BUREAU OF RECLAMATION

American River Group Notes

Conference Line: +1 (321) 209-6143; Access Code: 985 598 947#
Webinar: Join Microsoft Teams Meeting
Thursday, September 19, 2024

Action Items

1. ARG members drafting the power bypass proposal should email it to Thuy Washburn and Tom Patton by 9/25/24. [Complete]

Introductions

1. USBR: Drew Loney, Mechele Pacheco, Myrna Girald Perez, Spencer Marshall, Thuy Washburn, Zarela Guerrero, Todd Plain, Thomas Patton, Liz Kiteck, Carolyn Bragg
2. NMFS: Barb Byrne, Rachael Alcala, Sam Pyros, Robert Sheffer
3. USFWS: N/A
4. CDFW: Crystal Rigby, Drew Gaan, Duane Linander, Emily Fisher, Gary Novak, Jason Julienne, Molly Shea, Nick Bauer, Jennifer O'Brien
5. SWRCB: Nathalie Niepagen
6. California State Parks: N/A
7. Water Districts: Tony Barela
8. Regional Water Authority (RWA): Michelle Banonis
9. City of Sacramento: N/A
10. Sacramento County: N/A
11. Environmental Council of Sacramento: N/A
12. City of Roseville: Sean Bigley
13. Cramer Fish Sciences: Kirsten Sellheim
14. City of Folsom: N/A
15. DWR: John Ford
16. EBMUD: I-Pei Hsiu, Max Fefer

17. SMUD: Megan Peers
18. PCWA: N/A
19. Water Forum: Erica Bishop, Ashlee Casey
20. PSMFC: Logan Day
21. USACE: Casey Nyquist
22. CBEC Engineering: Chris Hammersmark
23. Shingle Springs Band of Miwok Indians: N/A
24. CSUS: Dede Birch
25. Kleinschmidt Group: Vanessa Martinez
26. WAPA: N/A
27. BKS Law Firm: Jennifer Buckman
28. Other: Rod Hall

Announcements

- Tom Patton, USBR, will be rotating in to cover American River operations starting in October/Water Year 2025, taking over for Thuy Washburn.

Housekeeping

- N/A

Fisheries Update

CDFW Updates

1. Carcass Surveys
    a. N/A
2. Chinook spawning
    a. N/A
3. Redd surveys
    a. N/A
4. Nimbus Hatchery Operations Update
    a. DO levels are trending slightly higher than they were around the time of the August meeting.

b. There are aerators present at the hatchery to improve aeration. Below the oxygenators, DO levels are measuring approximately 7 mg/l.

c. CDFW is still seeing signs of *columnaris* at the hatchery and is working to treat the issue.

Questions

1. N/A

Cramer Fish Sciences Updates

1. Dissolved Oxygen (DO)

    a. Cramer Fish Sciences (Cramer) shared DO levels from 9/4 to 9/16. (See last two pages for figures and charts.)

    b. While DO levels coming out of Folsom into Lake Natoma are still very low, there were localized improvements when/where spill was occurring.

    c. Cramer staff took spot measurements on 9/16/2024 at a few locations and concluded that there is localized variation within the basin that is being driven by which dam gate is open at any given time.

    d. Cramer will continue to share updated data as it becomes available.

Questions

1. NMFS commented that changing the baseline DO target from 6.5 mg/l to 7 mg/l is helpful because it now aligns more closely to the basin standard.
2. CDFW asked if USBR anticipates that the change in shutters will benefit DO or if they expect levels to remain the same. CDFW noted that 66°F had been reached at Watt Ave. and speculated that the layer(s) of cold water may be decreasing.

    a. USBR noted that current operations have been working in terms of water temperature control, so a timeline for a Folsom gate change is yet to be determined. They are not yet blending water with their coldest unit, but that would be the next step for temperature reduction rather than a gate change.

    b. Cramer added that a gate change would not likely do much to affect DO levels based on data from previous years. DO in the anadromous part of the river is more affected by what's happening below the Nimbus Dam gates.

    c. The Water Forum added that they haven't seen a lot of change with the shutter changes, but did see improvements in DO in Lake Natoma once the power bypass was in place last year. The bypass is what seemed to improve the conditions above Nimbus Dam.

