97% of average for this time of year. Precipitation has been flat through the summer, and little more is expected this water year.
- Reservoir Releases:
    - Keswick Dam releases to the Sacramento River are approximately 13,000 cfs. Reclamation expects to hold that through the end of July and likely into mid-August, depending on Delta conditions.
    - Lewiston Reservoir releases to the Trinity River are 450 cfs. Klamath conditions could require additional Trinity flows, yet to be determined, and Reclamation will monitor through the summer.
    - Clear Creek releases have dropped to 100 cfs, the minimum for the year, and will hold through most of August before ramping back up in September.
    - Spring Creek Power Plant is on a planned outage this week, so diversions are minimal. They ramp back up to the previous amount on Sunday, July 26.

        - Diversions off the river are near their peak and should taper slowly from late July through August.
- CVP Storage and Inflow:
    - Reservoir storage as a percentage of the 15-year average is 123% at Trinity, 107% at Shasta, 114% at Folsom, and 114% at New Melones.
    - Accumulated inflow is 1.079 MAF at Trinity and 4.517 MAF at Shasta, both 103% of the 15-year average; Folsom is at 96% and New Melones at 79%.
    - Storage will fall through the peak diversion season, though end of July storage is tracking slightly above the July forecast.
- Temperature Management:
    - Early July heat prompted Reclamation to close the remaining middle gates on the Temperature Control Device (TCD) and open all lower gates by July 10, earlier than the Temperature Management Plan projected. Temperatures have been stable at just above 51°F since.
    - Sacramento River at Clear Creek (CCR) temperatures exceeded the 53.5°F target for the first four days of July and again on July 10, reaching 53.7°F. Reclamation's adjustments brought temperatures back below the target.
    - Spring Creek Power Plant is running warm at 57°F to 58°F. Flow through the plant dropped to 587 cfs on July 20 and 10 cfs on July 21 because of the outage, and CCR temperatures dipped with the loss of that warmer contribution. Bringing Spring Creek water back in helps minimize use of the Shasta cold water pool.
    - The Clear Creek gauge at Igo has been out of service for several days following vandalism, and crews are replacing the temperature probe. Before the outage, temperatures were at or below the 61°F target. Reclamation is pulling from the coldest part of Whiskeytown for Igo and would ramp flows up sooner if temperature problems develop.
    - Near-term air temperature forecasts for Redding are steady around 100°F with lows near 70°F and no major heat waves so far this season. Reclamation will hold off on opening the side gate and continue watching conditions through July.

Reservoir Profiles and Cold-Water Pool: Graphs on Isothermobaths-2026, Graphs on Cold Water Pool Volume, Percent Exceedances (1998-2025):

- Shasta Reservoir:
    - Temperature profiles for Shasta Reservoir are collected weekly through the season. The most recent profile was taken July 21 and is trending as expected.

- At the lower-level gates, near elevation 815 feet, the profile is recording about 49°F, while water leaving the TCD is about 51°F. Reclamation verified that the middle gates are closed and attributes the difference to known leakage at the middle gate level, which is not significant.
- Shasta's isothermobath plot is typical for this time of year, with surface temperatures near 80°F and the cold water pool being drawn down.
- Cold water pool volumes are below average across all three profiles. The ≤52°F volume is a little below average, lower than wetter years but better than drought years. The ≤50°F volume is declining on a steeper slope than average because the lower gates opened earlier this year and is the range Reclamation is drawing from most heavily. The ≤48°F volume is trending near the 2022 and 2015 drought years.
- Shasta is between the 50% and 75% exceedance marks for ≤52°F, about 75% for ≤50°F, and in the 95% range for ≤48°F.

- Trinity Lake:
  - Trinity Lake's isothermobath plot shows surface warming as expected for this time of year, with a large cold water pool remaining.
  - Cold water pool volumes for the ≤52°F, ≤50°F, and ≤48°F profiles are all above average. Trinity is between the 25% and 50% exceedance marks for ≤52°F, just under 25% for ≤50°F, and slightly above 25% for ≤48°F.
- Whiskeytown Lake:
  - The Whiskeytown profile was taken July 9. Surface temperatures are warmer, and the coldest water is no longer present, which is typical of drier years.
  - Cold water pool volumes for the ≤60°F, ≤58°F, and ≤56°F profiles are near the middle of the range of comparison years, in line with expectations for Whiskeytown. Whiskeytown is at about the 50% exceedance for ≤60°F, due in part to diversions from Trinity Reservoir helping maintain the cold water pool, and just under 50% for ≤58°F and ≤56°F.
  - Water at the Spring Creek Power Plant intake elevation should be about 55°F, but water reaching Keswick is 57°F or higher. Temperature curtains at Oak Bottom near the headwaters and near the plant intake help plunge colder water deeper. Reclamation believes the curtain near the intake needs repair and is looking at scheduling that work, likely not this year.

