BUREAU OF RECLAMATION

American River Group

1:30 p.m.–3:30 p.m.
Conference Line: +1 (321) 209-6143; Access Code: 780 506 355#
Webinar: Join Microsoft Teams Meeting

Thursday, May 20, 2021

Notes

1. **Action Items**

    a. Chris Hammersmark will share the unofficial temperature runs with the group on Monday, May 24th.

    b. Craig Addley and Levi Johnson will coordinate on additional temperature model runs as needed.

    c. Levi Johnson will cc Jason Julienne and Morgan Kilgour on the temperature-related email to be shared with CDFW management as needed.

    d. Kearns & West will schedule two ad-hoc meetings for May 27 and June 3.

2. **Introductions**

    a. USBR: Ian Smith, Liz Kiteck, Spencer Marshall, Sarah Perrin, Drew Loney, Levi Johnson, Thuy Washburn, Lee Mao, John Hannon, Carolyn Bragg, Brad Hubbard

    b. EBMUD: Hasan Abdullah

    c. SMUD: Christine Giannani

    d. CDFW: Ken Kundargi, Morgan Kilgour, Tracy Grimes, Duane Linander, Gary Novak, Crystal Rigby, Jason Julienne

    e. USFWS: Craig Anderson & Paul Cadrett

    f. NMFS: Barb Byrne, Page Vick, Katrina Poremba

    g. PCWA: Ben Barker, Shane Motley & Craig Addley

h. City of Roseville: Sean Bigley

i. City of Folsom: Marcus Yasutake

j. BKS Law: Jennifer Buckman

k. San Joaquin Water District: Paul Helliker & Greg Zlotnick

l. City of Sacramento: Brett Ewart, Brian Sanders

m. Westlands Water District: Tom Boardman

n. DWR: Mike Ford

o. WAPA: Mike Prowatzke

p. Cramer Fish Sciences: Joe Merz, Kirsten Sellheim

q. Water Forum: Jessica Law, Paul Bratovich & Chris Hammersmark

r. SWRCB: Michael Macon, Emily Fisher & Reza Ghasemizadeh

s. PSMFC: Cory Starr & Logan Day

t. CSUS: Dede Birch

u. SARA: Clyde MacDonald

v. Kearns & West: Rafi Silberblatt, Kai Walcott & Susan Ellsworth

3. Housekeeping

a. None.

4. Fisheries Update

a. Tracy Grimes provided an update for California Department of Fish and Wildlife (CDFW). CDFW is re-starting juvenile sampling on the American River, targeting steelhead with seine nets at a total of 8 sites. Each site will be sampled once per month and temperature is currently the limiting factor; sampling will not occur if water temperature exceeds 21°C in order to minimize stress during handling.

b. The last Chinook hatchery release will occur next week. There have been no major losses to-date. For steelhead, hatchery water is at 64°F and fish are on medicated feed.

c. Questions/Comments

d. CDFW noted that it is seeing temperature-related impacts to steelhead at the hatchery including increased mortality and are awaiting scheduled release.

e. There was a test done on the new ladder which resulted in Chinook entering the ladder and making their way to the trap. Staff responded to get the fish back to the river and work has been done to temporarily prevent fish from getting in the ladder.

f. Kirsten Selheim provided an update for Cramer Fish Sciences (CFS) including a presentation on stranding and spawning survey data for the season. See meeting packet for details. An overview of the spatial distribution of redds and a comparison of 2021 redd count, as requested last meeting, was also provided. She noted that the 2017 number didn't represent a complete redd count since redd surveys were disrupted for several weeks by high flows.

g. NMFS asked if the majority of early steelhead spawning happened below Sunrise as opposed to nearer Nimbus dam because of fall-run spawning activity just below Nimbus Dam.

h. Don't know but that's one possible hypothesis. Steelhead aren't as much social spawners as Chinook.

i. Logan Day provided an update for Pacific States Marine Fisheries Commission (PSMFC). See meeting packet for more information.

5. Operations Forecast

a. Christine Giannini provided an update on Sacramento Municipal Utility District (SMUD) operations. See handout for details.

b. Ben Barker provided an update on Placer County Water Agency (PCWA) operations. See handout for details.

6. **Central Valley Operations**

a. Thuy Washburn, USBR, provided an update on Central Valley Operations (CVO). See handout for details. Washburn noted that the units mentioned in last month's handout should be a "T" and not a "B". The T means top shutter raised and B means bottom shutter raised.

b. The water outlook and associated temperature model run were not included in the packet because there are pending decisions to be made before the forecast can be prepared.

c. Folsom Reservoir warmed quickly in the two-week time period. The top layer of water went from the high 60's to over 70°F and the warm, top layer is

getting a lot closer to the middle gates due to decreasing reservoir elevation. Expect that the profile will warm further in the next two weeks.

d. Questions/Comments

    i. NMFS asked if there was an estimate for when the provisional ops outlook would be available.

        1. USBR indicated that they don't know.

    ii. NMFS noted that according to the 2019 BiOp, water-temperature-related take is exceeded in a Critical water year type if water temperature exceeds 68°F at Hazel Avenue. NMFS also acknowledges that given the hydrology and Folsom storage conditions for WY 2021, water temperatures are expected to exceed 68°F at Hazel Avenue for most of the summer. NMFS is coordinating with USBR on this issue.

    iii. USBR indicated that it is working with Water Forum to run additional temperature scenarios. Because no operations outlook is yet available, the runs will likely consider a low and high-release scenario to bookend potential operations. The runs consider 68°F, 70°F and 72°F targets at Hazel and should be shareable by early next week. Water Forum noted that the last runs targeted 74°F at Watt but Chris Hammersmark was able to reconfigure the model to target temperatures at Hazel.

    iv. **[Action]** Chris Hammersmark, Water Forum, will share the unofficial runs with the group on Monday, May 24th.

e. CDFW asked what this will mean for hatchery operations, noting that it will take time to plan for or move the Nimbus Hatchery steelhead and American River Hatchery trout. No options are currently favorable for holding and rearing trout species over the summer; therefore they are hoping to get a timeline for temperature increases to help understand how urgently they need to move fish out of the hatcheries.

    i. USBR indicated that it's likely 68°F at Hazel (which is representative of the water temperatures available to the hatchery) will be reached by June 1 and highly likely to reach 68°F by mid-June. The only way to avoid this is to pull a middle shutter, but that probably isn't going to happen since it will spend a lot of cold water that may be needed to support water temperatures through the summer.

    ii. CDFW indicated that in light of this temperature prediction, precautions to protect fish in hatcheries need to be taken now.

f. NMFS asked ARG members for thoughts on a temperature to target over the summer, noting that steelhead are a listed species within NMFS

jurisdiction. Given the constraints of the current water year, NMFS indicated that the current thinking within the agency is to support a temperature management approach that provides the coolest possible (likely in the low 70's) water temperature that can be sustained into late October, at which point seasonal meteorology and (if approved by Reclamation) a power bypass will support cooler water temperatures. The BA references that when the Governor declares a drought emergency, USBR will consider a power bypass at Folsom Dam.

g. PCWA noted that it has been doing temperature modeling over the last week or so and can provide that data along with Water Forum. Their temperature model shows 75°F at Watt and in late August, shows releases out of Folsom at 70°F.

h. USBR indicated a preference for an ad hoc ARG meeting and noted that adding a PCWA modeling agenda item may add too many variables to current Temperature Management Plan development.

    i. CVO noted that Water Forum's study will be complete but not sure if theirs will be. As soon as there is a decision, CVO can start working on it.

    ii. **[Action]** Craig Addley, PCWA, and Levi Johnson, USBR, will coordinate on the temperature model.

i. The City of Sacramento has started shifting treatment capacity to the Sacramento River plants and plans to do so for the foreseeable future.

    i. NMFS asked at what flow the Lower American River diversions have trouble. Is it 500 cfs?

        1. The City confirmed that yes, 500 cfs triggers concerns for the pump. The limiting factor for the diversion rate, min ideal speed, is 20-30 million gallons (x 1.55 is the cfs) a day.

    ii. USBR asked if the warmer water temperatures in the Sacramento River are considered in the City's equation.

        1. The City confirmed that their water quality crew is monitoring conditions in the river.

j. CDFW requested that USBR provide notification in writing, even if preliminary, as to when it will no longer be possible to remain below 68°F. This will assist in planning for potential evacuation of steelhead from the hatchery.

    i. USBR affirmed that temperatures won't be under 68°F much longer, likely 7-8 days, and can likely provide more detail at the ad hoc meeting next week.

1. CDFW indicated that if fish need to wait at the hatcheries and end up getting sick, it will prolong the duration of the fish being treated on hatchery grounds.

ii. USBR will give an update via email that captures the information regarding the 68°F threshold and include CDFW representatives.

1. **[Action]** Levi Johnson will cc Jason Julienne and Morgan Kilgour, CDFW, on the temperature related email.

k. NMFS asked how much water the hatchery takes in each day and if there would be any possibility of (for the long-term) creating a hatchery water delivery system from the bottom of Folsom reservoir to deliver colder water than is available below Nimbus Dam.

i. The hatchery demand and current intake at Nimbus Dam is 50–60 cfs. It would take a lot of infrastructure to make that work.

l. The ARG agrees to schedule an ad-hoc meeting for next week for the group to discuss additional data.

i. **[Action]** Kearns & West will schedule two ad hoc meetings for the next two Thursdays, 2:00-3:30pm.

ii. NMFS noted that even if final decisions haven't been made and there isn't an Operations Outlook as yet, reviewing the Water Forum's temperature runs will be helpful.

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Agenda

1. Introductions
2. Presentation
3. Housekeeping
4. Fisheries Update
    a. CDFW
    b. CFS
    c. PSMFC
5. Operations Forecast
    a. SMUD
    b. PCWA
    c. CVO
6. Central Valley Operations
    a. Temperature management
    b. Exceedance forecast & temperature schedules
7. Discussion
8. Next Meeting: Thursday, June 17, 1:30–3:30 p.m.

