



American River Group

Power Bypass Ad-hoc Meeting
Thursday, October 3, 2022

Notes

1. Action Items
 - a. KW to distribute fish mortality information as provided by ARG members.
2. Introductions:
 - a. USBR: Melissa Vignau, Thuy Washburn, Spencer Marshall, Elissa, Brad Hubbard, Leeyan Mao, Carolyn Bragg
 - b. NMFS: Barb Byrne, Stephen Maurano
 - c. USFWS: Paul Cadrett, Craig Anderson
 - d. CDFW: Crystal Rigby, Gary Novak, Tracy Grimes, Emily Fisher, Duane Linander, Erica Meyers, Nick Bauer, Chris McKibbin, John Hannon
 - e. SWRCB: Michael Macon, Lauren Beaudin, Reza Ghasemizadeh
 - f. PCWA: Ben Barker, Darin Reintjes
 - g. EBMUD:
 - h. SMUD:
 - i. City of Folsom:
 - j. City of Sacramento: Anne Sanger, Howard Moreland
 - k. San Juan Water District: Paul Helliker
 - l. Westlands:
 - m. City of Roseville:
 - n. DWR: Mike Ford
 - o. WAPA: Michael Prowatzke

- p. FishBio
 - q. Water Forum: Ashlee Casey, Erica Bishop, Chris Hammersmark
 - r. Cardno: Craig Addley, Vanessa Martinez
 - s. CFS
 - t. PSMFC: Hunter Morrison
 - u. Shingle Springs Miwok Band
 - v. Kearns & West: Mia Schiappi, Karis Johnston, Rafi Silberblatt
 - w. CSUS
 - x. Other: Tom Boardman, Michelle Banonis, Jennifer Buckman, Tom Boardman
3. Power Bypass Discussion
- a. Egg Mortality Models
 - i. CDFW provided results from egg mortality models run at 1,300 cfs with a 500 cfs power bypass. They chose to use the 1,300 cfs scenario for their models because the 900 cfs scenario deviates from the 2017 Flow Management Standard (FMS) Minimum Release Requirement (MRR). Temperature data provided by Cardno was put into the Egg Mortality Model on SacPAS (<https://www.cbr.washington.edu/sacramento/grow/>) and ran through each of the following models: Water Forum 2020; SALMOD 2006; and Linear (Martin 2016). These models have been agreed upon by ARG in previous years.
 - ii. Based on the models, the scenario with a power bypass beginning 10/20/22 does not provide the highest overall seasonal survival compared to a power bypass beginning on 10/29/22, but does provide a benefit to incubating eggs earlier in the season (up to 32%), from 10/22/22 – 11/1/22.
 - iii. CDFW also noted that a power bypass beginning on 10/20/22 would benefit the hatchery. In-river releases of fall-run Chinook salmon fry begin in early April. These releases are from the earlier adult spawners, the ones from early November, because they are similar in size to the natural juvenile fall-run Chinook that are rearing in river. If maturation is pushed back and there are not enough early adult spawners, it is unlikely that the hatchery will be able to do an in-river release next season. This could possibly increase stray rates and is not good for fishing and other recreation.

iv. In the data tables for the egg mortality model:

1. Orange: Indicates when survival is zero or assumed to be zero in the no bypass scenario but shows improvement in the bypass scenarios.
2. Green: Indicates when there is a larger difference in survival estimates to the point where the no-bypass scenario and the bypass scenarios begin to merge.
3. Blue: Indicates the time from when the bypass scenarios begin to merge to when the model begins to assume maximum survival.
4. Yellow: Indicates the date at which the model assumes maximum survival

b. Questions/Comments:

- i. NMFS commented that the egg mortality models are based on data from 2014 – 2016, acting as a super-cohort to represent drought years. The 10/20/22 power bypass start date provides a better opportunity for life history diversity, but at a potential cost for November survival. This may be an acceptable trade-off.
 - ii. NMFS also discussed that the egg mortality model egg-to-fry survival estimate that appears in the output summary does not capture the daily results, but rather overall cohort survival over the entire incubation season. Daily results can be found in the detailed tables shared with ARG. With a later start, there is a higher overall cohort survival rate, but this does not include pre-spawn mortality rates. A later start time for the bypass would likely lead to a loss of females before they spawn. The difference between the overall cohort survival is 5% between the two starts, but that likely is a wash based on pre-spawn mortality.
- c. Cardno commented that pre-spawn mortality is a critical part of the system and is not captured in the egg mortality models. In 2001, when temperatures were 67° F right up until spawning began, there was significant mortality, which was not captured in the modeling because the model only looks at egg-to-fry survival and not adult pre-spawn mortality. Temperatures this year are closer to 65° F. Based on a detailed analysis previously done, spring-run Chinook salmon mortality began around 65 – 65.5° F. In the future, this is a critical component to investigate fall power bypass conditions.
- d. NMFS commented that in the models currently used, there is an assumption that when a carcass is observed, the temperature dependent egg mortality is generally based on water temperatures beginning twelve days

prior. By mid-November, when temperatures are in the 50's, you will still see high mortality.

- e. CDFW commented that the long-term forecast indicates there will be above average temperatures during November. However, water temperatures will depend on localized heat waves.
 - i. Jenny commented that based on Daniel Sween's modeling of temperature, October ambient air temperature is going to be above average and there is likely going to be low precipitation. The model is a cautious model and does not predict a huge heat wave specifically, but generally above average temperatures.
- f. CDFW commented that when the water is too warm, hatchery fish enter the hatchery and are not ripe. These fish are held in holding ponds until the water is cool enough for spawning. Spawning at Nimbus Hatchery will begin on 11/01/22.

4. Minimum Release Requirement

- a. Jennifer Buckman commented that the MRR was incorporated into the 2019 Biological Opinion as one of the measures for the American River. To deviate would require consultation with NMFS.
- b. The MRR is expected to stay steady at 1,300 cfs through the end of the year. There may be a potential for the MRR to be reduced to 70% in January.
- c. SWRCB asked, if there were to be a very dry Sacramento River Index, would it make sense to reduce flows to 900 cfs during peak spawning, raise them again in November and December, and then reduce flows in January?
 - i. Water Forum responded that peak spawning occurs in November and the 30% reduction is the limit to try to reduce redd dewatering. Redd dewatering would not be at zero, but because redds are established at a minimum depth, stage changes from 1,300 cfs to 900 cfs would tend to not dewater redds. It could lead to poor water quality in the gravel.
- d. SWRCB further commented that the ARG almost always has a discussion in January regarding redd dewatering and the group usually reflects that they wish they had dropped flows lower earlier. With Reclamation being on the fence regarding a bypass, the ARG should propose the best operation for fish regardless of constraints. The best alternative may be starting on 10/20/22 at 900 cfs and the second is 10/20/22 at 1,300 cfs. If 900 cfs is the best option, it is important that it is advocated for by the group.