90% July Exceedance Forecast:

- End of September Shasta storage is predicted at 2.2 MAF and end of July at 2.97 MAF, while actual storage is tracking just over 3 MAF, so carryover is likely somewhat above 2.2 MAF.

- Sacramento River releases are forecasted at 13,900 cfs in July, though actual releases are closer to 13,000 cfs, and at 12,750 cfs in August, dropping to 8,000 cfs in September and 7,000 cfs in October before reaching the 3,250 cfs minimum flow in January. Delta needs make minimum flow take longer under this forecast.
- Trinity's end of September storage is forecasted at just over 1.5 MAF.
- Diversions from Trinity Reservoir are higher under this drier forecast, at 115 TAF through Spring Creek Power Plant in July, with maximum diversion continuing through September and into October. Reclamation can adjust these as conditions develop through the summer.
- For the Delta summary, Tracy pumping is at a minimum in July and increases in August before backing off in September.
- The 90% exceedance forecast is being used for the temperature modeling.

50% Exceedance Forecast:

- The 50% exceedance forecast differs only modestly from the 90%. Shasta storage is unchanged, at 2.97 MAF for the end of July and 2.2 MAF for the end of September, with September likely higher depending on August.
- Sacramento River releases are forecasted at 13,800 cfs in July and 13,500 cfs in August, both of which may prove high against actual releases near 13,000 cfs, before tapering to the 3,250 cfs minimum going into winter. Diversions are lower under this wetter scenario, though July diversions through Spring Creek Power Plant should be close to the 90 TAF estimate. Tracy pumping is minimal in July, picks up in August, and falls in between for September.

Outlooks:

- The Climate Prediction Center outlook issued July 16 shows slightly increased chances of above average temperatures for most of California in August, and a higher probability of above normal temperatures across August-October.
- The August precipitation outlook shows a slightly higher chance of monsoon moisture moving up from Mexico. Cloud cover can lower evening peaks while keeping nighttime and early morning temperatures elevated, affecting both the high and the low. The August-October precipitation outlook is similar, continuing through late summer and early fall.

Sacramento River Modeled Temperature, 2026 July 90%-Exceedance Water Outlook:

- The temperature model uses flows from the 90% exceedance forecast and L3MTO 25% meteorology, with the July 8 Trinity, July 9 Whiskeytown, and July 13 Shasta profiles. It does not incorporate the July 21 Shasta profile. The model projects the first side gate opening on August 9 and full side gate use on August 29, both earlier than the Temperature Management Plan projected, though Reclamation is hopeful that easing releases in August could push these dates back toward the plan.

- End of September cold water pool volume is projected at 174 TAF below 56°F, 58 TAF below 52°F, and 17 TAF below 48°F. The 174 TAF volume is extremely small and coincides with the projected side gate use and the rise in temperatures into October. Projected CCR temperatures average 53.3°F in August, 55.0°F in September, and 57.4°F in October and November.
- Accretions through August and Delta needs are the two driving forces that will dictate August releases. Reclamation will update the modeling runs and provide them to the group through the summer.

