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Sent: Wednesday, April 10, 2019 11:46 PM
To: Evan Sawyer - NOAA Affiliate
Cc: Garwin Yip
Subject: Shasta Section Review

Evan --

Here are some initial thoughts on the Shasta section given recent activity. More as I go through it Thursday (but don't hold off on anything).

I wasn't sure if you were working on it and didn't want to have version issues, so put comments in here. I can add them to the doc sometime if that is easier for you. Just give me 30 mins and I'll pop them in!

I think I "see" the "structure" that Maria was envisioning:

1. Here is the deconstruction action.
2. Here are the conceptual models (SAIL) of how physical/outside drivers, which are affected by the action, affect the species in this part of the valley.
3. Here's what we know about relationships between some of these drivers and each other (storage relates to flow relates to temperature management)
4. (For each section/component) Here's how we analyzed, but also the things that we noted were missing and therefore are making assumptions about or are simply describing here so that it clearly identifies the uncertainty and lays out the logic behind what we say subsequently.

She had a good point that we are writing for a judge. Keep that in mind when thinking how to lay out the argument.

Some specifics

SAIL Figures. (p 7) Can be in an "intro" section to the component to lay out logic of why we are looking at this the way we are. Inserting them with very brief explanations and the statement that "These published conceptual models are the basis for our analysis of effects of the action on the species and, especially when there is uncertainty or lack of detail in description of the project component, serve as the framework for our assumptions."

Bottom of p. 7 (• (Bulleted additions) Reclamation provided a partial comparison of the COS to the PA to describe the differences in project components in table 4-1 of the BA.) Yes. I think this is getting at it.

Top of p. 8 (• (Bulleted additions) Include a paragraph (each?) for the RPA actions) I don't think a paragraph for each is needed. Maybe a few sentences on the key ones, or a few sentences on each of a few groups. I can look into and help with this more. I also think we should say "these are RPAs you missed" but instead frame it as "Given our conceptual model of stressors and effects, NMFS will also consider the effects of the following, which were not explicitly captured by the PA description and/or modeling."

Middle p. 13 (A.adverse effects of operations on dampening natural spring hydrographs - - describe these effects and compare to an unimpaired hydrograph) Your outline response to this is to insert description of

spring base flows. I think this can start with figures suggested -- "The hydrograph for Feb-July for COS looks like this (should be able to generate that from Excel files. This differs from a natural unimpaired hydrograph (maybe Derek can dig into this) by shifting blah blah blah and reducing blah blah. For the species, this will mean that blah blah blah." Then, for the next bullet (B, adverse effects of early releases in April – early July ...), discuss what these shifts mean generally in terms of availability of water for temperature management later in the season. "Because winter-run are spawning may result in presence of incubating redds through November, releases in the early season can inhibit the ability to provide cold water through late summer and into October, when air temperatures typically being to decrease." Then, as a next step, you can take it down to specifics for this project. "Modeling of the COS shows that in X % of years, over Y% of the redds are exposed to temperatures above 56.5F DAT, which results in Z% mortality due to increased temperatures." (Or something like that -- I'm kind of writing hypothetically.)

P. 13 reference (this gets at why it's important but not what the effects are?) Ok, I get this. Here's the takeaway: We aren't just writing effects. We are writing out the foundation and framework of our understanding of drivers and responses. This will dictate our interpretation and understanding of any quantitative result, and whether that suite of results, be it a large suite or small suite, characterizes (to us, based on our foundation and framework of drivers and responses) accurately the effect of the action on the species. We need to identify what we believe, and why we believe it, and then describe how what we believe "interprets" the results to assess the species effect. This is very much writing it for the court, but that's the approach we are to take with this consultation (and others).

p. 19 • ((Bulleted additions) With regard to Reclamation's first method of controlling temperatures below Shasta). yes. I think this is the type of thing we need -- "here's the science to show what we know that will make us want to look into this. now we analyze the results and show that the modeling puts those results in a place of concern."

Time to stop. I'll keep thinking on this to be sure we can all provide you with what you need to beef up the parts that need it.

Thanks-
Cathy