PSMFC Updates

1. N/A

Operations Forecast

SMUD

1. There has been no precipitation this month through 9/19/2024. Precipitation totals for the water year (49 inches) are approximately 85.6% of the entire water year average as of 9/19/2024.
2. Runoff into the storage reservoir basin is 102% of the median as of 9/19/2024.
3. Total reservoir storage is 73% full at approximately 277 TAF.
4. Chili Bar daily average releases are forecasted at the following flow rates:
    a. September: 578 cfs
    b. October: 427 cfs
    c. November: 294 cfs
5. Questions and Comments
    a. N/A

PCWA

1. PCWA did not provide an update for the September meeting.

Central Valley Operations

USBR

1. Folsom Reservoir releases are at 1,700 cfs to 1,750 cfs as of 9/17/2024. Releases have been gradually dropping from 2,400 cfs since 9/1/2024.
2. Folsom storage levels are decreasing in preparation for the next water year. As of 9/17/2024, storage levels are approximately 474 TAF.
3. Minimum Release Requirement (MRR) is 1,750 cfs for September.
4. Folsom Dam water temperatures have increased from 61.7°F on 9/5/2024 to 63.9°F on 9/17/2024.
5. As releases in late August decreased to under 3,000 cfs, USBR reported they were waiting for the system to stabilize before determining the process for blending water temperatures. During this time, water temperatures exceeded the maximum target of 66°F.

6. The shutter change in late August has helped with temperature management at Watt Ave.
7. As of 9/18/2024, the shutters are in the following positions:
    a. Top shutters: Units 1-3 are raised;
    b. Middle shutters: Unit 1 is lowered; Units 2 & 3 are raised;
    c. Bottom shutters: Units 1 & 2 are lowered; Unit 3 is raised.
8. In the 50% exceedance operations forecast, the monthly American River release levels are anticipated to be 2,200 cfs for September, 2,000 cfs for October and 2,000 cfs for November.
9. At the 90% exceedance level, the monthly American River release levels are anticipated to be 2,000 for September, 1,500 cfs for October and 2,000 cfs for November.

Questions/Comments

1. NMFS asked about the maximum capacity of an individual unit.
    a. USBR responded that it depends on the elevation of the reservoir, but at the current time, 2,800 cfs can go through one unit. During September, they have been running all flows through Unit 2.
2. CDFW asked if USBR is seeing differences in DO between the temperature layers.
    a. USBR confirmed that as DO is measured through the various layers (with the bottommost layers having the lowest levels of DO). They estimate that DO will likely decrease further ahead of a potential power bypass because they are drawing water from the lower, cooler portion of the lake. In the meantime, USBR is working to improve DO conditions at the hatchery.
3. NMFS asked if USBR will continue to spill at Nimbus Dam to keep the DO at 7 mg/l or higher.
    a. USBR confirmed they'll continue to spill at Nimbus until DO until levels are above 7 mg/L.

Discussion

Water Temperature Modeling

1. Kleinschmidt Group presented the results of the following model scenarios requested by the ARG at the 9/6/2024 ad-hoc meeting:
    a. Baseline – no power bypass
        i. Scenario components
            1. 67°F at Watt for September

2. 64°F at Watt for October

ii. Modeling results:

b. 250 cfs

i. Scenario components:

1. Starting 10/17

2. 500 cfs bypass the first two weeks of November – until 56°F is reached at Watt Ave. or the bypass is no longer providing benefits

ii. Modeling results:

1. Aiming for cooler temperatures earlier on may result in using a greater water volume for the power bypass.

2. The modeled power bypass reduces temperature by about 2°F compared to the no-bypass option.

c. 500 cfs

i. Scenario components:

1. Starting 10/24

2. 500 cfs bypass the first two weeks of November – until 56°F is reached at Watt Ave. or the bypass is no longer providing benefits

ii. Modeling results:

1. In a warmer year, temperatures would decrease to about 60°F by late October. Additional cooling occurs due to an expected decrease in air temperature.