Lower American River 2021 Steelhead Spawning and Stranding Survey Summary

Spawning Survey

Figure 1. 2021 lower American River flow (AFO stream gage), temperature, and survey timing.

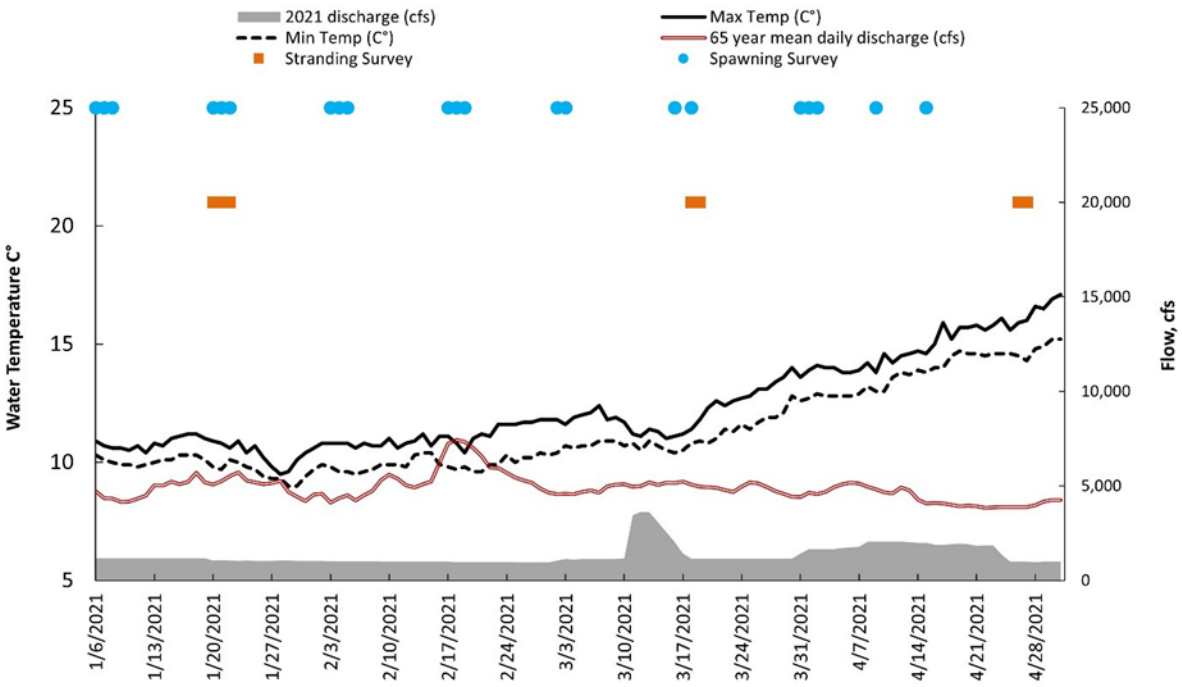


Figure 2. 2021 steelhead redd spatial distribution in the lower American River.

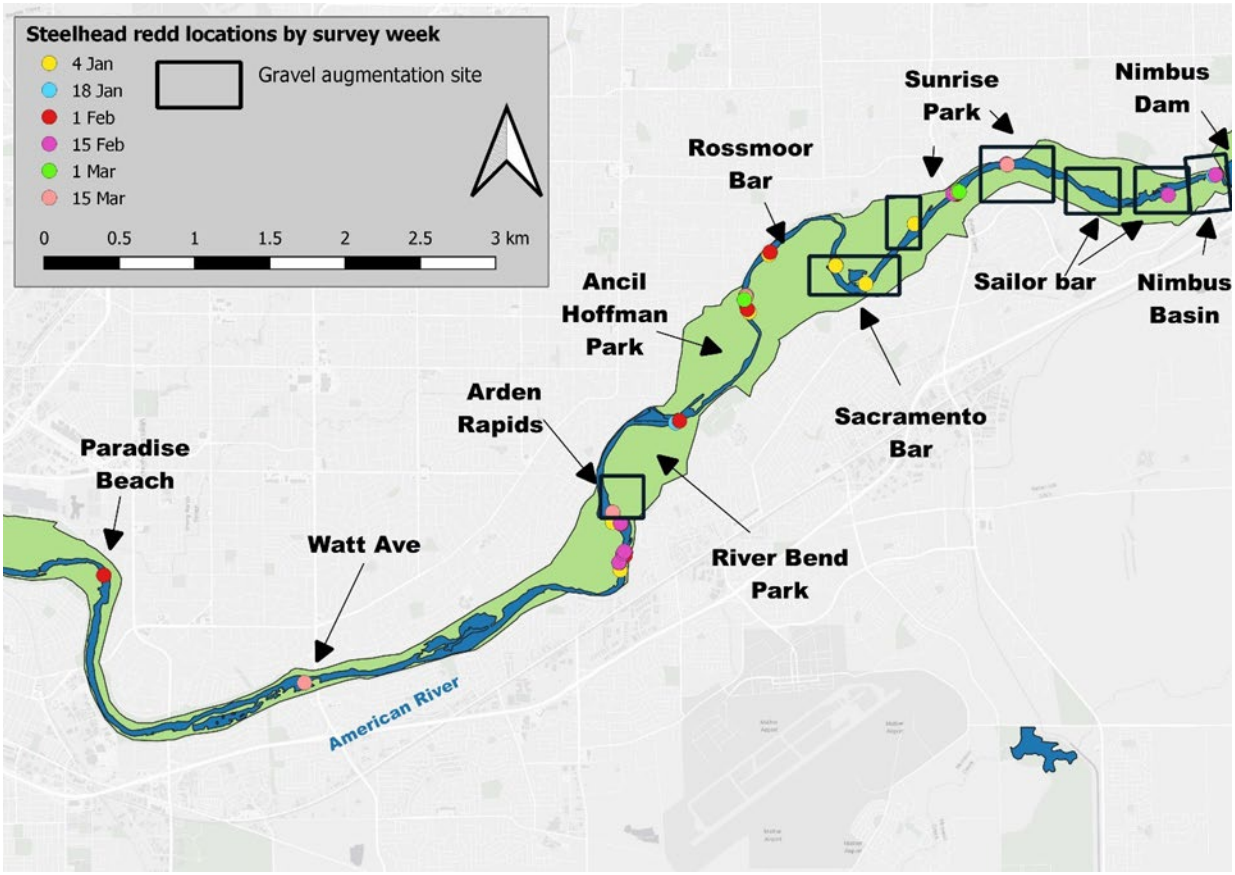


Figure 3. Temporal distribution of steelheads redds on the lower American River in 2021

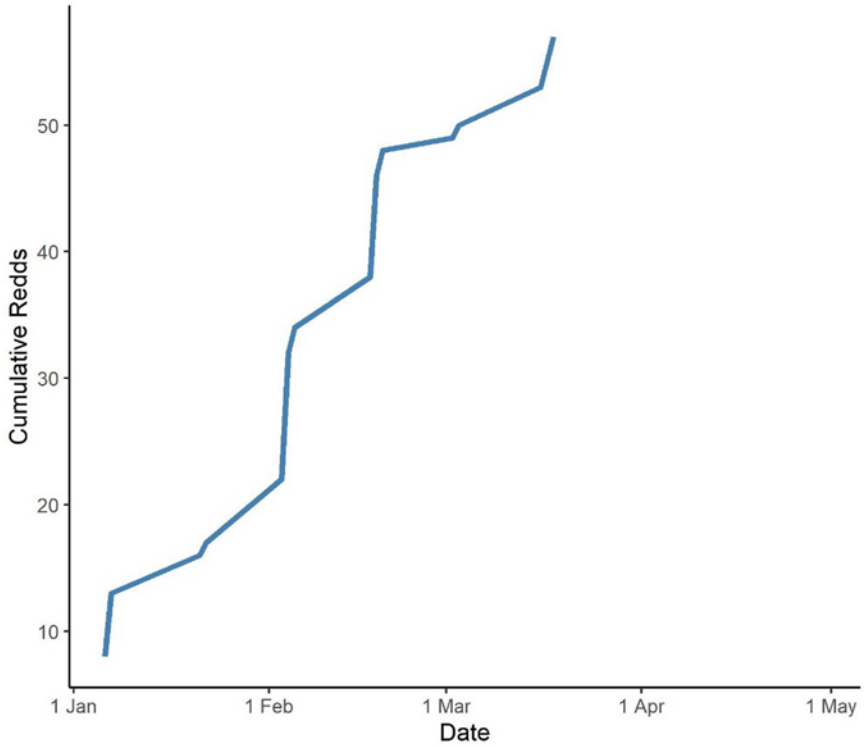
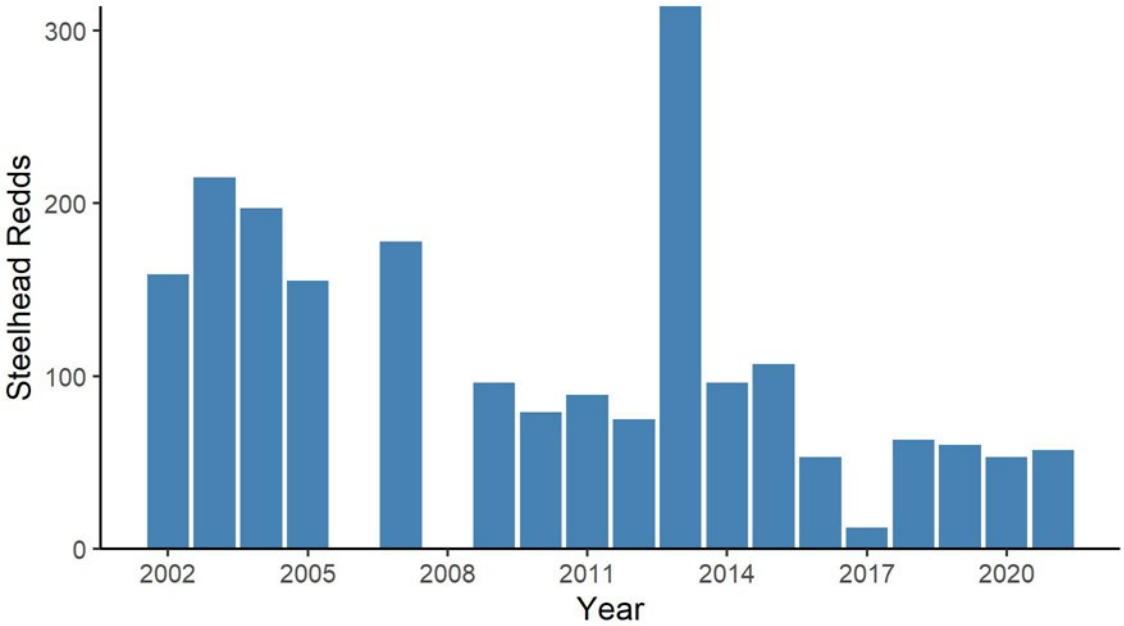


