

Sacramento River Temperature Task Group

Agenda, Thursday, June 23, 2022, 1:00 p.m.-2:45 p.m.

Conference Call:

+1(323) 457-6502 (US West) Meeting ID: 657 079 320# Join on your computer or mobile app: Click here to join the meeting 1:00 p.m. Welcome and Agenda Review Terra Alpaugh, Kearns & West Purpose and Objective 1:05 p.m. Terra Alpaugh, Kearns & West Action Items Tracking 1:10 p.m. Adam Fullerton, Kearns & West 1:15 p.m. Hydrology, Operations, Forecasts, and Tom Patton, Reclamation Temperature Management Coordinated Operations Agreement Update

- 1:25 p.m. Temperature Management and Temperature Dependent Mortality Modeling
 - Reclamation, SWFSC, SRSC Model Results
 - Modeling Assumptions Table
- 1:45 p.m. Discussion: SWFSC Seasonal Modeling Approach
- 2:00 p.m. River Fish Monitoring: (1) Carcass surveys,(2) Redd counts, (3) stranding and dewatering surveys
- 2:10 p.m. Fish Distribution/Forecasts: (1) Estimated percentage of the population upstream of Red Bluff Diversion Dam for steelhead, winter-run, and spring-run Chinook salmon; (2) Sampling at rotary screw traps at Red Bluff Diversion Dam;
 (3) Steelhead update (4) Livingston Stone Hatchery
- 2:15 p.m. Reclamation response letter to Yurok Tribe and Hoopa Valley Tribe letter related to Trinity River Management

2:35 p.m. Review Action Items

2:45 p.m. Adjourn

Tom Patton, Reclamation; Mike Deas, SRSC; James Gilbert, SWFSC

James Gilbert, SWFSC

Doug Killam, CDFW

Bill Poytress and Taylor Lipscomb, USFWS

Chris Laskodi, Yurok Tribe and Reclamation

Terra Alpaugh, Kearns & West

Action Items from June 9, 2022

- 1. Tom Patton, Reclamation Will check about regularly updating Spring Creek Powerplant temperature data on CDEC -
- 2. Tom Patton, Reclamation Will look into and report back on why the model run from March projected a 4.2°F higher temperature for Lewiston in October than the June model run.
- 3. Adam Fullerton, Kearns and West Set aside time in the next meeting to discuss Southwest Fisheries Science Center (SWFSC) request for feedback on whether to change their modeling approach for the implementation season.
- 4. All SRTTG Members: Provide feedback on the SWFSC's modeling approach, i.e., what information (planning vs. implementation approach) is most useful to your agencies in decision-making throughout the rest of the temperature management season. Email feedback to Miles Daniels (miles.daniels@noaa.gov)



Total Water Year Precipitation

Northern Sierra Precipitation: 8-Station Index, June 22, 2022



California Snow Water Content, June 13, 2022, Percent of April 1 Average

Statewide Percent of April 1: 0%

Statewide Percent of Average for Date: 0%

OFFICIAL 30-Day Forecasts

Issued: June 16, 2022



UNITED STATES DEPARTMENT OF THE INTERIOR U.S. BUREAU OF RECLAMATION-CENTRAL VALLEY PROJECT-CALIFORNIA DAILY CVP WATER SUPPLY REPORT

June 21, 2022 RUN DATE: June 22, 2022

Table 4. Reservoir Releases in Cubic Feet/Second

| RESERVOIR | DAM | WY 2021 | WY 2022 | 15 YR MEDIAN |
|-------------|----------------|---------|---------|--------------|
| TRINITY | LEWISTON | 458 | 465 | 705 |
| SACRAMENTO | KESWICK | 8,074 | 3,849 | 10,888 |
| FEATHER | OROVILLE (SWP) | 2,750 | 3,500 | 3,300 |
| AMERICAN | NIMBUS | 1,838 | 2,261 | 3,341 |
| STANISLAUS | GOODWIN | 1,502 | 873 | 552 |
| SAN JOAQUIN | FRIANT | 265 | 1,642 | 354 |