Questions and Discussion

- SWRCB asked Reclamation to describe the earlier projected side gate pull, about a week earlier than the June modeling and earlier again than May, and for its impressions of the models and the WTMP suite.
    - Reclamation responded that the modeling uses the 90% forecast while conditions are running somewhat better than it assumes. The Temperature Management Plan's 12,600 cfs August assumption is close to the latest Keswick forecast. The goal is to delay the side gate pull as long as possible, since temperatures glide upward once the gates are used. The August 9 first pull is ahead of the plan's August 23 date, though full side gate use is only about a week off. Reclamation called the steeper ≤50°F cold water pool trend concerning and noted that blending Spring Creek water back in helps preserve the coldest water. Meteorology is tracking warmer, and August will be the key month.
- SWRCB asked Reclamation if they could add a Balls Ferry trace to the plot.
    - Reclamation agreed to add the trace to the next plot.
- CDFW recalled a previously stated end of September cold water pool target of about 400 TAF as a level Reclamation would feel comfortable with and asked whether that was correct.
    - Reclamation confirmed that 400 TAF would be much more comfortable. The modeling has tracked closely with the rule of thumb table Reclamation checks on expected fall temperatures relative to the cold water pool estimate. The projected 174 TAF continues to decline and is a concern, though consistent with the modeling.
- CDFW noted the projection is about 200 TAF below the 400 TAF level discussed earlier in the season and noted that shaving flows is looking more helpful this year. They asked what would have to change to bring flows down, adding that lower flows would also reduce redd dewatering.
    - Reclamation responded that it is watching diversions, since easing them leaves more water in the river at a 13,000 cfs release and helps meet Delta needs. D-1641 water quality requirements are the near-term constraint

through the first half of August, easing after mid-month. Reclamation has reduced Tracy pumping from three units back to two and moved a scheduled American River flow increase to help meet Delta needs, a trade-off intended to reduce draws on Shasta, and expects lower Sacramento River diversions within weeks and significantly in August, freeing up water for Delta needs rather than reservoir releases. Running operations tightly is why temperatures have been bumping against and occasionally exceeding the 53.5°F target, and Reclamation remains concerned about the early side gate pull.

Temperature Management Plan Update

Tom Patton, Reclamation, provided an update on the status of the Temperature Management Plan (TMP). Reclamation is in the ballpark of where the plan projected temperature management would be at this point, with some ground to catch up. This is a unique year, with substantial storage but a limited cold water pool, and Reclamation is working to manage the competing goals involved.

Temperature-Dependent Mortality Updates

Josh Israel, Reclamation, presented updated temperature-dependent mortality (TDM) estimates for Winter-run Chinook salmon, distributed to the SRG ahead of the meeting. The modeling followed the approach used in the 2026 TMP, with one difference being that it was run in the SacPAS fish model web interface rather than the code used in the TMP, because of capacity and staffing constraints.

- Under the July 17 WTMP scenario, pooled mean TDM is 2.4% for the carcass survey redd distribution with the stage-dependent model, 19.4% for carcass with the stage-independent model, 7.1% for the aerial survey redd distribution with the stage-dependent model, and 23.6% for aerial with the stage-independent model.
- Re-running the 2026 TMP scenario in SacPAS produced results consistent with the values reported in the TMP across most combinations. The exception is the aerial redd distribution paired with the stage-dependent model, where the SacPAS results averaged lower than the TMP results. Reclamation is still working through the reason.
- Compared with the TMP scenario, predictions from the stage-independent model increased substantially while stage-dependent predictions changed only slightly, a difference attributed to warmer temperatures at the end of the temperature control period. The stage-dependent model applies the critical temperature threshold only during a narrow four-day window before hatching, while the stage-independent model applies it at any point before the egg or sac fry emerges from the redd, so the July 17 scenario exposes more eggs and sac fry to warmer temperatures in September and October, which the stage-independent model captures.

Miles Daniels, SWFSC, presented the Science Center's TDM estimates. The memo was distributed shortly before the meeting.

- The setup is unchanged from prior months, using the CE-QUAL-W2 and RAFT models for temperature and the stage-independent and stage-dependent models for egg mortality. The reservoir profile was updated to the July 21 profile, so there may be differences on that basis. The release scenario is the 90% exceedance forecast Patton presented; the 50% forecast was not run. Hydrology uses the DWR Bulletin 120 May 90th percentile forecast, and meteorology uses 2014, a comparatively warm year in the record.
- The Science Center made two changes at the group's request. Carcass data is now included alongside aerial survey data as a redd distribution input, and Reclamation's temperature time series was added as a comparison to the Science Center runs. The memo also adds language on TDM uncertainty.
- Monthly mean temperatures from the Science Center runs and the Reclamation runs agree fairly well. Both show warm October temperatures that are of concern. The comparison is not intended to indicate that either set of runs is correct.
- Mean TDM across the population is about 22% using aerial survey data and about 19% using carcass data, with little difference between the two inputs, and the stage-dependent model produces lower TDM than the stage-independent model, consistent with Reclamation's results. The comparable values presented in June were about 17% and about 3%, so the shift is modest and in the expected direction.

