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NMFS – Reclamation
Shasta RPA Draft Proposed Amendment Workshop No. 4
February 12, 2018

Introductions

<u>In-person</u>		
1. Pablo Arroyave (Reclamation)	22. Ansel Lundberg (SMUD)	44. Ben Ransom (PCWA)
2. Don Bader (Reclamation)	23. Dave Mooney (Reclamation)	45. Greg Reece
3. Caren Barcelo (NMFS)	24. Dave O'Connor (Reclamation)	46. Jason Roberts (CDFW)
4. Lee Bergfeld (MBK)	25. Paul Olmstead (SMUD)	47. Deanna Sereno (CCWD)
5. Thad Bettner (GCID)	26. Nancy Parker (Reclamation)	48. Russ Stein (DWR)
6. Tom Boardman (SLDMWA)	27. Maria Rea (NMFS)	49. Greg Zlotnick (SJWD)
7. Frances Brewster (SCVWD)	28. Jeff Rieker (Reclamation)	50. Craig Addley (PCWA/Cardno Inc.)
8. Jennifer Buckman (ARD Contractors- consultant)	29. Evan Sawyer (NMFS)	51. Michelle Banonis (Reclamation)
9. Barb Byrne (NMFS)	30. Dan Steiner (Exchange Contractors- consultant)	52. Mike Battles (ACID)
10. Steve Chedester (Exchange Contractors)	31. Ann Williams (MBK)	53. Walter Burret (MBK)
11. Ammon Danielson (WAPA)	32. Rod Wittler (CVPIA- Reclamation)	54. Andy Duffy
12. Vadim Demchuk (SWRCB)	33. Michael Wright (Reclamation)	55. Christina Durham (NMFS)
13. Sheila Greene (Westlands)	34. Garwin Yip (NMFS)	56. Ken Emanuel (SWRCB)
14. Michael Harty (Kearns & West)	<u>Call-in/WebEx</u>	57. Bill Emmanuel (RD 108)
15. Paul Hauser (Trinity PUD)	35. Jim Anders	58. Randi Field (Reclamation)
16. Michelle Havey (Anchor QEA)	36. Lewis Bair (RD 108)	59. Mike Ford (DWR)
17. Josh Israel (Reclamation)	37. Eric Danner (NMFS- SWFSC)	60. Robert Franklin (Hoopa Tribe)
18. Marianne Kirkland (DWR)	38. Miles Daniels (NMFS-SWFSC)	61. Anna Garcia
19. Maury Kruth (NCPA)	39. Allison Febbo (SWC)	62. James Gilbert (Reclamation)
20. Kenneth Kundargi (CDFW)	40. Steven Handy (Redding Electric Utility)	63. Brett Gray (Natomas Mutual Water Co)
21. Duane Linander (CDFW)	41. Eric Leitnerman (SCVWD)	64. Tom Hard (BLM)
	42. Todd Manley (NCWA)	65. Li-Ming He (USFWS)
		66. Vance Howard
		67. Brian Hughes (Reclamation)
		68. Allison Jacobsen (Reclamation)
		69. Liz Kiteck (Reclamation)
		70. Anne Kwedar (MBK)
		71. Rod M. (Sutter Mutual)

DRAFT

	43. Shelley Ostrowski (WWD)	72. Vanessa Martinez (Cardno) 73. Jon McClain (City of Redding) 74. Doug Obegi (NRDC) 75. Janice Pinero (Reclamation) 76. Diane Riddle (SWRCB) 77. Jon Rubin (SLDMWA) 78. Mark Ryan 79. Russel Stein (DWR) 80. Brycen Swart (NMFS) 81. Josh Watkins (City of Redding) 82. Carl Wilcox (CDFW) 83. Travis Yonts (Reclamation)
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1. Opening Remarks (Maria Rea – NMFS, Jeff Rieker – Reclamation)