2. In a cooler year, additional cooling is observed, partially due to shutter position.

d. Targeting 58°F at Watt Ave. by 10/15 and 56°F by 11/1

i. Scenario components:

1. Allow for a power bypass with a maximum of 500 cfs at any time starting at the point in time of the temperature drop

ii. Modeling results:

1. Warmer year, using 2020 data

a. It is not possible to reach 58°F by 10/15. It is likelier that the coolest possible temperature would be 63-64°F by

mid-October and possibly down to 60°F by the end of October.

b. Temperatures measuring 58°F would not be achievable until the second week of November.

2. Cooler year, using 2017 data

a. October water temperatures are cooler than in the warmer year modeling runs.

b. November water temperatures in 2017 were slightly warmer than those of 2020. This may have just been a result of the weather.

c. Temperatures of 59°F would be expected by November 1, with a possible increase to 61-62°F in mid-November, depending on weather conditions.

e. Targeting 60°F at Watt Ave. by 10/15 and 58°F by 11/1

i. Scenario components:

1. Allow for a power bypass with a maximum of 500 cfs at any time starting at the point in time of the temperature drop

ii. Modeling results:

1. Warmer year, using 2020 data – same as Scenario d above

2. Cooler year, using 2017 data - same as Scenario d above

Questions and Comments

1. CDFW asked if Kleinschmidt Group is tracking the 2020 data to be more applicable for this year rather than the cooler 2017 temperature data.

a. Kleinschmidt Group responded that this is not necessarily the case, since every year is unique in terms of meteorology. November of 2017 had a warmer November than 2020, but 2020 had a much warmer September and beginning of October.

2. NMFS asked for clarification regarding the bypass volumes for Scenarios D and E.

a. Kleinschmidt Group confirmed that when the bypass volumes are summed up, Scenarios B and C totaled approximately 22 TAF of bypass volume. For the other scenarios, reaching the warmer of the two targets, the bypass volume measured approximately 30-34 TAF. To reach the cooler of the two temperature targets (i.e., Scenario D), nearly twice the volume of water would need to be used as compared to Scenarios B and C.

3. CDFW asked what sort of shift in timing could be expected if monthly releases average 1,500 cfs during October (as opposed to 2,000 cfs).

a. Kleinschmidt Group replied that releases of 1,500 cfs would result in a bypass that is a little more effective compared with releases of 2,000 cfs because it would be composed of a 500 cfs bypass combined with 1,000 cfs of warmer water. A release of 2,000 cfs would be composed of a 500 cfs bypass combined with 1,500 cfs of warmer water. It would also mean that the coldest water would take longer to deplete. The downside would be the possibility of higher heat in early October; however, that dynamic flips toward the end of October where the higher flows could slow the amount of cooling that occurs as water goes downstream.

4. NMFS asked about the risk of completely using up the cold-water storage pool.

    a. Kleinschmidt Group responded that as bypass water is released, the profile shown on the water temperature charts is pulled down and the coldest water stays at the bottom until turnover occurs. When a bypass is conducted earlier and at a larger volume, it will probably keep pulling from that cold water. The model will keep pulling as long as it is providing a benefit until the point where the temperature target is reached.

5. CDFW asked for the estimated volume of cold-water pool available in these scenarios.

    a. Kleinschmidt Group responded that a previous analysis showed approximately 25 TAF. These scenarios are using a total of almost 23 TAF, including nearly all of the coldest water available, and it would be available between the river outlet and the lowest-up position of the powerhouse intakes.

    b. CDFW asked USBR if they anticipate any changes to that volume between the current date and a potential upcoming bypass.

        i. USBR replied that they don't see the volume of water changing between now and then.

        ii. Kleinschmidt Group added that due to continued mixing in the reservoir, the top of the cold-water pool does slightly erode over time, but it's not a dramatic change.

