NMFS Comments on the Effects Determinations (Chapter 7) and Effects Analysis (BA Chapter 5)

	Title	Topic	NMFS Comment	Proposed Resolution or Path Forward	Resolution
	Effects Determinations	**Reclamation's Determination**			
1	Winter-run Chinook salmon	Overall Beneficial, Likely to Adversely Affect	Overall Beneficial determination appears based on comparative analysis to the WOA scenarios. The NMFS BiOp conclusions must be based on an aggregate analysis, not comparative NMFS assumes this is LAA		
2	Winter-run Chinook salmon - Critical Habitat	Beneficial to No Effect, provides benefits to critical habitat	Beneficial determination appears based on comparative analysis to the WOA scenarios. The NMFS BiOp conclusions must be based on an aggregate analysis, not comparative Determination is not clear. Is the determination NLAA or LAA for critical habitat?	Clarify Reclamation's determination	
3	CV spring-run Chinook salmon	Overall Beneficial, Likely to Adversely Affect	Overall Beneficial determination appears based on comparative analysis to the WOA scenarios. The NMFS BiOp conclusions must be based on an aggregate analysis, not comparative NMFS assumes this is LAA		

4	CV spring-run Chinook salmon - Critical Habitat	2 determinations provided: (1) Overall long-term beneficial effects (2)temporary localized adverse effects but long-term beneficial effects	Beneficial determination appears based on comparative analysis to the WOA scenarios. The NMFS BiOp conclusions must be based on an aggregate analysis, not comparative Need to clarify determination. NMFS assumes LAA	Clarify Reclamation's determination	
5	CCV steelhead	Overall beneficial to the population of the DPS, but likely to adversely affect	Overall Beneficial determination appears based on comparative analysis to the WOA scenarios. The NMFS BiOp conclusions must be based on an aggregate analysis, not comparative NMFS assumes this is LAA		
6	CCV steelhead - Critical Habitat	Overall long-term beneficial effects	Beneficial determination appears based on comparative analysis to the WOA scenarios. The NMFS BiOp conclusions must be based on an aggregate analysis, not comparative Does Reclamation mean NLAA? Need to clarify	Clarify Reclamation's determination	
7	Southern Oregon / Northern California Coho Salmon	Overall beneficial, but likely to adversely affect	Overall Beneficial determination appears based on comparative analysis to the WOA scenarios. The NMFS BiOp conclusions must be based on an aggregate analysis, not comparative NMFS assumes this is LAA		
8	Southern Oregon / Northern California Coho Salmon - Critical Habitat	Although there may be adverse effects to certain PBFs, Reclamation's determination is overall beneficial	Beneficial determination appears based on comparative analysis to the WOA scenarios. The NMFS BiOp conclusions must be based on an aggregate analysis, not comparative Need to clarify determination? LAA or NLAA?	Clarify Reclamation's determination	

9	North American Green Sturgeon	Overall beneficial, but likely to adversely affect	Overall Beneficial determination appears based on comparative analysis to the WOA scenarios. The NMFS BiOp conclusions must be based on an aggregate analysis, not comparative NMFS assumes this is LAA		
10	North American Green Sturgeon - Critical Habitat	May adverse components of critical habitat while also resulting in benefits	NMFS assumes this is LAA		
11	Eulachon	May Affect, Not Likely to Adversely Affect			
12	Eulachon - Critical Habitat	May Affect, Not Likely to Adversely Affect			
13	Southern Resident Killer Whale	May Affect, Not Likely to Adversely Affect	NMFS disagrees with this determination	NMFS will address in the BiOp, but see information needs below.	
14	Southern Resident Killer Whale - Critical Habitat	May Affect, Not Likely to Adversely Affect	NMFS disagrees with this determination	NMFS will address in the BiOp	
15	CCC steelhead	No Effect	NMFS does not consult on No Effect determinations	Defer to Reclamation on their determination	
16	CCC steelhead - Critical Habitat	There is no determination made by Reclamation	Clarify if Reclamation's determination for the species also applies to critical habitat. NMFS does not consult on No Effect determinations	Clarify Reclamation's determination. Defer to Reclamation on their determination	

	General				
17	Effects Analysis	Level of detail and support	Most effects descriptions provide only a qualitative description of risk (for both COS and PA) relative to the WOA[1]. General statements such as "overall effects are beneficial" are often made with no or limited support. Effects descriptions even less robust for the "conservation measures" or programmatic actions. Some conclusive statements appear to be inconsistent with the data provided. For example, temperature modeling in the American River shows water temperatures in the PA that are not suitable for steelhead, despite the statement on page 5-133 that, "*The implementation of the proposed 2017 FMS measures under the proposed action would provide suitable habitat conditions in the lower American River for CV Steelhead, particularly during drought conditions and improve conditions for this life stage*."	Provide supporting rationale and/or updated analysis as appropriate. Ultimately, NMFS will draw own effects conclusions.	
18	Biological Modeling	Biological modeling needed to support the effects analysis	The lack of biological modeling limits our ability to assess magnitude of effects. One major gap is non-use of the winter-run life cycle model	NMFS SWFSC is carrying out the WR life-cycle modeling. ICF conducting additional modeling. Cathy Marcinkevage is coordinating this with SWFSC and Katrina Harrison at Reclamation.	
19	Figures	Interpretation of standard flow figures	For example, in Figure 5.6-8 on p. 5-16: How are error bands determined? Does "Long-term	Reclamation to clarify.	