- NMFS opened the meeting by thanking everyone for their participation in this series of workshops. About one year ago NMFS proposed amendments to the Shasta Reasonable and Prudent Alternative (RPA) actions under the NMFS Biological Opinion for the long-term operation of the Central Valley and State Water Projects (NMFS BiOp). Due to the drought and lower survival than anticipated in 2014/2015, NMFS wanted to think about the way the RPA is operated now and compare operations between existing and proposed RPA amendments (e.g., moving the temperature compliance point upstream). NMFS proposed a range of objectives to be met in different water year types and needed to validate those to expedite the decision-making processes. In 2017, adult returns from the 2014 brood year were only 1,155 adults, the second lowest in 20 years, and over 70% of those were Livingston Stone National Fish Hatchery returns. Temperature management this past summer was very effective, with an observed egg-to-fry survival of 44%, when water temperature was managed to achieve 53° F daily average at the CCR gage, compared to a recent average of 20%. NMFS appreciates all the CALSIM modeling work Reclamation has done and their support in developing a joint collaborative draft science plan.
- Reclamation opened the meeting by acknowledging the hard work of the modeling team and an appreciation of everyone's flexibility with participation and scheduling of these workshops. There is a lot of material to cover, so they are going to get started but will be happy to go through technical questions after the presentation.

2. Workshop Objectives, Agenda, and Format (Jeff Rieker – Reclamation, Mike Harty [facilitator] – Kearns & West)

- Reclamation went over the objectives of today's workshop, which are to provide updates to, discuss, and receive input on the following topics:
 - Comparison of the Draft Proposed RPA Amendment (issued January 19, 2017; http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/nmfs_s_draft_proposed_2017_rpa_amendment_-_january_19_2017.pdf) to the current RPA
 - Real-time temperature management for the 2017 Sacramento River temperature management season
 - Updated model sensitivity analyses
 - Next steps in the amendment process
 - Draft Science Work Plan
- Reclamation noted that the workshop format would be to provide brief presentations on each of the topics followed by open floor questions and dialogue before moving on to the next topic.
- The meeting facilitator outlined the format of the meeting and went over some of the ground rules.
- This was followed by introductions around the room and then on the phone – each person introduced themselves as well as their affiliation (see list of participants on page 1).

3. Presentation (Garwin Yip – NMFS; Jeff Rieker – Reclamation) – Overview of the Shasta RPA Amendment vs. Current RPA (PowerPoint slides were sent to meeting participants in advance of the meeting)

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- NMFS provided a side-by-side comparison of the 2011 RPA amendment and the Draft Proposed Shasta RPA amendment. The purposes of the draft proposed amendment are to:
 - Set interim operational changes that are necessary at this time
 - Provide a bridge between the current Shasta RPA actions and completion of the re-initiation of consultation (approximately 3 to 5 years).
- Draft proposed RPA amendment features:
 - Action I.2.1 – There have been criticisms of the 2011 performance measures because sometimes they cannot be met (e.g., in 15% of the years the measures are not met, which equates to 1.5 years/10 years because a year either meets it or it doesn't); therefore, the proposed RPA amendment moves to objective-based measures.
 - Action I.2.3 – We need to look at the whole system (e.g., Folsom, etc.) and Delta outflow, not just Shasta Reservoir to provide all the necessary water.
 - Action I.2.4 – The 2017 operational study evaluated the temperature compliance location (Clear Creek CDEC gage [CCR]), temperature metric (daily average temperature [DAT] surrogate), and temperature criterion ($\leq 53^{\circ}\text{F}$ DAT wet year target).
- NMFS outlined how the Australian Model Framework objectives could be applied in different water years – protect (critical years), maintain (dry years), recover (below normal years), and enhance (above normal and wet years).
 - Jeff Rieker (Reclamation) went over the timeline for the process, which included a structured stakeholder engagement process (i.e., a series of workshops).
- The Long-term Operations Biological Opinions (LOBO) review was conducted by the Independent Review Panel (IRP) during a December 4–7, 2017 meeting, and recommendations from the review were provided in a letter from the Delta Science Program dated January 25, 2018.

Meeting attendees provided the following questions and feedback:

- Question: (Paul Olmstead – SMUD) – The Australian model is based on restoration of an ecosystem, but we are trying to recover a species at Shasta. I see a disconnect – we want to recover a species but we're relying on model for ecosystem restoration. What results are you expecting? How is the field work going to equate to the lab work? How are you going to schedule operations in February when we don't know what the water year is going to look like?
 - Garwin Yip (NMFS): The Australian model is a framework to work within, not a model to follow. One of their conclusions was to be prepared for a drought rather than wait until a drought happens, so what lessons can we learn from that process? I don't think we're looking for recovery of winter-run Chinook salmon with this RPA.
- Question: (Maury Kruth – NCPA) – In March, Reclamation sent a letter to NMFS. How many of those concerns have been addressed?
 - Jeff Rieker (Reclamation): We have not received a response letter from NMFS, but perhaps we can revisit this in the next steps section.