Figure 4. Comparison of 2021 redd counts with previous years. A total of 57 steelhead redds were observed in 2021



Note: Redd surveys were not possible for several weeks in 2017 due to high flows, therefore the redd count is likely lower than the actual number of redds in the river. Redd surveys were not conducted in 2006 and 2008 due to low visibility in the Lower American River

Stranding Surveys

Table 1. Summary of stranded juvenile salmonids on the Lower American River observed during stranding surveys that occurred 18-19 March and 26-27 April 2021. Values reported below are total salmonids; numbers in parentheses below salmonid counts are fish that were positively identified as steelhead. A total of 1,534 juvenile Chinook Salmon and 43 juvenile steelhead were rescued and returned to the river with assistance from CDFW staff in 2021.

Dates	Location (river mile)	Nimbus, above hatchery weir (22)	Upper Sunrise above side channel (21)	Upper Sunrise side channel (21)	Lower Sunrise side channel (19)	Lower Riverbend Side Channel (13)	Below River Bend side channel (13)
18 - 19 March	# pools	0	1	1	1	2	0
18 - 19 March	total area (m²)	0	466	2,332	16	564	0
18 - 19 March	total stranded salmonids (steelhead)	0	199 (18)	373	NA[1]	327	0
26 - 27 April	# pools	1	1[2]	1[2]	0	1[2]	1

Dates	Location (river mile)	Nimbus, above hatchery weir (22)	Upper Sunrise aboveside channel (21)	Upper Sunrise sidechannel (21)	Lower Sunrise sidechannel (19)	Lower RiverbendSide Channel (13)	Below River Bendside channel (13)
	total area (m²)	50	420	60	0	208	161
26 - 27 April	**total stranded salmonids (steelhead)**	1	7 (3)	548 (20)	0	31 (2)	5

[1] Indicates that salmonid were present but were unable to be captured or identified

[2] Indicates same pool from last survey, that reconnected following a flow increase and then disconnected againprior to subsequent survey

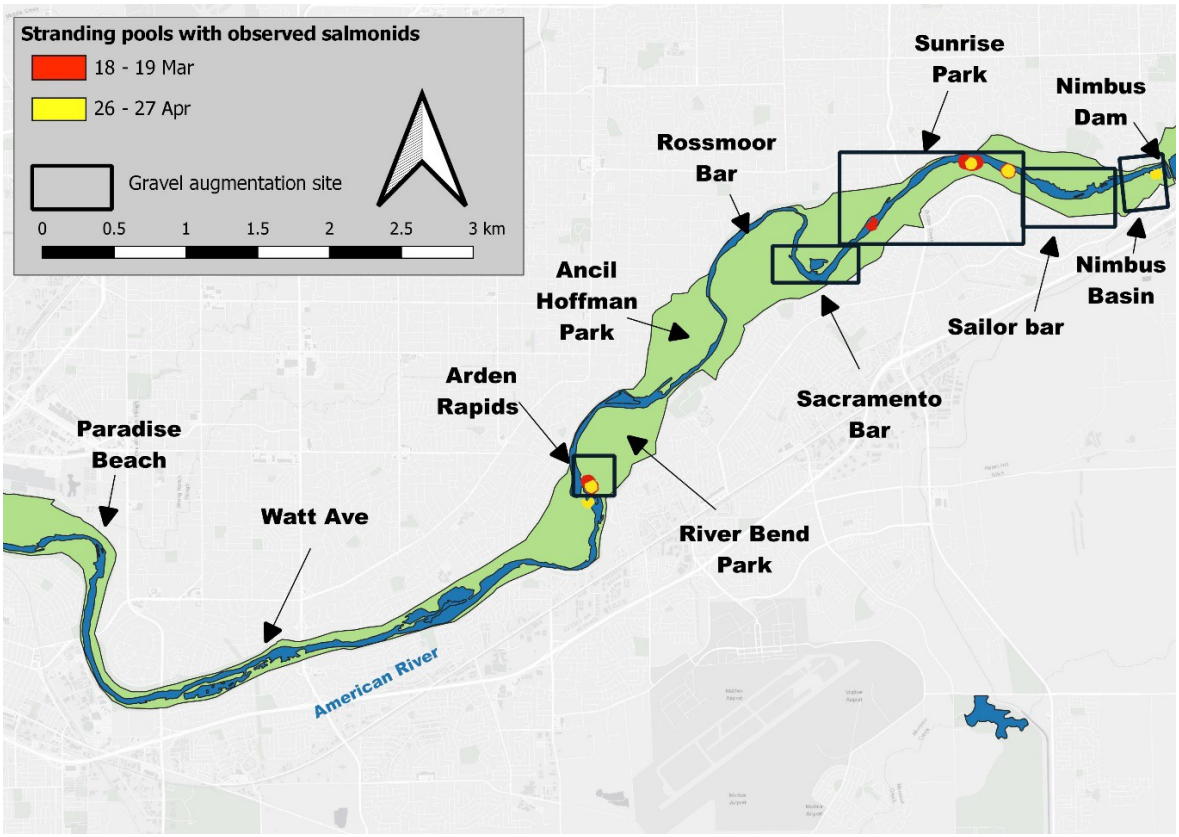


Figure 5. 2021 lower American River stranding locations

Pacific States Marine Fisheries Commission

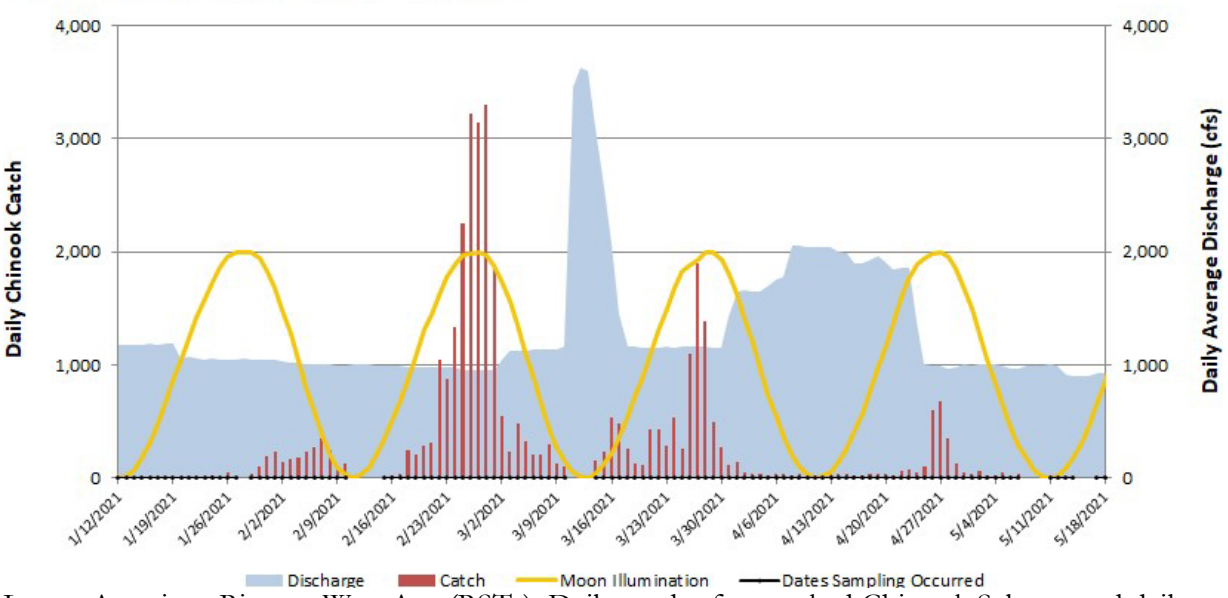
Update through 05/18

Unmarked Juvenile Chinook Salmon (length-at-date):