Table 5. Storage in Major Reservoirs in Thousands of Acre-Feet

| RESERVOIR | CAPACITY | 15 YR AVG | WY 2021 | WY 2022 | % O 15 YR AVG |
|----------------------|---------------|-----------|-----------|---------|---------------|
| TRINITY | 2,448 | 1,637 | 1,194 | 725 | 44 |
| SHASTA | 4,552 | 3,264 | 1,832 | 1,794 | 55 |
| FOLSOM | 977 | 748 | 315 | 850 | 114 |
| NEW MELONES | IELONES 2,420 | | 1,266 806 | | 57 |
| FED. SAN LUIS | 966 | 422 | 181 | 288 | 68 |
| TOTAL NORTH CVP | 11,363 | 7,486 | 4,788 | 4,463 | 60 |
| MILLERTON 520 | | 396 | 260 | 359 | 91 |
| OROVILLE (SWP) 3,538 | | 2,373 | 1,209 | 1,801 | 76 |

Table 5. Accumulated Inflow for Water Year to Date in Thousands of Acre-Feet

| RESERVOIR | CURRENT WY 2021 | WY 1977 | WY 1983 | 15 YR AVG | % O 15 YR AVG |
|-------------|--------------------|---------|---------|-----------|------------------|
| TRINITY | 460 | 187 | 2,430 | 944 | 49 |
| SHASTA | 2,426 | 1,958 | 9,686 | 4,040 | 60 |
| FOLSOM | 1,485 | 293 | 5,570 | 2,086 | 71 |
| NEW MELONES | 497 | NA | 2,181 | 781 | 64 |
| MILLERTON | 714 | 172 | 3,277 | 1,062 | 67 |

| RESERVOIR | CURRENT WY 2022 | WY 1977 | WY 1983 | AVG (N YRS) | % OF AVG | LAST 24 HRS |
|---------------------------------|--------------------|---------|---------|----------------|-------------|----------------|
| TRINITY AT FISH HATCHERY | 18.87 | 12.06 | 54.65 | 30.53 (60) | 62 | 0.0 |
| SACRAMENTO AT SHASTA DAM | 41.27 | 17.41 | 112.33 | 59.65 (65) | 69 | 0.0 |
| AMERICAN AT BLUE CANYON | 64.06 | 15.64 | 103.88 | 64.73 (47) | 99 | 0.0 |
| STANISLAUS AT NEW MELONES | 19.39 | NA | 45.33 | 26.73 (44) | 73 | 0.0 |
| SAN JOAQUIN AT HUNTINGTON LK | 24.26 | 17.20 | 81.40 | 40.01 (47) | 61 | 0.0 |