- Question: Sheila Greene (Westlands Water District) – Can you provide the rationale for the temperature-dependent mortality biological objectives?
 - Garwin Yip (NMFS): The information can be found in the memo enclosed with our January 19, 2017, draft proposed Shasta RPA amendment.
 - *Follow-up: A brief discussion about the targeted temperature-dependent mortality objectives is provided on pages 9-10 of Enclosure 3 in the January 19, 2017, letter from NMFS to Reclamation proposing the amendment. The letter is posted (under the “Biological Opinion Actions” header) at: http://www.westcoast.fisheries.noaa.gov/central_valley/water_operations/*
- 4. Presentation (Jeff Rieker – Reclamation) – 2017 Real-time Temperature Management (PowerPoint slides were sent to meeting participants in advance of the meeting)
 - Reclamation provided an overview of the 2017 operational study and the hydrologic conditions. That was a record-breaking water year, and Reclamation was able to operate all gates on the temperature control device (TCD).

Meeting attendees provided the following questions and feedback:

- Question: Deanna Sereno (CCWD) – Was Reclamation operating to the 53°F DAT this year?
 - Jeff Rieker (Reclamation): Yes.
- Question: (phone) – To determine the water year, are you using the previous November through October water?
 - Jeff Rieker (Reclamation): Yes, we are using the information already coming in to make determinations on the water year type.
- Follow-up Question: (phone) – When are those decisions made?
 - Jeff Rieker (Reclamation): The decisions are effectively being made during the spring, with holding temperatures beginning in April/May and spawning/incubation temperatures in the summer.
- 5. Presentation (Jeff Rieker – Reclamation) – Update on the 2017 System-wide Evaluations of Draft Proposed Shasta RPA Amendment (PowerPoint slides were sent to meeting participants in advance of the meeting)
 - Reclamation provided an overview of the modeling process and the water operations comparative sensitivity analysis.

Meeting attendees provided the following questions and feedback:

- Question: (Maury Kruth – NCPA) – What were your assumptions on Trinity deliveries into Shasta? Did it go beyond the Record of Decision (ROD)?
 - Jeff Rieker (Reclamation): The model was consistent with current assumptions, including the Trinity ROD. Yes, it did assume the 50 thousand-acre-feet (TAF) in the fall in dry and critical years only.
- 6. Presentation (Jeff Rieker – Reclamation) – Sensitivity Analysis (PowerPoint slides were sent to meeting participants in advance of the meeting)
 - Reclamation provided an overview of the comparative sensitivity analysis for water operations. Reclamation used the existing modeling framework along with mimicking

- the 2013 to 2015 drought relaxations and curtailments to simulate more recent conditions. In addition, the system operation assumptions were held the same, but the proposed Shasta storage and Keswick release constraints were added.
- The model was run under two scenarios (current operations and the proposed NMFS amendment) to determine the magnitude of potential benefits/impacts by attempting to apply the proposed Shasta storage carryover and Keswick release constraints of the CVP/SWP system.
 - Reclamation provided an overview of the comparative analysis for temperature management. Reclamation used the existing modeling framework with the CalSim NMFS alternative monthly results compared with the CalSim current operations monthly results.
 - The model was run under the two scenarios (current operations and the proposed NMFS amendment) to determine the incremental benefits/impacts of the proposed temperature target by attempting to apply the proposed Shasta storage carryover and release criteria.
 - Reclamation provided an overview of the salmon mortality model assumptions. Reclamation used the existing modeling framework with the daily HEC-5Q NMFS data compared with the daily HEC-5Q current operations data.
 - The model was run under the two scenarios (current operations and the proposed NMFS amendment) to determine the incremental benefits/impacts of the temperature-dependent mortality by attempting to apply the proposed Shasta storage carryover and release criteria.

