

---

**From:** J. Stuart - NOAA Federal <j.stuart@noaa.gov>  
**Sent:** Thursday, April 25, 2019 4:04 PM  
**To:** Howard Brown - NOAA Federal  
**Cc:** Evan Sawyer - NOAA Federal; Sarah Gallagher - NOAA Federal; Barbara Byrne; Cathy Marcinkevage; Garwin Yip  
**Subject:** Re: Uncertainties

Here is a list of my key uncertainties for the Delta Division:

- Frequency of future water quality conditions that would warrant opening of the DCC gates in December and January. We assumed that the future would look like the past as far as the frequency of water quality exceedances of the modeled thresholds. This may not hold true given changes in climate, and future operations of reservoirs and the Projects.
- Development of the trigger thresholds for spring-run and steelhead for the OMR management proposal. We do not have an estimate of annual spring-run cohort population to base a trigger on, and it is quite uncertain whether a viable surrogate can be developed that would be protective of spring-run. The same uncertainty exists for natural steelhead. In order to have a population based index trigger, we would need to have a better understanding of the two populations and their annual juvenile production.
- The uncertainty surrounding the impacts of the increased April and May export levels. The effects may not be as straightforward as modeled, and may be compounded by the changes in the local hydrodynamics created by the increase in exports.
- Vulnerability of San Joaquin River steelhead to the effects of not having a HORB in place during the emigration period. The modeling done by Buchanan (2019) is based on only a few years of data during drought years, but shows a consistently lower survival rate w/o the HORB in place for all flows modeled. How might this change with different water year types and export levels?
- Overall uncertainty to the effectiveness of the proposed OMR management actions - in my opinion the actions would reduce the protections already in place from the 2009 opinion and would increase the level of risk from project effects to exposed fish, reducing the probability of survival. Instead of being protective, the management proposal leads to more risk and loss.
- Impacts to fish passage, particularly for Southern Sierra Nevada Diversity Group steelhead, sDPS green sturgeon, and the San Joaquin River experimental population of spring-run in relation to the installation of the south Delta agricultural barriers for both juvenile and adult life stages. We particularly do not know the impacts to adult passage in relation to the barriers.
- Uncertainties related to the implementation of the PA where the description of each project element is vague. For example the restoration of 6,000 acres of tidal habitat - we don't know where this will occur, what the success metrics will be, and how we will monitor the effectiveness of the restoration. Likewise, it is very unclear how Reclamation and DWR will make their decisions regarding the "risk assessment" for implementing protective actions and how the services and CDFW will be involved.

On Thu, Apr 25, 2019 at 2:49 PM Howard Brown - NOAA Federal <[howard.brown@noaa.gov](mailto:howard.brown@noaa.gov)> wrote:

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

--

**Howard L. Brown**

*Policy Advisor*

*NOAA Fisheries, West Coast Region*

*U.S. Department of Commerce*

(916) 930-3608

[Howard.Brown@noaa.gov](mailto:Howard.Brown@noaa.gov)



[www.westcoast.fisheries.noaa.gov](http://www.westcoast.fisheries.noaa.gov)

--

**Evan Bing Sawyer,**  
Natural Resource Management Specialist  
*NOAA Fisheries West Coast Region*  
*U.S. Department of Commerce*  
Office: (916) 930-3656  
[Evan.Sawyer@noaa.gov](mailto:Evan.Sawyer@noaa.gov)  
[www.westcoast.fisheries.noaa.gov](http://www.westcoast.fisheries.noaa.gov)



--

**Howard L. Brown**  
*Policy Advisor*  
*NOAA Fisheries, West Coast Region*  
*U.S. Department of Commerce*  
(916) 930-3608  
[Howard.Brown@noaa.gov](mailto:Howard.Brown@noaa.gov)



[www.westcoast.fisheries.noaa.gov](http://www.westcoast.fisheries.noaa.gov)

--

**Jeffrey S. Stuart, M.S.**  
*Fishery Biologist*

*NOAA Fisheries West Coast Region*  
*U.S. Department of Commerce*  
*California Central Valley Office*  
*650 Capitol Mall, Suite 5-100*  
*Sacramento, CA 95814-4706*

Office: 916-930-3607  
[J.Stuart@noaa.gov](mailto:J.Stuart@noaa.gov)



**Find us online**

[www.westcoast.fisheries.noaa.gov](http://www.westcoast.fisheries.noaa.gov)