Table 6. Accumulated Precipitation for Water Year to Date in Inches

| DATE | MDWT TCD ¹ | MDWT SHD | MDWT SPP ¹ | MDWT KWK | MDWT SAC ² | MDWT CCR | MDWT BSF | MDWT BND | MDWT RDB | MDWT IGO | MDWT LWS | MDWT DGC | MDWT NFH | MDR Shasta Generation | MDR Spring Creek P.P. | MDR Keswick Total | MDAT RDD | MDAT BSF | MDAT RDB |
|-------|--------------------------|-------------|--------------------------|-------------|--------------------------|-------------|-------------|-------------------|-------------|-------------|-------------|-------------|-------------|-----------------------------|-----------------------------|-------------------------|-------------|-------------|-------------|
| May | 53.5 | 51.7 | 52.6 | 54.5 | 55.3 | 56.2 | 58.8 | 60.8 | 61.9 | 53.9 | 51.0 | 53.8 | 55.3 | 3172 | 75 | 3504 | 68.5 | 65.5 | 67.7 |
| 06/01 | 52.7 | 50 | 53.8 | 54.0 | 55.4 | 56.6 | 60.3 | 62.8 | 64.0 | 56.2 | 53.0 | 58.4 | 60.7 | 3281 | 358 | 3764 | 74.0 | 70.8 | 72.8 |
| 06/02 | 54.1 | 50.5 | 53.6 | 53.4 | 54.8 | 56.1 | 60.1 | 63.3 ^A | 65.2 | 57.0 | 53.4 | 59.4 | 61.7 | 2995 | 356 | 3773 | 76.5 | 73.5 | 76.5 |
| 06/03 | 52.4 [×] | 49.8 | 53.6 | 53.9 | 54.8 | 55.7 | 59.4 | 62.4 | 64.5 | 56.5 | 53.5 | 58.6 | 60.6 | 3123 | 358 | 3796 | 73.0 | 70.0 | 73.6 |
| 06/04 | 51.4 ^B | - | 53.7 | 54.1 | 54.8 | 55.4 | 58.0 | 60.5 | 62.4 | 56.0 | 53.0 | 56.5 | 58.4 | 3314 | 290 | 3959 | 67.0 | 64.9 | 65.7 |
| 06/05 | 51.5 ^B | - | 53.7 | 52.7 | 54.0 | 54.9 | 57.4 | 58.9 ^A | 60.5 | 56.6 | 53.1 | 56.9 | 57.3 | 3468 | 374 | 3954 | 66.0 | 63.2 | 65.8 |
| 06/06 | 51.6 | 49.5 | 53.7 | 52.6 | 54.0 | 55.1 | 58.4 | 60.7 | 61.6 | 57.6 | 52.7 | 58.6 | 59.4 | 3594 | 362 | 4017 | 72.5 | 70.7 | 71.6 |
| 06/07 | 51.6 | 49.3 | 53.9 | 52.2 | 53.6 | 54.8 | 58.8 | 61.9 | 63.4 | 57.7 | 53.1 | 58.7 | 60.7 | 3171 | 355 | 3989 | 77.0 | 71.9 | 74.4 |
| 06/08 | 51.9 ^A | 50.0 | 53.9 | 52.3 | 53.7 | 55.0 | 59.1 | 62.3 | 64.1 | 58.3 | 53.7 | 60.7 | 62.7 | 3205 | 363 | 3959 | 80.5 | 75.6 | 75.4 |
| 06/09 | 50.2 | 49.0 | 53.9 | 52.3 | 53.8 | 55.1 | 59.4 | 62.8 ^A | 64.7 | 58.0 | 53.9 | 60.4 | 63.2 | 3235 | 360 | 3945 | 83.5 | 79.4 | 83.1 |
| 06/10 | 51.6 | 49.1 | 54.1 | 52.5 | 54.3 | 55.7 | 59.9 | 63.2 ^A | 65.3 | 58.9 | 54.5 | 61.9 | 64.6 | 3714 | 355 | 3949 | 84.5 | 81.3 | 85.3 |
| 06/11 | 52.1 | 49.5 | 54.3 | 52.4 | 54.0 | 55.7 | 60.6 | 64.3 ^A | 66.0 | 58.7 | 54.9 | 62.7 | 65.0 | 3474 | 385 | 3947 | 83.5 | 81.3 | 82.8 |
| 06/12 | 51.0 | 49.8 | 55.5 | 53.0 | 54.3 | 55.3 | 59.2 | 63.1 | 65.7 | 58.1A | 55.4 | 61.6 | 64.4 | 3257 | 366 | 3968 | 72.5 | 70.7 | 74.0 |
| 06/13 | 51.9 [×] | 48.1 | 55.0 | 53.6 | 54.6 | 55.6 | 58.9 | 61.0 ^A | 62.5 | 57.2 | 55.6 | 59.6 | 61.0 | 2402 | 240 | 4032 | 69.5 | 67.3 | 68.7 |
| 06/14 | 50.2 ^B | - | 54.1 | 53.5 | 54.9 | 56.0 | 59.3 | 61.5 ^A | 62.8 | 57.6 | 55.5 | 60.4 | 62.3 | 4076 | 335 | 3963 | 76.0 | 72.0 | 73.7 |
| 06/15 | 49.9 | 48.8 | 55.3 | 51.9 | 53.9 | 55.5 | 59.7 | 62.4 | 63.9 | 57.9A | 54.7 | 61.0 | 63.8 | 3534 | 435 | 3948 | 80.0 | 75.4 | 78.3 |
| 06/16 | 50.2 | 49.7 | 54.5 | 52.0 | 53.5 | 54.6 | 59.1 | 62.3 ^A | 64.5 | 57.7 | 54.4 | 59.9 | 62.1 | 3650 | 399 | 4071 | 76.0 | 73.5 | 75.4 |
| 06/17 | 49.7 | 48.4 | 55.6 | 51.8 | 53.0 | 53.8 | 57.5 | 60.4 ^A | 62.4 | 56.6 | 54.7 | 58.2 | 60.8 | 2867 | 359 | 4049 | 66.0 | 63.1 | 62.4 |
| 06/18 | 49.6 | 48.3 | 54.5 | 51.9 | 53.3 | 54.3 | 57.4 | 59.8 | 61.7 | 56.9 | 54.8 | 58.6 | 60.7 | 2752 | 363 | 4034 | 65.5 | 64.3 | 65.6 |
| 06/19 | 50.2 | 48.8 | 55.5 | 51.7 | 53.3 | 54.5 | 58.3 | 61.0 | 62.6 | 56.7 | 54.7 | 59.4 | 61.8 | 3373 | 290 | 3963 | 72.5 | 69.6 | 71.8 |
| 06/20 | 50.6 | 48.9 | 55.1 | 51.7 | 53.2 | 54.5 | 58.5 | 61.1 | 63.0 | 56.5 | 54.6 | 60.7 | 63.8 | 3812 | 76 | 3883 | 80.0 | 75.5 | 77.5 |
| 06/21 | 50.5 | 49.7 | 54.9 | 52.0 | 53.7 | 55.1 | 59.0 | 61.8 ^A | 63.6 | 56.6 | 54.8 | 61.0 | 64.8 | 3736 | 76 | 3849 | 88.5 | 82.1 | 84.8 |
| Jun | 51.2 | 49.3 | 54.4 | 52.6 | 54.0 | 55.2 | 59.0 | 61.8 | 63.5 | 57.3 | 54.2 | 59.7 | 61.9 | 3335 | 326 | 3943 | 75.5 | 72.2 | 74.3 |
| | | | | | | | | | | | | | Total CFS | 70033 | 6855 | 82812 | | | |
| | | | | | | | | | | | | | Total AF | 138908 | 13597 | 164254 | | | |