Fall	Late Fall	Spring	Winter
35,059	26	267	3

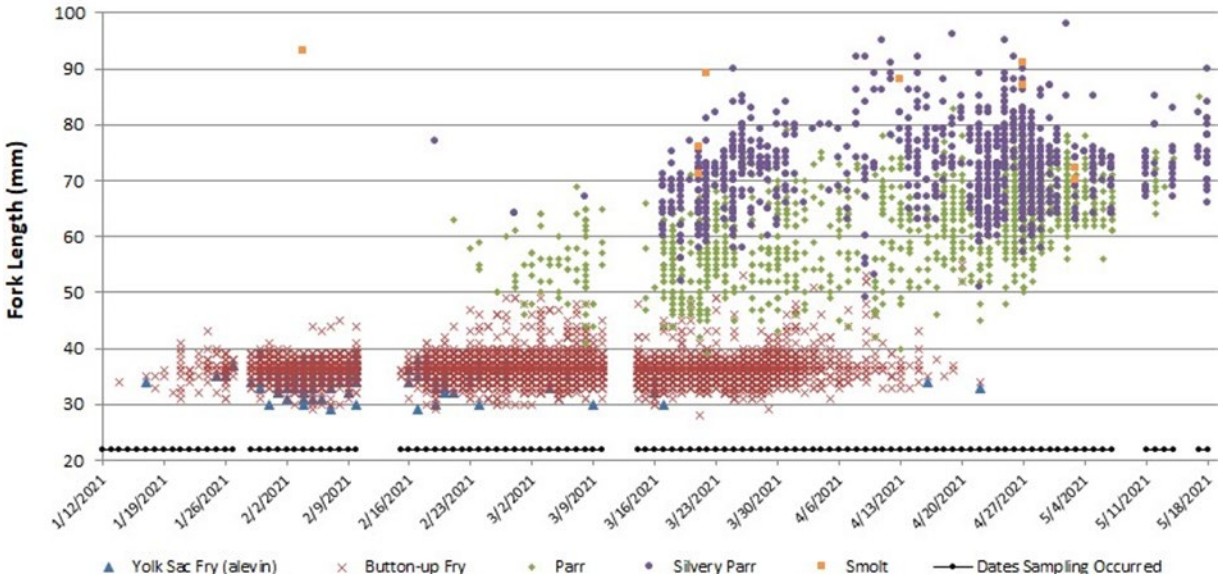
Unmarked Steelhead (life-stage):

Fry	Parr	Smolts	Adults
176	60	0	1



Lower American River at Watt Ave (RSTs): Daily catch of unmarked Chinook Salmon and daily average discharge at Fair Oaks during the 2021 Lower American River rotary screw trap survey season.

Lower American River at Watt Ave (RSTs): Daily fork of length distribution by life stage of unmarked Chinook Salmon measured during the 2021 Lower American River rotary screw trap survey season.


Fork Length (mm)
100
90
80
70
60
50
40
30
20
1/12/2021
1/19/2021
1/26/2021
2/2/2021
2/9/2021
2/16/2021
2/23/2021
3/2/2021
3/9/2021
3/16/2021
3/23/2021
3/30/2021
4/6/2021
4/13/2021
4/20/2021
4/27/2021
5/4/2021
5/11/2021
5/18/2021
Yolk Sac Fry (alevin)
Button-up Fry
Parr
Silvery Parr
Smolt
Dates Sampling Occurred

SMUD Upper American River Project Update

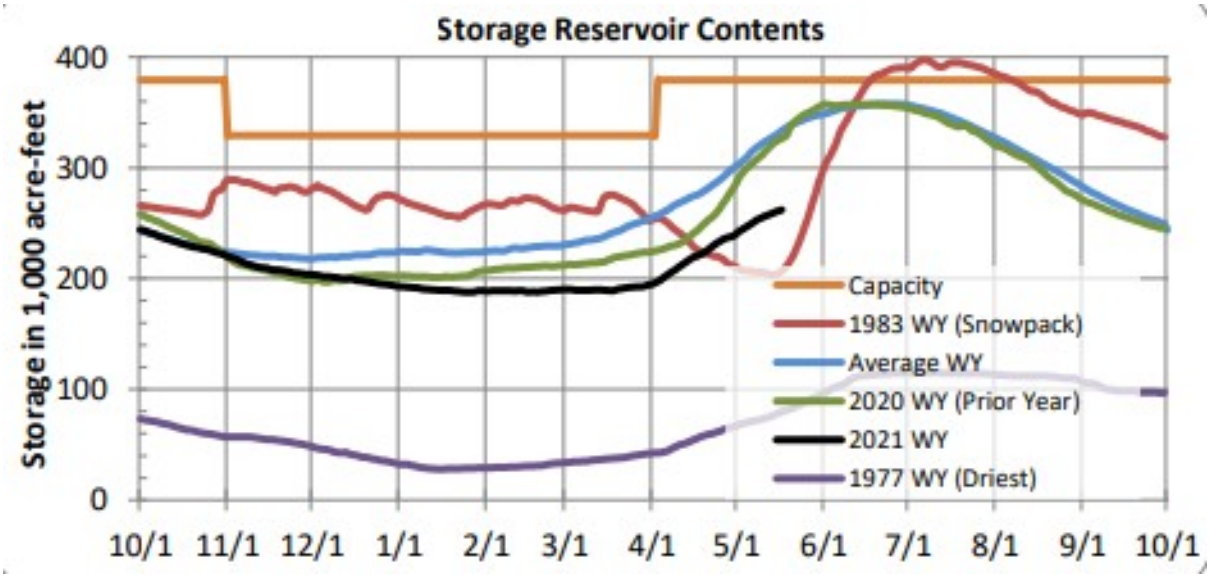
Conditions – 18 May 2021:

- May precipitation through 05/17/21 07:00 is .00 in., which is 0% of the May average of 2.97". Precip. for the water year to date is 29.60" which is 55% of average to date (53.89) and 52% of the entire water year average of 57.32".

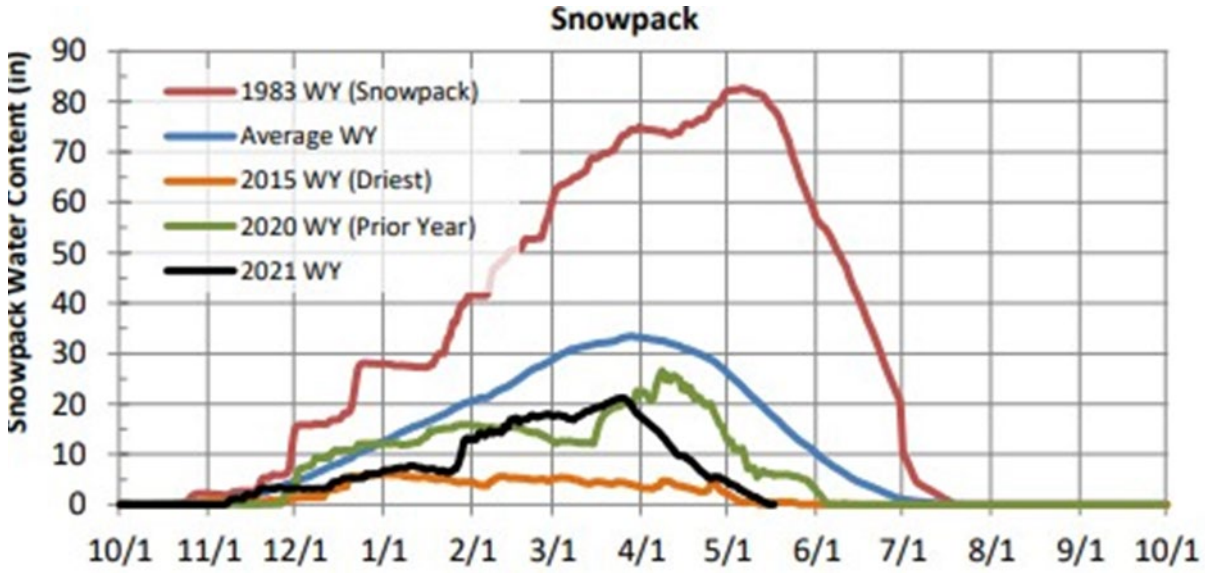
Combined reservoir storage for Loon Lake, Union Valley and Ice House Reservoirs

- 262,827 acre-feet (Storage this time last month: 256,291 acre-feet)
- 69% full
- 78% of historical average (historical average: 334,906 AF / 88%)
- Up 2% from last week

May 18, 2021 reservoir storage: (Figure 6)



May 18, 2021, snowpack: (Figure 7)


Snowpack
Snowpack Water Content (in)
90
80
70
60
50
40
30
20
10
0
1983 WY (Snowpack)
Average WY
2015 WY (Driest)
2020 WY (Prior Year)
2021 WY
10/1
11/1
12/1
1/1
2/1
3/1
4/1
5/1
6/1
7/1
8/1
9/1
10/1

Individual Reservoir Storage:

- Loon Lake: 54,159 AF
- Ice House: 31,583 AF
- Union Valley: 177,085 AF (73% of avg)

Last year (on May 18, 2020), storage was at 87% (330,348 AF). **Total winter capacity: 379,174 AF.*

Chili Bar releases into the South Fork American River

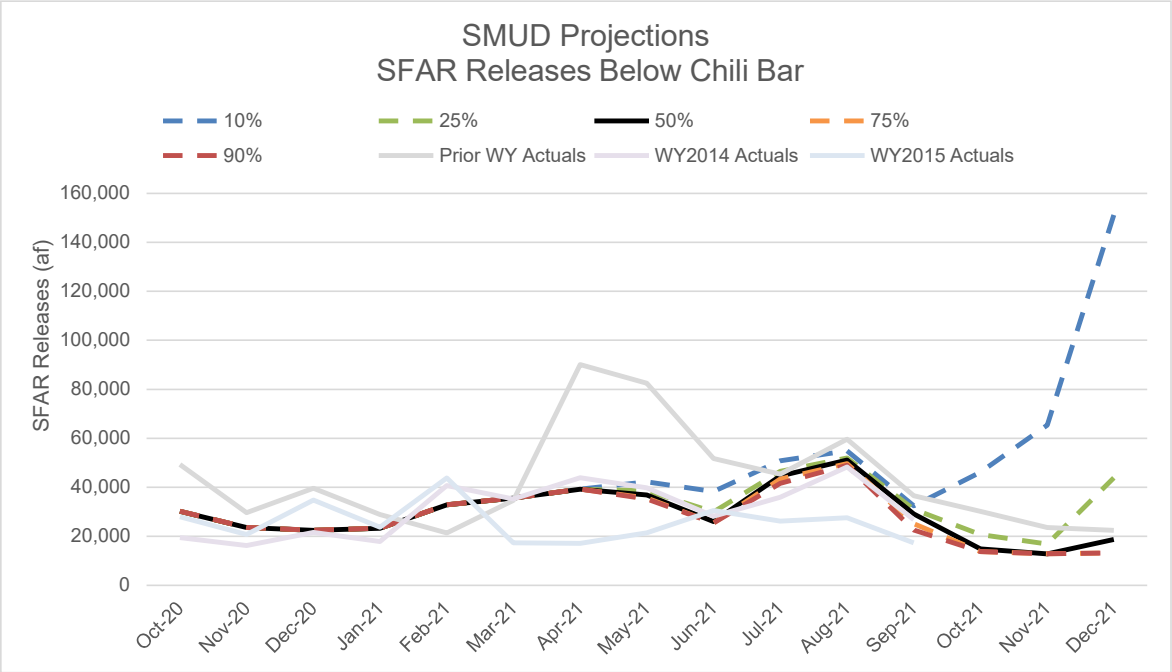
- April 2021 releases:
    - Daily average flow: 660 cfs
    - Total releases: 39,273 AF
- May 2021 releases (May 1-17):
    - Daily average flow so far: 730 cfs
    - Total releases so far: 24,643AF