Meeting attendees provided the following questions and feedback:

- Question: (Pablo Arroyave – ICF for Friant Water Authority) – Has Reclamation looked at these results closer since September and are these the final results?
 - Jeff Rieker (Reclamation): Yes, this is the refined version. We decided to keep the initial approach we had tested.
- Question: (next to Mike Harty) – Do these models only run through 2003?
 - Jeff Rieker (Reclamation): Yes, these CalSim runs go through 2003.
- Question: (Thad Bettner – GCID) – I question both the current operations and NMFS runs because they don't make sense for what we actually see. There is a potential for these to not be necessarily realistic compared to the needs of the system.
 - Jeff Rieker (Reclamation): We will want to address that in the upcoming runs.
- Question: (Lee Bergfeld – MBK) – I recommend you look at the historic Keswick releases to see what Thad is talking about with the runs not being realistic.
 - Jeff Rieker (Reclamation): Noted.
- Question: (Paul Olmstead – SMUD) – Is this looking at fall and spring releases together?
 - Garwin Yip (NMFS): Spring Keswick release limits are intended to limit April and May releases (for middle types of water years) when Reclamation would not be able to meet the temperature requirements.
- Question: (??) – When would you be curtailing deliveries?

- Nancy Parker (Reclamation): The model will set allocations that the system is able to meet on an annual basis. That will affect deliveries throughout the year. Allocations all fall within the same framework.
 - Question: (Greg PDI) – Was the water quality control plan included? Were there any model runs with the full protections?
 - Nancy Parker (Reclamation): In the 7 driest critical years, there were relaxations that mirrored the 2014/2015 operations.
 - Question: (Paul Olmstead – SMUD) – What is ELT Q5?
 - Nancy Parker (Reclamation): It is the Early Long-Term (ELT) climate change model (Q5), a hydrology input dataset that reflects a middle-of-the-road climate change scenario in 2025. This is the same dataset used for the Department of Water Resources (DWR) and WaterFix studies.
 - Question: (Paul Olmstead – SMUD) – The model results indicate Reclamation would be forced to implement the M&I shortage policy, right?
 - Jeff Rieker (Reclamation): Yes, for a large number of years it would.
 - Question: (Paul Hauser – TPUD) – Why do you discount the years of higher mortality as noise?
 - Mike Wright (Reclamation): The NMFS amendment scenario results in higher Shasta Reservoir storage and the water level is higher, so you can mix releases from the upper and middle gates at different elevations and mix the temperatures to get as close to 53 °F as possible. The current operations scenario is a lower lake level where there is only access to release water from the middle gates and Pressure Relief Gates, so the releases are generally colder. What the results don't show very clearly is that mortality spikes when you run out of cold-water pool, which is more likely in the lower lake level scenario.
 - Question: (Paul Olmstead – SMUD) – There is a big disconnect with whether there will be power bypasses to meet the objective. In a normal operation, how much physiographically is available each year?
 - Jeff Rieker and Mike Wright (Reclamation): The model does account for cold water pool declines but may not include the bypass.
 - Question: Deanna Sereno (CCWD) – The model was used to adjust the allocations to meet September storage targets only, and then just looked at the resulting April and May storage – is that correct?
 - Jeff Rieker (Reclamation): Yes
 - Question: (??) – Can you briefly describe how the allocations were adjusted?
 - Nancy Parker (Reclamation):
7. Presentation (Jeff Rieker – Reclamation) – Next Steps (PowerPoint slides were sent to meeting participants in advance of the meeting)
- Reclamation provided an overview of:
 - the work completed in 2017;
 - the re-consultation process;
 - the need for NMFS and Reclamation to look at temperature target location, value, metric concepts and studies; and
 - the operations concepts to be evaluated in 2018.

Meeting attendees provided the following questions and feedback:

- Question: (Pablo Arroyave – ICF for Friant Water Authority) – Have there been any discussions as to where this process falls in Track 1, 2, or 3?
 - Dave Mooney (Reclamation): It probably won't fit under Track 1, but it could possibly fit in Track 2, and if not then Track 3.
- Question: (Paul Hauser – TPUD) – The power contractors are currently at an 11% allocation, but with these proposed changes the cost of power will increase significantly. Will that budget impact be considered in future analyses? Will you quantify that budget impact to Reclamation?
 - Jeff Rieker (Reclamation): The proposal as-is creates huge impacts and it cannot be treated as a single element. How do the impacts balance out? We have started down that path but have not completed that analysis yet.
- Question: (Tom Boardman – SLDMWA) – My question relates to the exceedance slides for delivery impacts. I realize there will be refinements, but the long-term average allocation for agricultural service contractors is 43%. The way I read the impact is a 25% reduction to our long-term allocation with this proposed RPA.
 - Jeff Rieker (Reclamation): That is why it is so important to get this into a system-wide picture, so we can find solutions that are not as impactful.