- i. Water Forum responded that redd dewatering is of the most concern when operations are over the MRR and less of an issue if they are operating to the MRR in the fall. The MRR is designed based on the Redd Dewatering Protective Adjustment (RDPA) rather than actual flows. There are instances when flows are above the MRR that allow for greater reduction into January and that's why there is a high risk of redd dewatering. It is not that we have zero redd dewatering at this level, but it does prevent significant dewatering.
 - ii. Cardno commented that the MRRs are derived based on a long set of hydrology, and these types of questions were incorporated into the design. It does not mean it is always correct, but it was thought about. Although, the 900 cfs may save a bit in the spring, there is a long history of hydrology to check how frequently there will be dewatering issues.
 - iii. NMFS commented that the reason they ran a scenario at 900 cfs was to look at the outcome. However, 900 cfs is a deviation from the Proposed Action which they try to avoid. There are protections for redd dewatering, which include the MRR. They are also not inclined to deviate if the option is unlikely.
 - iv. NMFS also commented that based on experience, American River flows out of Folsom Reservoir are rarely at 900 cfs in the fall. The ARG needs to think of the most likely scenario and manage expectations about what is possible. Their inclination is to wait and see what the flows are predicted to be out of Folsom for this time period. If things warm in October, we also have the option to have a regulatory discussion about dropping flows at that time.
 - v. NMFS further commented that they need to be careful about the language used when discussing the bypass. When modeling the releases, they need to assume the 900 cfs or 1,300 cfs, however that is not the actual proposal. The proposal is not for total release levels, it is for 500 cfs of bypass water.
 - vi. Water Forum presented a recent plot from cbec on the Weighted Usable Area for Chinook spawning. Based on the plot, the river is wetted reasonably enough at both 900 cfs and 1,300 cfs.
- e. Reclamation commented that in the event flows did decrease to 900 cfs, they have created a significant amount of spawning habitat that would be suitable. If there would be better water temperatures at 900 cfs then that should be considered.
 - f. NMFS responded that it would depend on ambient air temperatures downstream, specifically at Watt Avenue.

- g. Craig commented that based on the temperature's models for Watt Avenue, the water will be cooler in November. 900 cfs helps the river temperatures early in the river, however, further downstream the 900 cfs and 1,300 cfs scenarios are the same.
- h. NMFS reiterated that 900 cfs is a deviation from the PA. In the past few years, they have for multiple months, implemented an MRR based on the 90% ARI forecast rather than the 50% Sacramento River Index due to dry conditions. It sounds like SWRCB and Reclamation are not averse to this deviation. There will need to be a formal discussion between Reclamation and NMFS about the deviation. However, if it ends up being that flows out of Folsom are going to have to be higher than 900 cfs, then it does not make sense to go through the bureaucracy.
- i. Reclamation responded that, after discussion with the Delta office representative, current Delta conditions are behind on salinity requirements, and it is unlikely that releases out of Folsom Reservoir will be able to get down to 900 cfs on 10/20/22. It may be possible closer to the end of October but that is uncertain.

5. Preliminary Agency Bypass Scenario Preferences

- a. NMFS supports a power bypass of 500 cfs on 10/20/22 with releases out of Nimbus at 1,300 cfs with the hopes of a cool November.
- b. CDFW, hatchery staff supports a power bypass of 500 cfs on 10/20/22 with releases out of Nimbus at 1,300 cfs.
- c. CDFW Water Branch and Region 2 staff supports a power bypass of 500 cfs on 10/20/22 with releases out of Nimbus at 1,300 cfs. They also want to emphasize the importance of doing a power bypass in general. This will be the 3rd drought year that has been impactful for fall-run Chinook salmon spawning. Temperatures are already expected to be much higher than what is acceptable for fall-run Chinook spawning and a power bypass was discussed earlier in the season with our temperature management plan.

6. Operational Alternatives

- a. Reclamation asked the ARG that if there is a power bypass on 10/20/22 and the temperature is below 61° F, would the group prefer to reduce flows from 500 cfs to a lower release or continue using the full 500 cfs power bypass.
- b. NMFS commented that implicitly, during a bypass, the water is supposed to run at 500 cfs until the cold water runs out or the water temperatures reach 56° F. Because 61° F is not ideal for eggs, they would prefer to continue running at 500 cfs.

- c. CDFW commented that, for the hatchery's sake, they also agree to continue to run at 500 cfs or until the water temperatures reach 56° F. They will be using their incubators to incubate down to 56° F, but they do not have enough incubators to cover the entire run. Their goal is to preserve eggs.

7. Next Steps

- a. CDFW will pull together the necessary documents for the proposal. Via email, NMFS and CDFW will discuss whether they are going to prepare a formal proposal or if something less formal is more appropriate.