[1] For example (p. 5-17) "Therefore, all potential adverse effects of low flows on Winter-run Chinook Salmon spawning and incubation listed above are expected to be much less severe under the proposed action or COS than under the WOA."

			average" mean over all years in the CALSIM record?		
	Southern Resident Killer Whale	Southern Resident Killer Whale			
20	Southern Resident Killer Whale Analysis	Analytical Needs	No quantitative estimates of fall-run Chinook production in the Central Valley or Trinity in the PA or other scenarios; these estimates are necessary to assess how the prey base is affected by the PA.	Estimate Chinook salmon production under the PA with support from Reclamation staff	
	Shasta/Sacramento	Shasta/Sacramento			
21		Seasonal Operations	What are the assumptions that went into the baseline modeling?	Provide additional detail.	
22		Shasta Cold Water Pool Management (p. 4-27)	No specific effects provided on results under 4-tiers of cold water management, including examples of duration of 56 at CCR. Not sure what is happening in Tiers 2 and 3. Is "Model II" from Anderson 2018 what is used as "the Anderson model"? The insufficiency in this section is that here is not enough information to determine how often (% of years) Reclamation expects to be in a particular "tier" (There is some information in Appendix D from which to infer based on historic occurance of a particular water-year-type but that is all). Although the % of years in a tier is described on page 5-20 (based on total storage May 1, 1922-2003: (tier 1 = 69%, t2 = 17%, t3 = 7%, and t4 = 8%), this does not necessarily reflect future conditions.	Provide additional detail.	

			Given that there is no provision in PA to build storage to meet any targets, how is this brought into the modeling and analysis?		
23	Spring pulse flow	Spring pulse flows (p. 5-41)	No description % or # of years where Reclamation would expect to satisfy the constraints regarding implementing a spring pulse flow.	Provide additional detail.	
24	Shasta Dam Raise	Shasta Dam Raise (p. 5-52)	Hard to understand the various models compared here -- CP4, CP4A, Full Obligation, and how they relate to the COS and PA. Seems like the PA modeling results are used throughout rest of effects section, so assumed flows/temps may not be consistent throughout. How does the revised COA fit into the various runs?	Provide additional detail.	
25		5.6.4 (Effects of Conservation Measures)	This whole section should be organized around an adaptive management framework, where Reclamation identifies a particular management/science uncertainty and then defines a range of relevant operations that will be tested to reduce that uncertainty. Once the range of operations is defined reclamation may then provide the expected range of effects. This is not the case here.	NMFS recommends a commitment to use the adaptive management framework agreed to by the five agencies for CWF.	
26		Appendix D (4.3 HEC5Q PA assumptions)	It is unclear from the description of Shasta temperature management assumptions under the PA, if the "tactical approach" was actually modeled? No details on how temperature schedules were updated to match the strategy identified in the PA.	Provide additional detail.	
27	Figures	Interpretation of Cold Water Capabilities figures (p. 5-19 to 5-20).	For example, in Figure 5.6-10 on p. 5-19, what are the yellow dots? To tell which tier would be implemented, need to "subtract the outflow from	Reclamation to clarify.	

			the inflow, correct? Are all results on 5-19 to 5-20 from the PA scenario?		
	Trinity				
28	Seasonal Operations (p. 5-447 to 5-449)	Temperature modeling outputs	No temperature modeling for compliance locations. Only Lewiston temp modeling provided. Lesiston is not a compliance point, nor does it provide insight into rearing habitat or adult migration conditions in the river. Results of temperature modeling at Douglas City and North Fork-Helena are needed	Provide additional detail.	NMFS and Reclamation may have lined up some RBM-10 modeling which would provide the necessary information
29	Seasonal Operations (p. 5-447 to 5-449)	Modeling	No habitat modeling or fish production modeling for SONCC coho salmon. Without one or the other can't estimate population effects and associate the proposed action with effects to the species, or use habitat as a surrogate.	Provide additional detail.	
	Stanislaus	Stanislaus			
30	Appendix D, Attachment 3-1, 3-2, and 3-4	All Stanislaus River-related COS results	COS flow requirements are implemented based on the New Melones yeartype. However, all COS results (storage, flow, temperature) are summarized based on the yeartype defined by the 60-20-20 Index (the method in the PA). These 60-20-20 yeartype bins for the COS results do not accurately capture the modeled operations. For example, The Critical year bin in the COS results might include years in which the modeling implemented the Dry or Below Normal year schedule, because the 60-20-20 Index was Critical while the New Melones yeartype was Dry or Below Normal. Additional information is needed to (a) summarize	Provide additional detail or direct NMFS to where the information can be found.	

