

Talking Points – Shasta Stakeholder Workshop #4
February 12, 2018

NMFS Specific:

- Why an adjustment/adaptive management is needed:
 - Recent multiple years of drought conditions (from 2012-2016)
 - New science and modeling
 - Data demonstrating low population levels of winter-run and spring-run
 - Potential for increased flexibility & predictability
 - Sets interim operational changes that are necessary at this time
 - Phased approach, provides a bridge between current RPA and completion of the reinitiation of consultation (estimated at 3-5 years)
- The winter-run escapement estimate of 1,155 in 2017, with >70% hatchery returns, is ongoing evidence of the low population of winter-run and the near-term challenges to stabilize and increase this species throughout all of its life history stages.
- There was an estimated 44% egg-to-fry survival of juvenile winter-run to Red Bluff Diversion Dam in 2017. This indicates the operational study that targeted 53°F daily average temperature (DAT) at CCR in 2017 was effective at providing better water temperatures for egg and alevin incubation.
- NMFS appreciates the modeling work that Reclamation has put in to evaluating the potential system-wide effects of implementing the Shasta RPA amendment, to link the CalSim modeling outputs to the temperature model, and especially to link those outputs to the temperature-dependent mortality model.
- NMFS also appreciate the joint work of our biological staff to review the biology and science needs, and develop the draft joint science plan which is currently out for review.

Reclamation Specific:

- Reclamation appreciates NMFS comments, and would like to recognize the work of our modeling and operations teams over this past year.
 - We believe the development of the new modeling tools and linkages will be valuable in ongoing efforts to look at how to best manage Shasta's cold water resource, while considering the system as a whole.
 - We were fortunate that the abundant water supply last year gave us an opportunity to conduct the operational temperature study, which provided insight into the management of water temperatures near the location of the redds.

Joint

- NMFS and Reclamation have worked diligently together over the course of a year further explore the operational implications associated with Shasta operations and winter-run protections.
- The results of the analyses conducted this year show that the operational elements of the draft proposal (storage targets, release restrictions) could effectuate system-wide changes.
 - For the purposes of the analyses, those changes were evaluated as a sensitivity analysis to develop an order of magnitude of the volume of potential changes, but the exact manner in which the changes would be manifested could be distributed in a variety of different ways depending on legal and policy determinations.

The 2017 operational study and associated egg-to-fry survival estimates did not identify substantial temperature-dependent mortality when operating to 53°F DAT over the redds during winter-run spawning, egg incubation and emergence. There may be other temperatures that are effective, as well as times when meeting temperatures in this range over the redds is not feasible, and with this in mind:

- (1) we need to continue to work to refine concepts on the appropriate temperature and metric to ensure protection during these life stages,
- (2) we need to continue to work on multi-life stage and multi-species considerations that will enhance the likelihood of meeting appropriate temperatures in more years and
- (3) we need to develop off-the shelf contingencies that minimize lethality when temperatures in this range are not achievable.

Furthermore, we have worked to summarize current management questions, ongoing science and potential future science needs in a draft science plan, which is currently out for review.

Next steps envisioned by the agencies are as follows:

- Ongoing efforts in this arena need to occur in the venue of the larger Reconsultation effort.
 - The recent reformulation of the Reconsultation effort provides an opportunity for the development of a specific focus group/activity within that realm to look at how to best accomplish the development of measures that provide for adequate water temperatures throughout the temperature management season.
 - We want to get our best and brightest minds, including those of our stakeholders, focused on ways to address the needs of Sacramento River winter run while considering the system as a whole, including the other species involved.
- At the same time, both agencies recognize the need to focus on the further evaluation of targeting a protective temperature management at the location of the redds, and developing contingencies when that is not feasible.
 - With that in mind, we plan to continue our efforts to conduct operational studies in 2018 and beyond, and as a bridge to the completion of reinitiation of consultation.
 - The 2017 operational study of a 53°F DAT at the CCR gage was a good starting point; however this was in the context of the wettest water year on record for the Sacramento River, and more focused evaluations should provide us the opportunity to refine the concepts to ensure we can make the best use of the cold water pool, while considering any potential impacts to the remainder of the system. This will involve focused evaluation of the specific temperature, target location, and metric.
 - In addition we need to recognize that not every year will provide the ability to meet optimal temperatures at the redds, so we need to focus on alternative mechanisms to address water-short and drought years, to optimize the use of limited cold water pool and maximize survival during those conditions.
 - These efforts will also be conducted under the focus group under the Reconsultation, but will involve the ongoing coordination of real-time operations.
 - As a starting point, the agencies are currently discussing the development of an additional operational study for 2018.

- Recognizing that hydrologic conditions are much different than those in 2017, this may involve the development of plans for how to address a more limited cold water pool.
- Both agencies agree to pursue a collaborative science effort to continue to prioritize science to address key management questions, and learn from each year's operational decisions. We are engaged in discussions with various stakeholders to take this effort to the next step.