Table 2. South Fork American River Runoff Forecast (in cfs, daily average forecasted flow, forecast 2021-5-18)

Basin	May 18	May 19	May 20	May 21	May 22	May 23
SFA Above Slab	275.1	208.1	166.3	280.1	364.8	310.0
Slab Creek	37.4	38.8	40.7	42.7	44.2	45.2
Combined South Fork	313	247	207	323	409	355

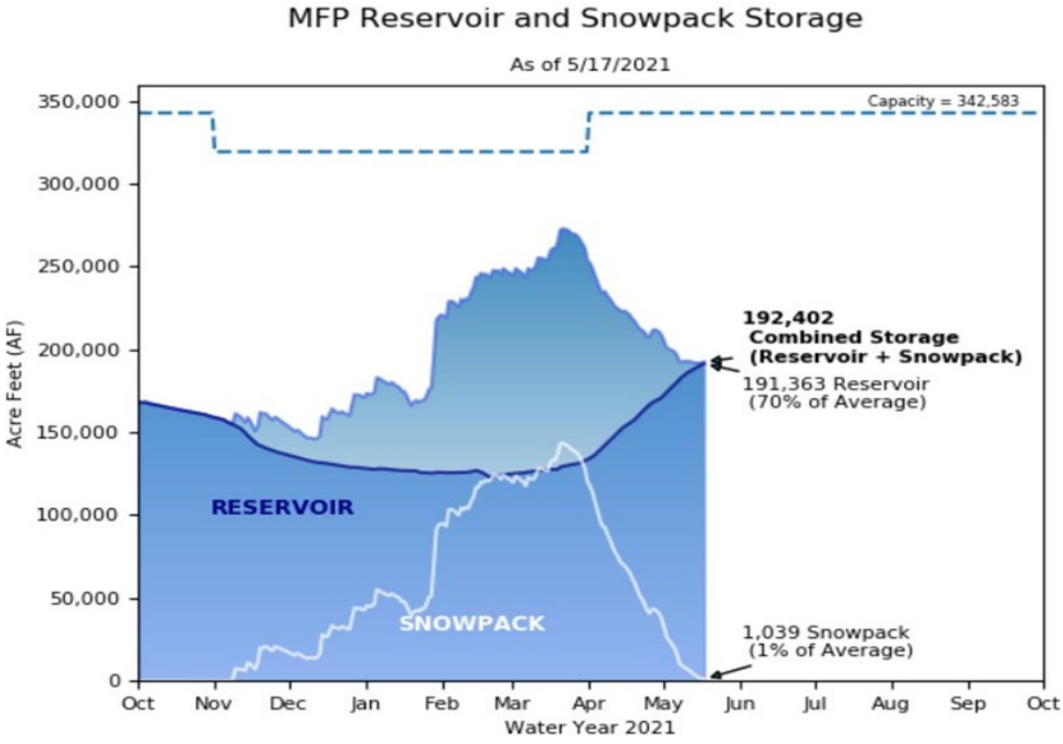
Runoff into the storage reservoir basins is 49% of median to date through May 16. The snowpack is 0% of average at selected snow sensors.

South Fork American River Releases Forecast, updated 2021/5/12 (Figure 8)

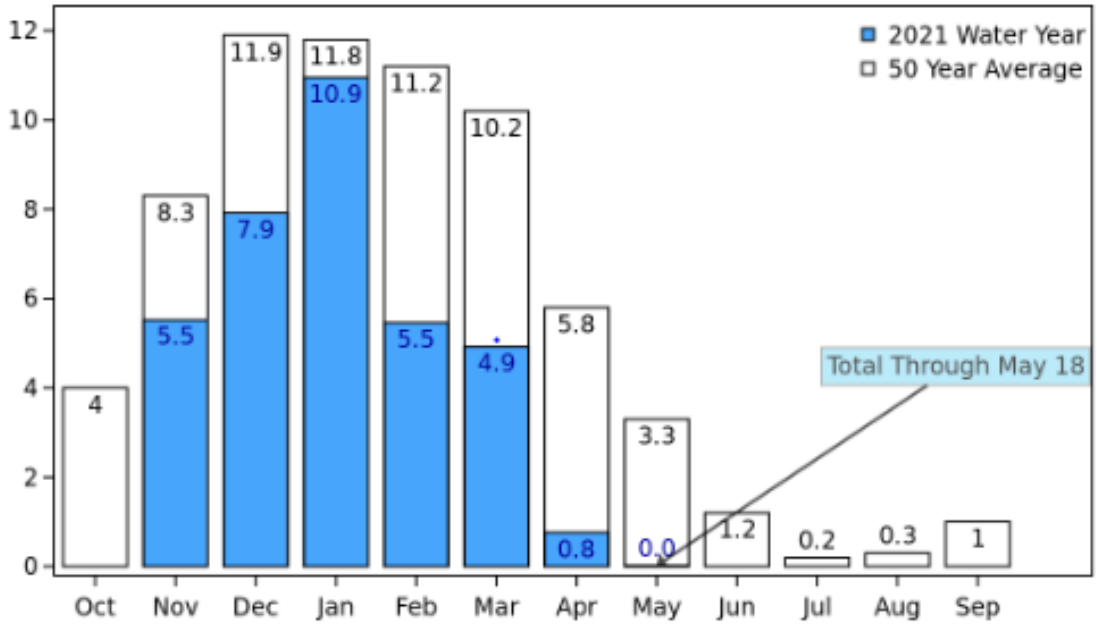

SMUD Projections
SFAR Releases Below Chili Bar
10%
25%
50%
75%
90%
Prior WY Actuals
WY2014 Actuals
WY2015 Actuals
SFAR Releases (af)
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21

PCWA MFP Operations Overview for American River Operations Group (Real Time Data as of May 19, 2021)

- French Meadows Storage = 72,000 AF of 136,405 AF = 53% Capacity
    - MFAR above FM Inflow (R24) =7-day AVG ~185 cfs
- Hell Hole Storage = 121,000 AF of 207,590 AF = 58% Capacity
    - Five Lakes Inflow (R23) = 7-day AVG~100 cfs
    - Rubicon Inflow (R22) = 7-day AVG~120 cfs
- Combined Storage (FM+HH) = 193,000 AF/342,590 AF = 56% Capacity; ~70% of AVG
    - 7 Day Change =+6,000 AF
- MFAR @ R11: 7 day daily average 275 cfs
- MFP in storage conservation -running Middle Fork/Ralston Units 1-2 hrs/day.