Questions and Discussion

- SWRCB asked which Reclamation results correspond to the Science Center's 20% and 17% estimates.
    - SWFSC responded that Science Center runs use RAFT for the full river temperature landscape, while Reclamation runs use a linearly interpolated landscape built from Keswick, CCR, and Balls Ferry. TDM estimates are fairly similar.
    - Reclamation agreed the modeling is converging across code, timing assumptions, and stage-dependent versus stage-independent approaches. Reclamation and SWFSC will align the redd and aerial row labels before the next meeting to avoid inverted results.
- Friends of the River noted that results across the Science Center and Reclamation modeling are converging with the largest difference stemming from the underlying model, stage-dependent versus stage-independent, rather than the survey type. Friends of the River described the smaller difference between survey inputs as reassuring.

CDFW Sacramento River Fish Monitoring Update

Matt Johnson, CDFW, provided an update on carcass surveys and shallow redd monitoring. Johnson announced that Jamie Ebenal has accepted a position as a CDFW environmental

scientist, taking over the Winter-run carcass survey work and continuing the shallow redd monitoring she has been doing for PSMFC.

- Carcass recoveries over the last week suggest the survey is at the top of the spawning bell curve. It is unknown how long the peak will last, but it appears that the majority of Winter-run that returned this year spawned in the river within the last seven to ten days.
- CDFW has handled 2,953 Winter-run carcasses to date, including 1,646 females, of which 1,427 were completely spawned. Hatchery origin fish account for 84% of carcasses, tracking with last year, and pre-spawn mortalities total 98, including 73 females and 25 males.
- Carcass recoveries remain concentrated in the upper reach, Section 1 from Keswick to Anderson-Cottonwood Irrigation District (ACID) Diversion Dam. Section 2, from Turtle Bay downstream, is normally a busy spawning area and has been quiet this year.
- Spawn timing has shifted later again in 2026, continuing the trend seen in 2025. Later emergence timing is expected, with eggs in the gravel later in the season.

Shallow Redd Monitoring:

- CDFW is currently tracking 69 shallow redds, the lowest at river mile 292, with projected emergence dates ranging from September 13 to October 19.
- Of the 69 shallow redds, 25 are concentrated on the river right below Market Street. This is a problematic area because the spawning habitat there does not activate until flows are high. Most of those redds are estimated to dewater at about 11,000 cfs, and three are currently in less than 12 inches of water.

Questions and Discussion

- WWD noted that dashboard carcass numbers have shifted substantially for past weeks, with week 25 showing 206 carcasses on July 13 and 25 on the day of the meeting, and asked what was happening.
    - CDFW explained that a server migration at its Portland headquarters affected dashboard values. The dashboard is back up and current through Sunday, so it does not yet reflect the roughly 900 carcasses handled during the week; data entry is still catching up. CDFW noted that the numbers presented came directly from CDFW databases.
- CDFW asked whether the Excel spreadsheet download remains correct.
    - CDFW confirmed the spreadsheet is still correct but is a day behind.
    - CDFW agreed to notify the group when the dashboard is current.
- MBK asked how the estimated dewatering flows in the shared spreadsheet were calculated and whether other data sources were used.

    - PSMFC responded that dewatering flows are estimated in the field from past spawning data and refined as flows drop and locations are remeasured. Mark Gard's model from last year shows where locations disconnect rather than exact flows. Some redds hold in shallow water across a wide range of flows, then sit inches out of water after a 250 cfs drop.

- MBK asked whether water surface elevation data is available for the sections where data is collected.
    - CDFW indicated that water surface elevations collected last year by Mark Gard support the 2018 LiDAR data, the only such dataset available, and will confirm whether the data is accessible.
- SWRCB asked whether the upstream concentration of spawning offsets the later arrival timing, and whether this year is shaping up to resemble last year in terms of TDM results, redd distribution, and timing.
    - CDFW indicated that the shift in spawning locations is not attributable to any single factor. Contributing conditions may include warmer water last spring concentrating fish in the upper river and a high proportion of hatchery-origin fish moving as far upstream as possible toward Livingston Stone. Redds in that habitat are generally less susceptible to dewatering, as much of it is in deeper water. CDFW anticipates later redd emergence than in recent years; last year's latest expected emergence date for a shallow redd was November 22.
- USFWS asked whether the carcass survey summary included the proportion of hatchery versus natural origin returns.
    - CDFW confirmed the proportion is 84% hatchery origin. USFWS noted that this raises questions about the relationship between hatchery origin returns and spawn timing, and about how spring temperatures are categorized as warmer or cooler, and CDFW agreed there are connections that could be drawn.