Legend

- = 1-9 hours of data missing (Average includes estimations) А
- = 10 or more hours of data missing (Average not calculated В
- = Station out of service С
- D = Record high air temperature
- Е = Record low air temperature
- MDWT = Mean Daily Water Temperature (Farenheit)
- MDR = Mean Daily Release (CFS)
- MDAT = Mean Daily Air Temperatures (Farenheit)

Notes

- ¹ Temperatures are weighted averages based on individual penstock flow and temperature ² Highlighted cells in the TCD column indicate a TCD change was made on that day ² Current Sacramento River control point (see page 4 for more details)

- ³ Data is currently being collected locally and periodically downloaded. Once downloaded and certified by USGS, missing data will be added.



| Station Details | | | | | | |
|-----------------|------------------|--|------------|--|--|--|
| Code | Body of Water | Location ¹ | CDEC Link | | | |
| TCD | N/A | Shasta Power Plant | N/A | | | |
| SHD | Sacramento River | 0.3 miles downstream of Shasta Power Plant | <u>SHD</u> | | | |
| SPP | N/A | Spring Creek Power Plant | N/A | | | |
| KWK | Sacramento River | 0.8 miles downstream of Keswick Dam | <u>KWK</u> | | | |
| SAC | Sacramento River | 4.8 miles downstream of Keswick Dam | SAC | | | |
| CCR | Sacramento River | 9.7 miles downstream of Keswick Dam | CCR | | | |
| BSF | Sacramento River | 25 miles downstream of Keswick Dam | BSF | | | |
| JLF | Sacramento River | 34 miles downstream of Keswick Dam | <u>JLF</u> | | | |
| BND | Sacramento River | 41 miles downstream of Keswick Dam | BND | | | |
| RDB | Sacramento River | 58 miles downstream of Keswick Dam | <u>RDB</u> | | | |
| IGO | Clear Creek | 7.3 miles downstream of Whiskeytown Dam | <u>IGO</u> | | | |

| Water Right Temperature Control Points | | | | | | | | | |
|--|-------|------------|------------|------------|--|--|--|--|--|
| River | Point | Temp. (°F) | Begin Date | End Date | | | | | |
| Sacramento | SAC | 55 | 06/15/2021 | 05/02/2022 | | | | | |
| Sacramento | SAC | 58 | 05/02/2022 | 06/07/2022 | | | | | |
| Sacramento | SAC | 54.5 | 06/07/2022 | TBD | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