Lake Spaulding Precipitation: Water Year 2021



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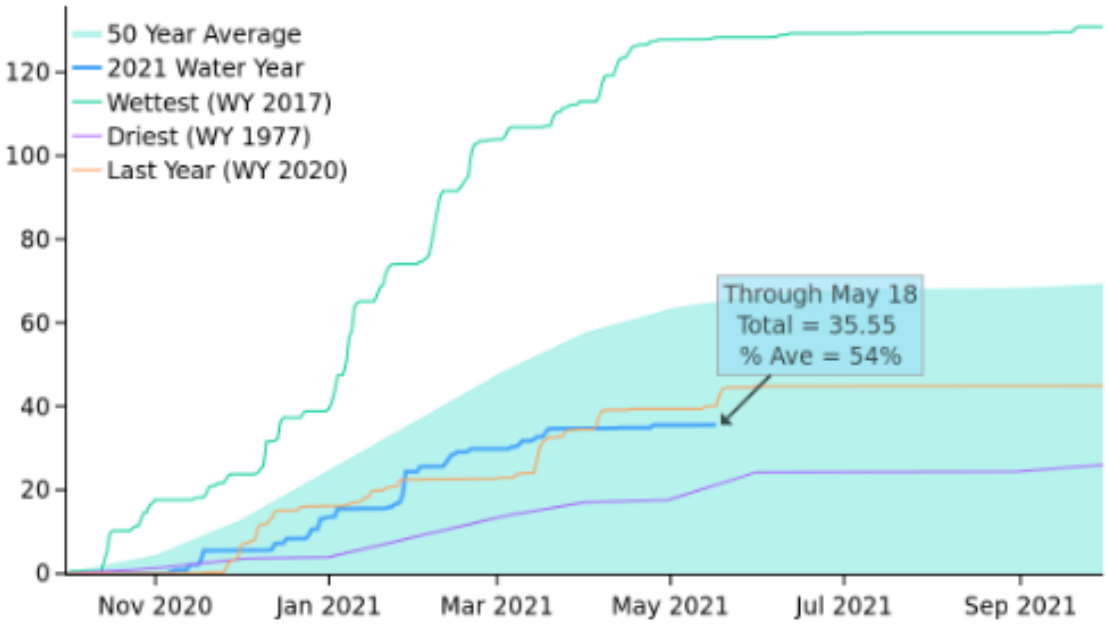
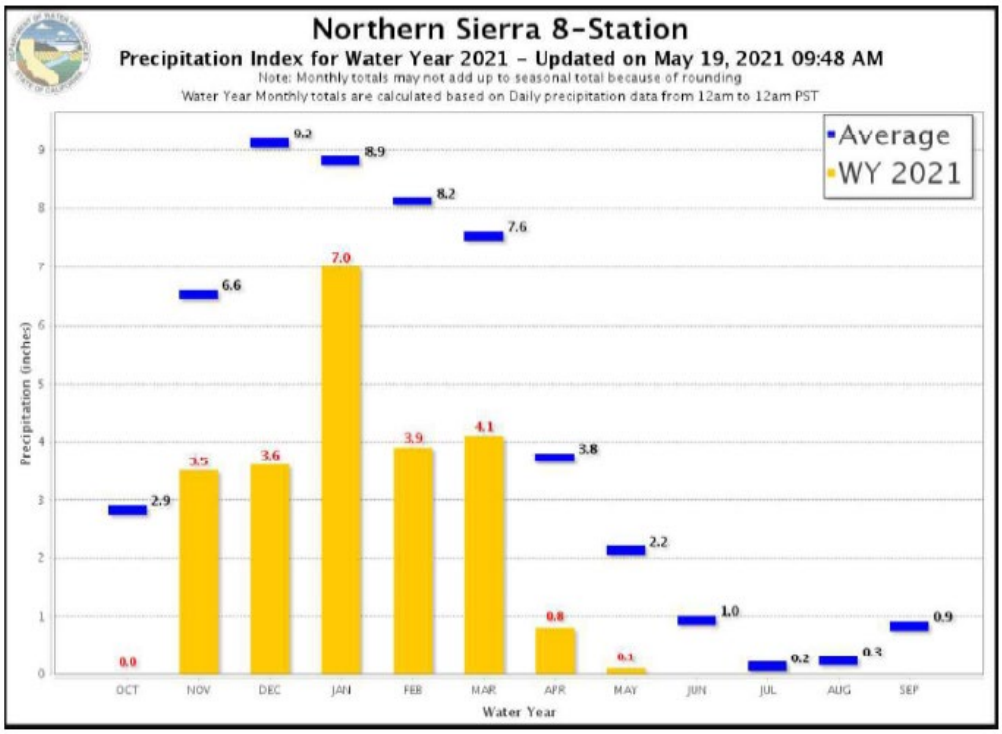


American River Summary Conditions – May (On-going)

Currently the conditions for the April has been dry, with no precipitation event projected for the next two weeks. The average precipitation for the month of May is 0.1" . The Sacramento Valley WY Type Index 40-30-30 under both the 90% and 50% exceedance is categorized as a Critical Year.



Storage/Release Management Conditions

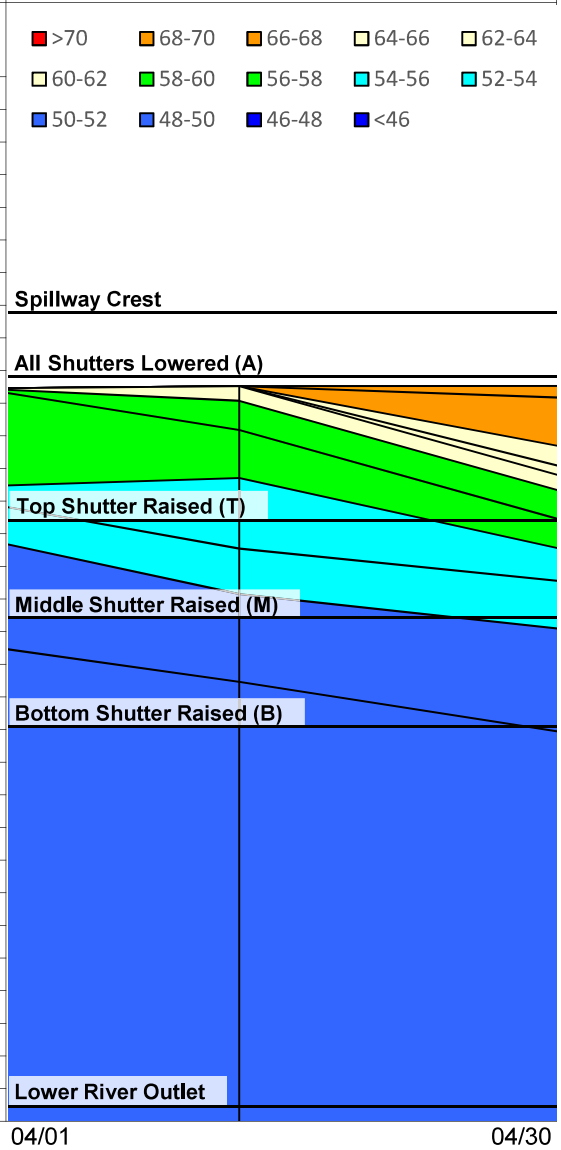
- Releases are currently at 1000 cfs to comply with the SWRCB D1641
    - Increase releases on April 19, 2021 from 900 cfs to 1000 cfs.

Temperature Management

- Top Shutters: Units 1, 2, & 3 - raised (elev. 428 to lower)
- Middle Shutter s: Units 1, 2, & 3 - lowered
- Bottom Shutter s: Units 1, 2, & 3 - lowered

DATE	Mean Daily Temperatures (°F)							Release (CFS)	Storage (TAF)	Unit Shuter Position / Load Percentage					
	Water						Air			Unit 1		Unit 2		Unit 3	
	NFA	ARP	AFD[1]	AHZ	AWP	AWB	CSU	Nimbus	Folsom						
Mar	48.6	48.3	50.5	52.7	53.3	53.9	53.3	1604							
04/01	54.1	53.6	53.2	55.9	57.2	58.3	66.4	1790	361	T	43	T	34	T	23
04/02	54.2	53.9	53.0	56.1	57.3	58.3	65.0	1806	362	T	33	T	45	T	22
04/03	54.3	53.6	52.4	55.9	57.0	57.8	55.9	1786	362	T	30	T	39	T	30
04/04	54.4	53.4	52.9	56.1	56.9	57.5	54.8	1784	363	T	43	T	38	T	19
04/05	54.5	53.7	53.1	55.7	56.9	57.7	56.1	1875	363	T	37	T	40	T	22
04/06	54.9	53.0	53.5	55.8	57.1	58.0	58.4	1896	365	T	31	T	42	T	27
04/07	55.2	55.0	52.9	56.0	57.1	57.9	55.8	1804	365	T	35	T	37	T	27
04/08	55.0	52.4	54.0	56.6	57.5	58.1	58.3	2039	365	T	34	T	36	T	30
04/09	55.1	54.4	54.0	56.1	57.4	58.4	59.5	2034	365	T	39	T	31	T	30
04/10	55.3	55.0	54.3	56.8	57.6	58.2	59.2	2035	365	T	30	T	44	T	26
04/11	55.7	55.3	54.9	57.0	58.4	59.3	63.1	2035	365	T	12	T	73	T	15
04/12	56.0	55.9	55.0	57.4	58.5	59.3	64.1	2035	363	T	41	T	31	T	29
04/13	56.1	56.2	54.3	57.5	58.5	59.2	59.5	2034	363	T	41	T	32	T	28
04/14	56.4	55.9	55.2	57.7	58.5	59.1	58.1	2033	363	T	66	T	25	T	9
04/15	56.3	55.0	55.3	57.4	58.8	59.5	60.1	2038	362	T	43	T	29	T	28
04/16	56.0	56.5	55.6	58.0	59.1	59.7	60.9	2038	362	T	36	T	35	T	29
04/17	56.9	57.2	56.5	58.9	59.6	60.4	67.6	2036	360	T	26	T	47	T	27
04/18	57.4	57.3	56.5	58.7	60.6	61.5	70.0	2050	359	T	18	T	39	T	43
04/19	57.7	58.0	56.4	59.4	60.6	61.4	65.8	2058	358	T	54	T	29	T	17
04/20	58.1	58.6	55.7	59.2	60.5	61.3	61.4	2056	357	T	50	T	28	T	23
04/21	58.7	59.7	56.5	59.5	60.7	61.4	60.4	1993	356	T	51	T	26	T	24
04/22	58.9	60.2	56.1	59.0	60.3	61.2	57.0	2007	355	T	40	T	40	T	20
04/23	59.0	59.2	56.4	59.3	60.4	60.9	57.9	2002	354	T	45	T	38	T	16
04/24	58.5	58.5	56.1	59.1	59.9	60.4	57.3	1534	354	T	47	T	30	T	23
04/25	57.4	56.7	55.7	59.2	59.4	59.7	55.4	1046	355	T	27	T	38	T	35
04/26	56.9	55.7	56.8	59.2	59.9	60.0	53.9	1011	356	T	39	T	51	T	10
04/27	57.0	56.9	57.6	59.1	60.6	61.5	61.0	1011	357	T	37	T	55	T	9
04/28	57.4	59.2	57.2	60.1	62.0	63.1	67.6	1014	357	T	33	T	33	T	35
04/29	58.7	60.3	57.6	60.4	63.0	64.6	70.5	1012	357	T	31	T	37	T	31
04/30	59.9	60.9	57.4	60.7	63.1	64.8	67.8	1011	359	T	46	T	40	T	14
-															
Apr	56.5	56.4	55.2	57.9	59.1	60.0	61.0	1763							
						Total AF		104931							

Isobath Plot



Legend

?	= 1-9 hours of data missing
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#	= Station out of service
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A	= All Shutters Lowered
T	= Top Shutter Raised
M	= Middle Shutter Raised
B	= Bottom Shutter Raised
O	= Unit Outage

Notes

[1] AFD is a weighted average based on hourly flow values, including generation, bypass and spill.