Fall Power Bypass Egg Survival Results at Hazel

1. CDFW shared modeling results on fish egg mortality based on the five power bypass scenarios and comparison of the warmer (2020 meteorological data) and cooler (2017 meteorological data) years. Carcass data from the 2012 carcass surveys were also used.

2. In a warmer year (2020 meteorological data), the scenarios ranked in the following order in favor of egg survival in October:

a. The 58°F/56°F temperature target scenario and the 60°F/58°F temperature target scenario both resulted in very similar data and show survival increases from 0% beginning approximately 10/12.

b. 250 cfs bypass beginning on 10/17 shows survival increases from 0% beginning approximately 10/17.

c. 500 cfs bypass beginning on 10/24 shows survival increases from 0% beginning approximately 10/21.

d. No bypass scenario shows survival increases from 0% beginning approximately 10/22.

3. In a cooler year (2017 meteorological data), the scenarios ranked in the following order in favor of egg survival in October:

    a. The 58°F/56°F temperature target scenario and the 60°F/58°F temperature target scenario both resulted in very similar data and show the earliest survival increases from 0% beginning approximately 10/8.

    b. 250 cfs beginning 10/17 shows survival increases from 0% beginning approximately 10/13.

    c. 500 cfs beginning 10/24 shows survival increases from 0% beginning approximately 10/14.

    d. No bypass scenario shows survival increase from 0% beginning approximately 10/17.

4. The ARG discussed including the following items in the power bypass proposal:

    a. CDFW suggested including the rationale for the request and data on poor salmon returns.

    b. NMFS suggested noting that the sooner fish can spawn, the sooner they can mature and be released. Their spawning tends to get pushed later due to the warmer temperatures, but by the time they're mature enough to migrate out, the water temperature is too warm.

    c. CDFW recommended noting the DO benefits that result from a power bypass (including protecting the only trout hatchery).

Questions and Comments

1. NMFS expressed a preference for having four weeks of some level of bypass versus three weeks of 500 cfs.

2. CDFW reiterated that the power bypass will improve oxygen at the hatchery which will allow fish to move up the ladder. Last year, it took 7-10 days for the oxygen to arrive at the hatchery and allow for opening the ladder. Getting cold water earlier leads to better quality eggs at the hatchery.

3. ARG members expressed a preference for ranking options in the following order in the Power Bypass proposal:
    a. Scenario E: Targeting 60°F/58°F
    b. Scenario B: 250 cfs bypass
    c. Scenario C: 500 cfs bypass
4. Once USBR receives the Power Bypass proposal they will start working on analyzing power costs.

Annual Report

USBR outlined the assignments for the Annual Report. A document with this information and timeline will be distributed to the ARG. [Complete; emailed on 9/23]

Next Meeting

The next regularly scheduled ARG meeting is on Thursday, October 17. The meeting will be virtual.

