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**From:** Dan Lawson - NOAA Federal <dan.lawson@noaa.gov>  
**Sent:** Monday, April 22, 2019 8:17 AM  
**To:** Barbara Byrne - NOAA Federal  
**Cc:** Garwin Yip - NOAA Federal  
**Subject:** Re: Southern Resident effects and I&S

This is where I have to turn right back and ask salmon biologists and those who know this system well enough what would help fall-run, as well as the other Chinook populations, the most. As best I can tell, water temperatures and Delta survival are the largest stressors. I think it's good that hatchery fish are trucked around the Delta, but that only gets you so far (and is a lot of work to continue). Improved Delta survival would help both natural and hatchery. What might be interesting is to look at some of the other stressors that are not included in the models used for production outputs. It isn't clear to me that entrainment/salvage is directly modeled there, and I think I understand this stressor would increase under the PA due to certain operational changes. I think I understand spring-run entrainment/salvage is going way up in particular? Although I hadn't focused on them yet, but I'd be looking at measures to help them too given their role in diversity of Chinook resources and their potential to concentrate prior to running in the winter/spring when Southern Residents are most likely to be in the Southern portion of their range and a little more northerly distribution.

Dan

On Sun, Apr 21, 2019 at 7:29 PM Barbara Byrne - NOAA Federal <[barbara.byrne@noaa.gov](mailto:barbara.byrne@noaa.gov)> wrote:  
Dan -- I am pulling together a list of "stressor minimization measures" to send for internal review on Wednesday. In many cases, any measures we list for listed species may help fall-run as well, but do you have any specific suggestions in relation to SRKW?

On Fri, Apr 19, 2019 at 5:25 PM Dan Lawson - NOAA Federal <[dan.lawson@noaa.gov](mailto:dan.lawson@noaa.gov)> wrote:  
Greetings all

I just wanted to let you know I have placed updated drafts of the effects analysis and Integration in appropriate ROC folders. While the drafts are complete, there are some outstanding questions identified by my comments that would be helpful to get input on from CV salmon folks and the group here. To highlight:

1. I have been tracking the hatchery question, and the last I saw Nimbus is not part of the proposed or interrelated/interdependent actions. These drafts reflect this. Any change to this aspect has relevance here.
2. I have some questions regarding relative characterization of some of the big stressors between ESA-listed Chinook ESU and non-listed. At the moment, I generally consider the main stressors for the listed Chinook to be similar in the scope and scale of their effects to non-listed Chinook. But I have set the table to offer any further clarification of that in the effects analysis as i could imagine there might be some important differences in either direction worth noting. This would also be very important for me to understand to think about the next sections of the opinion that would follow.

I am not quite sure what my next step is. While I know that I will have Penny review things asap/simultaneously with other reviews, I don't think I would want to start that until we have talked about these questions and the overall state of affairs regarding the review. I'll be standing by for further orders.

Dan

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