<u>Notes</u>

¹ Distances are approximate



| Station Details | | | | | | |
|-----------------|---------------|--------------------------------------|------------|--|--|--|
| Code | Body of Water | Location ¹ | CDEC Link | | | |
| LWS | Trinity River | 1.1 miles downstream of Lewiston Dam | LWS | | | |
| DGC | Trinity River | 19 miles downstream of Lewiston Dam | DGC | | | |
| NFH | Trinity River | 38 miles downstream of Lewiston Dam | <u>NFH</u> | | | |

| Water Right Temperature Control Points | | | | | | | | |
|--|-------|------------|------------|----------|--|--|--|--|
| River | Point | Temp. (°F) | Begin Date | End Date | | | | |
| Trinity | DGC | 56 | Sep-15 | Oct-01 | | | | |
| Trinity | NFH | 56 | Oct-01 | Dec-31 | | | | |

<u>Notes</u>



2022 Shasta Temperature Profiles































TDM Modeling

June 16, 2022 SWFSC DRAFT

Additional information available at:

https://oceanview.pfeg.noaa.gov/CVTEMP/download

DRAFT - Preliminary Results - For Discussion Purposes Only

Planning Phase Outputs

Modeling Assumptions

- 1. May 99% B120 Exceedance Forecast Shasta Inflow
- 2. June 15 Shasta initial profile
- 3. 2015 meteorology
- 4. Spring Creek PP contributions to Keswick as provided in USBR 90% exceedance operational outlook from June 2
- 5. SAC gage temperature target location (achieving target NOT guaranteed)
- 6. Redds distributed in time and space according to 2021 aerial redd surveys (a compressed distribution relative to historical variability; 2016-2021 for comparison)
- 7. One scenarios considered (Target Temperature of 54.5F)
- 8. Combination of CE-QUAL-W2 models for Shasta and Keswick, and RAFT for temperature predictions
- 9. USBR predicted temperatures plotted are from June 2 scenario.

Model Outputs (Last meeting's)



Model Outputs (Scenario 1, 54.5F Target)



Example of what has changed between model runs



How Updates to Model Have Changed Redd Temperature Exposure This Season

We can plot the temperature exposure of a Redd



Only changes in temperature exposure above ~53.5F will affect TDM



We can add traces from other model runs and related information



Info for Each Redd Detection Date in Seasonal Context

Information about population of redds for a given deposition date:

- N redds = number redds detected on a survey for a given date
- % population = the percent of the population detected over the entire season observed on this date.
- TDM= the mean annual TDM estimated for redds detected on this date. Estimates are color coded by model run date



The temperature exposure trace of a redd given its detection time by CDFW. Color coded by model run date.

This is the mean temperature exposure for redds detected on the date. In this example there were 61 redds detected on July 26 at varying locations in the river.

Changes in Exposure for all Redd Detection Dates from 2021, Applied to 2022 Season





Implementation Phase Outputs

Mortality Landscape and TDM Estimate for June 16th Scenario



Mean annual TDM based on 2016-2021 redd distribution = 47%

Conclusions

- **For the "planning" output**: Mean annual TDM estimated to be between 39-46% depending on redd distribution assumption. "This is about a 10% drop from the June 9th run.
- For the "implementation" output: Mean annual TDM estimated to be 47% using the 2016-2021 redd distribution. * Same as last run.
- Changes in TDM for the planning output from June 9th to June 16th can, in part, be described using the redd temperature exposure plots, with mean exposure often being ~0.5 °F lower in the June 16th run. This relates to the observed inflow into Shasta being larger than forecasted and the observed outflow from Shasta being lower than forecasted. *Other inputs/factors likely changed between these runs.



United States Department of the Interior

BUREAU OF RECLAMATION Washington, DC 20240



INREPLYREFER TO:

86-63000 1.1.02

VIA ELECTRONIC MAIL ONLY

Joseph L. James, Chairman Yurok Tribe 190 Klamath Boulevard Post Office Box 1027 Klamath, CA 95548

Joe Davis, Chairman Hoopa Valley Tribe Post Office Box 1348 Hoopa, CA 95546

Subject: In response to - Emergency Interim Actions to Protect Tribal Trust Assets of the Trinity River and the Initiation of Consultation on the Trinity River Division of the Central Valley Project under the Endangered Species Act

Dear Chairman James and Chairman Davis,

Thank you for your March 25, 2022, letter to the Bureau of Reclamation (Reclamation) and National Marine Fisheries Service Assistant Administrator Janet Coit concerning this year's actions on the Trinity River and the role of the Trinity River Division (TRD) in the 2021 Reinitiation of Consultation on the Long-Term Operation of the Central Valley Project (CVP) and the State Water Project (SWP). Reclamation also values your perspectives and insights shared at the related May 9, 2022, government-to-government consultation, as well as your patience with our continued internal discussions.