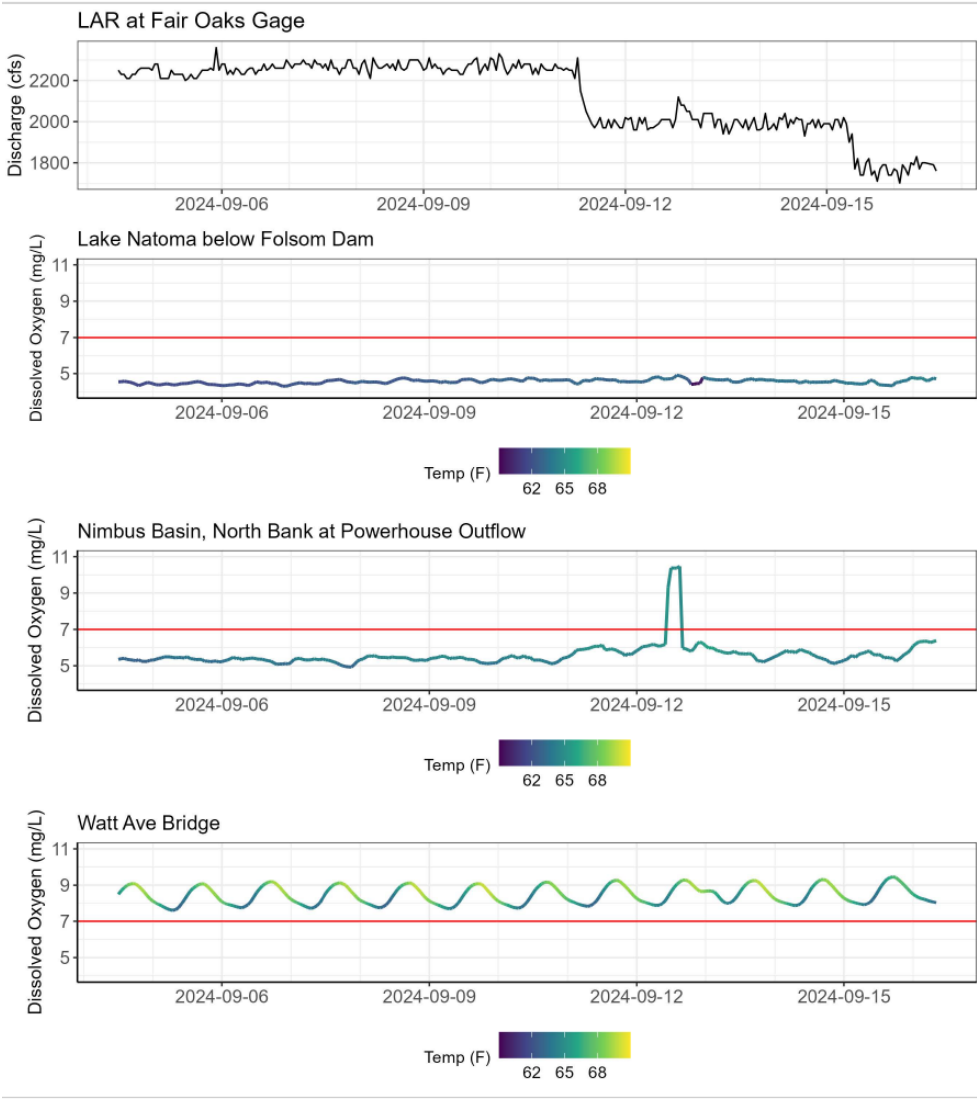

Figure 1. Lower American River at Fair Oaks Gage, Lake Natoma below Folsom Dam, Nimbus Basin, North Bank at Powerhouse Outflow, and Watt Ave Bridge measuring dissolved oxygen (mg/L) beginning on September 6, 2024.

Figure 1 is four-line graphs that look at dissolved oxygen in milligrams per liter over time, as well as temperature.

The first line graph shows discharge for the Lower American River at Fair Oaks Gage from September 6, 2024, until September 15, 2024.

The second line graph shows dissolved oxygen and temperature for the Lake Natoma below Folsom Dam from September 6, 2024, until September 15, 2024.

The third line graph shows dissolved oxygen and temperature for the Nimbus Basin, North Bank at Powerhouse Outflow from September 6, 2024, until September 15, 2024.

The fourth line graph shows dissolved oxygen and temperature for Watt Ave Bridge from September 6, 2024 until September 15, 2024.