			the observed flows in the COS scenario based on New Melones yeartype, and (b) some sort of crosswalk to compare yeartypes for all years in the CALSIM record according to the two yeartype determination methods.		
	Bay-Delta				
31	Flow effects to rearing/outmigrating salmonids	(p-5-42)	BA states "The SST concluded altered 'Channel Velocity' and altered 'Flow Direction' were the only two hydrodynamic mechanisms by which exports and river inflows could affect juvenile salmonids im the Delta", and provides a version of Figure 2-2 from p. 5 of the SST report. This completely mischaracterizes the SST's conclusion and ignores the identification of diverse effects pathways on pages 4 and 6 of the SST report.	One example of how NMFS may have different interpretations of reports.	
32	5.6.3.4.1.1 Rearing to outmigrating juveniles in Bay-Delta - Entrainment (winter-run)	(p. 5-43 to 5-44)	Qualitative assessment using the modeled average exports over 3-4 month blocks from Cal Sim for the Dec-Feb and Mar-June periods of entrainment. The export rates were then inputted into the Zueg/Cavallo entrainment model to generate a range of entrainment values based on WR population percentages without providing the actual values. The effects assessment concludes that entrainment under the PA will go up compared to the COS, but that the restrictions to exports based on the population cumulative loss will be protective by limiting the OMR flows to no more negative than -3500 cfs for the remainder of the season (50% of take limit). Section doesnot describe how much additional salvage and loss will occur compared to the COS. It also mistakenly infers that this is a salvage metric rather than a loss metric for WR.	Provide additional detail.	
33	5.6.3.4.1.2. Routing (of	p. 5-45 to 5-46	Qualitative assessment of routing and survival based on the "overlap" figures in Appendix H.	Provide additional	

	WR in the Delta)		This section does not provide the actual numbers or magnitude of routing / survival estimates based on the differences in velocity, which would help in assessing potential additional (or reduced) take for the proposed project with a quantifiable metric. Discrepancies between values for % overlap in text and figures in appx. H, differences may be greater than reported in text. Using the survival models for acoustic tagged fish (i.e., work by Perry and others), survival estimates for these channel reaches and routing could be generated giving a more quantitative evaluation of survival due to routing and velocity changes related to the differnt actions.	details. Some entrainment modeling could be done using USGS model?	
34	5.6.3.4.4.3 Through Delta Survival - WRCS		Section describes through reach survival as a function of the channel velocities in the mainstem Sac River between Walnut Grove (DCC gates) and upstream near Sutter/Steamboatboat sloughs using DSM2. The percentage overlap of channel velocities was used as a surrogate for the differences in survival between WOA, COS, and PA.	Using the calculated channel velocities from DSM2, it should be possible to calculate the changes in survival rates for these reaches, which then gives a quantitative comparison rather than a qualitative one, such as reach survival changes "x" percentage in a wet year type between the WOA and the PA, or between the PA and COS scenarios.	
35	DCC5.6.3.5 Delta Cross	Lack of modeling	PA states that Reclamation will make final	Provide additional	

	Channel Operations (WRCS) -- p. 5-47		determination for gate closures to protect fish following their risk assessment, which could lead to more WR lost earlier in the season due to gates remaining open longer based on Reclamation's discretion. Reclamation has not provided any details regarding the procedure for their risk assessment process. Have not seen any modeling results to indicate that impacts to emigrating listed fish will be equivalent or different to what was in the 2009 opinion. Have not seen the results of any hydrodynamic modeling indicating how operations of the DCC gates will alleviate any water quality issues in the interior or southern Delta when exceedances of the water quality standards has been forecasted to occur. Reclamation has increased the time to make gate closures from 24 hours to 48 hours - this needs explanation and a risk assessment for how much additonal risk listed fish will see with an additional day of delay in gate operations. Should also include the aspects of the lower Mokelumne RIver attraction flow operations as this is new to the DCC operations.	details.	
36	Suisun Marsh Salinity Control Gates Operation*	(p. 4-55 and A-130)	If water from the managed wetlands is discharged to Suisun Bay and surrounding waters, how does this impact water quality, including DO, P, N, and any contaminants from the wetlands such as herbicides or mercury? How will the boat locks reoperation impact listed fish moving through the Sacramento River adjacent to the locks. Most of these elements were only described in cursory fashion without any scientific support or	Provide additional details.	

			analysis provided in the description. If scientific studies are available, then that information should be provided with the project proposal. For example showing how flows through the restored ship locks at the upper end of the Sacramento DWSC might affect flows in the DWSC over the year with the gates in both the open/closed positions, and how Sacramento mainstem conditions may be impacted during those same operations. This could help inform how flows/velocities might change in each channel and how survival may be altered based on flows and velocity factors.		
37	5.6.3.11 OMR Management (WRCS)	Beginning on p. 5-51	Very qualitative assessment of entrainment for the effects analysis with no "numbers" given. No comparison between the different operational scenarios provided. No justification or evidence provided for the conclusion that the PA will be "similar or less" to the COS. Where are effects due to storm flexes described?		
	5.6.4.12 Clifton Court Predator Management (WRCS)		Very minimal analysis. No description as to how this will be done, when it will be done, and what level of predator control is targeted.		