8. Presentation (Jeff Rieker – Reclamation) – Update on Temperature Modeling Plan (PowerPoint slides were sent to meeting participants in advance of the meeting)

- Reclamation provided a brief overview of the Shasta Lake and Keswick Reservoir flow and temperature modeling program.

Meeting attendees provided the following questions and feedback:

- Question: (Paul Olmstead – SMUD) – Do you have an isothermal bathymetric graph for Keswick Reservoir?
 - Jeff Rieker (Reclamation): We are evaluating whether we need that this year or not.
 - *Follow-up: Jeff will connect Paul with Mike Deas to answer this question.*

9. Presentation (Evan Sawyer – NMFS) – Science and Monitoring Work Plan (PowerPoint slides were sent to meeting participants in advance of the meeting)

- NMFS provided an overview of the status and objectives of the Science and Monitoring Work Plan. The plan is still in draft form and NMFS is currently looking for feedback on management questions, the implementation of prioritization and funding of research and monitoring, and any other feedback.
- Send feedback to Evan Sawyer, evan.sawyer@noaa.gov by March 2

Meeting attendees provided the following questions and feedback:

- Question: (Paul Hauser – TPUD) – Are you analyzing climate impacts to ocean conditions? If ocean conditions are overwhelming anything we do in the river, what will be done then?

- Evan Sawyer (NMFS): That falls outside the scope of this science plan.
- Josh Israel (Reclamation): The re-initiation of consultation process will evaluate a series of alternatives as a way that the CVP could be operated.
- Maria Rea (NMFS): There is a life cycle model to evaluate the importance of ocean conditions.
- Question: (Paul Olmstead – SMUD) – How will you judge the success of this plan? Are you looking at number of adult returns?
 - Maria Rea (NMFS): This plan is just one piece of the management framework for this species. Temperature-dependent mortality is a proposed key metric of success.
- Question: (Paul Olmstead – SMUD) – How is this being paid for? Are Central Valley Project Improvement Act (CVPIA) funds being used?
 - Dave Mooney (Reclamation): There is a combination of funding, including CVPIA funds as well as water and power contracts.
- Question: (Paul Hauser – TPUD) – This proposal is insolvent because funding will be cut to nothing with the proposed impacts to power contractors.
 - Jeff Rieker (Reclamation): The budget analysis piece of this analysis will be coming.
- Question: (Greg Zlotnick – SJWD) – Is there anything that directly shows what the impact is on Folsom Reservoir? You need to be able to show the impacts to the rest of us.
 - Jeff Rieker (Reclamation): Refer to Slide 60 (Annual Delivery Exceedance [March-February] – Ag and M&I). We held Folsom constant in these model runs, recognizing that the real-world scenario would actually include modifications to Folsom.
- Question: (Pablo Arroyave – ICF for Friant Water Authority) – What kind of outreach does Reclamation envision for 2018?
 - Jeff Rieker (Reclamation): Forecast numbers just came in, so we will be developing a work plan over the next few months. We want to continue discussions at another meeting in the next couple months in concert with SWRCB and NMFS.
- Question: (Maury Kruth – NCPA) – What will Reclamation be operating under for 2018?
 - Jeff Rieker (Reclamation): Reclamation will operate under the “old” RPA, but we see an opportunity to conduct an operational study that focuses on what location, value, and metric makes sense.
- Question: (Paul Olmstead – SMUD) – Which metric requires more water – 7DADM or DAT? If you’re managing to a closer location, don’t you have to release more water?
 - Jeff Rieker (Reclamation): The answer is not entirely straightforward. One approach is to manage as you normally would from a flow perspective. We do not necessarily need to release more water when managing to a closer location because it could be that we use lower gates and pull deeper, colder water, but the question is whether we need that water later in the season.

10. Concluding Remarks

- If anyone has suggested edits to these Notes and Responses to Questions, let Michelle Havey (mhavey@anchorqea.com) know by March 30.

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