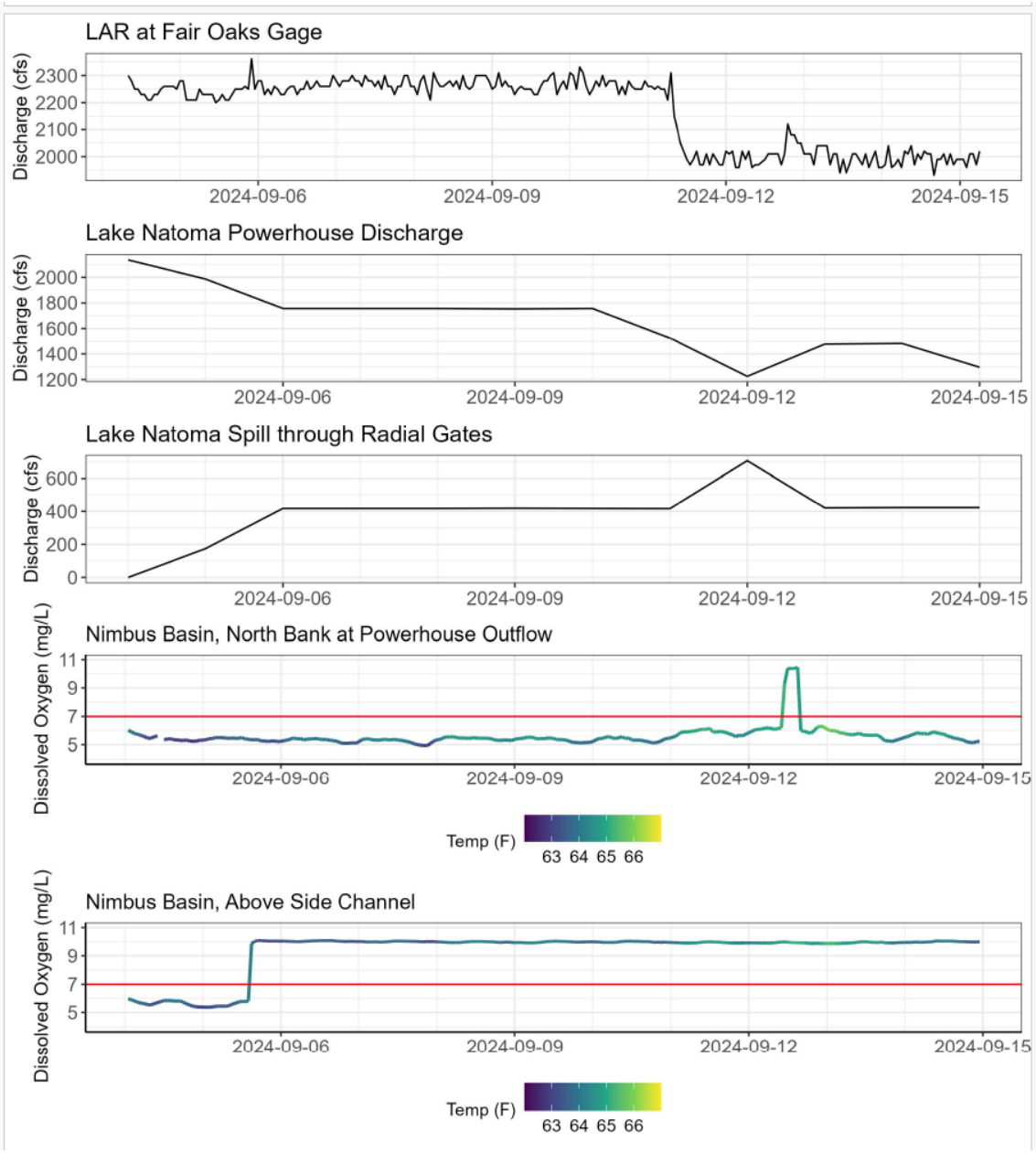

Figure 1. Lower American River at Fair Oaks Gage, Lake Natoma Powerhouse Discharge, Nimbus Basin (North Bank at Powerhouse Outflow, and Nimbus Basin (Above Side Channel) comparing discharge, dissolved oxygen, and temperature beginning on September 6, 2024.

Figure 1 is five line graphs that look at discharge in cubic feet per second as well as dissolved oxygen and temperature over time.

The first line graph shows discharge for the Lower American River at Fair Oaks Gage from September 6, 2024, until September 15, 2024.

The second line graph shows discharge for the Lake Natoma Powerhouse Discharge from September 6, 2024, until September 15, 2024.

The third line graph shows discharge for the Lake Natoma Spill through Radial Gates from September 6, 2024, until September 15, 2024.

The fourth line graph shows dissolved oxygen levels and temperature at Nimbus Basin, North Bank at Powerhouse Outflow from September 4, 2024, through September 16, 2024.

The fifth line graph shows dissolved oxygen levels and temperature at Nimbus Basin, Above Slide Channel from September 6, 2024, through September 15, 2024.