
From: Garwin Yip - NOAA Federal <garwin.yip@noaa.gov>
Sent: Friday, June 7, 2019 11:21 PM
To: Evan Sawyer - NOAA Federal
Cc: Howard Brown - NOAA Federal; Cathy Marcinkevage - NOAA Federal; Barbara Byrne - NOAA Federal; Naseem Alston - NOAA Federal
Subject: Re: Confirming Shasta Temperature management ITS approach

Evan,

It's obvious that you've done a lot of thinking on this, and researching the 2009 BiOp ITS to compare and contrast. As you know, we discussed this morning, so hopefully my responses, in **red**, are consistent with what I said!

-Garwin-

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On Thu, Jun 6, 2019 at 4:28 PM Evan Sawyer - NOAA Federal <evan.sawyer@noaa.gov> wrote:

Hi all,

Short version: Is everyone OK with identifying the take limit for Shasta temperature operations using a similar method to what was taken in '09 (take limited by a TCP set by the SRTTG and incorporated into Reclamation's temperature management plan)? **No**

Long version: I spoke with Naseem about developing take for the PA action components in the Shasta/Sacramento Division and I was planning to start with the temperature management tiers. I think what would work best is to follow a similar approach to the one we used in '09: where we would limit take based on Reclamation's proposed operations and where take would be exceeded if temperatures exceed those identified in Reclamation's plan. The biggest issue I see tying take to Reclamation's annual operations plan is that I think Reclamation would bristle at the idea that deviations from the plan would be take? **Correct**. How is this currently resolved? **It's not. We "make" Reclamation "consult" with us, but don't wave the ITS in their face.** I know there have been instances where they haven't met temperatures but according to the '09 opinion I think that constitutes take? **Correct, but in 2009, if I recall accurately, we used habitat as a surrogate for take.**

I had initially thought to use the Calsim/HEC5Q modeling results to identify, for each tier and species, the "proportion of time above a specific temperature threshold" to be more specific but to not go so far as to identify a temperature dependent mortality or proportion of a population. I found this approach to have some unavoidable "Cons" though.

The Pros: **I note that most of these bullet points are true, but not without caveats, so conditional.**

- It's more specific to our analysis and in some cases could offer Reclamation more flexibility in operations since it's more of a clear "limit". **I suggest including a row in the take table for this line of thinking, and maybe include the CalSimII model results for each tier proportion, but keep it as a placeholder pending current discussions on performance measures. In addition, we need to figure out how the proportions can be implemented in 10 years (e.g., 7% of years in tier 4 means we can't have one, unless we make it 10%).**
- The Calsim modeling provided the expected frequency each tier would occur which is a critical component of what overall take is expected. **Possibly, but with the caveat that the CalSimII modeling spans an 82-year record, so absorbs highs, lows, and multiple years of each. For example, the drought years of ~1927-32 were part of the tier frequency results, but cannot be considered in the 2020-2030 duration of the BiOp. We need to think about how this could be applied. Also, see response, above.**
- We've already presented the Calsim/HEC5Q results in the effects section in the summary tables as a surrogate for proportion of population (rather than the TDM results which incorporate spatial and temporal variability, but only for WR). This means the quantitative "work" is done. **True, but incidental take doesn't have to be quantity (amount), it could be extent or surrogate.**
- Using the Calsim/HEC5Q results would allow for a consistent approach across species (rather than mortality results which are specific to WR only). **True, but it's best available and most appropriate, so if it's most appropriate to use TDM for WR, but we don't have data for SR, so be it. We can use something else.**
- Using the CalSim/HEC5Q results avoids some compounding error (and assumptions) of modeling results based on modeling results based on modeling results (Calsim --> HEC5Q --> Martin/Anderson TDM models). **True, but that's the nature of the modeling world, and we should not shy away from using the TDM models because of that because it does get closer to biological effects.**
- Reclamation should be 'comfortable' with this approach as they tend to say that the HEC5Q results over-estimate temperature exceedences that would otherwise be avoided through real-time/daily operations (it should be within reclamation's ability to avoid exceeding the take). **True, except Reclamation continues to claim that they didn't propose tier frequency, so I would say that despite the latter part of the statement, they're not comfortable with hardwiring tier frequency, either.**

Essentially the "Cons" identified below make using the specific Calsim modeling results difficult and they illustrate why a simple approach tied to Reclamation's annual plan is maybe all we can do:

- Using the modeling results is problematic in Tiers 2, 3, and 4 because modeling does not capture the PA approach **What's the PA approach? The words in the proposed action, as opposed to the modeling?** (but we didn't analyze it either). Modeling assumes Reclamation will try and meet a temperature target of 53.5 at CCR for as long as possible, while the PA is more dynamic **True**. Also in tiers 3 and 4 there is no expectation of even meeting 53.5, so take based on how often 53.5 is exceeded is a set up for failure. **But contrary to the "con," above, we could establish the limit for take to be the mean, average, or maximum of the modeled TDM for a given tier. For tier 3, Reclamation can operate to 55.9 throughout the temperature management season and result in close to 100% TDM, which is considerably higher than the model results indicate, because that type of tier 3 scenario is probably not reflected in any year in the hydrologic record, so Reclamation can exceed take for tier 3 even though we expect tier 3 years to happen.**

- This issue was resolved in '09 by having take limited by the TCP which is established by the SRTTG (temp and location). **But in 2009, the TCP could move upstream, whereas here, the PA doesn't propose a different TCP besides CCR.** We could do this again relying on operations described in Reclamation's temperature management plan **We don't know what that is now, though.** but that will only include *information* from the SRTTG and it remains Reclamation's discretion? **Correct, big difference between 2009 and now.**
- In '09 we also identified not meeting the performance metrics as exceeding take. Should we do this again? **It depends on where the current discussions take us. Based on one of the LOBO review comments, we didn't pursue Reclamation's compliance with those performance metrics. Specifically, (1) if we couldn't meet a Bend Bridge in 2011, when could we? and (2) on a 10-year running average, how can we meet a metric of 15%?** As we develop the performance metrics there's been a lot of discussion of "charting an independent panel", so I'm not sure how that would "fit" with the performance metrics being used as a take limit? **Head scratcher.** Maybe the performance metrics could be used if take were described as exceeded when "operations were found to be inconsistent with the performance metrics" which may be a question for the independent panel? **That seems circular, but we need to quantify the amount or extent of take now, rather than after a given peer review process.**

Could there be a combo-approach where the take limit is set based on 1) the frequency of tiers described in the modeling, and 2) Reclamation's summer temperature management plan, and 3) some form of "consistency" language related to the performance metrics? **Yup.**

Any thoughts or concerns? Were we litigated on the '09 approach that I'm proposing in part to emulate? **Not that I remember**

Thanks,
Evan

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