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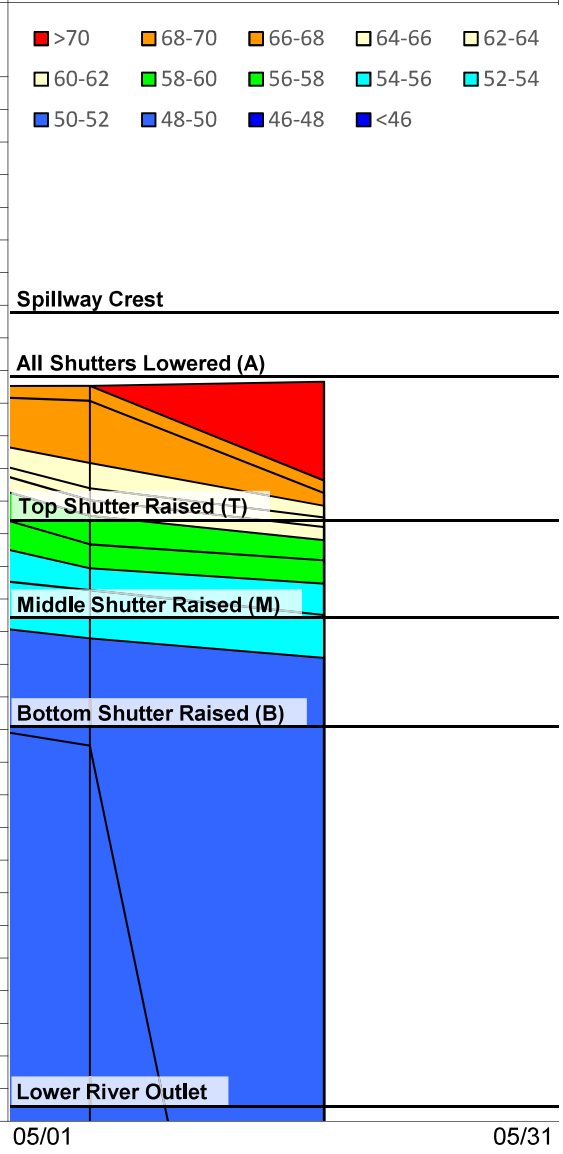
DATE	Mean Daily Temperatures (°F)							Release (CFS)	Storage (TAF)	Unit Shuter Position / Load Percentage					
	Water						Air			Unit 1		Unit 2		Unit 3	
	NFA	ARP	AFD[1]	AHZ	AWP	AWB	CSU	Nimbus	Folsom						
Apr	56.5	56.4	55.2	57.9	59.1	60.0	61.0	1763							
05/01	60.5	60.3	57.3	61.0	63.2	64.6	63.7	1011	360	T	43	T	50	T	7
05/02	61.3	60.1	58.2	62.1	63.9	65.5	68.3	1012	362	T	17	T	70	T	14
05/03	61.4	59.5	59.0	63.3	65.0	65.9	73.7	1015	363	T	17	T	58	T	25
05/04	62.0	60.5	59.0	62.9	65.7	67.2	75.5	1014	363	T	21	T	34	T	44
05/05	62.6	61.4	59.3	62.4	65.5	67.6	75.2	1022	364	T	69	T	27	T	4
05/06	63.0	60.1	58.7	62.4	64.9	66.6	64.9	1021	366	T	64	T	30	T	6
05/07	62.9	61.1	59.5	63.5	65.2	66.3	65.0	1021	367	T	56	T	27	T	17
05/08	62.8	60.6	60.2	64.1	65.3	66.7	72.0	1027	368	T	1	T	76	T	23
05/09	63.0	61.1	60.1	64.4	66.5	67.5	74.7	1022	369	T	22	T	68	T	10
05/10	63.7	62.0	60.6	64.7	66.5	68.0	75.3	1020	369	T	39	T	60	T	1
05/11	64.1	62.9	60.4	64.8	67.4	68.8	75.8	1022	369	T	44	T	34	T	22
05/12	65.4	64.5	60.6	64.2	67.1	69.1	74.6	1021	369	T	47	T	44	T	10
05/13	66.1	65.9	60.6	64.1	66.9	68.5	67.8	953	369	T	31	T	31	T	38
05/14	66.5	63.9	59.9	64.5	66.8	68.1	63.0	936	370	T	29	T	36	T	35
05/15	66.3	64.8	60.7	64.3	65.9	66.9	60.8	926	370	T	32	T	38	T	31
05/16	67.0	64.8	60.3	64.7	67.0	67.4	61.0	933	370	T	30	T	40	T	30
05/17	67.1	64.9	60.7	64.6	66.3	67.1	60.6	931	370	T	30	T	40	T	31
05/18	67.5	65.4	60.4	64.7	67.1	67.9	66.1	917	370	T	38	T	35	T	27
05/19															
05/20															
05/21															
05/22															
05/23															
05/24															
05/25															
05/26															
05/27															
05/28															
05/29															
05/30															
05/31															
May	64.1	62.4	59.7	63.7	65.9	67.2	68.8	990							
						Total AF		35353							

Isobath Plot



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United States Department of the Interior
Bureau of Reclamation, Central Valley Project – California
Daily CVP Water Supply Report
February 14, 2021
Run Date: May 18, 2021

Table 3. Reservoir Releases in Cubic Feet/Second

Reservoir	Dam	WY 2020	WY 2021	15-Year Median
Trinity	Lewiston	987	1,592	2,649
Sacramento	Keswick	8,541	8,822	8,822
Feather	Oroville (SWP)	2,050	2,500	2,050
American	Nimbus	1,730	917	1,749
Stanislaus	Goodwin	1,207	901	1,207
San Joaquin	Friant	534	385	451

Table 4. Storage in Major Reservoirs in Thousands of Acre-Feet

Reservoir	Capacity	15-Year Average	WY 2020	WY 2021	% of 15-Year Average
Trinity	2,448	1,775	1,884	1,292	73
Shasta	4,552	3,617	3,578	2,108	58
Folsom	977	762	750	370	49
New Melones	2,420	1,492	1,876	1,402	94
Fed. San Luis	966	593	481	342	58
Total North CVP	11,363	8,239	8,569	5,514	67
Millerton	520	346	421	255	74
Oroville (SWP)	3,538	2,551	2,438	1,411	55

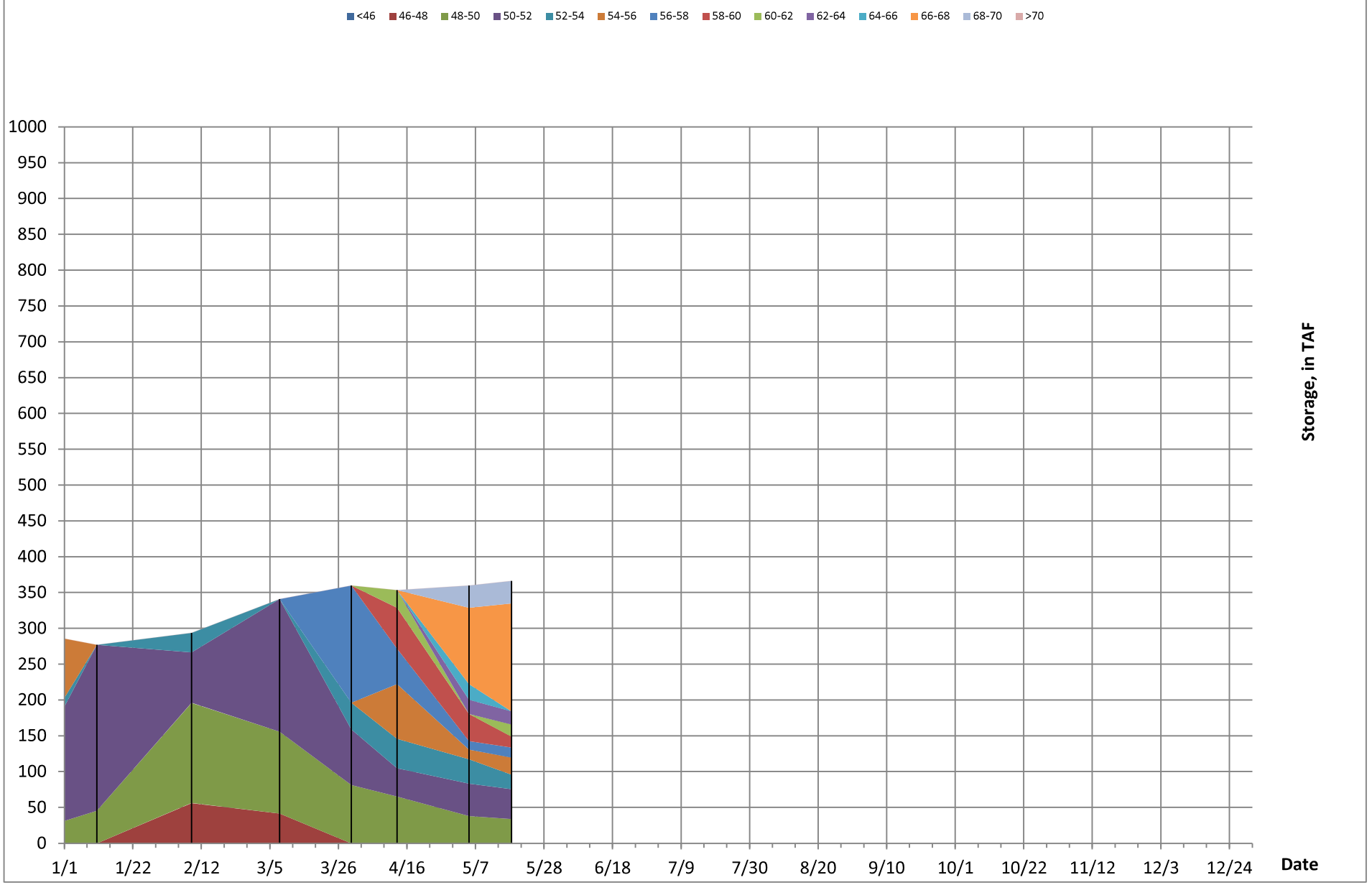
Table 5. Accumulated Inflow for Water Year to Date in Thousands of Acre-Feet