In view of the discussions we have had subsequent to your letter, this letter will address efforts underway by Reclamation to help best alleviate concerns as we enter the critical spawning season for coho and chinook salmon, and respond to your requests specific to the re-initiation of consultation on both CVP/SWP, as well as on the TRD.

As you know, California and the Trinity River are experiencing unprecedented dry conditions. This year has been determined to be "critically dry," a third consecutive such year (in fact, it will mark the fourth critically dry year in the last five years). As a direct result, we entered this spring with just under 800,000 acre-feet of total storage and are projected to fall below 500,000 acre-feet at Trinity reservoir towards the end of the water year. Reclamation is taking several interim

actions on the Trinity River, summarized below, which are intended to help address these hydrologic conditions:

- We have set up the Trinity River Temperature Task Group (TRTTG) to meet on interim actions for Trinity River temperature management;
- We have entered into discussions with the National Marine Fisheries Service for actions on the Trinity River;
- We have made the greatest possible reductions to trans-basin diversions to ensure enough flow is maintained through Lewiston Reservoir in support of temperature control on the Trinity River;
- We will explore utilizing the Trinity Dam auxiliary bypass to support temperature management later in the season;
- We are exploring 3D modeling and other tools for analyzing Lewiston Reservoir and Trinity River temperature management;
- We are exploring ways to modify and/or coordinate State Water Resources Control Board Order 90-5 requirements in the fall to prioritize and provide colder water for Coho spawning in November and December; and
- We will begin technical discussions this month to analyze the potential need for fall augmentation flows.

Consultation on the Long-Term Operation of the CVP and SWP, and Consultation on the TRD

Reclamation recently held six virtual public scoping meetings to prepare for development of an Environmental Impact Statement analyzing potential modifications to the long-term operation of the CVP and SWP. We appreciate the input provided by the Hoopa Valley Tribe and Yurok Tribe and have incorporated comments from your letter into the scoping report¹ as part of the process. We look forward to working with the Hoopa Valley Tribe and Yurok Tribe on potential actions for the consultation and will request technical meetings to further develop one or more alternatives.

With respect to your request for a separate consultation specific to the TRD, Reclamation agrees that sufficient new information exists to pursue a new consultation with the fisheries agencies specific to operations of the TRD and plans to do so. We are considering the scope, sequencing, and roles and responsibilities as well as looking ahead to a plan for engagement with our partners, including the Hoopa Valley Tribe and Yurok Tribe. Thank you for your patience while we work through these next steps.

In the weeks ahead, we will re-engage with the Hoopa Valley Tribe and Yurok Tribe with more specific information on the processes described in your March 25 letter and discussed during our May 9 consultation.

Thank you for your engagement as we all manage the challenges of the prolonged drought. For more information, please contact California-Great Basin Regional Director Ernest Conant at (916) 978-5000 or econant@usbr.gov.

¹ <u>https://www.usbr.gov/mp/bdo/docs/lto-scoping-report-2022.pdf</u>

Sincerely,

DAVID

Digitally signed by DAVID PALUMBO Date: 2022.06.13 PALUMBO 09:37:42 -04'00'

David Palumbo Deputy Commissioner for Operations, Bureau of Reclamation

cc:

Ernest Conant, California Great Basin Regional Director, Bureau of Reclamation, U.S. Department of the Interior, econant@usbr.gov

Janet Coit, Assistant Administrator, NOAA Fisheries, U.S. Department of Commerce, janet.coit@noaa.gov

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Bryan Newland, Assistant Secretary for Indian Affairs, U.S. Department of the Interior, Bryan newland@ios.doi.gov

Jared Huffman, U.S. Congressman – CA 2nd District