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**From:** Howard Brown - NOAA Federal <howard.brown@noaa.gov>  
**Sent:** Thursday, April 25, 2019 2:49 PM  
**To:** Evan Sawyer - NOAA Federal  
**Cc:** Sarah Gallagher - NOAA Federal; Barbara Byrne; J. Stuart; Cathy Marcinkevage; Garwin Yip  
**Subject:** Re: Uncertainties

I think uncertainties regarding effects are the main thing that I am looking for. I think that there are really three tiers to choose from with the first probably being the top priority (sorry Evan, no 4th tier)

1. Uncertainties in how a species or habitat would actually respond to an actions.
2. Uncertainties related to process for decision making
3. Uncertainties related to scientific understanding or interpretation of science

Hope that helps.

Howard

On Thu, Apr 25, 2019 at 2:33 PM Evan Sawyer - NOAA Federal <[evan.sawyer@noaa.gov](mailto:evan.sawyer@noaa.gov)> wrote:  
Hey Howard,

I have a question regarding the type of uncertainty you're looking for? I don't know about other Divisions but in the Sacramento River there are 2 types of uncertainties: uncertainties related to the way the PA is (or isn't) described (operational uncertainty?), and uncertainty as to what effects are?

Using the proposed spring pulse as an example, that project component has both types of uncertainty.

- First, it's uncertain when Reclamation would implement a pulse because of the caveats to implementation and whether a spring pulse would cause "Reclamation to drop into a lower Tier of the Shasta summer temperature management or interfere with the ability to meet other anticipated demands on the reservoir."
- Second, it's uncertain as to the effect of the spring pulse. There is the indication that a spring pulse would benefit outmigrating juveniles and there is a study proposal to look at these effects but there is still uncertainty.

I think the second uncertainty, the type that would benefit from adaptive management, is what you're looking for?

Thanks,  
Evan

On Thu, Apr 25, 2019 at 2:03 PM Howard Brown - NOAA Federal <[howard.brown@noaa.gov](mailto:howard.brown@noaa.gov)> wrote:  
Sorry for this late-in-the-day request, by I am hoping you folks might be able to pull together a short list of key uncertainties from your effects analysis drafting. I am meeting with Reclamation and FWS tomorrow to discuss adaptive management and it would be more than helpful to get your latest views on uncertainty. I suggest now more than key uncertainties per division. Short bullet points would be perfect. COB today would be ideal!  
Thank you!  
Howard

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