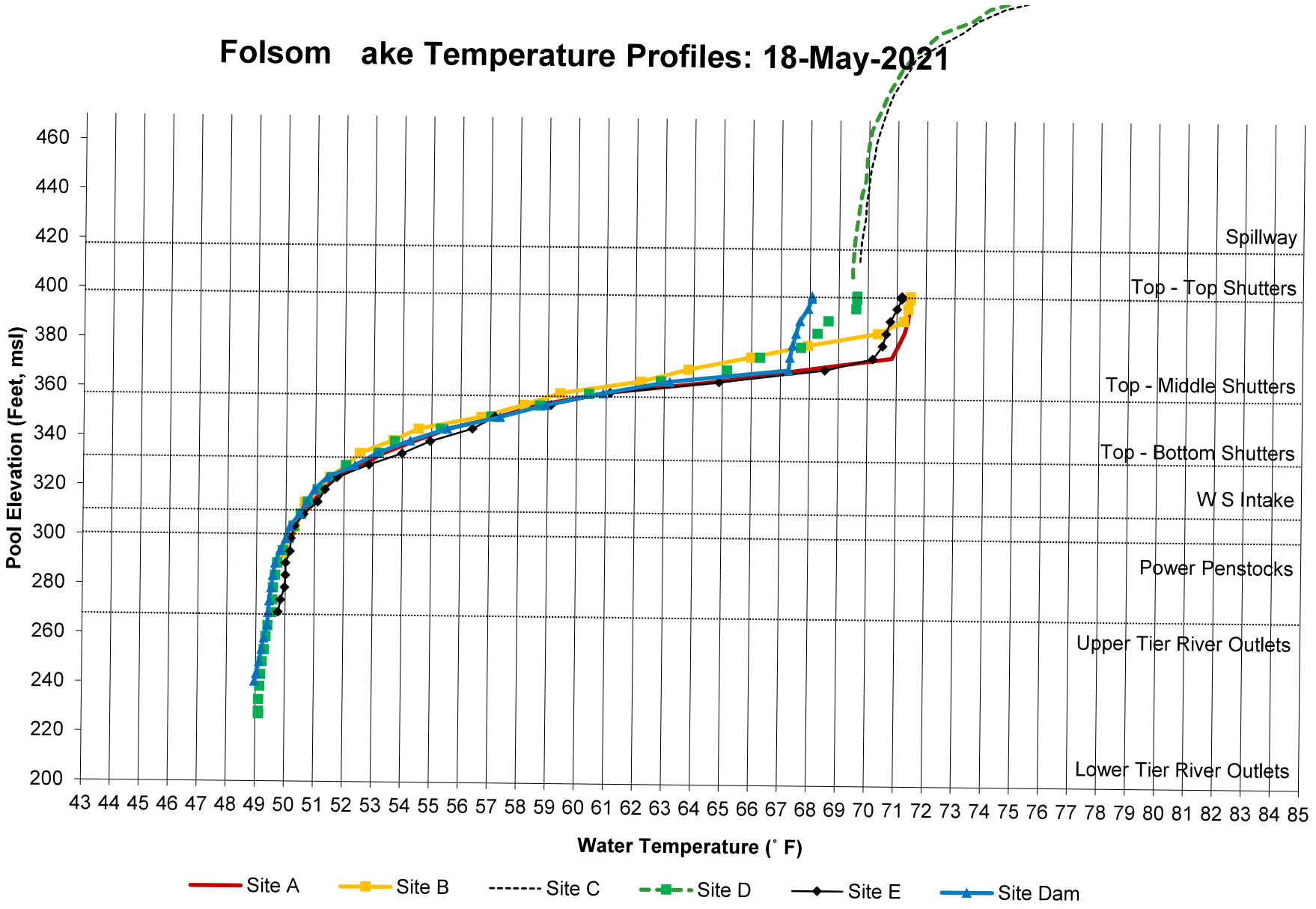
Reservoir	Current WY 2021	WY 1977	WY 1983	15-Year Average	% of 15-Year Average
Trinity	302	144	1,665	824	37
Shasta	1,809	1,720	8,778	3,745	48
Folsom	628	254	4,617	1,805	35
New Melones	267		1,463	631	42
Millerton	361	124	2,144	757	48

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

Reservoir	Current WY 2021	WY 1977	WY 1983	Avg (N Years)	% of Avg	Last 24 Hours
Trinity at Fish Hatchery	16.21	12.18	54.59	29.64 (59)	55	0.00
Sacramento at Shasta Dam	23.52	15.23	112.07	58.06 (64)	41	0.00
American at Blue Canyon	31.41	15.64	103.28	62.99 (46)	50	0.00
Stanislaus at New Melones	16.78		45.33	26.31 (43)	64	0.00
San Joaquin at Huntington LK	17.60	15.70	80.80	39.26 (46)	45	0.00

Folsom Lake Isothermobaths - 2021
(Water Temperature, in ˚ F)



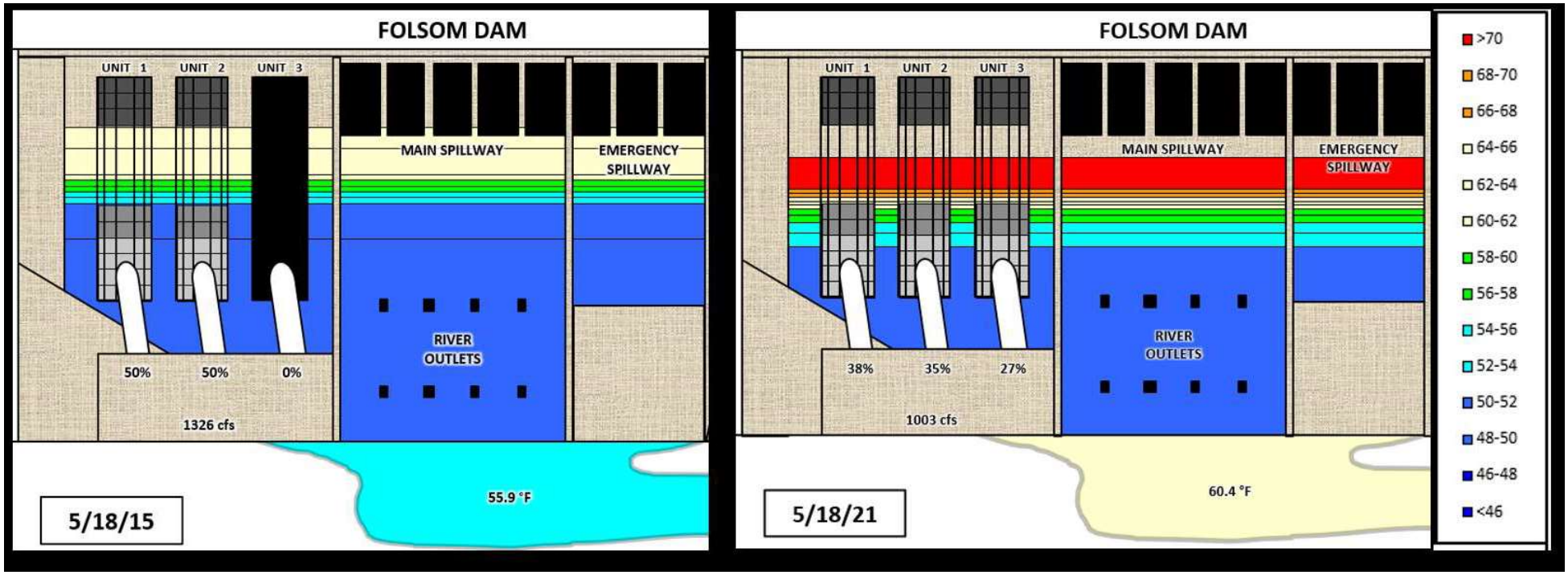

Folsom ake Temperature Profiles: 18-May-2021
Pool Elevation (Feet, msl)
460
440
420
400
380
360
340
320
300
280
260
240
220
200
43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85
Water Temperature (˚ F)
Spillway
Top - Top Shutters
Top - Middle Shutters
Top - Bottom Shutters
W S Intake
Power Penstocks
Upper Tier River Outlets
Lower Tier River Outlets
Site A
Site B
Site C
Site D
Site E
Site Dam

Folsom Cold Water Pool

Folsom Reservoir: Cold Water Volume

Profile Date:	5-19-21
Volume less than 58 °F (TAF):	133.5
Penstock Elevation (ft):	327
Volume (TAF):	85
Approximate Max. Temp (°F):	52.2

2015 Vs. 2021


FOLSOM DAM
UNIT 1
UNIT 2
UNIT 3
MAIN SPILLWAY
EMERGENCY SPILLWAY
RIVER OUTLETS
50%
50%
0%
1326 cfs
55.9 °F
5/18/15
FOLSOM DAM
UNIT 1
UNIT 2
UNIT 3
MAIN SPILLWAY
EMERGENCY SPILLWAY
RIVER OUTLETS
38%
35%
27%
1003 cfs
60.4 °F
5/18/21
>70
68-70
66-68
64-66
62-64
60-62
58-60
56-58
54-56
52-54
50-52
48-50
46-48
<46

~ Two Week Progression