USFWS Fish Conditions, Forecasts and Hatchery Updates

Kaitlin Dunham, USFWS, was not able to present the Livingston Stone Hatchery update. Kearns & West will follow up with Dunham and share any updates by email.

Bill Poytress, USFWS, shared a brief update on juvenile fish at Red Bluff.

- Winter-run passage is just starting to ramp up, so passage is very low, which is typical for this time of year. Cumulative passage does not reach 5% until around the beginning of September.
- USFWS is collecting genetic samples for parentage analysis.

SRG Guidance Document Update

Mandy Migura, Reclamation, provided an update on progress responding to comments received on the draft SRG guidance document. Migura is Reclamation's new Long-Term Operations (LTO) manager and is stepping in for Jo Anna Beck during her extended leave. Migura thanked participants for the time they dedicated to a thoughtful review of the document and for comments highlighting where additional clarity is needed and asked for patience as she takes extra time to ensure the edits are accurate and clear.

- Comments asked about the acronym for the Fish and Water Operations Group. Section 2 reproduces verbatim language that uses "FWOG", while other sections use "FAWOG", which is the current usage in practice. Because the Section 2 text cannot be changed, the final document will show both acronyms. Both refer to the same group.
- Comments on the verbatim language in Section 2 cannot be addressed in that section. Reclamation is exploring whether they can be resolved elsewhere in the document and will track them for a future LTO reconsultation.

Questions and Discussion

- No questions or discussion.

CVTEMP Introduction

Miles Daniels, SWFSC, introduced the updated CVTEMP decision support tool, available at cvtemp.ucsc.edu. The tool has been in development for several years, and this release reflects feedback from the SRG. Daniels asked participants to share any feedback and offered to hold additional sessions to walk through the tool in more detail.

- The site runs a series of linked models automatically each day, incorporating new meteorology forecasts, river temperature observations, and other updated inputs, so results change daily. The home page summarizes salmon egg survival, river conditions, meteorology, watershed conditions, and reservoir conditions, with the option to add topics, and descriptive text throughout explains what is being shown.
- The summary shows a population mean TDM of 16% under the stage-independent model and 8% under the stage-dependent model for the July 90% forecast, based on the 2025 redd distribution. The meteorology summary showed a 16-day peak air temperature forecast of 113°F.
- Each summary item links to a fuller analysis tab. The salmon tab shows seasonal TDM projections as a time series beginning June 1, with the stage-independent model above the stage-dependent model. The trend is fairly flat with a slight increase in recent months. The TDM landscape figure plots time against distance downstream from Keswick, with color indicating TDM from roughly 2% to 96%. A vertical marker separates the hindcast and forecast periods and advances as the models rerun, white dots show redds for a selected aerial survey year, and carcass data is being added.

- Additional tabs cover meteorology, watershed, reservoir, and river conditions. Figures can be downloaded as PNG files and the underlying data as Excel files.

Questions and Discussion

- USFWS asked whether the updated tool is at the same web address as the previous version.
    - SWFSC responded that there is a new link and that the old page will be redirected to it. SWFSC will send the link to the SRG, and it is included in this summary.

Additional Announcement & Review Action Items

WWD recommended dedicating time at a future meeting to TDM estimates, including what constitutes a meaningful difference, why models produce different values, and the assumptions TDM requires. WWD noted that substantial new information has emerged in recent years and that the group currently reviews estimates but interprets them separately.

- Kearns & West responded that a meeting to discuss the models and their assumptions is being worked on and that more planning remains to be done.

Tom Patton, Reclamation, reminded the group that discussion of fall flows will begin at an SRG meeting scheduled for Tuesday, August 18, ahead of the next regular monthly meeting. Kearns & West confirmed that the invitation went to the entire SRG group.

The next SRG meeting is scheduled for Thursday, August 27.

Adjourn